



UNIVERSITY OF
LIVERPOOL

School of
Environmental
Sciences

POSTGRADUATE RESEARCH CONFERENCE 2023



THE ORIGINAL

REDBRICK

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Locations:

Day 1 - Hilton Liverpool City Centre (The Grace Suite)

Day 2 - University of Liverpool Central Teaching Hub (CTL-4-FLEX)

Event link:

<https://www.liverpool.ac.uk/environmental-sciences/events/pgr-conference/>

Registration link:

<https://www.liverpool.ac.uk/environmental-sciences/events/pgr-conference/registration/>

Voting link:

<https://www.liverpool.ac.uk/environmental-sciences/events/pgr-conference/vote/>

Zoom link to join virtually:

Topic: PGR conference day 1

Time: **May 15, 2023 08:00 AM London**

Join Zoom Meeting:

<https://liverpool-ac-uk.zoom.us/j/95623180295?pwd=eTh3c2ZqZ3g3R2xmdGd0WFczRUV5Zz09>

Meeting ID: **956 2318 0295**

Passcode: **0#J9mrj=**

Welcome from PGR Director

We are happy to welcome you to our Annual PGR conference, an event that has been a milestone in our School since its creation. Previously, this conference was embedded in our PGR annual progression. Now, it is an event that brings us together, from different disciplines, to learn from each other and showcasing the exciting research undertaken across the school.



On behalf of the PGR committee and myself, I deeply thank the organising committee for their time, effort and creativity in managing our SoES PGR conference 2023. The first day, Monday, is dedicated to talks and posters, at a venue outside of our campus, the Hilton Hotel. To expand the reach of our PGR community, we have enabled remote access to the entire Day 1 program via Zoom link. This means that PGRs and academic staff can present and attend the program from wherever they are located. On Tuesday, we will reconvene on campus, and this day will be dedicated to panel discussions on different topics.

Looking forward to seeing you all at the conference.

Dr Fabienne Marret-Davies
SoES PGR director

Postgraduate Research Conference Organising Committee

Dina-Leigh Simons
Ella Bytheway-Jackson
Chloe Gray
Belinda Aulia
Meghan Grant
Mohammad Meidiansyah (Medi)
Millie Goddard-Dwyer

PGR Committee

Dr Fabienne Marret-Davies
Prof Andy Biggin
Dr Samantha Patrick
Dr Ruth Cheung-Judge
Prof Andy Morse
Dr Chia-Lin Chen

Professional Services Support

Student Experience

Claire Rimmer
Miles Carlyle-Neve

Management Services

Lindsay Davies
Artemis Mermigki

Marketing and Communications

Jamie Hughes
Alison Barkley

Postgraduate Research Conference Organising Committee 2023

Dina-Leigh Simons

dina-leigh.simons@liverpool.ac.uk

Dina is a second-year PhD student in the Department of Earth, Ocean and Ecological Sciences as part of the ACCE DTP. Her work focuses on how climate change is impacting coastal communities using molecular methods and big data. More broadly, her research interests include macroecology, conservation, and global change. She also enjoys teaching within the department and communicating her science through social media.

Ella Bytheway-Jackson

E.Bytheway-Jackson@liverpool.ac.uk

Ella is a third year PhD student in the Department of Geography and Planning. Her research explores the development of children's services in the late nineteenth and early twentieth century Poor Law system using archival data from the Birkenhead Union. Her research interests include social exclusion and inequality, children's care, education and welfare provision. She is a member of the advisory board for the RGS-IBG Carceral Geography Working Group. She also enjoys teaching, political education with the annual festival The World Transformed and volunteering as a School Governor.

Chloe Gray

C.Gray4@liverpool.ac.uk

Chloe is a second year PhD student in the Department of Geography and Planning. Her research investigates the physical and chemical properties of maritime derived particulate matter which enable it to be tracked as it flows through an urban

environment. She also enjoys getting involved in teaching and is an active member of the University Canoe Club.

Belinda Aulia

Belinda.Aulia@liverpool.ac.uk

Belinda is a third-year PhD student in the Department of Geography and Planning. Her research investigates the challenges of managing urban growth inside metropolitan areas, as seen by the appearance of urban sprawl in suburbs and the resulting huge agricultural conversion. Her research uses an institution as a theoretical lens to investigate how structure and agency interact in the context of decision making in planning permission and the planning process. She also enjoys teaching, cooking, and serving on the executive board of DOCTRINE (Indonesian PhD Association in the UK).

Millie Goddard-Dwyer

Millie.Goddard-Dwyer@liverpool.ac.uk

Millie is a third year PhD student in the Department of Earth, Ocean and Ecological Science researching the interaction between carbon, trace metals, and microorganisms in the ocean using microbiological and analytical chemistry methods. She enjoys going to sea for months aboard ships for her research and exploring nature in her spare time by hiking and running.

Meghan Grant

Meghan.Grant@liverpool.ac.uk

Meghan is a 1st year PhD in Human Geography. Her PhD title is Fatness and

the Urban Environment: A study of fat experiences through the lenses of racism, Class and Health. She aims to understand the way fatphobia, racism, and classism intersect with the way that cities function in a UK context. Meghan graduated in sociology from the University of Leicester in 2013 and got a master's in social and public policy from the University of Leeds in 2016. After taking a break from studying to work as a Researcher in London, she has moved back up North to do her PhD. She also hosts Bending Boundaries, a Podcast about Equality and Diversity within PhDs.

Mohammad Meidiansyah (Medi)

M.Meidiansyah@liverpool.ac.uk

Medi is a second year PhD student in the Department of Geography and Planning. His research titled 'Does participatory budgeting matter in rural development in Indonesia? Lesson learned from the Indonesian Village Fund'. The study's main purpose is to examine the participative decision-making process that identifies rural stakeholders' preferences and needs. He is also currently working as a civil servant in Indonesia.

CALL FOR VOLUNTEERS!

POSTGRADUATE CONFERENCE ORGANISATION COMMITTEE 2024

The PGR Conference would not be possible without the student organisation committee.

We need you to be involved in organising the event next year!
Please email envspgr@liverpool.ac.uk if interested.

This year's organisation committee can also be contacted if you have any question about what the role involves.

Dina: dina-leigh.simons@liverpool.ac.uk

Chloe: c.gray4@liverpool.ac.uk

Ella: e.bytheway-jackson@liverpool.ac.uk

Meghan: meghan.grant@liverpool.ac.uk

Belinda: belinda.aulia@liverpool.ac.uk

Millie: millie.goddard-dwyer@liverpool.ac.uk

Speaker statements – Panel session 1 (Making change with research)

Dr Grzegorz Muszynski

Postdoc for Climate Processes Group at the University of Oxford

Grzegorz Muszynski is a computer scientist who works at the interface of machine learning, deep learning, and climate science. Grzegorz is currently a postdoctoral researcher in the sub-department of Atmospheric, Oceanic and Planetary Physics at the University of Oxford. Prior to joining Oxford, he was a data scientist in the Artificial Intelligence Lab at the British Antarctic Survey in Cambridge. He graduated with his PhD in Computer Science from the University of Liverpool, and he carried out his PhD research work at the Lawrence Berkeley National Laboratory, Berkeley, California in the US. His current research focuses on the development of machine learning emulators of cloud models to improve our understanding of aerosol-cloud interactions. Grzegorz enjoys reading books, travelling, and experimenting with cooking in his free time.

Prof Stefano Mariani

Professor of Marine Biodiversity at Liverpool John Moores University

Since completing his PhD at University of Rome “La Sapienza”, Italy, in Animal Biology, Stefano has conducted research in over four different universities. Currently based at Liverpool John Moores University, Stefano is a marine ecologist, population geneticist and evolutionary biologist, with an innate fondness for fish. He is interested in studying biodiversity at various organisational levels, with the support of the universal language of DNA sequences. His vision is that his work can contribute to the sustainable management and conservation of Earth. He is also

particularly keen to do everything in his power to facilitate and support access to and enjoyment of marine research for prospective students and early career scientists from less-represented backgrounds.

Dr Viola Ross-Smith

Science Communications Manager at BTO (British Trust of Ornithology)

Viola has been working full-time in science communications since 2015. Before then, she was a seabird ecologist for several years, and honed her communication skills tackling inaccurate coverage of gulls in the media. She holds a BTO C permit for bird ringing. Viola has also worked in campaigns for RSPB, in gibbon conservation in Thailand and in policy for the European Institutions in Brussels. Viola completed her PhD from Cardiff University in 2009. Currently, Viola is responsible for promoting BTO science as well as edits BTO News and helps to manage BTO social media.

Sarah Stamper

Media Relations Manager (Science & Engineering)

Sarah is part of the press team in the Faculty of Science and Engineering at the University of Liverpool. Her role in the University Press Office is to enhance the University’s reputation through the promotion of its world-leading research and innovation portfolio. This involves researching, writing and distributing press releases that promote the University’s work to as wide an audience as possible. She also advises staff on matters relating to the media.

Dr Tatiana Moreira de Souza
Lecturer in Planning

Tatiana Moreira de Souza is a lecturer in Planning, Department of Geography and Planning, University of Liverpool. Before joining the University of Liverpool, Tatiana worked as a lecturer and research fellow at Oxford Brookes University and as a research associate at University College London. Some of the research projects she worked on includes the €6.5 million EU FP7-funded research project DIVERCITIES, during which she gained in-depth knowledge of

issues related to migration, ethnic minority entrepreneurship and the governance of diversity in a European comparative perspective, and on a project led by Professor Claire Colomb, from UCL that investigates the regulatory responses from 12 European cities to the rapidly developing phenomenon of short-term (holiday) rentals, facilitated by online platforms. Tatiana holds a BSc in Architecture and Urbanism from the University of Sao Paulo, Brazil, and a MSc in Urban Regeneration and a PhD in Planning Studies from University College London.



Speaker statements – Panel session 2 (Careers outside of academia)

Dr Nick Rogan

MDM Consultant at PLUS Retail

Nick carried out his undergraduate, masters and PhD in the Ocean Sciences department at the University of Liverpool between 2004 and 2014, before taking a postdoctoral researcher role at GEOMAR (Kiel) in Germany. Nick's studies led him towards the technical side of Ocean Sciences, where he learnt to code in Fortran, C++ and Matlab, and to manipulate datasets and graphically represent data in a wide range of ways. Following the completion of his postdoctoral contract in 2016 Nick was invited to join a data consultancy as an application consultant, where he found leaning on his technical expertise helpful when expected to "learn on the job" alongside the Chief Technical Officer of the consultancy. Nick thoroughly enjoyed this job and was surprised how much of his skillset was directly transferrable to the world of business data in private companies. Businesses behave much like an ecosystem or a chemical solution (e.g., the ocean), with sources of data, sinks (consumption) of data and processes that transform the data in a myriad of ways. Nick continues to enjoy helping business users to define their problems, establish the priority of their needs, and deliver modifications to their software platforms to make their lives easier.

Dr Jane Turner

Retired Researcher and Consultant

Following a joint honours degree in Biophysics and Zoology, Jane completed her PhD on the lyotropic liquid-crystalline phase-behaviour of dyes and some anti-asthmatic drugs, which in turn led to a spell at Manchester University researching

in optical physics. From there, she was recruited by Unilever to work as a colloid scientist, but quickly moved into the newly formed Bioscience research unit at Port Sunlight where she had great fun doing fundamental research on stratum corneum and hair. An abrupt change in career path then saw Jane take responsibility for project and risk management in Port Sunlight, and eventually Unilever worldwide. She left Unilever in 2000 to set up her own management consultancy, specialising in planning and risk-managing research. Jane has effectively retired but can be coaxed back for particularly worthwhile projects. Retirement includes being Co-Chair of the Wirral Green Party, a volunteer for Citizens Advice, and the County Recorder (Cheshire) for birds. She has three daughters, a dog, and a passion for Ornithology.

Dr Jamie Halliwell

Qualitative Researcher at Wirral Council

Jamie is a qualitative insights researcher in Public Health at Wirral Council. His work captures the voices of residents on issues such as health and wellbeing, the cost of living and regeneration which contributes to the council's Health and Wellbeing strategy. He graduated in 2022, with a PhD titled "'Party for everybody?': interrogating the shaping of sexual identities through the digital fan spaces of the Eurovision Song Contest" which explored the shaping of sexual identities in the digital fan spaces of the Eurovision Song Contest. He applied digital and mixed research methods using materials including WhatsApp Group Chats and netnography to examine the how fans expressed their sexual and fan identities on social media platforms such as Facebook and Twitter.

Dr Lauren Greehy
Senior Research Executive at Ninth Seat

Lauren completed her PhD in Human Geography at the University of Manchester in October 2021 titled “Making sense of perfume”, contributing to sensual and sensory geographies literature. She specialises in sensory and creative qualitative methodologies with a lens through consumer commodities. In February 2022, Lauren moved into the private sector of market research, joining Ninth Seat where they work directly with clients across the world to better understand the embodied consumer experience to design and optimise the products that enter our everyday lives.

Dr Charlotte Williams
Research Scientist at NOC (National Oceanography Centre)

Charlotte’s research focuses on how physical processes such as mixing impact the distribution of oxygen, nutrients and phytoplankton in our shelf seas, and how we can implement marine autonomous vehicles (AUVs) effectively to measure this. Charlotte completed her MSc in Applied Physical Oceanography at Bangor University in 2009, and her PhD at the University of Liverpool in 2014 and has been working with the NOC’s fleet of AUVs since then. Her current research is focussed on how offshore wind farms could impact marine ecology through changes in mixing, and currently has AUVs deployed in the North Sea to investigate this.



DAY ONE – 15 May, Hilton Liverpool City Centre (The Grace Suite)

09:00 – 09:10 WELCOME FROM PROF DOUG MAIR (Dean)	
09:10 – 10:45 SESSION ONE	
Chaired by: Fionnuala McCully - Earth, Ocean and Ecological Sciences	1h 35m
09:10 – 09:50 Third Year talks (40 minutes)	
09:10 – 09:20	Nourah Alnajdi (Earth Sciences)
09:20 – 09:30	Ella Bytheway-Jackson (Human Geography)
09:30 – 09:40	Martijn Eikelboom (Ocean Science)
09:40 – 09:50	Christopher Russell (Planning, NTHU Taiwan, Online)
09:50 – 10:05 First Year talks (15 minutes)	
09:50 – 09:55	Rose Agbo (Human Geography)
09:55 – 10:00	Scott Akhtar-Lewis (Earth Sciences)
10:00 – 10:05	Lin Ji (Planning, XJTU, Online)
10:05 – 10:45 Third Year talks (40 minutes)	
10:05 – 10:15	Jessie Foest (Physical Geography)
10:15 – 10:25	Millie Goddard-Dwyer (Ocean Science)
10:25 – 10:35	Hui Wang (Human Geography, XJTU, Online)
10:35 – 10:45	Alice Lowry (Ecology/Marine Biology)
10:45 – 11:10 Coffee break (25 minutes)	

11:10 – 12:10 SESSION TWO	
Chaired by: Dr Patrick Ballantyne – GDSL, Human Geography	1h
11:10 – 11:35 First Year talks (25 minutes)	
11:10 – 11:15	Meghan Grant (Human Geography)
11:15 – 11:20	Jennifer Hamilton (Planning)
11:20 – 11:25	Linnet Jessell (Ecology/Marine Biology)
11:25 – 11:30	Bjoern Matthies (Ecology/Marine Biology)
11:30 – 11:35	Cara Mattu (Human Geography)
11:35 – 12:05 Third Year talks (30 minutes)	
11:35 – 11:45	Eve Merrall (Ecology/Marine Biology)
11:45 – 11:55	Ruth Neville (Human Geography)
11:55 – 12:05	Thomas Nichols (Earth Sciences)
12:05 – 13:05 Poster Session (20 posters – 1 hour)	
13:05 – 14:00 Lunch and networking (55 minutes)	

14:00 – 15:20 SESSION THREE	
Chaired by: Natascia Panozzo – Physical Geography	
1h 20m	
14:00 – 14:30 Third Year talks (30 minutes)	
14:00 –14:10	Jack Walker (Ecology/Marine Biology)
14:10 –14:20	Tegan Havard (Earth Sciences)
14:20 –14:30	Qianyou Wang (Earth Sciences)
14:30 – 14:50 First Year talks (20 minutes)	
14:30 –14:35	James Forrester (Physical Geography)
14:35 –14:40	Matthew Mason (Human Geography)
14:40 –14:45	Nicolas Del Canto (Planning, Video)
14:45 –14:50	Samuel Jones (Earth Sciences)
14:50 – 15:20 Third/Fourth Year talks (30 minutes)	
14:50 –15:00	Benjamin Storey (Earth Sciences)
15:00 – 15:10	Zihao Wang (Planning)
15:10 – 15:20	Xin Meng (Ocean Science)
15:20 – 15:40 Coffee break (20 minutes)	

15:40 – 16:30 SESSION FOUR	
Chaired by: Michael Mahony – Geography and Planning	1h 5m
15:40 – 16:05 First Year talks (25 minutes)	
15:40 – 15:45	Trang Thu Nguyen (Human Geography)
15:45 – 15:50	Hannah Jones (Planning)
15:50 – 15:55	Bram Setyadji (Ecology/Marine Biology)
15:55 – 16:00	Umrah Mahadik (Planning, Video)
16:00 – 16:05	Akos Balog (Human Geography)
16:05 – 16:45 Third Year talks (40 minutes)	
16:05 – 16:15	Belinda Aulia (Planning)
16:15 – 16:25	Thomas Fitter (Physical Geography, Video)
16:25 – 16:35	Hannah Slocombe (Human Geography)
16:35 – 16:45	Cameron Ward (Human Geography)
16:45 – 17:00 Coffee break and tallying votes (15 minutes)	
17:00 – 17:30 Close and prizes/awards (30 minutes)	

DAY TWO – 16 May, Central Teaching Hub (CTL-4-FLEX)

09:00 – 10:15 WELCOME AND RESEARCH COMMUNICATION WORKSHOP	
09:00 – 09:15	Fionnuala McCully – Getting your research noticed (10 minutes with 5 minutes Q&A)
09:15 – 09:30	Dina-Leigh Simons – Science and social media (10 minutes with 5 minutes Q&A)
09:30 – 09:45	Meghan Grant – Creating your own podcast (10 minutes with 5 minutes Q&A)
09:45 – 10:15	Activity: Communicating your research (30 minutes)
10:15 – 10:45 PGR forum (Mind-mapping session) (30 minutes)	
10:45 – 11:10 Coffee break (25 minutes)	
11:10 – 11:30 Talk from PGR Journal Editor (15 minutes with 5 minutes Q&A)	

11:30 – 13:00 PANEL SESSION 1 (MAKING CHANGE WITH RESEARCH)	
Chaired by: Ella Bytheway-Jackson – 3rd Yr Student, Human Geography	1h 30m
Dr Grzegorz Muszynski Postdoc for Climate Processes Group at the University of Oxford	
Prof Stefano Mariani Professor of Marine Biodiversity at Liverpool John Moores University	
Dr Viola Ross-Smith Science Communications Manager at BTO (British Trust of Ornithology)	
Sarah Stamper Media Relations Manager at University of Liverpool	
Dr Tatiana Moreira de Souza Lecturer in Planning	
13:00 – 14:00 Lunch break (1 hour)	

14:00 – 15:30 PANEL SESSION 2 (CAREERS OUTSIDE ACADEMIA)	
Chaired by: Dr Pavitra Kumar – Postdoc in Dept of Geography & Planning	1h 30m
Dr Nick Rogan MDM (Master Data Management) Consultant at PLUS Retail	
Dr Jane Turner Retired Researcher and Consultant	
Dr Jamie Halliwell Qualitative Researcher at Wirral Council	
Dr Lauren Greehy Senior Research Executive at Ninth Seat	
Dr Charlotte Williams NOC (National Oceanography Centre) Scientist	
15:30 – 17:30 Pizza and Quiz (2 hours)	

Vivian Ubaku Agbasoga

Environmental Impacts of Telecommunications Masts and Base Station Projects in Nigerian Neighbourhoods: The Role of EIA

Telecommunication contributes 14.3 per cent to Nigeria's gross domestic product (GDP). Despite its importance, residents living near masts and base station projects are apprehensive about their multiplication and associated impacts. These worries raise concerns about minimising risks and amending regulations. This study explores the environmental impacts of telecommunications masts and base station projects in Nigerian neighbourhoods and investigates the role of EIA in their installations. In doing so, it developed a framework of analysis based on international best practices of environmental management and EIA. Data collection was from three sources. Firstly, this study analyses forty (40) EIA reports of completed mast projects to examine EIA practices during their installations. Secondly, the study analyses forty (40) semi-structured interviews with stakeholders and a questionnaire survey exploring residents' perceptions of the mast area. Subsequently, it conducts three (3) case studies and site visit observations to understand the study subjects better and validate interview data. Lastly, this study compares findings against the analysis framework and provides recommendations.

Rose Agbo

Exploring The Nexus Between Energy Access, Energy Poverty, Climate Change And The Gender Perspective

The absence of sufficient choices in accessing sustainable and modern energy services to support economic and human development' is the root of energy poverty (De Groot et al., 2017).

While most poor rural households in Nigeria have strong preferences for sustainable energy, and are willing to transition to clean energy sources, they cannot afford the upfront costs of these energy sources that can move them out of poverty (Nduka, 2021).

This study analyses the role of women as a key resource in the production, consumption, and management of household energy towards addressing energy poverty situations. Women constitute the majority poor, living in rural communities and are disproportionately impacted by climate change and the high rate of poverty because of the special roles they play in households (Aluko & Mbada, 2020).

Though underutilized in the energy service delivery process, women are the mainstream users, and their role is central in the widespread adoption of clean cooking solutions (Abdullahi, 2017).

Scott Akhtar-Lewis***Exploring reactions under stress in the mantle using mineral analogues***

Convection in the mantle controls the geological evolution of the earth. There are different minerals present at different depths within the earth which can be detected as seismic wave velocity discontinuities. These discontinuities at ~410 km & ~660 km separate the upper and lower mantle in a region known as the transition zone. It is well understood how temperature effects the depth of mantle discontinuities, but the effect of stress on mantle discontinuities is poorly understood. This project aims to perform experiments transforming an analogue mineral called olivine into ringwoodite (spinel) under stress to investigate the conditions needed for the reaction and the reaction rate. This will be achieved by analysing small structures that form within the deformed sample of olivine and ringwoodite using a scanning electron microscope. Electron Backscatter Diffraction (EBSD) will be used to measure the orientation of olivine and ringwoodite grains which make up the bulk sample. The patterns of orientation observed will provide an insight into the effect of stress on reaction kinetics.

Claudia Akolam***Women Empowerment and Environmental Impact Assessment in Ghana***

Gold mining in Ghana dates to the colonial era when Ghana was called Gold Coast due to huge gold deposits found in the country. Even though gold mining has been of significant economic benefit to the country, it has also caused serious environmental challenges.

Environmental Impact Assessment (EIA) is crucial for examining the possible impacts of proposed projects and it is one of the measures adopted by Ghana to manage the environmental impacts of mining. Women in Ghana are often more affected by environmental changes because of cultural practices that makes them unable to contribute effectively to discussions relating to land and decision-making. It is important to consider women's perspectives in EIA for ensuring their interests and rights protection. Hence, this research argues that considering women's perspective in EIA in the gold mining sector is relevant to ensure a gender inclusive EIA that meets the needs of all affected persons.

Nourah Alnajdi***Caprock and overburden characterisation: avoiding leakage of CO₂ from Carbon Capture and Storage (CCS) sites***

Storing carbon dioxide in depleted hydrocarbon reservoirs and aquifers is an essential method to inhibit the emission of CO₂ in the atmosphere. For this type of strategy to work, a low permeable caprocks such as mudstones must seal the CO₂ within the reservoir for a long-term storage avoiding any possible leakage from the injection site. Properties of mudstones such as geochemical and petrophysical can control the leakage integrity of CO₂. Samples are taken from potential CCS sites for laboratory experiments and petrophysical analysis. Shale samples are characterised via thin section preparation, SEM, XRD, BET and MICP. The Rodby shale of the Acorn storage site is less porous and more permeable than Lista shale of the East Mey. The Rodby shale is calcite-rich unlike the Lista shale. This project is expected to be used as reference in future work of CCS to tackle the effect of CO₂ fluid flow simulation.

Belinda Ulfa Aulia***Metropolitan Growth Management: Understanding the Challenge of Controlling and Directing Urban Growth within Metropolitan Areas***

Suburbanisation without effective metropolitan organisation in multi-level governance constellations remains a riddle to be answered in terms of its growth management. Particularly in the Global South nations, the phenomenon of metropolitan turnaround, where the population in the fringe area grows much faster than the core has accelerated urban expansion into suburban areas, mostly with rural administration. Differentiation between rural and urban areas are becoming increasingly blurred as urban residential has occupied many spaces within agricultural land. The inward-looking behaviour of local governments has created competition especially those near the urban core as they seek to maximise their local revenue. However, previous research has argued two things can play a role in overcoming urban sprawl, the formal institutions (property rights and land use regulations) and the informal institutions (how the actors interact). Thus, to have a deeper understanding of how these two factors may be inter-related to the difficulty in curbing urban sprawl in multi-level governance constellation, this study uses a case study approach, using Institutional Resource Regime (IRR) theoretical lens because of its capability to analyse formal and informal elements of the institutional dimension to understand the practice of land use management. This study argues that in multi-level configuration, by understanding who the planning permission decision-making actors are (hold power in enabling or disabling development) in every layer and how the formal and informal arrangement on their strategies, we can better understand what the difficulty in curbing sprawl is and suggest potential recommendations for collective action.

Akos Balog***A Digital Twin of Resilient Future Retail Centers for Post Pandemic Social and Economic Recovery***

The project aims to create a “Digital Twin” of the retail centres within Liverpool City Region through an agent-based model. By incorporating data about the characteristics, usage patterns, and dynamics of the retail centres, the model will provide a comprehensive view of the centres for consumers, retailers, and the government. The purpose of this project is to better understand how the functions and uses of retail centres are changing and how they can be managed and supported to ensure their sustainable and resilient recovery from the pandemic. The project will be carried out in collaboration with Liverpool City Region Combined Authority to develop models that will help test scenarios for enhancing the recovery and future resilience of the retail centres. The ABM will enable stakeholders to see how different scenarios would impact the retail centres and help them make informed decisions about managing and supporting these centres for the future.

David Bareham***Supporting complex legal and commercial decision making through Data Science***

This presentation presents some preliminary results from an investigation into predicting the outcome of cases of the European Patent Office’s Boards of Appeal using textual content extracted from court judgements. Leveraging Natural Language Processing (NLP) and Machine Learning, this study formulates a binary classification task to predict whether the prior judgement was affirmed or dismissed at the conclusion of the appeal. The textual input is represented using a variety of common NLP methods such as n-grams, TF-IDF and word embeddings. This includes the training of a custom word embedding, Patent2Vec, which is the first word embedding to be trained on textual information relating to patents using approx 17B tokens. Predicting the outcome of Patent cases is novel in the literature and these results will help to demonstrate whether this is a fruitful legal domain for further exploration.

Ella Bytheway-Jackson***Unlocking the carceral mobilities and experiences of children in the Poor Law Union System, Birkenhead 1898–1913***

This presentation explores the provisions made for children who were orphaned, deserted or removed from their communities to the Poor Law system at the turn of the twentieth century in Birkenhead. Understood through the nexus of care and control, it examines how physical separation was used to punish and transform these children into independent, rational and ideal citizens. Building on recent work by Soares (2023) which posits that children experienced positive emotions and attachment to staff in institutions, this work critiques how care has been defined within this literature and posits that these systems contained humanizing elements in order to justify their dehumanizing practices.

Nicolas Del Canto***The relationship between urban vitality and offices-to-residential (OTR) conversion in UK cities***

This research addresses the relationship between urban vitality and office-to-residential (OTR) conversions in UK cities. OTR conversion has been taking place in cities worldwide and will continue whether authorities have planned it or not – in most cases, driven by the need to cope with housing shortage demands. However, after the pandemic, developing OTR conversions has focused significant attention because of the drop in office vacancies related to the appearance of hybrid or working-from-home trends. In this context, policymakers have asked, “can empty office space be the solution for the housing crisis?” The standpoint of this research is from a different perspective. If OTR conversion is seen as an ongoing phenomenon that will keep evolving, this research suggests using urban vitality as a tool to steer a better housing quality provision. Thus, this research will allow identifying neighbourhoods’ vitality clusters to encourage OTR conversion in areas with high vitality potential.

Martijn Eikelboom***A novel voltammetric method for determination of inorganic arsenic at near-neutral pH: a case study from Mexico and India***

Routine monitoring of groundwater is integral to combatting the global issue of arsenic pollution. Here, we present the voltammetric determination of total inorganic arsenic in conditions of near-neutral pH using a novel gold microwire electrode. The best response was obtained in chloride-containing acetate buffer with analytical parameters better than those obtained in acidic conditions (limit of detection of $0.28 \mu\text{g L}^{-1}$ for 10 seconds deposition time, and a linear range up to $20 \mu\text{g L}^{-1}$). The new voltammetric method was used to measure arsenic concentrations in contrasting groundwaters conditions: the reducing, As(III)-rich groundwaters of India (West Bengal and Bihar regions) and the oxidising, As(V)-rich groundwaters of Mexico (Guanajuato region). Very good agreement was obtained in all groundwaters between arsenic concentrations obtained by ICP-MS and by voltammetry (slope = +1.029, $R^2 = 0.99$). The voltammetric method is sensitive, fast, easy-to-use, reproducible, and enables on-site detection of arsenic in groundwater.

Thomas Fitter***Multiscale analysis of intermittent rivers: Linking gravel-bed topography to surface flow***

The movement of fluid within space and time is complex and undergoes three-dimensional evolutions that are challenging to predict, interpret and forecast. Analytical attempts to describe and predict turbulence within fluvial systems creates challenges due to the non-linear nature of turbulent structures. A considerable challenge is providing a linkage between water-worked gravel bed topography and river surface flow. Multiple studies have explored this linkage using both intrusive and non-intrusive measurement techniques within laboratory settings; however, complexities arise when applying similar techniques to the field. This study aims to apply a low-cost, remote measurement technique to examine the effect of riverbed topography on the surface flow within a gravel-bed river. Riverbed data were captured on the River Manifold and Lathkill Dale, UK, using a Faro Scene X330 Terrestrial Laser Scanner (TLS) during the summer of 2022, after which the streamwise and spanwise flow velocities were obtained over three increasing discharges using an optical flow tracking velocimetry (OFTV) method called FlowontheGo.

Jessie Foest***Does marginality explain differences in temporal seed production patterns among populations?***

Masting, highly variable and synchronised seed production, affects the dynamics of plant and animal populations and occurs across biomes. In this talk, I will explain the climatic marginality hypothesis, and discuss if masting is most intense under marginal climates.

We used 435 time-series (19 species) from MASTREE+ to capture intraspecific variation in masting metrics CVp, AR(1), and Psd across climate marginality gradients.

While intraspecific variation in masting was large, we found no strong evidence that CVp varied in congruence with the climatic marginality hypothesis. The variation in AR(1) and Psd partially matched predictions, although effects were limited. Species-specific models revealed that no species conformed to the overall theoretic framework across gradients and metrics. Our ability to predict responses of masting to changing environmental conditions will depend on our capacity to explain this plasticity.

James Forrester***Engineering with Nature for Coastal Protection***

Our coasts are under increasing threat from rising sea levels and storms, causing damage to properties and infrastructure through flooding and erosion. Existing coastal interventions can be non-optimal, have a limited lifespan and overlook changes in future climate.

Nature-based solutions have gained interest in the field of coastal management, due to their protective qualities and contribution toward other vital ecosystem services. Albeit, there is a lack of guidance for implementing these solutions.

With a rising popularity for seagrass transplantation to restore marine habitats and sequester carbon, there is motivation to assess the application of seagrass transplantation and its effect on flooding and coastal erosion.

Using the Delft3D numerical model this study will test the changes in coastal hydro/morpho dynamics at Morecambe Bay with a transplanted seagrass patch, to test whether it could be an effective method for coastal protection.

Millie Goddard-Dwyer***Iron binding humic ligands in the Southern Ocean***

The availability of iron (Fe) controls the carbon cycle over much of the ocean via control of primary production. Fe availability is influenced by a varied pool of Fe binding organic molecules, including Fe binding humic substances (Fe-HS). Fe-HS are abundant and ubiquitous and therefore likely play an important role in Fe cycling. However, the distribution of Fe-HS and the processes involved in its cycling are unresolved. Due to a lack of observations, this knowledge gap widens in Fe limited regions, where Fe cycling is thought to exert the strongest control on carbon cycling. The Southern Ocean is a primarily Fe-limited region containing localised Fe-rich waters originating from sub-Antarctic islands. We present the first quantification of Fe-HS concentration in this region. This dataset is complemented by microbial incubation experiments designed to probe the processes underpinning variation in Fe-HS between the region's Fe-limited and Fe-rich waters. Ultimately, these data help provide mechanistic understanding into the controls on the Southern Ocean Fe cycle which controls carbon cycling in the region.

Meghan Grant***Fatness and the built environment***

My research will build on geographical work on 'obesogenic environments' and fatness, which draw attention to the ways in which social, political and economic factors shape people's consumptive practices. My research will explore the themes of ethnicity and poverty in the UK, to assess the impact of environment on health. Existing research on race, urban environments and fatness are based in America, where many of the assertions around access to food do not exist in the same way in the UK. I will conduct qualitative walking interviews with fat people living in Brent. Brent, London, an area identified as obesogenic. Brent is densely populated with high levels of obesity, health inequalities and 64% of residents are BAME. Additionally, the council has a number of policies which identify the link between the local environment and health. Focusing on a specific location will allow me to investigate health in a broader sense, not focusing my research solely on individuals but placing them within their environmental context.

Chloe Gray***Using low cost sensors and analytical chemistry to characterise maritime derived particulate matter and enable its identification in ambient air samples***

Particulate matter (PM) is a type of non-gaseous air pollution that exists as an aerosol. There is a wealth of evidence supporting the negative health and environmental impacts of PM, especially for particulates with a diameter of under 2.5µm, commonly known as PM2.5.

Despite this evidence, the UK's PM monitoring network has inadequate spatial density because the cost is too prohibitive. Low cost sensors (LCS) have the potential to solve the problem by filling the gaps in the current monitoring network, which has resulted in lots of research into their reliability, accuracy and calibration. This PhD looks to expand that research using LCS and chemical data to identify unique PM signatures created by specific emission sources. Subsequently, the identified signatures will be detected in ambient locations across Liverpool, using source apportionment of LCS data alone, enabling the movement of PM through the urban environment to be tracked.

Ros Green***Assessing the vulnerability of migrating waterfowl populations to offshore wind farms***

Waterfowl (geese, swans, ducks and sawbills) may interact with offshore wind farms (OWFs) as they migrate over the sea, and UK governments must assess the scale of impact these interactions might have on protected waterfowl populations. Vulnerability assessments can help with this process by identifying the species at greatest risk, and the key knowledge and data gaps for those species. We conducted a vulnerability assessment for waterfowl migrating in and out of the UK, and found that geese and swans would experience the highest severity impacts if they do encounter OWFs, but any waterfowl populations migrating across the North Sea are most vulnerable, due to the density of OWFs there. Empirical data on flight altitude, nocturnal flight activity and avoidance rates were lacking for most waterfowl populations, and efforts should be made in future to reduce the uncertainty in these metrics.

Jennifer Hamilton***The Role of Neighbourhood Planning in Delivering Healthy Urban Green and Blue Spaces***

The project aim is to explore the role of governance in the delivery of healthy urban green and blue spaces, particularly in more deprived areas. Neighbourhood Planning enables communities to have direct power over the vision for and development and growth of their local area and potentially offers opportunities for targeted actions to reduce inequalities in health and wellbeing. However, Neighbourhood Plans are often based in more affluent areas. To ensure that more people in disadvantaged areas have their say, it is important to consider the complexities of community engagement and participation. There is little guidance on how to ensure that the plan making process can capture and reflect the views of wider audiences in the local community beyond those who are already engaged. This research seeks to identify how Neighbourhood Planning can be better utilised by people in deprived urban areas for the delivery and management of new and existing green and blue spaces.

Tegan Havard***Magma mixing in basaltic fissure systems***

Basaltic fissures erupt lavas that can travel 10's of kilometres from the initial elongate volcanic vent, posing danger to nearby communities. Fissure eruptions are fed by vertical sheet intrusions of magma known as dykes that transport magma from source (km depth) to surface. Mixing of magmas affects products erupted from the vent, e.g. a Kilauea 2018 eruption vent transitioned to less explosive behaviour as hotter, low viscosity magma mixed in. Here we model two magmas interacting in a new experiment setup, building on previous work that has used immiscible fluids and a cubic or cylindrical geometry (Fig. 1). The fluids fully mixed with water used, but took longer with higher density downwelling fluids. Typically, mixing was localised towards the system centre before spreading out. Images were systematically captured to investigate changing fluid density, mixing and fluid dynamics (Fig. 2). Fluid samples were taken to measure the fluid density and viscosity before and after mixing.

Matthew Howard***Regional inequity of financial vulnerabilities and indebtedness over time***

Qualifying the impacts of local area characteristics on personal debt challenges: Upon failure to repay outstanding debts over an extensive period, individuals are often taken to court. This record of court judgements can help to quantify the extent of debt in England and Wales, something that so far has received little quantitative attention. Using XGBoost models on court and census data to identify the key characteristics of regions with high judgement case counts and valuations to help quantify which local effects influence an individual's experience of debt. Results are still in the initial stages, but several characteristics (such as relative lack of education and poorer health) have already been identified as clearly matching the spatial patterns of court case concentrations, in support of previous qualitative observations. However, with extreme debt often being a very individual experience, there are noticeable limitations attempting to establish causes at more regional levels.

Jade Hrintchuk***Using crystal alignment in a basaltic dyke to investigate magma flow in volcanic plumbing systems***

Volcanic fissure eruptions form long and narrow cracks in the Earth's surface which are fed by vertical sheet intrusions (dykes) of magma, posing widespread hazards. To understand magma flow during these eruptions, crystal alignment, shape and size can be used. When individual crystals are too small to be measured in the field, microanalysis (optical microscopy and scanning electron microscopy) is required. Here we examine samples from the main pathway for magma ascent in a localised volcanic vent from the Budj Bim Volcanic Complex, south east Australia. These samples are basaltic, comprising of olivines, clinopyroxenes, and a fine-grained plagioclase-rich groundmass. Electron backscattered diffraction (SEM-EBSD) shows that plagioclase crystals share a crystallographic preferred orientation (CPO). CPO in plagioclase can be used as an indicator of magma flow, as elongate crystals are expected to align parallel to flow direction. Understanding historic fissure eruptions is important as it enables us to prepare for future eruptions and reduce their impacts on society.

Linnet Jessell***Can polar seabirds really adapt to climate change?***

The ability of animals to adapt to the changing climate is crucial for populations to persist. However, environments are changing not only on average, but are also becoming more variable. While it is widely accepted that variation in traits is necessary for plasticity in response to a changing environment, variability in behavioural and life-history traits in animals is not well understood. Foraging behaviour is strongly influenced by the environment but only recently have studies shown that it is variability in this behaviour that may allow individual to adapt to climate change. Here, using data from a variety of polar seabird species, in combination with measures of environmental variability, we when it is adaptive to be variable in multiple traits, on an individual, population, and species level.

Ying Chang***Sustaining Urban Green Commons: An Institutional Approach to Securing the Longevity of Community Gardens in the Yangtze Delta***

Community gardens in China face management challenges that threaten their longevity. This study focuses on the management issues of community gardens, from an institutional approach to urban green commons. After the literature review, this study identifies the stakeholders and actors of representative community gardens in three cities of the Yangtze Delta by questionnaire and interviews, then, followed by a documents analysis of the statutory and legal norms and regulations that define the property rights, responsibilities and obligations of different stakeholders and perceived ownership, rights and obligations of participants. The main focus of this study is to identify the explicit and implicit institutional variables that impede the longevity of community gardens and to propose opportunities that establish clear definitions of rights, responsibilities and obligations to regulate inclusive and collective governance of community gardens. By enriching the understanding of the urban green common and its practical application at the micro-neighbourhood level, this study will contribute to the longevity of community gardens in China.

Hannah Jones***Well-being at the coast: maximising the socio-cultural benefits of England's seascapes***

Coastal environments are important social and cultural assets. They are valued by local communities and visitors for their natural and aesthetic qualities, and have significant historical, industrial and architectural features. They are places of rest, leisure, contemplation and healthy activities. A recent study links living by the coast to improved mental health, especially for people of lower income (Garrett et al, 2019). In order to maximise their benefits, the qualities of coastal settings should be understood and incorporated into decision-making. This study aims to investigate how Natural Capital and Well-being Research can be better integrated into the Seascape Character Assessment (SCA) process to aid decision-makers to maximise their value for both individuals, community and wider society. Fieldwork using mixed methodologies will be utilised to examine how the coast can be sustainably used to improve well-being in England.

Samuel Jones***The Gas Transport Properties of the Mercia Mudstone Group***

Radiogenic gas escape from a geological disposal facility (GDF) can occur advectively via aqueous fluids or as a separate gas phase. The Mercia Mudstone Group (MMG) gas been identified as a potential host rock, and previous work at the university has shown permeabilities to be as low as 10–20mD (Armitage et al., 2016). Permeability and principal controls on fluid migration within the MMG have not yet been extensively measured throughout a complete core. Measurements will be taken under differing stress and temperature conditions representative of those experienced within a GDF. This project aims to determine how stratigraphy, mineralogy, petrography, pressure, and temperature may affect flow characteristics of the highly heterogenous MMG. On completion, this data can be combined to quantitatively predict the characteristics of various stratigraphic intervals, which can be linked to wireline and core sedimentology for upscaling.

Alice Lowry***Reconstructing the health and trophic history of ringed seals in the Canadian Arctic using metabolically inert tissues***

Environmental change is altering the behaviour, diet, physiology and demography of ringed seal populations in the Canadian Arctic. As the Arctic continues to warm, changes to prey species is expected to affect ringed seals by driving dietary shifts and changes in caloric intake, with possible consequences for the health of individuals and their reproductive success. However, the relationship between diet and the physiological 'health' of ringed seals is poorly understood in the Arctic.

This project aims to develop a novel method for reconstructing both the 'health' and trophic history of individual ringed seals concurrently over the first 7-12 years of their life by analysing nitrogen stable isotope ratios of individual amino acids and the concentrations of multiple hormones in the annual growth layer groups (GLGs) in their claws (n=26). In this talk I will present my preliminary results from hormone assays and plans for the next stages of this project.

Umrah J. Mahadik***Connecting Religious Values to Climate Change Adaptation and Planning***

This research investigates the intersection of religious beliefs, values, and climate action to understand how we can effectively act on the most urgent environmental and moral issue of our time, climate change. Whilst there is widespread consensus on the evidence, the use of facts is limited in efforts to tackle climate change, as motivation to act is often more influenced by ideology and personal values. Psychologists argue that religion is among the most powerful of all social forces, playing an adaptive role in society whilst sustaining communities; a mosaic of psychological influences on the human-nature relationship which encourages people to act collectively in tackling what has been called the world's biggest collective action problem. This research aims to create an original, practical and innovative indexing system to score the adaptive capacity of dominant world religions and link this to Neighbourhood Planning.

Bayan Shabeeb***Environmental impact assessment and management of produced water in the southern Iraqi oil fields***

The oil fields in southern Iraq are among the most significant in the world because of their vast reserves. These fields produce a large amount of water from the oil and gas extraction processes, forming a multifaceted mixture of hydrocarbons, salts and other pollutants. Discharges of produced water into the environment can significantly impact soils, waters (surface and ground), air, health and ecosystems. Therefore, managing produced water management in an environmentally sustainable manner is essential. In this context, this PhD research study aims to identify international best practices for dealing with water generated in oil production in an environmentally sustainable manner, focusing on the environmental impact assessments (EIAs) that were produced in the permitting process. The key aim is thus to explore how water produced in oil fields is taken into account in EIA (and underlying planning applications) of oil extraction activities. The research approach will be qualitative and will involve document reviews, case studies, photographs, site visits, and semi-structured interviews.

Matt Mason***Fuelling Hate: The Role of Social Media in Hate Crime***

This project focuses on the role of social media on incidents of hate crimes in the real world. It seeks to add to understanding of online anti-immigration sentiment and its influence on related acts of violence in the UK. Prior research has established there exists significant amounts of anti-immigration sentiment expressed online, though little is understood on its geographic pattern or the spatial factors associated with it. Similarly, emerging evidence has shown a relationship between the amount of anti-immigration content online and the number of hate crimes committed, though the causal relationship has yet to be explored.

This project has two main objectives:

1. Examine and understand the geography of UK online anti-immigration sentiment content;
2. Estimate the causal influence of online anti-immigration content on offline hate crime. This research will contribute to the academic literature as well as provide insight into policy debates around the influence of social media.

Bjoern Matthies***Exploring the unintended consequences of zero-deforestation oil palm***

The ongoing loss of rainforest linked to tropical commodities has led many companies to agree on zero-deforestation commitments (ZDCs) to reduce the loss of biodiversity and carbon emissions. However, these ZDCs were primarily developed to focus on protecting moist tropical forests, driven by the assumption that they support the highest biodiversity and carbon. Agricultural expansion is already driving the conversion of other natural ecosystems (e.g. tropical grassy biomes: grasslands, savanna and shrublands). This expansion on savannas has been encouraged partly as some savannas are considered human-derived or semi-natural, and hence perceived to be potentially less valuable for biodiversity.

This project aims to understand the impact of oil palm expansion into the African savannas by collecting new field data to quantify changes in biodiversity (ground flora and ants), ecosystem functioning and carbon stocks focusing on plantations in Central Africa, a region where oil palm is native.

Cara Westerberg Mattu***Indigenous Future-making Versus the Westminster-modelled State: Exploring the Joys, Pains, and Dreams of Maya Women and Youth (on their terms)***

Indigenous communities in Latin America and the Caribbean continue to be negatively racialized, are exposed to structural violence, and suffer the consequences of controversial 'development' practices linked to enduring forms of colonial power (Wainwright, 2011; Gahman and Thongs, 2020). This research will raise awareness of realities lived by Maya women and youth residing in the Toledo District, southern Belize, on their terms, by casting light on institutional barriers they face vis-à-vis pursuing Maya definitions of health, wellbeing, and autonomy. It will highlight the political agency of women and youth by illustrating their joys, dreams, and struggles via a desire-based research design (Tuck, 2009). Photovoice, arts-based envisioning, interviews, and focus groups will be used – corresponding to ethnographic-style community-based participatory action research practice that prioritizes the 4 R's (Respect; Responsibility; Reciprocity; Relevance). This PhD contributes to scholarship on Indigenous self-determination, grassroots development, socio-spatial processes of racialisation, and the co-construction of sustainable futures.

Farida Khuril Maula***Unpacking Community Participation in Slum Resettlement (A Comparative Study of Slum Resettlement Projects in Indonesia)***

Most literature demonstrates that slum upgrading is one of the best solutions for improving the condition of slums rather than eviction and demolition. However, recent findings have argued that upgrading does not always produce good results in the long term. Along with time, the physical condition of slums did not improve, and it worsened. Most projects that aim to revitalize or redevelop urban areas significantly impact slums and informal settlements. In many cases, the eviction and resettlement of the slum dwellers are necessary. Most of the slums resettlement projects in Indonesia did not involve the community in the planning process. The community is only notified when the project plan is finished, so many protests since they disagreed with the plan that will change their livelihood. It is evident from this note that the communities were limited in their participation, providing evident that the government applied a top-down approach. On the other hand, community participation can be seen as a means of improving the effectiveness of planning and development to benefit the community by empowering themselves. However, not all community participation achieves outstanding results. For example, in Indonesia, many cases of community participation in slum upgrading projects remain controlled by the government, and this government appears unable to respond to initiatives within the community itself. As a result, many projects that aim to improve the condition of slums produced disappointing results even though the government has involved the community. Despite this, recent slum resettlement projects in Indonesia are implementing a new approach by engaging the community in planning. It is still unknown whether community participation in the resettlement project helps to produce optimal results for the projects or not. Thus, this research will address the issue of community participation in the slums resettlement project by

exploring how different types of community participation shapes the outcome of the planning process. Research on community participation in slums resettlement projects will fill the knowledge gap on the participatory process in urban development. It is significant to explore this to ensure whether community participation helps or hinders the planning process of slum resettlement projects since not many scholars are conducting this research, particularly in the Indonesian context.

This research aims to explore how far community participation can influence the planning process of resettlement projects. Several objectives were formulated as follows:

1. Outlining government policies and strategies in resettling slums in the national and local context.
2. Identifying the interested stakeholders and their motives for participation (including identifying who holds the power in the planning and decision making process).
3. Exploring the conditions that have been established for community involvement in two case studies.
4. Analyzing how community members can impact the planning of slum resettlement project.
5. Developing a framework of community involvement in the resettlement planning process.

Freddie Mckendrick***Individual-level variability in plasticity of foraging effort at glacial fronts in a High Arctic seabird***

Marine-terminating glacial fronts provide rich foraging hotspots for Arctic-breeding seabirds but their profitability exhibits significant variability. The ability of individuals to adjust foraging effort at glaciers to current conditions therefore plays a major role in shaping the trade-off between energy expenditure and resource acquisition for species breeding in the Arctic. Using GPS data from 90 black-legged kittiwakes (*Rissa tridactyla*) breeding in the high Arctic we quantify individual-variation in plasticity of foraging effort at glacial fronts. Individuals differed significantly in their behavioural response to the level of glacial runoff, a key predictor for the profitability of glaciers as foraging hotspots. Furthermore, individuals experiencing more variable and poorer conditions at glaciers exhibited greater plasticity in foraging effort. As glaciers in the Arctic shrink and retreat on land, individuals less-plastic or over-reliant on glacial fronts may face additional pressures when finding resources and variability in reproductive success may begin to emerge.

Mohammad Meidiansyah***Does participatory budgeting matter in rural development in Indonesia? Lessons learned from the Indonesian Village Fund***

Rural development is important in most of the global south due to the increase in urbanisation rates. To ensure that the development needs of rural areas are truly a community initiative, it is significant to bring along representatives from different levels of authority and engage the community at every stage of the process to develop a consensus. Therefore, one of the strategies to strengthen rural development policy is through the implementation of participatory budgeting, a form of citizen participation in which citizens are involved in the process of deciding how public budgets are spent. However, participatory budgeting is a challenge in developing rural areas due to limited citizen participation and a lack of public role awareness, which leads to poor outcomes. The aim of this research is to outline how regulations, policies, the impact of the Village Fund outcomes, and the citizen participation influence rural development in Indonesia. The research methods include document analysis, an observation of the public meetings, and semi-structured interviews with various stakeholders.

Xin Meng

Increased summer storms will reduce bottom water oxygen concentrations in a temperate shelf sea

In temperate shelf seas, the bottom water oxygen is frequently seen to decrease during the stratified period as a natural consequence of organic matter being remineralised and the seasonal thermocline preventing the replenishment of oxygen from the atmosphere. However, the subsurface chlorophyll maximum (SCM) is a generator of oxygen in the base of the thermocline. Mixing across the thermocline by episodic strong wind events could supply oxygen from the SCM into the bottom water and so offset some of the oxygen reduction arising from organic matter degradation. To explore this possibility, we set up a simple 1-D numerical model to simulate the seasonal cycle in a temperate shelf sea. By adding strong wind mixing, the oxygen concentration in the bottom water becomes lower by the end of autumn than in the case with no wind events. This paradoxical result occurs because the wind mixing also brings organic matter from the SCM into the bottom water, which increases degradation. A warmer climate will lead to lower oxygen concentrations simply because of the reduction in oxygen solubility in seawater; our results also suggest that any climate-driven increases in wind mixing could further worsen bottom water oxygen conditions in temperate shelf seas.

Eve Merrall

Assessing Multiple Threats to Seabirds

Anthropogenic change threatens seabirds with a host of challenges, including but certainly not limited to depletion of their food stocks by fishing, habitat degradation and loss through marine industrial developments, lethal and sublethal harm from pollution such as marine plastics, heavy metals and oil spills. And of course climate change. Seabirds are a very vulnerable group, and the UK is home to many important populations of species that are threatened on a global scale. It can be difficult to tease apart the differing impacts of these pressures on seabirds at the species and population level. This is necessary to work out how best to target conservation efforts and prioritise locations for important developments such as renewable infrastructure – pressures can be cumulative and co-exacerbating, and how populations respond is determined by complex demographic relationships as well as external environmental factors. My project seeks to usefully untangle some of this mess.

Hafi Munirwan***Regulating Informal Street Vending – A Comparative Study on Local Policy in Indonesia***

With increased urbanisation, informal street vending has become one of the major urban challenges over the past decade especially in Global South cities. Street vending is seen as a form of urban disorder that disturbs vehicle and pedestrian flow, also generating conflict over public space. So far, governments have mainly tried to ban street vending, but this attempt has failed, with street vendors resisting and maintaining their operation outside of regulations. Hence, new attempts have been made, and it is now accepted and recommended that it is better to formalise street vending. However, the formalisation attempt has also failed with street vendors resisting and maintaining their operation outside of regulations. Indonesia is one of the countries where street vending is perceived as a problem, with most cities increasing efforts to formalise street vending following the introduction of national legislation in 2012. This research discusses a comparative study of local policies towards street vending formalisation in Indonesia. The aim of this research is to explain how regulations, policies, self-organisation mechanisms, and engagement between governments and vendors influence street vending formalisation. The research argues that facilitating vendors' self-organising capacity is important to achieve formalisation.

Ruth Neville***Evaluating the Impact of the End of Free Movement (Brexit) on Inflows of International Students into UK Universities using Difference-in-Differences (DiD)***

Whilst the numbers of international students attending UK universities has been increasing in recent years, the 2021/22 and 2022/23 academic years saw a decline in applications from EU domiciled students. It is hypothesised that this decline is a direct result of the end of free movement due to the UK's withdrawal from the European Union and that students are deterred both by the financial costs and social costs of Brexit. Further, we hypothesise that COVID-19 restrictions have limited impact on these declines. This research uses acceptances data provided by the Universities and Colleges Admission Service as well as COVID stringency indicators to uncover the extent of this decline. Using difference-in-differences and hierarchical modelling, it is found that there is a substantial decline in EU students as a result of the end of free movement and that the nature of this decline varies across the continent. We also explore whether the end of free movement has led to declines in applications and acceptances from any other key origin countries as a means to understand whether there is changes in perception of the UK as a welcoming destination for international students. We also find that these differences vary depending on the type of institution attended in the UK.

Trang Thu Nguyen***Aspirations, Hopes, and Experiences of Vietnamese International Students***

International students (IS) play a crucial role in global higher education and migration systems. Unfortunately, the voices of IS have been silenced within contemporary debates, which predominantly frame IS through a homogeneous figure as passive and deficient; and overlook the diversity of their backgrounds, such as social class, race, gender, and ethnicity.

This narrow view fails to acknowledge the agency of IS and their conscious choices in establishing and navigating their networks. While further research has increasingly focused on individual agency, it can sometimes overemphasize an individual's control over their actions and ignore the social setting or structure within which they operate. To address these issues, this study employs a transnational lens to explore the aspirations, hopes, and dynamic experiences of Vietnamese IS. The aim is to provide a nuanced understanding of IS as transnational subjects who negotiate their lives amidst structural factors, forge and sustain cross-border linkages. This study uses a multi-sited ethnographic approach that involves participant observation at different sites in Vietnam and the UK, and semi-structured interviews with Vietnamese IS.

Thomas E Nichols***Compositional and textural variations in the subsurface of a modern macro-tidal estuary***

Here we present how the Ravenglass Estuary, a modern macro-tidal estuary in northwest England, has been used as an analogue for deeply-buried reservoirs due to the presence of detrital clay grain coats in the estuarine sediment. Upon burial and diagenesis, detrital grain coats may become altered to form continuous authigenic grain coats, known to preserve porosity and permeability by inhibiting the formation of quartz overgrowths which might otherwise fill pores. Previous surface studies of the estuary have revealed that clay grain coats are distributed heterogeneously, and concentrated in marginal inner estuary tidal flats but almost absent in the outer estuary. Here we show how machine learning methods, based on combined bulk geochemical and textural data, have been used to classify sub-depositional environment in geotechnical cores from the Ravenglass Estuary, providing a framework to explore environmental and compositional changes essential for predicting the generation of grain coats in deeply-buried reservoirs.

Andrew K Palmer***Motivations to visit green and natural spaces: How perceptions of 'quality' vary across different communities.***

Ethnic minority groups have been shown to visit natural spaces less and face several barriers. The purpose of this research is to explore these issues and to understand how the 'quality' of natural environments is perceived, how these perceptions are shaped, and what might be done to improve access, experiences, and diversity in natural spaces. We used a range of qualitative techniques centring around photo-elicitation interviews. Our early findings demonstrate that confidence in nature is sometimes linked to upbringing and rurality, cultural traditions influence nature-related practices, barriers can be broken down through the minority led nature groups, and that people with activist or politicised identities are calling for decolonisation of the environmental sector to achieve change. We also found that multiple entry points and recruitment strategies are needed and that outsider researchers face particular challenges in brokering relationship and harnessing co-production.

Lyuboslav Petrov***Low-carbon identities and metropolitan desires: an interpretative study of retrofit delivery by housing associations in Merseyside***

In response to the low-carbon economy in city-regional policymaking, the status of housing associations (HAs) has been arguably elevated among business and political elites. Instead of conceptualising low-income tenants as 'receivers' of housing retrofit, HAs are beginning to recognise that it would be fair to include them in the process, facilitating uptake. However, the rise of these collaborative approaches could also be seen as a post-political consensus where HAs emphasise on 'commonalities' and 'harmonisation' to reduce tenant agency and low-carbon politics at the metropolitan level. This PhD explores an intentionally varied sample of HAs in Merseyside, who are now starting to emerge as 'retrofit players', in different ways. Utilising the interpretative constant comparison approach, my task would be to explore the influence of their varying organisational identities, as varied mechanisms for tenant engagement/empowerment, and for confronting competing institutional logics and accountability drivers faced sub-nationally.

Christopher Russell***The Effect of High-speed Rail on Inter-Regional Knowledge Sharing and Developing an Inter-Connected High-Tech Science Landscape in Taiwan***

The purpose of my research is to provide an understanding of whether social and tacit high-tech based knowledge can be transferred between regions through the shrinking of geographical distances that high-speed rail offers. This is because I want to find out whether high-speed rail is a justifiable investment in transport infrastructure for nations and regions that wish to improve their knowledge communities and productivity, as well as improve accessibility for businesses and local talent and promote regional balancing. This is in order to help my readers to expand their perspective on the high-speed rail cost-benefit debate due to its costly implementation, as well as introduce new theory and understanding of how social and tacit knowledge can be moved outside of local communities. Through patent and publication data, and interviewing of local actors, this project targets the semiconductor industry in Taiwan and the regional high-tech clusters of Hsinchu and Tainan.

Bram Setyadji***Developing data and capacity-limited stock assessment methods for sustainable neritic tuna fisheries***

Global seafood consumption is expected to triple in the next three decades, but most fish stocks, including small tuna, have already declined in the last 50 years. Coastal countries are the most vulnerable and are bearing the brunt of the consequences. They also face uncertainty regarding their fish supplies because data dependability, quality, and availability impeded most assessment results, including those for small tuna in Indonesia. This study aims to address data collection challenges, develop robust abundance indices, conduct a feasible stock assessment procedure, and develop a possible harvest strategy for small tuna in Indonesia's archipelagic and Exclusive Economic Zone areas.

Dina-Leigh Simons

Assessing rocky intertidal biodiversity in light of climate change using eDNA metabarcoding

Climate change is affecting marine ecosystems by changing organism fitness and altering species distributional ranges. Intertidal species play an integral role in shaping marine communities, but are highly sensitive to ocean warming. Sustained visual monitoring can quantify changes in intertidal communities, however, possess inherent limitations which can reduce monitoring accuracy. Environmental DNA (eDNA) methods have shown to increase the resolution and scope of biodiversity monitoring across numerous environments, although little work has been completed in the intertidal. By conducting UK-wide sampling, this project applies eDNA metabarcoding alongside visual surveys to assess changes in intertidal biodiversity in light of climate change. The project will address the need to understand the ecological dynamics of climate change impacts to identify management interventions that may assist biosphere resilience to climate change. I will present an overview of the project progress to-date, including current hypotheses, sampling headway, and results from completed work.

Hannah Slocombe

Baby Banks in the UK

Rising levels of hardship since the introduction of austerity have rendered essential items unaffordable for many low income families with young children. Baby Banks – organisations that freely provide essential items and equipment to those with, or expecting, babies and young infants – have grown in the last decade. To date, Baby Banks have received little academic attention outside of a small body of medical literature examining their role in providing infant formula. This research explores the scale and nature of Baby Banks in the UK, including who uses them and why. It does so by drawing on a national-level survey of these organisations, as well as in-depth interviews with staff, volunteers and those that have used, or currently use, Baby Banks.

Molly Spater

Disentangling Environmental Change in the Amazon: Vegetation responses to Holocene drivers in the Yasuní National Park, Ecuador

Current research is challenging the idea of Amazonian forests as untarnished, mature ecosystems, suggesting instead that a more complex patchwork of forests exists in varying stages of recovery from previous perturbations. The Yasuní National Park, located in northeastern Ecuador, holds some of the highest levels of plant and animal diversity on the planet and is also home to several indigenous groups. Despite the ecological and cultural importance of Yasuní, only a few palaeoecological studies exist within the region. Here we present pollen, charcoal, and XRF analyses of a record taken from a *Mauritia flexuosa* palm swamp spanning the last 8,000 years. While rainforest elements were constant throughout the record, a replacement of the dominant taxa *Iriartea* by *Mauritia* occurred over the last 1,500 years. We interpret this change as a transition from seasonally flooded forest to a palm swamp and suggest it was driven by shifts in local hydrology.

Benjamin Storey

Reactivation of abandoned oil fields for green energy production

Given the global drive to net-zero carbon emissions the need to diversify the energy sector has never been more important. It is estimated that around the world there are tens of thousands of abandoned oil fields, some of which have not been properly decommissioned and are leaking harmful greenhouse gases. With the aid of airt injection these fields may be repurposed to produce green energy, either from enhanced geothermal systems or by the in-situ production of hydrogen. The aim of this work is to put to use the wealth of knowledge and research from the oil and gas sector, along with the trillions of pounds worth of investment globally to use in producing green energy. Geothermal energy and hydrogen represent a clean source of domestic heating, domestic electricity production and fuel for transportation, these can be produced with the materials and cost-efficient re-use of already in place infrastructure, with the added benefit of closing off potential methane leaks in the process.

Ibrahim Tinni Tahiru

Lobe hierarchy or lobe anarchy? Exploring deep-water fan stacking patterns using a numerical stratigraphic forward model

Flow-topography interaction in submarine fans, and how these interactions influence and create fan strata, remains a key area to understand in deep-water depositional systems. Several authors have described submarine fan strata as a three-or-four-order hierarchical arrangement, from bed or bed-set scale to lobe and lobe set scales. However, terminological discrepancies make these classifications difficult to compare and it is not clear if these lobe classifications really do describe fundamental properties of deep-water strata, or are just arbitrary, imposed models. We explore this question here using Lobyte3D, a reduced-complexity numerical stratigraphic forward model of turbidity flow routing and stacking patterns that evolve as sediment accumulates on a submarine-fan surface. For each model run, model behaviour was analysed by plotting down-slope flow routes and area deposition maps. Plots show how lobe formation is closely linked to avulsion history occurring due to a simple steepest-descent model algorithm and deposition thresholds.

We use several types of cluster analysis techniques, including KMeans, DBSCAN, and hierarchical clustering algorithms in order to test for natural grouping in the Lobyte3D output data that might provide more robust quantitative definition of what lobes are. Of the methods tested, the DBSCAN (Density-Based Spatial Clustering of Applications with Noise) algorithm performed best defining quantifiable groupings in the deposited strata that might define lobes. The results reveal that deposition from flows stacking both laterally and vertically prior to a considerable change in flow route owing to avulsion can be shown to belong to the same class, but this grouping breaks down in some circumstances, for example when flow volumes or seafloor topography are more variable.

Alexander Tully

Lithology Dependence of Magnetic Behaviour and Fidelity

Currently our best predictions of future variations in Earth's magnetic field are too short to meet the needs of long term investments, such as for satellites and ground based infrastructure. From current research frontiers such as understanding the evolution of the deep Earth and the physics of extreme geomagnetic features, implications for the predictability can be made. However, this is impeded by uncertainty in the reliability of palaeointensity data.

We are developing state of the art palaeointensity stochastic models in order to approach this challenge. These models will be able to simulate experiments and provide a new a big data methodology to assess the uncertainty of the result. In order to ground truth these models vast amounts of data are needed as inputs, far more than can be acquired individually, and is vital to this data-driven endeavour.

We present new insights in the reliability of differing lithologies for palaeointensities through compiled hysteresis and demagnetisation datasets, obtained through data-mining the MagIC database and beyond, from which a better understanding of the impact they have on experimental results can be gathered.

India Uppal

Using gradient-boosted equivalent sources to grid large magnetic datasets

We investigate the use of gradient-boosted equivalent sources to model a large-scale magnetic dataset. Airborne surveys have larger spacing between adjacent lines compared with along-line spacing. Using the equivalent source technique, magnetic data can be interpolated onto a regular grid at constant height. This is particularly useful to prepare the data for further use, such as geologic interpretation. The equivalent source technique uses a finite layer of sources to generate the same field as the observed data. These sources are then used to predict the field in unobserved locations. However, estimating the source coefficients that best fit the observed data is computationally demanding. To overcome this problem, the source coefficients are estimated similar to gradient boosting used in machine learning. We demonstrate using synthetic surveys, that the gradient-boosted equivalent sources are able to predict both the total-field anomaly and the norm of the anomalous field with a low computational cost.

Jack Walker

Scavenging ecosystem services in woodlands and gardens along an urban-rural gradient

Scavenging by animals is an essential ecosystem service that removes carrion or littered food waste from the environment, benefiting public health and reducing waste management costs. These services are of particular importance in urban environments, yet ecosystem services in urban areas are likely to be threatened. Here, we address three key questions regarding the urban delivery of scavenging services that remain inadequately explored. First, it is unclear how the provision of scavenging services varies along urbanisation gradients. Second, the relative contributions of invertebrates have rarely been quantified as most assessments of urban scavenging focus on vertebrates. Third, there has been negligible exploration of how the provision of scavenging services varies across urban land-covers. We address these knowledge gaps by quantifying scavenging rates by vertebrates and invertebrates across a gradient of urbanisation intensity in paired locations comprising gardens and urban woodlands. We find surprisingly negligible variation in service provision along the urbanisation gradient, greater contributions of vertebrates across most of the urbanisation gradient, and a significant reduction in scavenging services in gardens relative to urban woodlands.

Haojia Wang

Evaluating the plan environmental impact assessment (PEIA) system in China: a systematic analysis of urban planning PEIA effectiveness

Strategic Environmental Assessment (SEA) has been considered as an important decision support framework in the formulation of policies, plans and programmes (PPPs) in many countries and regions, and in China, Planning Environmental Impact Assessment (PEIA), considered as a core component and the most common form of SEA. After decades of development of PEIA, planners, decision makers and scholars continue to question the effectiveness of PEIA implementation. However, current effectiveness evaluation studies are concentrated in only a few mega-cities, and the evaluation system and indicators are poorly developed. Therefore, the main objective of this research is to systematically analyse the effectiveness of PEIA in China by taking urban planning PEIA in different city as the research object, and to systematically analyse the framework, process, mechanism of PEIA in the city with high effectiveness as an example, to provide guidance for PEIA in other cities and improve the effectiveness of SEA in China.

Hui Wang

Cultural Events and the City: The Migration of FIRST International Film Festival from Beijing to Xining, China

In existing studies on the relationship between cultural events and urban transformation, neoliberalism narratives of urban entrepreneurship have been prominently emphasised. As this paper argues, discussions of the cultural economy rarely pay sufficient attention to the agency of the creative class, and often fail to consider that those modes of urban governance may differ. This paper draws on a study of the geographical factors involved in developing the FIRST International Film Festival, which was held in the city of Xining on the Tibetan Plateau. It explores the reasons for the relocation of the FIRST International Film Festival from Beijing to Xining, and the purposes and ways in which Xining employs the FIRST International Film Festival. From these findings, the study suggests that the geographical expressions of cultural industries themselves, as well as the diversity of development interests and considerations in a particular place, are essential to gain a comprehensive understanding of the connections between cultural events and the city.

Qianyou Wang

Multiscale subdivision and correlation of rift lake stratigraphy using a continuous wavelet transform: performance and optimization of parameters and strategies

Wavelet transform increasingly is applied to the analysis of time series in Earth Sciences, such as climate data, seismic signals, and sedimentary successions. To date, it has not been demonstrated that wavelet transform allows rift lake stratigraphical subdivision and correlation at varied spatiotemporal scales. In this study, an integrated sedimentological and stratigraphical study was conducted on the Lower Cretaceous Shahezi (K1sh) Formation in the Songliao Basin, northeastern Asia. A continuous wavelet transform (CWT) approach was applied to transform well logs into time frequency domains. WavSeq, a MATLAB based application, was prepared to decompose gamma ray and density logs, detect the multiscale sedimentary cyclicity, locate the critical scales and sequence boundaries, correlate the periodic cyclic successions. This work demonstrates that the CWT is a successful, fast, and easy method for subdivision and correlation from well log data, but the performance of CWT based rift stratigraphy interpretation depends on the stratigraphic completeness, the allocyclic change and the discontinuities recorded in the sediment successions.

Zihao Wang

The relationship between land value capture strategy and air quality in China

Land is a fundamental production factor for China's development, which is not only related to economic development but also has a close connection with urban air pollution. This study focuses on 93 important cities in China to explore the relationship between industrial land prices and PM2.5 concentration, as well as the subsequent impact of PM2.5 concentration on commercial and residential land prices. Several findings emerged in the first stage of the research: (1) fixed effects model reveal a negative impact of industrial land prices on PM2.5 concentration, (2) the mediating model tests the moderating effects of population density and industrial structure on the relationship between industrial land prices and PM2.5 concentration, (3) heterogeneity tests find a negative correlation between industrial land prices and PM2.5 concentration in provincial capitals and non-provincial capitals, as well as in eastern cities, western cities, first-tier + new first-tier cities, and third-tier cities. (4) Local model (GTWR) shows that the coefficient of industrial land prices on PM2.5 concentration ranges from -1.3 to -1.4, with a mean of -0.019. Additionally, K-means clustering reveals a positive correlation between industrial land prices and PM2.5 concentration in western cities, while the opposite is true for eastern cities. The next stage of the research will investigate the impact of PM2.5 concentration on commercial and residential land prices in urban areas.

Cameron Ward

Spatial temporal dynamics of gas consumption in England and Wales: Assessing the residential sector using sequence analysis

The UK residential sector is inefficient and has an overwhelming reliance on natural gas as a heating source. For the UK to meet its 2050 net zero obligations, this sector will need to go through a process of decarbonisation.

Previous studies acknowledged the spatial disparities of household energy consumption, but have neglected how this varies overtime. This paper advances these shortcomings via a sequence and clustering analysis to identify common gas consumption trajectories within England and Welsh neighbourhoods between 2010–2020. Four clusters are identified: “Very High to High Consumption”; “High to Medium Consumption”; “Medium to Low Consumption” and “Low to Very Low Consumption”.

The clusters were contextualised using spatial datasets representing the socio-economic and built environment. Across all clusters, the proportion of inefficient dwellings were high, but there was a clear trend of higher consumption associated with lower proportions of efficient dwellings. The results are useful for policy members on where best to locate electrification and retrofitting measures to facilitate a cleaner and more equitable residential sector. Policy targeting of areas with continual high gas consumption will accelerate the decarbonisation process, whilst targeting areas who continually under consume are likely to be in fuel poverty will enhance the household’s finances and well-being.

Notes

VEGETARIAN CATERING FOR THE PGR CONFERENCE 2024

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