

Water Challenges in a Changing World

MAY NEWSLETTER

Hello all and welcome to the Water Challenges in a Changing World newsletter. This month we share some exciting news about the brilliant guests that will be joining us for the Water Seminar Series in the next 2 months. We have a wide range of guests, both national and international, so there should be someone for everyone to be excited about. Suman will be sending out calendar invites for all and as always, there is the option to attend in person or online. If you will be attending in person, it's really helpful to us if you say this when responding to invites as it allows us to organise numbers for the networking lunches that follow each of our talks. You can read further details in the newsletter but here is the list of guests we have lined up for you:

Date/ Time	Speaker	University	Talk Title
13th June	Prof Okke Batelaan	Flinders University	Hydro(geo)logical Conceptual Research - Hedgehogs and Foxes
23rd June	Dr Andrew Gray	University of California	Managing Microplastics? Lessons from the Transport Cascade
24th June	Prof M. Bayani Cardenas	University of Texas	How a river's periodic pulse affects its liver: hyporheic zones in the Anthropocene
7th July	Roger Wainkwa Chia	Kangwon National University	Soil and Groundwater Microplastic Contamination
10th July	Prof Dan Parsons	Loughborough University	Assessment of evolving flood hazard and risk: the role of channel morphodynamics



Water Challenges in a Changing World

UOB TO HOST UK'S ONLY STOP ON THE 2025 BIRDSALL-DREISS LECTURE TOUR

Please register [here](#) to be added to the official invite with details of the location and online link.

We are proud to announce that we will host the sole UK engagement of the 2025 Birdsall-Dreiss Distinguished Lecture Series, featuring Professor M. Bayani Cardenas from the University of Texas at Austin. This prestigious lecture series, organised by the Geological Society of America (GSA), brings leading

hydrogeologists to institutions worldwide to share their cutting-edge research.



Professor Cardenas, the J. Nalle Gregory Regents Professor of Geological Sciences at the Jackson School of Geosciences, has been selected as the 2025 Birdsall-Dreiss and LaMoreaux International Distinguished Lecturer. His research focuses on hydrologic flow and transport processes across various scales and settings, from Arctic permafrost to tropical reefs.

Professor Cardenas will present his lecture titled:

"How a river's periodic pulse affects its liver: hyporheic zones in the Anthropocene"

This talk will delve into the critical role of hyporheic zones—the regions beneath and alongside streambeds where groundwater and surface water mix—in maintaining river ecosystem health, especially in the context of human-induced environmental changes.

 Date: Monday, 24th June 2025

 Time: 12:00 PM – 1:00 PM

 Location: To Be Confirmed [please register here](#) to be added to the official invite with details of the location and online link.

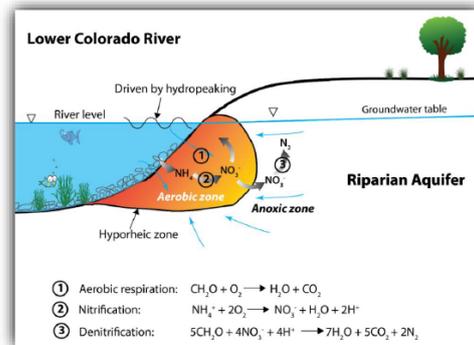
 Networking Lunch: From 1:00 PM onwards

Water Challenges in a Changing World

This event offers a unique opportunity for students, researchers, and professionals in hydrology, environmental science, and related fields to engage with Professor Cardenas's insights on the dynamic interactions between hydrologic processes and ecological systems. We warmly invite you to join us for what promises to be an inspiring and insightful session.

Lecture 2

- **How a river's periodic pulse affects its liver: hyporheic zones in the Anthropocene**
- Sixty percent of the world's major rivers are regulated by dams. This presentation discusses water, nutrient, and thermal energy transfers throughout a dam-regulated river corridor. It showcases measurements from hyporheic zones, which function as the river's liver, of the Lower Colorado River in Texas taken during periodic releases, natural flooding, and baseflow. Simulations of river hydraulics, groundwater flow, and energy and reactive transport generalize the observations. The models and observations collectively show how river regulation has drastically changed hydrobiogeochemical processes over potentially thousands of kilometers of rivers, reflecting the state of most large river corridors in the Anthropocene.
- Key contributors: Audrey Sawyer, Katelyn Kaproth-Gerech, Blair Francis, Jeffery Watson, Stephen Ferencz, Sebastian Muñoz, Bethany Neilson, Philip Bennett, Peter Knappett, Pin Shuai and many other collaborators
- Major funding source: National Science Foundation (EAR-1343861 and 1344547)



THE GEOLOGICAL SOCIETY OF AMERICA®

TEXAS Geosciences
The University of Texas at Austin
Jackson School of Geosciences

WATER SEMINAR SERIES – JUNE

UNIVERSITY OF BIRMINGHAM

Hydro(geo)logical Conceptual Research - Hedgehogs and Foxes

Prof. Okke Batelaan
Professor of Hydrogeology
Flinders University, Australia

13 June 2025 | 12-1pm | Hybrid |
Room G08, Elm House | Water Seminar Series

Water Challenges in a Changing World

You are warmly invited to join us for our first June Water Seminar Series talk by **Professor Okke Batelaan from Flinders University, Australia**, on the **13th June 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: Hydro(geo)logical Conceptual Research - Hedgehogs and Foxes

Abstract: In this contribution, I will present Flinders University and the hydro(geo)logical research of the National Centre for Groundwater Research and Training (NCGRT) shortly. The antique text fragment on 'Hedgehogs and foxes' is then used to



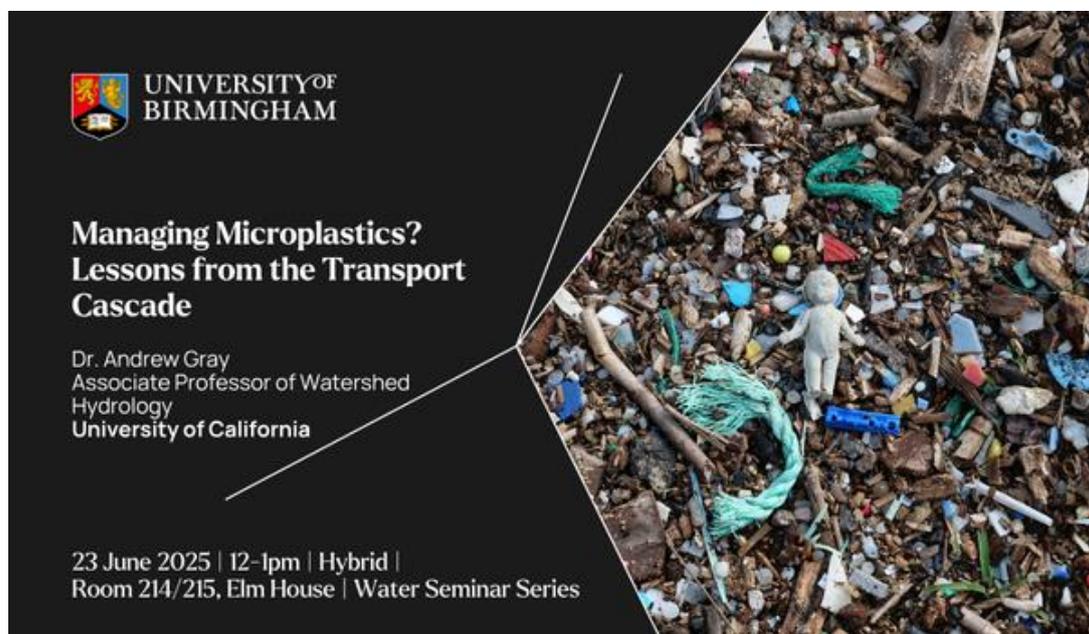
introduce a concept for our hydro(geo)logical science and its researchers by acquainting various people with their philosophical, literary, historical, and recent scientific works. The focus along this journey will be on conceptual models, hypothesis testing and sustainability of (ground)water systems.

Bio: Okke Batelaan holds a PhD in Engineering from the Free University Brussels and an MSc in Hydrogeology from the Free University of Amsterdam. He is a Strategic Professor in Hydro(geo)logy, College of Science and Engineering, Flinders University, Adelaide, Australia, since 2012. At Flinders University, he is Chief Investigator in the National Centre for Groundwater Research and Training. He teaches courses on groundwater hydrology, groundwater modelling, and integrated water resources management. Previously, he worked for more than 20 years at the Free University Brussels and the KU Leuven, Belgium. He has supervised more than 200 MSc/PhD students from all continents. Professor Batelaan has research expertise and an extensive publication record in shallow groundwater hydrology, recharge-discharge estimation, urban hydrology, distributed hydrological/groundwater

Water Challenges in a Changing World

modelling, ecohydrology, impacts of landuse and climate change on groundwater systems, and the history of hydrology. He has collaborated with many researchers and institutes on projects in Australia, Europe, Asia, South America and Africa. He is the Education and Training Lead for the One Basin CRC, member of the Board of the Goyder Institute for Water Research and Chair of Editors-in-Chief of Journal of Hydrology.

<https://www.flinders.edu.au/people/okke.batelaan>

A seminar poster for the University of Birmingham. The poster features the university's crest and name in the top left. The main title is "Managing Microplastics? Lessons from the Transport Cascade". Below the title, it lists the speaker: "Dr. Andrew Gray, Associate Professor of Watershed Hydrology, University of California". At the bottom, it provides the date and time: "23 June 2025 | 12-1pm | Hybrid | Room 214/215, Elm House | Water Seminar Series". The right side of the poster is a photograph of a large pile of microplastic debris, including a small white doll, a green plastic ring, and various other small pieces of plastic and wood.

The second June talk of our Water Seminar Series will be by Dr Andrew Gray on the **23rd June at 12pm** in Room 214/214 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, please drop

Water Challenges in a Changing World

s.hira@bham.ac.uk an email. As always, feel free to forward onto anyone who you think will benefit from the talk.

Title: Managing Microplastics? Lessons from the Transport Cascade

Abstract: Can we inform the management of microplastic pollution with what we have learned from investigating microplastics in aquatic systems so far? What does the history of water quality management have to teach us? Plastics, like natural sediments, are mostly produced in watersheds and then transported across a cascade of environmental compartments, shedding finer particles, until fundamentally transformed or stored in long-term sediment deposits. The ubiquity, complexity, potential toxicity, and increasing environmental loading of microplastics has motivated and sustained a wide range of transport investigations – particularly from watersheds to coastal marine environments. As field, laboratory, and numerical modeling approaches to characterizing microplastic transport dynamics mature, it is time to review our findings and consider our future research trajectories in terms of the key motivation for all contaminant research – management. Looking to the history of water quality management, particularly of sediment and sediment associated contaminants, we find a number of key lessons regarding standardization, monitoring, and the potential pitfalls of flux- and process-based approaches.

Biography: Dr. Andrew Gray is an Associate Professor of Watershed Hydrology in the Department of Environmental Sciences at the University of California, Riverside. He completed his doctoral work in Hydrologic Sciences at the



University of California, Davis where he focused on fluvial sediment dynamics in small mountainous rivers. Dr. Gray's research focuses on the processes controlling water and sediment transfer, with particular interest in wildfire impacts on sediment dynamics, coastal sedimentology, sediment source investigation, and microplastic pollution.

Water Challenges in a Changing World

LECTURE BY DR JESUS D. GOMEZ-VELEZ

Dr Jesus D. Gomez-Velez from the Environmental Science Division, at the Oak Ridge National Laboratory, USA will be carrying out a talk at the University of Birmingham on **Wednesday, 25th June, 10-11 am** in BioSciences NG08. Please contact Joshua Larsen j.larsen@bham.ac.uk for more information.

Tackling Wicked Environmental Challenges Through a Hydrologic Systems Lens

Wicked environmental challenges arise from the complex interactions among hydrologic, ecological, and human systems. This talk highlights how a perspective rooted in the dynamics and nested nature of flow, transport, and transformation within watersheds can reveal the interconnected drivers behind these issues. We focus on three challenges. The first is flooding, where physics-based models with varying levels of fidelity enable us to capture the interplay between topography, the river network, and the spatiotemporal structure of rainfall and landscape disturbance. This provides new tools for predicting hydrologic and biogeochemical responses and designing enhanced observational networks. The second challenge is water scarcity, where we examine the depth of the critical zone in mountainous terrains. Deep circulation within the mountain block is a vital water source for alluvial valleys and influences the location and characteristics of unconventional water resources necessary to mitigate rising water and energy deficits for communities in arid and semiarid climates. Lastly, we address declining water quality, exploring the significance of river corridor connectivity for predicting water quality from river reaches to entire continents. The approaches presented here share a common theme: integrating hydrologic science with systems thinking. This perspective can deepen our understanding of environmental processes across scales and develop more effective strategies for managing them, ultimately fostering resilient and adaptive solutions in both natural and engineered landscapes.

Bio

Dr. Jesus Gomez-Velez is a Senior Research Scientist in the Environmental Science Division at Oak Ridge National Laboratory (ORNL). His research aims to

Water Challenges in a Changing World

understand and predict how water, energy, and matter move, accumulate, and transform within complex, interconnected natural and engineered systems, as well as how these processes affect humans and ecosystems. To achieve this, he utilizes field experiments, environmental observations, numerical modeling, data science, and machine learning.

Before joining ORNL, Jesus served as an Assistant Professor in the Department of Civil and Environmental Engineering at Vanderbilt University. He earned his Ph.D. in Earth and Environmental Science from New Mexico Tech, M.S. degrees in Hydrology and Applied Mathematics from New Mexico Tech, and a B.S. in Civil Engineering from the National University of Colombia at Medellin. He also worked as a National Research Program postdoctoral fellow at the USGS in Reston, VA.



Water Challenges in a Changing World

EUROPEAN GEOSCIENCES UNION

Written by Ajay Gupta

Just returned from an incredible week at #EGU2025 in Vienna, Austria — my second time attending this amazing conference, and it was just as inspiring as the first! 🌍💧💡



I had the opportunity to present my research work on "Impact of reservoir storage on drought propagation", where I received valuable feedback and insights, and engaged in great discussions with researchers from around the world. It was a pleasure to reconnect with

colleagues and friends, and attend numerous thought-provoking sessions that left me motivated and full of new ideas.

A highlight for me was attending the Drought in the Anthropocene Network (DitA) splinter session, where I met many passionate researchers working on drought-related topics. The exchange of knowledge was inspiring, and I'm excited about the potential for future collaborations.

I would like to thank my supervisors Prof. Manoj Jain, Dr. Rajendra Prasad Pandey and Prof. David M. Hannah for their constant support, encouragement, and belief in my work. I would also like to thank Prof.



Stefan Krause, Prof. Shasha Han and the Birmingham Water team for the memorable week at the EGU.

I sincerely thank the Commonwealth Scholarship Commission in the UK for supporting me with the travel fund.

Water Challenges in a Changing World

DAVID HANNAH ATTENDS RANGOLI RADIO

Prof David Hannah was live on Rangoli Radio on the 10th May, talking about his work on water resources. The interview received positive feedback from listeners who were inspired by the conversation.

In case you missed it, here is the link to listen back -

<https://rangoliradio.com/shows>

Choose the Rangoli Role Models section, and here you also get a view of a variety of work as part of their community initiative.



Partnership With



Rangoli Radio Role Model Show featuring world-renowned climate scientist **Professor David M. Hannah**. HIS groundbreaking work on water resources is helping shape global responses to climate change. Don't miss this exclusive opportunity to hear the inspiring journey and visionary insights of the University of Birmingham's Deputy Pro-Vice-Chancellor for Sustainability and UNESCO Chair in Water Sciences – a true pioneer whose research is safeguarding our planet's most precious resource for future generations.



Broadcast live at 10 am (UK) Saturday 10th May



Water Challenges in a Changing World

2025 EURO-FRIEND ONLINE SEMINAR & TRAINING SERIES

◆ **Session 3 – June 18th, 1:00 PM (UK time)**

Title: FRIEND-Water Networking Event

Speakers: FRIEND-Water Regional Coordinators

🔗 [Register here](#)

AI AND SUSTAINABILITY POSTGRADUATE RESEARCH SYMPOSIUM



BISCA are thrilled to be hosting this Post-Graduate Research Symposium under our AI and Sustainability theme. *Please kindly share this event with your research colleagues and any Post-Graduate Researchers who may be interested in joining us.*

Date: Wednesday 2 July 2025

Time: 09:30 – 15:00

Location: Elm House, Edgbaston Park, Bristol Road, B5 7SW

AI and Sustainability Theme Lead: Dr Xilin Xia

Tea and coffee to be provided throughout the day along with Lunch.

A banner with a teal background and white text. The text reads "Water Challenges in a Changing World". The background of the banner shows a blurred image of water with light reflections.

Water Challenges in a Changing World

Introduction & Aim

We stand at a critical juncture where pressing global sustainability challenges – including climate change mitigation, biodiversity loss, natural hazard management, sustainable resource use, and water security – demand innovative solutions. At the same time, the rapid advancement and increasing integration of Artificial Intelligence (AI) into our daily lives and research practices present unprecedented opportunities and sometimes challenges. AI offers powerful tools for data analysis, pattern recognition, prediction, and automation, holding immense potential to accelerate progress towards a more sustainable future.

This symposium aims to bring together Post-Graduate Researchers (PGRs) from across the University to foster a collaborative environment for sharing knowledge, showcasing innovative approaches, and discussing best practices – as well as potential pitfalls – in the application of AI to sustainability-related research. We seek to explore the diverse ways AI is being leveraged to understand, address, and solve complex environmental and societal challenges.

General Registration

Please register to attend the Symposium using this [link](#):

Abstract Submission

We are inviting Post-Graduate Researchers to submit an abstract to present at the Symposium.

The link for submitting an abstract is [here](#):

Please note that the call for abstracts closes on Friday 30 May 2025.

Water Challenges in a Changing World

WATER THEME PUBLICATIONS

Clayton, G. E., Richards, L. A., Fox, B. G., Thorn, R. M. S., Bowes, M. J., Read, D. S., & others. (2025). Associations of anthropogenic activity and tributaries with the physicochemical, nutrient and microbial composition of the Ganga (Ganges) River, India. *Water Research*, 278, 123374. <https://doi.org/10.1016/j.watres.2025.123374>

Chun, K. P., Octavianti, T., Dogulu, N., Tyrallis, H., Papacharalampous, G., & others. (2025). Transforming disaster risk reduction with AI and big data: Legal and interdisciplinary perspectives. *Wiley Interdisciplinary Reviews: Data Mining and Knowledge Discovery*, 15, e70011. <https://doi.org/10.1002/widm.70011>

Kreibich, H., Sivapalan, M., AghaKouchak, A., Addor, N., Aksoy, H., Arheimer, B., & others. (2025). Panta Rhei: A decade of progress in research on change in hydrology and society. *Hydrological Sciences Journal*, 1–27. <https://doi.org/10.1080/02626667.2025.2469762>

Annual GEES PGR Conference May 2025

PhD Student: Saad Al-Yousuf

Supervisors: Prof. David Hannah and Dr. Shasha Han

Presentation Title: Defining and Assessing Drought–Flood Abrupt Alternation (DFAA) Events Across Diverse Catchments in the UK

Water Challenges in a Changing World

UPCOMING GRANTS

[UKRI - Access to high performance computing facilities: spring 2025](#)

Deadline to apply: 22/05/2025

Award amount: other

This opportunity provides an open and flexible route to computational support for high quality projects across the entire UK Research and Innovation (UKRI) remit.

[UKRI – Proof of Concept](#)

Deadline to apply: 29/05/2025

Award amount: £100-250k

Apply for proof of concept funding to support the commercialisation of research and the development of new products, processes or services.

[UKRI – Proof of Concept](#)

Deadline to apply: 29/05/2025

Award amount: £100-250k

Apply for proof of concept to support the commercialisation of research to enable spinouts or social ventures, licencing or other commercialisation pathways. Applications from any disciplines are welcomed. No pre-existing UK Research and Innovation (UKRI) funding is required. The programme will not support discovery-driven research. You must be based at a UK research organisation

[NIHR Climate Change and Health: Adapting Health and Social Care Systems - Development Awards](#)

Deadline to apply: 17/06/2025

Award amount: £100k

NIHR invites applications for research that addresses the challenges of climate change by building resilience into the delivery of health and social care services during severe weather events. Smaller development awards will be offered initially. Their purpose is to enable research teams to come together to develop ideas with potential to help UK health and social care services to operate efficiently during extreme weather events.

[HORIZON-EIT-2025-KIC-WATER — call for proposals](#)

Deadline to apply: 17/06/2025

Award amount: €5M

The new "Water" EIT KIC (Knowledge and Innovation Community) will address critical challenges related to the relevant fields of the water, marine and maritime sectors and ecosystems, and demonstrate excellence in each activity area (innovation, entrepreneurship and skills education and business creation / acceleration) to build on and upscale innovative solutions developed under existing programmes and initiatives such as Horizon Europe and EU Missions. The EIT KIC will develop an integrated

Water Challenges in a Changing World

approach across water, marine and maritime sectors and ecosystems and will address the following challenges and opportunities through the EIT's innovation model.

[UKRI – Interdisciplinary research to tackle epidemic treats](#)

Deadline to apply: 19/06/2025

Award amount: £3.75M

Apply for funding to undertake ambitious interdisciplinary research to tackle epidemic diseases of animals, humans or plants for a duration of up to five years.

[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.

[UKRI – Policy Fellowship 2025](#)

Deadline to apply: 15/07/2025

Amount: £180-280k

Spend 18 months as a UK Research and Innovation (UKRI) core policy fellow, Natural Hazards and Resilience policy fellow or What Works Innovation fellow to inform policy to address pressing national and global challenges.

[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.

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 and unexpected scientific opportunities.

Water Challenges in a Changing World

[UKRI – Knowledge Transfer Partnership](#)

Open for business and not-for-profit organisations. Partnerships can last between 12 and 36 months. 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