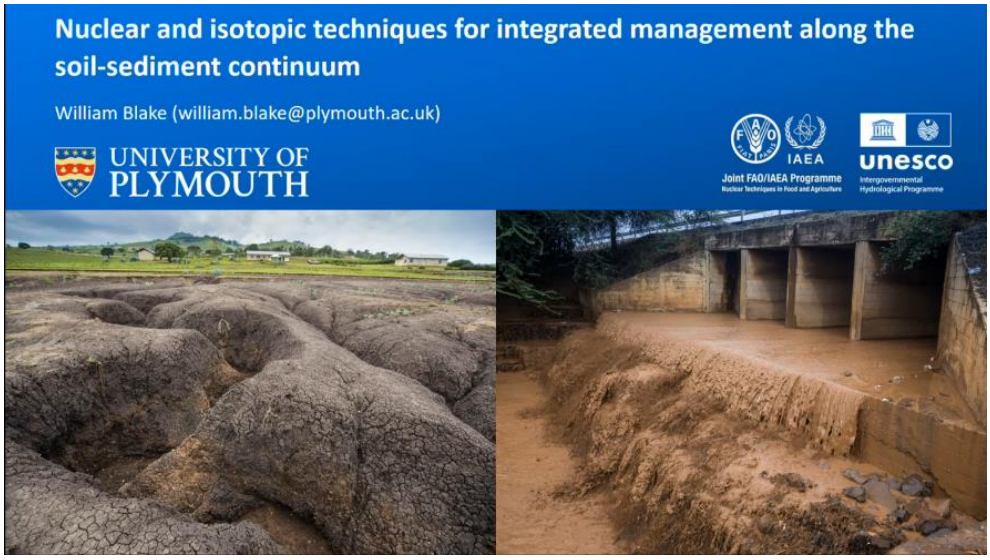
Water Challenges in a Changing World

OCTOBER NEWSLETTER

WATER SEMINAR SERIES RECAP

We started off the first Water Seminar of the academic year with Prof William Blake from the University of Plymouth who gave his talk "Nuclear and isotopic techniques for integrated management along the soil – sediment continuum". If you missed the talk and would like to watch it back, please click here.



WATER SEMINAR SERIES NOVEMBER

We have two Water Seminars this month. The first one will be an online seminar by Dr Sascha Müller from Lund University, Sweden. His talk is titled ***"Nanoplastic transport in porous media: The role of minerals, water flow and the presence of fungi on transport dynamics"***

and will take place on the **13th November at 12pm GMT.** You will have received a calendar link for this, but if you haven't and would like to attend, please contact Suman.

Abstract*:* This presentation focuses on the interactions of nanoplastics (NP) with subsurface-relevant interfaces and highlights key processes governing NP fate and transport. Interactions between various

minerals and different types of NP will be examined, with particular emphasis on the influence of nanoparticle shape and surface chemistry on transport dynamics. Data will be presented demonstrating the flow-rate dependency of NP transport in mineral-doped quartz porous media. Fungal communities, which are widely present in subsurface environments, may further influence NP behavior; however, this interface remains largely unexplored. Results from microfluidic experiments will be presented to provide new insight into nanoplastic- fungi interactions within porous media environments.

Bio: Sascha Müller is a researcher in the Biology Department at Lund University, Sweden. His work focuses on understanding subsurface transport of water, nanoparticles, and emerging contaminants from the nanoscale to the catchment scale. He employs chemical, isotopic, and physical tracers to reveal groundwater pathways and residence times. His recent research examines the fate and mobility of nanoplastics underground, integrating multi-scale experiments with transport and interaction modeling to determine how mineral surfaces, particle properties, flow regimes, and biological processes influence nanoparticle movement. Building on this work, his current project explores the mycoremediation potential for nanoplastics.

The second seminar will take place in person at Elm House in room G08 on the **27th of November at 12pm GMT.** Julia Martin – Ortega will be giving her talk titled ***"We cannot address global water challenges without social sciences".*** Please join us for this talk, followed by a networking lunch at 1pm in G05.

Abstract: Julia will be providing an overview of her 20 years career as an interdisciplinary researcher advancing the role of social sciences in addressing water challenges. During her presentation, she will use her invited piece in the launching issue of Nature Water: We cannot address global water challenges without social sciences | Nature Water to make the argument that academics, funders and publishers need to support interdisciplinary research processes in which social sciences are placed on an equal footing with the natural sciences and engineering, drawing from her own experience and expertise.

Bio: Julia Martin-Ortega is professor of Ecological Economics and Associate Director of water@leeds, one of the largest interdisciplinary water research hubs in any university in the world. Her research aims to further the understanding of the relationships of communities and individuals with ecosystems and how policy can best make use of this understanding for sustainable water and land management. She specialises in inter and transdisciplinary research approaches oriented to the delivery of societal impact. She is member of Natural England's Science Advisory Committee, Northern Ireland's Department of Agriculture, Environment & Rural Affairs Science Advisory Group and Defra's Advisory Group for the Global Centre on Biodiversity for Climate. Her work has been adopted by the UK Climate Change Committee and informed its 7th Carbon Budget. She has influenced the UN & World Bank's Valuing Water Initiative and has contributed to the work of the UN's Special Rapporteur on Water and Human Rights. Her research has influenced law (e.g. the notion of value in Scotland's Water Resources Act), policy programmes (e.g. Northern Ireland's £35M Soil Nutrient-Health Scheme) and environmental practice (e.g. England's PeatPilots, Scotland's Peatland Action Plan). Julia is the founder of the Water Woman Initiative, which rewards and empowers women in water research for their inspiring nature of their achievements.

NEW STARTERS

Zahran Al-Maawali

I'm Zahran from Oman, a first-year PhD student in Civil Engineering. My key interests are mainly related to understanding the hydrological processes associated with flash floods in arid regions through a GIS-based hydrologic/hydraulic modelling approach. Although arid regions are characterized by water scarcity, intensive and sudden rainfall events can cause severe flash floods with considerable damages and loss of lives. The threat of these floods is exacerbated by climate change and rapid urbanization.

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Jaswant Singh

Hi everyone, I'm Jaswant Singh. I joined the SmartWater team as a Research Fellow within GEES in August 2025. I look after the high-frequency water-quality sensor network across Birmingham's rivers and streams and analyse the data we collect to better understand when and where pollution pressures occur. I work closely with advanced in-situ sensors, including In-Situ, Proteus, TriOS and Xylem systems, making sure we capture reliable and high-quality measurements from the field. I also develop workflows to clean, analyse and visualise large time-series datasets so we can gain clearer insights into water-quality dynamics across our catchments.

Some of you may already know me from my previous time at the University from April 2023 to April 2024 as a Commonwealth Scholar. Since then, I completed my PhD at IIT Roorkee, India, where my research focused on how microplastics move through soil and groundwater systems using field studies and large-scale experiments. More recently, I worked as a Postdoctoral Fellow at the National Research Council of Italy (CNR-IRPI) from November 2024 to August 2025, studying submarine groundwater discharge and coastal aquifer salinisation in Southern Italy. I'm excited to be back in Birmingham and to contribute to SmartWater's mission of building smarter, more responsive monitoring systems that help protect our rivers and support resilient water resources.

Anjali Vijeata

We are excited to welcome Dr. Anjali, a new Marie Sklodowska-Curie Fellow from India, who will be working under the expert supervision of Prof. Stefan Krause at the University of Birmingham. Dr. Anjali's doctoral research focused on the design and development of advanced nanomaterials for wastewater treatment. At UoB, she will be working on an urgent and pressing issue: The environmental impact of plastic pollution, specifically the growing concern surrounding nanoplastics. Her research project, titled Nanoplastsorption,

focuses on developing innovative carbonaceous nanosorbents, that can effectively capture and retain nanoplastic particles in freshwater environments, preventing their harmful accumulation. Through this research, Dr. Anjali seeks to find effective solutions for removing nanoplastics from water sources, helping to ensure cleaner and safer drinking water for communities around the world. In collaboration with her secondment partner Polymateria, a leader in plastic degradation technologies, Dr. Anjali will have access to advanced facilities and resources that will further enhance her research. Together, they will explore various types of nanoplastics, their characteristics, and how they behave in water environments. This interdisciplinary approach will challenge existing paradigms and provide critical evidence needed to understand the long-term impact of nanoplastics.

UOB WATER GROUP AT IAHS 2025

The University of Birmingham's Water Group had a strong presence at the IAHS 2025 Scientific Assembly in Roorkee. Attending from the group were Prof Stefan Krause, Prof David Hannah, Liam Kelleher, James White, Shasha Han and Ritesh Moon. They were joined by UoB-affiliated colleagues Ajay Gupta, who recently completed a CSC research stay with us, and Shravani Gupta, who will begin her CSC stay in November and also served on the conference organising committee.

Prof Stefan Krause delivered an engaging talk on Ecohydrology and environmental change, while Prof David Hannah took part in a panel discussion in his role as President of the IAHS International Commission on Surface Water. You can read further about Prof Hannah's experience here. The UoB team enjoyed an informative and inspiring week filled with lively scientific discussions, networking opportunities and plenty of social activities, strengthening international links and showcasing Birmingham's contribution to global hydrological science.

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PAPER PUBLISHED IN ENVIRONMENTAL SCIENCE & TECHNOLOGY WATER

Written by Uwe Schneidewind: We are happy to announce the publication of the research article 'Sediment-Water Interfaces as Traps and Sources of Microplastic Fragments and Microfibers – Insights from Stream Flume Experiments' in ACS ES&T Water. For the full article please see here.

In this work, we studied how nylon fibres and fragments of various sizes are transported near the sediment-water interface of artificial gravel and mixed sediment streambeds, and how they deposit out of the water column under varying flow conditions. For this, we conducted stream flume experiments back in 2020, using our very own Environmental Change Outdoor Laboratory (EcoLab) at the University of Birmingham. These experiments were then combined with a stochastic modelling approach and Latin hypercube sampling to optimize the parameters describing microplastic deposition and resuspension. Our results show that nylon deposition significantly depends on particle shape and stream flow velocity, and that the deposition and near-bed transport of microplastic particles is a complex process that cannot be well described by Stoke's law as has often been done in the past.

This work was mainly funded from the Leverhulme Trust research grant "Plastic Rivers" and an individual grant from the German Research Foundation. While the results will surely have an impact, a big part of the project involved the preparation of new methods for microplastic research and a lot of great time in the EcoLab and beyond with an amazing group of people.

Ecolab-Team: Holly Nel, Anna Kukkola, Valerie Ouellet, Nicolai Brekenfeld, Uwe Schneidewind (left); Andy Chetwynd, Ben Howard (right). Jen Drummond, Katie Reilly (not shown).

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SUCCESSFUL THESIS

WRITTEN BY AJAY GUPTA

I am thrilled to share a Major Milestone – I've successfully completed my Ph.D. from the Department of Hydrology, **Indian Institute of Technology, Roorkee**!

The journey from Mr Ajay Gupta to Dr Ajay Gupta has been one of perseverance, continuous learning, and countless unforgettable experiences. From endless hours of reading research papers, refining research objectives, draughting manuscripts, navigating deadlines, securing visas, attending international conferences, and managing multidisciplinary tasks—this journey has tested and taught me in ways I never imagined.

Yes, there were moments of self-doubt and setbacks. But every challenge instilled resilience, and every low strengthened my resolve.

My doctoral research, titled "A study on drought propagation in a semi-arid river basin of peninsular India", focused on utilising novel approaches and publicly available hydrometeorological datasets to understand drought studies and their propagation from meteorological to hydrological drought in detail.

I'm deeply grateful to my supervisors Prof. **Manoj Jain** and Dr **Rajendra Prasad Pandey** for their exceptional guidance, support and timely evaluation of my work throughout my Ph.D. journey. Their mentorship has been instrumental in shaping both my academic development and research capabilities.

A heartfelt thanks to my UK supervisor, Prof. **David M. Hannah** for hosting me as a Commonwealth Split-site Scholar at the **University of Birmingham**. His mentorship significantly broadened my research perspective and enabled international collaboration.

Finally, my heartfelt appreciation goes to my family members, especially my father, who believed in me even when I doubted myself. And to my lab mates, colleagues, and friends at both **Indian Institute of Technology, Roorkee** and the **University of Birmingham** – your support made this journey all the more meaningful.

While the "Ph.D." is complete, the learning continues. I look forward to translating my research into real-world solutions for sustainable water management and climate resilience.

FROM SCIENCE TO SOCIETY

Exploring the role of international organisations in advancing global water science and practice amidst geopolitical shifts.

Monday 1st December 2025, 09:15 – 16:45 GMT

Institution Of Civil Engineers, One Great George Street, Westminster, London, SW1P 3AA, United Kingdom In-Person

Register HERE

Find out more on the conference webpage

Join us on 1st December for a unique opportunity to explore the role of international organisations in advancing global water science and practice.

To celebrate the 50th anniversary of UNESCO'S INTERGOVERNMENTAL HYDROLOGICAL PROGRAMME, we're bringing together researchers, practitioners, and policymakers, for a dynamic and thought-provoking conference featuring:

Keynotes, panellists, and convenors leading global hydrological initiatives

- **Presentations** showcasing the impact of coordinated international collaborations, with a focus on UK contributions
- **Interactive polls, panel discussions, and a debate** featuring diverse perspectives from policy, youth, academia, NGOS, and private sector consultants

- **Opportunities to explore** how uk hydrologists can support and benefit from coordinated multilateral programmes

Find out more, including a list of confirmed speakers and panellists here: from science to society: conference on global water challenges

The event is open to all and jointly organised by British Ecology Society (BHS), the UK centre for Ecology & Hydrology (UKCEH), on behalf of the UK committee for international hydrology, which acts as the UK national committee for the international hydrological programme (IHP) OF UNESCO.

PLASTICS WORKSHOP

Tickets are selling fast for our third **Environmental Micro – and Nanoplastic Identification and Characterisation Workshop**, which takes place from the 2nd to the 6th February 2026. This successful workshop is designed for PhD students, postdocs and professionals and is taught by Prof Stefan Krause (University of Birmingham) and his team. It is supported by the Water Research Centre and BISCA. More information about this course and the online shop to purchase tickets can be found here. Please share widely with those who you think would benefit.

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MNP2026 CONFERENCE AT UOB

6th – 10th July 2026 | University of Birmingham, UK

Global plastic pollution is on the rise, with micro- and nanoplastic particles and plastic associated chemicals of concern posing threats to the environment and human health. Assessing those risks requires detailed understanding of the sources of plastic pollution and of the fate and transport mechanisms of micro- and nanoplastic that determine environmental and human exposures and uptake pathways.

About the Conference

Join global experts studying the environmental and human health impacts of micro-and nanoplastics and associated chemicals.
This international event will for the first time bring together interdisciplinary researchers, public and private sector practitioners from environmental, health, social, behavioural and political backgrounds to catalyse discussions of the interconnected plastic challenges in a One Health context. The five-day event will feature keynote talks, interactive panels, and research showcases designed to spark meaningful dialogue and innovative approaches. With a strong focus on cross-disciplinary collaboration, the conference welcomes academics, policymakers, students, and industry professionals alike.

Register your interest here

WATER THEME PUBLICATIONS

Reza Dehbandi

Abbasi, S., Hashemi, N., Rahnama, S., Najmeddin, A., Yusefi, M.R., Kardel, F., Dehbandi, R., Mina, M., Amiri, H., Keshavarzifard, M. and Purmahmood, H., 2025. Regional and climatic variations in atmospheric microplastic deposition: A study throughout Iran. *Environmental Technology & Innovation*, p.104577.

Jahedi, F., Takdastan, A., Ahmadi, M., Shoushtari, M.H., Dehbandi, R., Fard, N.J.H. and Turner, A., 2025. Exploring the Presence of Microplastics in Lung Lavage of Respiratory Patients and Correlation with Airborne Microplastics. *Atmospheric Environment*, p.121560.

Forutan, G., Sarkaki, A., Dehbandi, R., Ghafouri, S., Hajipour, S. and Farbood, Y., 2025. Chronic Exposure to Microplastics Induces Blood–Brain Barrier Impairment, Oxidative Stress, and Neuronal Damage in Rats. *Molecular Neurobiology*, pp.1-9.

Jahedi, F., Dehbandi, R., Talepour, N., Jaafarzadeh Haghighi Fard, N., Ravanbakhsh, M., Jorfi, S., Ahmadi, M. and Maleki, R., 2025. Abundance, distribution, and ecological risks of microplastics in urban and agricultural topsoil of Mian-Ab Plain, Iran. *Discover Applied Sciences*, *7*(7), p.667.

Jahedi, F., Fard, N.J.H., Ahmadi, M., Takdastan, A., Shoushtari, M.H., Dehbandi, R. and Turner, A., 2025. Microplastics in urine, sputum and lung lavage fluid from patients with respiratory illnesses. *Environmental Research*, *274*, p.121278.

Jahedi, F., Fard, N.J.H., Khafaie, M.A., Hesam, S., Dehbandi, R. and Kaydi, N., 2025. Characterization of Airborne Microplastics and Exposure Assessment in the Mahshahr Special Economic Zone, Northern Persian Gulf. *Atmospheric Pollution Research*, p.102585

UPCOMING GRANTS

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.