Water Challenges in a Changing World

JUNE NEWSLETTER

Hello all and welcome to the June Water Challenges in a Changing World newsletter. This month we have 2 guests joining us for our final **Water Seminar Series** of the academic year. More details can be found in the newsletter.

7th July	**Roger Wainkwa Chia**	**Kangwon National University**	**Soil and Groundwater Microplastic Contamination: Focus on abundance, limitations in Methodologies, and Implications for Infant Health**
10th July	Prof Dan Parsons	Loughborough University	Assessment of evolving flood hazard and risk: the role of channel morphodynamics

WATER SEMINAR SERIES – JULY

You are warmly invited to join us for our Water Seminar Series talk by Dr. Wainkwa Chia Rogers on the **7th July at 12pm** in Room G08 at Elm House. This will be followed by a

networking lunch at 1pm. The calendar invite for this seminar talk has been sent but if you haven't received this and would like to be added to the invite, please drop s.hira@bham.ac.uk an email. As always, feel free to forward onto anyone who you think will benefit from the talk.

Title: Soil and Groundwater Microplastic Contamination: Focus on abundance, limitations in Methodologies, and Implications for Infant Health

Abstract: In recent years, microplastic (MP) pollution has become a serious environmental issue, perhaps even more pressing than climate change due to its potential impacts on ecosystems and human health. Largely due to the complexity of MP contamination pathways and behaviors, reliable methods for the detection and quantification of MPs in soil, groundwater, and human biospecimens remain limited despite increasing awareness. This presentation highlights the results of our recent study assessing soil and groundwater MP abundance in peri-urban and agricultural areas in South Korea and investigating the presence and distribution of MPs in soil and groundwater systems. This presentation examines the best techniques to maximize the analysis of soil, groundwater, and human samples, as well as methodological pitfalls and existing limitations. Furthermore, this presentation links environmental MP contamination to public health issues through a literature-based discussion of the dangers posed by early life exposure, particularly to newborns through contaminated food and drinking water. The presentation concluded by stressing the urgent need for interdisciplinary collaboration, strengthened surveillance procedures, and coordinated policy initiatives in order to reduce risks and protect vulnerable groups.

Keywords: Microplastics, Groundwater, Soil, Infant Health, Sampling Methods, Contamination, Environmental Health

Bio: Dr. Wainkwa Chia Rogers holds a PhD in Biological and Environmental Sciences and currently serves as a Research Professor at the Institute of Earth Resources, Department of Geology, Kangwon National University, South Korea. His research focuses on the distribution and fate of contaminants particularly emerging

pollutants such as microplastics within soil and groundwater systems across both rural and urban landscapes. Rogers has a strong background in soil biogeochemistry, nutrient cycling (carbon, nitrogen, and phosphorus), and soil health, with a growing focus on how climate change influences the behavior and mobility of these contaminants. In addition to his expertise in soil science, he has developed a working knowledge of groundwater hydrology, which supports his investigation of contaminant transport pathways and interactions between surface and subsurface environments. Recently, Rogers has also contributed to the scientific understanding of the health impacts of microplastics on humans, including review work focused on their potential effects on infants and vulnerable populations. His field research spans a range of geographic and land use contexts, including farms and greenhouses in Cameroon, Ethiopia, and South Korea, urban environments such as parks, schools, and residential areas in Seoul, and groundwater monitoring wells in Kansas and Missouri, USA. Through these efforts, Dr. Rogers evaluates contaminant sources, distribution patterns, and potential mitigation strategies aimed at protecting both soil and water quality under changing environmental conditions.

You are invited to join us for our final Water Seminar Series talk of the year by Prof Daniel Parsons, Professors of Geosciences and Pro-Vice Chancellor for Research and Innovation at Loughborough University on the **10th July at 11:15am** in Room G08 at Elm House. This will be followed by a networking lunch at 12:15pm. The calendar invite for this seminar talk has been sent but if you

haven't received this and would like to be added to the invite, please drop s.hira@bham.ac.uk an email. As always, feel free to forward onto anyone who you think will benefit from the talk.

Title: Assessment of evolving flood hazard and risk: the role of channel morphodynamics

Abstract: Flooding is the most destructive natural hazard that humanity faces. Over a billion people globally are already exposed to the risk of flooding, but by 2050 this number is expected to double as a result of anthropogenic climate change, population growth, and encroachment into at-risk areas. Global Flood Models (GFMs) are vital tools for producing flood hazard maps supporting impact estimates, planning and policy interventions. GFMs typically assume that the bankfull flow-carrying capacity (channel conveyance) equates to a flow discharge with a specified return period (typically once in two years) that is spatially and temporally invariant. However, in reality, conveyance capacity is determined by the river channel size, shape and roughness and so varies in response to erosion and sedimentation - change that is presently unrepresented, which biases GFM predictions to unknown magnitudes. Herein we address and evaluate these questions by applying the Fathom GFM to estimate inundated areas and population exposure across a 135,000 km2 region of the Mississippi River floodplain by forcing the model with an empirically-constrained range of space-time varying conveyance capacities. We find that these estimated conveyance capacities (typical RPs < 1yr) differ substantially from the 2-year RP often assumed, leading to substantial underestimates of flood hazard predictions (up to 20%) and consequent underestimates of population exposure (up to 52%). These results indicate how geomorphological variability is a first order control in estimating flood hazard and risk, and that it is therefore vital such changes are included in flood hazard and risk formulations and predictions into the future.

Biography: Daniel Parsons, Professor of Geosciences and Pro-Vice-Chancellor for Research and Innovation at Loughborough University in the UK, awardee of the prestigious European Research Council Consolidator Award, current President of the Division for Geomorphology of the European Geosciences Union, internationally renowned for his work on flow processes and sediment

transport in rivers, coasts, and estuaries, and the deep sea, including work addressing flood hazard and risk.

JUNE WATER SEMINAR SERIES RECAP

Throughout June, we hosted a dynamic Water Seminar Series featuring three outstanding speakers who offered insights into critical issues in hydrology and water science. The series brought together researchers, students, and professionals to engage in thought-provoking discussions on topics ranging from groundwater conceptual models to microplastics transport, culminating in the prestigious Birdsall-Dreiss Lecture.

13 June — Prof. Okke Batelaan (Flinders University)

Talk Title: Hydro(geo)logical Conceptual Research - Hedgehogs and Foxes
Prof. Batelaan opened the series with a stimulating presentation exploring the nature of hydrogeological conceptualization. Drawing on Isaiah Berlin's metaphor of "hedgehogs and foxes," he illustrated how different scientific approaches—specialist versus integrative—shape our understanding of groundwater systems. The talk prompted lively discussions on the value of diverse thinking in tackling complex hydrological challenges.

23 June — Dr. Andrew Gray (University of California)

Talk Title: Managing Microplastics? Lessons from the Transport Cascade
Dr. Gray delivered a compelling lecture on the behaviour and fate of microplastics in riverine and watershed systems. Highlighting findings from recent fieldwork, he examined how microplastics travel through sediment and water pathways and discussed the limitations of current management

strategies. His talk offered a sobering yet informative look at the scale of the microplastics issue and opened up conversations on actionable solutions.

<u>24 June — Prof. M. Bayani Cardenas (University of Texas)</u>

Birdsall-Dreiss Distinguished Lecture

Talk Title: How a River's Periodic Pulse Affects Its Liver: Hyporheic Zones in the Anthropocene

We were honoured to host Prof. Bayani Cardenas for this year's Birdsall-Dreiss Lecture, a capstone event in the seminar series. Over a two-day visit, Prof. Cardenas not only delivered an engaging lecture on the critical role of hyporheic zones—often referred to as a river's "liver"—in regulating water quality and ecosystem health but also spent considerable time with our students. His insights and mentorship during one-on-one research discussions were incredibly valuable, leaving a lasting impact on our academic community.

Water Challenges in a Changing World

The Water Seminar Series continues to be a platform for knowledge exchange and community building. We are grateful to all speakers and participants for making the June series a success and look forward to future sessions that inspire collaboration and innovation in water science.

DAPHNE WATER SOLUTIONS WINS INNOVATION AWARD

We're proud to share that Daphne Water Solutions has been awarded the Innovation Award at the Midlands Sustainability Excellence Awards 2025! This recognition celebrates the company's pioneering work in sustainable water management and its commitment to driving environmental impact through innovation.

A special congratulations to Luisa Orsini and her team, who are members of the Water Theme at the University of Birmingham, for her role in this achievement. The award highlights the importance of research-led, practical solutions to regional and global water challenges.

Learn more about the awards here: Midlands Sustainability Excellence Awards

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CELEBRATING 50 YEARS OF WATER SCIENCE: UNESCO IHP ANNIVERSARY

From the 10th to the 13th of June 2025, UNESCO celebrated the 50th anniversary of its Intergovernmental Hydrological Programme (IHP) at its Paris Headquarters. Marking five decades of global leadership in water science, the event featured high-level panel discussions, artistic performances, and reflections on the programme's evolution from its origins in 1975 into today's integrated, transdisciplinary initiative tackling complex water challenges worldwide.

Members from the Water Group, Prof Stefan Krause and Prof David Hannah attended the anniversary celebrations. Their participation highlighted the continued collaboration between leading academic researchers and international water governance bodies. The event underscored IHP's lasting impact through innovation, cooperation, and knowledge exchange—principles that align closely with the mission and work of our team.

For more information, visit: unesco.org/en/ihp/50y

2025 EURO-FRIEND ONLINE SEMINAR & TRAINING SERIES

🔷 **Session 4 – July 9th, 3:00 PM (UK time)**
Title: *Using R for Hydrological Analysis: Some Useful Examples*
Speaker: Nejc Bezak (University of Ljubljana & UNESCO Chair)
📎 Register here

VIVA PREPARATION ARTICLE

Dr Susan Quick has written a great article about viva preparation for PGR students. Click here to check it out.


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June 9, 2025

D2: Communication and dissemination, D:

In the first of two consecutive posts on the viva, ***Susan Quick****, a part-time doctoral student from the Birmingham Institute of Forest Research (BIFoR) who has recently*

ABOUT

This blog looks at topics related to personal and professional development for postgraduate researchers at the University of Birmingham. The information presented here does not reflect the views of the University of Birmingham.

AJAY ATTENDS COMMONWEALTH PHD CONFERENCE

Written By Ajay Gupta

I had the incredible opportunity to attend the Commonwealth PhD Conference 2025, hosted by the Commonwealth Scholarship Commission in the UK at the Cumberland Lodge, a historic former royal residence in Windsor Great Park, UK!

Over three enriching days, I had the privilege to present my research in a 4-minute spotlight talk titled "A Study on Drought Propagation in a Semi-Arid River

Basin of Peninsular India." The presentation opened the door to valuable feedback, engaging discussions, and fresh insights from fellow scholars from across the Commonwealth - each bringing diverse disciplinary perspectives and passion for global change. In addition, I participated in roundtable discussions focused on community engagement, sparking collaborative conversations around how research can be more inclusive and impactful in addressing sustainable development challenges.

A heartfelt thank you to Prof. Allan Hill for his inspiring leadership and vision; Mariam Golashvili, CSC Programme Officer; Nighat Anwar, Senior Research and Evaluation Officer; Ruth Louise McConnell, Programme Manager (Policy); and Sharmin Choudhury, Student Engagement Officer, for their seamless organisation of this conference.

My sincere gratitude goes to my supervisors, Prof. Manoj Jain, Dr. Rajendra Prasad Pandey, and Prof. David M. Hannah, for their unwavering support and encouragement throughout this journey.

I sincerely thank the Commonwealth Scholarship Commission in the UK for supporting my participation through the travel grant.

WATER THEME PUBLICATIONS

Hill, M. J., White, J. C., Hawkins, J., Binu, N., Baker, E., Greaves, H. M., & Sayer, C. D. (2025). Both pond creation and restoration provide long-term biodiversity gains in agricultural landscapes: Implications for conservation. *Biological Conservation, 291*, 111279. https://doi.org/10.1016/j.biocon.2025.111279

Tran, T.C., Tang, Q., Zhao, G. *et al.* Projected changes in average and extreme precipitation under global warming in Vietnam. *Nat Hazards* (2025). https://doi.org/10.1007/s11069-025-07386-x

Singh, A., Mansfield, H., Pregnolato, M. and Wright, N. (2025), A Subgrid Modelling Approach to Nature-Based Solutions (NbS): Enhancing Flood Risk Management in Riseley, UK. J Flood Risk Management, 18: e70067. https://doi.org/10.1111/jfr3.70067

UPCOMING GRANTS

NERC - Pushing the frontiers of environmental research: July 2025
Deadline to apply: 16/07/2025
Award amount: £950k
Apply for funding to pursue an ambitious, high risk and high reward curiosity-driven project in environmental research.

NERC - Biological influence on ocean carbon: novel modelling approaches
Deadline to apply: 24/07/2025
Award Amount: £312.5k
Apply for funding for a project to improve representation of biological processes in carbon storage models. It must be led by a UK researcher and can have US team members that are NASA supported.

Marine Institute Post-Doctoral Fellowship Call 2025
Deadline to apply: 18/09/2025
The Marine Institute is pleased to announce a call for proposals for Post-Doctoral Fellowships of up to four years in duration. We are seeking applications for seven defined topics under this call. Proposals are invited from suitable Research Supervisors at Higher Education Institutions or eligible Public Research Bodies in the Republic of Ireland or Northern Ireland.

[UKRI - Pre-announcement: DARE UK Real-world Research Exemplar Programme]
Deadline to apply: 5/11/2025
Award amount: £365 – 609k
Apply for funding as a real-world research exemplar to use, evaluate and influence new capabilities within and between trusted research environments.

[NERC – Opening up the environment]
Deadline to apply: 21/01/2026
Award amount: £708k
Apply for funding to deliver activities to increase the diversity of the UK environmental science community.

[AGU – Horton Research Grant]
Deadline to apply: 27/03/2026
Award amount: $10k
The Horton Research Grant is awarded to up to three Ph.D. students studying hydrology, water resources, or a closely related field each year and is made possible through the generosity of the Robert E. Horton Fund for Hydrologic Research. The purpose of the award is to promote excellence by encouraging the next generation of professionals in the hydrological sciences.

[AGU – Cryosphere Early Career Award]
Deadline to apply: 27/03/2026
Award amount: £700
The Cryosphere Early Career Award is presented annually and recognizes significant early career contributions to cryospheric sciences and technology from honorees within 10 years of receiving their Ph.D.

Open Calls with no closing date:

[IGB: Leibniz Institute of Freshwater Ecology and Inland Fisheries – Senior Fellows]
We invite excellent established scientists to apply for a research visit at IGB. We offer stays for 3 to 12 months to enable senior scientists to contemplate and pursue new inspiring research ideas in collaboration with scientific staff at IGB. At the time of application, successful candidates can be based at institutions in any country worldwide except Germany. Scientists residing in Germany are not eligible to apply, independent of their nationality.

[NERC Urgency Fund (£100k)]
Apply for funding to respond quickly to transient, unexpected environmental research opportunities created by sporadic natural occurrences such as earthquakes, droughts, floods, or ephemeral events in ecosystems.

UKRI – Knowledge Transfer Partnership

Open for business and not-for-profit organisations. Partnerships can last between 12 and 36 mounts. Business provide one-third to half the project cost depending on their size.

NERC - Work with US-based researchers on environmental science research

Award amount: £300k Apply for funding to work with US-based researchers on an environmental science application. Collaborative work is governed by an agreement between NERC and NSF.

Work with Brazilian researchers: NERC FAPESP lead agency

This opportunity allows UK-based researchers and researchers in the State of São Paulo, Brazil to submit a collaborative proposal under existing NERC funding opportunities. This will go through a single review process.

UKRI - Collaborate with researchers in Norway

UK Research and Innovation (UKRI) and Research Council of Norway (RCN) have signed a Money Follows Cooperation agreement to reduce barriers to cross-border collaboration.

UKRI - Collaborate with researchers in Luxembourg

UK Research and Innovation (UKRI) and FNR have signed a memorandum of understanding (MoU) to welcome and support collaborative applications. The MoU provides for a lead agency agreement whereby UKRI will receive and assess joint applications from eligible UK and Luxembourg applicants on behalf of both organisations

EPSRC - overseas travel grant: Nov 2023: responsive mode

You can apply for an overseas travel grant in any area within the remit of Engineering and Physical Sciences Research Council (EPSRC). We will award 80% of the full economic cost (FEC) of the project.