THE INSTITUTE FOR GLOBAL INNOVATION

October 2023

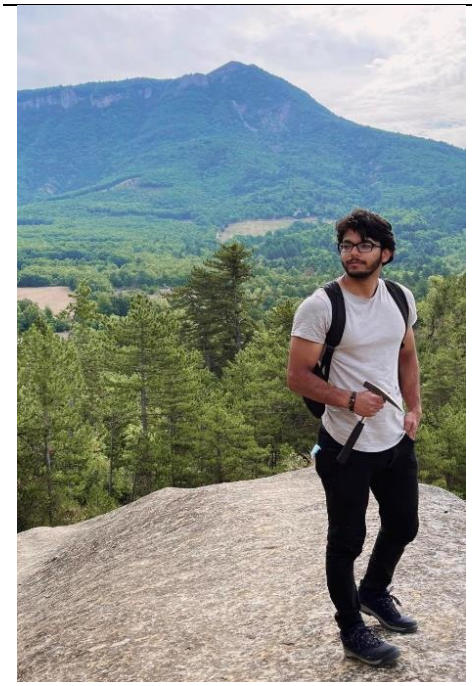
Water Challenges in a Changing World

OCTOBER NEWSLETTER

Hello everyone – we hope you are all having a good start to term and looking forward to Halloween. We would like to take the time to thank all the theme members for contributing their information and updates to us in preparing for the VC and PVC for research visit to the IGI. Some key summaries of the information show that in the 5-years of the Water Challenges Theme there has been a combined grant income of £44.3M, also in 2021 water related grant income accounted for 11% of all UoB research income. Understandably much of this may have occurred by itself, but hopefully the theme has been helpful in assisting through network building and seed funding some of these works. A big congratulations to all those that have won these grants.

We hope everyone enjoyed our theme sandpit meeting at BISCA - the aim was to learn more about BISCA and develop onward plans for the theme outside of the IGI. Please read more in the news section below, and we hope to see you at the next sandpit in November.

NEW MEMBER OF STAFF



Fuad Alqrinawi has recently become a member of GEES to undertake his PhD focusing on the fate and transport of micro- and nanoplastics in groundwater. This is part of the PlasticUnderground project, where his research will center on modeling the movement of these particles through sand column experiments.

Fuad holds a Master's degree in Hydrology from IHE Delft Institute for Water Education in the Netherlands and he is deeply interested in tracer hydrology, and understanding the emerging contaminants transport mechanism within groundwater aquifers. In his master's thesis, he delved into the world of colloidal particles in groundwater aquifers, utilizing Silica encapsulated, superparamagnetic DNA particles (SiDNAmag) in a 3-D sand tank experiment.

His skill set covers a wide spectrum, from groundwater and hydrological modelling to using Python for analyzing, visualizing and modelling large data sets.

Water Challenges in a Changing World

NEW PGR STUDENT - ERINA BROWN

Hi all, I've just moved recently from Glasgow, where I've been for the past 6 years. I completed my undergraduate degree in mechanical engineering, and then an MSc in sustainability and environmental studies, both at Strathclyde University.

My MSc thesis investigated quantifying microplastic pollution from plastic recycling facilities, in which I took samples of the water used by the recycling processes both before and after the facility's installation of filtration and analysed these using the Nile Red method. I then continued this research past my MSc to develop into a paper which I published earlier this year. I am really excited to start my research here with Sophie Comer-Warner and Stefan Krause in the fate and transport of microplastics in groundwater/soil. I am starting my PhD part-time as I am also working part-time with Atkins in their Bioresources team, in which we work in wastewater and sewage sludge treatment, involving looking at resource recovery and the outputs/outlets (including the current concern around biosolids to agricultural land).

NEW PGR STUDENT - ZIJIAN CHEN

After obtaining my bachelor's degree from North China Electricity Power University in China, I studied for my master's degree at the University of Leeds in the UK. During the five years of bachelor's and master's studies, I learned about water, atmosphere, noise and solid waste. Finally, I chose water as my research direction according to my interest.

I am currently working in Professor Stefan Krause's group on modelling microplastic fate and transport in freshwater ecosystems. Because of the need for modelling in this project, I also learned CFD in Professor Bruno Fraga's group.

Water Challenges in a Changing World

HANNAH GUNTER VISITS INDIA

Article by Hannah Gunter:

In May of this year, I undertook 8 weeks of fieldwork in Northern India to provide data for my PhD thesis. My focus is on using field-deployable fluorescence sensors to record information on water quality in real-time, with a particular focus on the use of fluorescence to detect E. coli and potential faecal pollution in water. I use a field-deployable Proteus multi-parameter water quality sensor, which includes two fluorescence sensors and a suite of physicochemical sensors.

The interest in Northern India was focused on the groundwater springs which occur throughout the region. These springs are used for both potable and household supplies. The primary aim was to validate the use of fluorescence as a method of detecting E. coli in environmental waters. The secondary aim was focused on further understanding the contamination pathways in groundwater springs based on both fluorescence signals and the more general physicochemical water quality parameters.

Collecting fluorescence data in a very colourful spring in Nathuakhan.

In 8 weeks, I managed to collect data on 56 different sites spanning 4 geographical regions in Uttarakhand, across the lesser and middle Himalaya. We were able to set-up a mobile laboratory which could be operated out of our accommodation allowing us to do overnight bacteria culturing, so every sample had both fluorescence and bacterial culture data. The use of a method to validate fluorescence is a key topic of discussion in the development of the technology and the use of the grant has allowed a robust dataset to investigate just that. The sites sampled spans a wide variety of underlying geologies and land use with the potential to use the data collected to understand more about pollution pathways and how pollution moves through the landscape.

The richness of this dataset would not have been achievable had it not been for the DARO grant which funded the entire trip and I want to extend my deepest gratitude to those that made it possible. This has resulted in a unique dataset covering an extensive geographical region which will provide a fresh perspective on the quality and contamination of groundwater springs in the lesser and middle Himalaya.

THE INSTITUTE FOR GLOBAL INNOVATION

October 2023

Water Challenges in a Changing World

Collecting fluorescence data in the Pali Gad, Thatyur.

Upper Himalayas from Tungnath – an excursion in between fieldwork sites!

Collecting fluorescence data from a spring in Nathuakhan.

Our main field lab set-up (incubator and autoclave not in shot!)

Water Challenges in a Changing World

WATER SEMINAR SERIES

Our second Water Seminar Series of the year was carried out by Dr. Gemma Coxon from the University of Bristol. Dr. Coxon is senior lecturer and a UKRI Future Leaders Fellow. The title of Gemma's talk was 'Projecting droughts in rapidly changing human-water systems across the UK'.

The talk was carried out online and in the IGI, followed by a networking lunch. Please email s.hira@bham.ac.uk to be given access to the talk recording.

Talk summary: A reliable water supply is often taken for granted in the UK. However, decreasing water supply from anthropogenic climate change, coupled with increasing water demand from a growing population are projected to lead to frequent water shortages across the UK by 2050. The seminar presented recent advances in national-scale hydrological modelling and our understanding of human influences on river flows using a unique dataset of spatially explicit, time-varying abstractions and discharges across the UK. It looked ahead to discuss how we can better understand human impacts on river flows and droughts and provide national-scale projections of hydrological drought that consider both water supply and water demand.

THE INSTITUTE FOR GLOBAL INNOVATION

October 2023

Water Challenges in a Changing World

WATER SEMINAR SERIES – NOVEMBER TALKS

We have 2 exciting Water Seminar Series talks coming up in November. Both talks will take place in room **G05 at the IGI** and will be followed with a networking lunch. Please see links below to register your interest/ join the webinar online. We hope to see many of you in person.

16th Nov, 12 – 1pm - Andras Szeitz Tickner, PGR student at McMaster University

Stream thermal regimes in subarctic Canada – what role does permafrost play, and at what scales?

Stream temperature is the master water quality variable, as it strongly influences stream physical and biological processes. Local environmental conditions can strongly influence stream thermal patterns, and landscapes in northern Canada are rapidly changing in response to climate change. This seminar will present the first regional-scale analysis of stream temperatures in subartic Canada (Yukon Territory), with a focus on the influence that permafrost plays on stream thermal regimes, along with some context on cold regions hydrology. This research sheds some light into the role that permafrost plays on stream temperature as a control on catchment storage and energy exchange, and how we might expect thermal regimes to change as permafrost degradation continues.

Register Interest

THE INSTITUTE FOR GLOBAL INNOVATION

October 2023

Water Challenges in a Changing World

22nd Nov, 12 – 1pm – Dr. Dave Tickner and Dr. Conor Linstead from the WWF-UK

How fundamental, applied and activist freshwater sciences can contribute to monitoring and recovery of the world's rivers

If the world is to solve the problems of the Anthropocene, including rapid biodiversity loss, a combination of fundamental, applied and activist science will be needed. Fundamental science is primarily concerned with acquisition of new knowledge for its own sake. Applied science seeks to use knowledge to address real world challenges. Activist science aims to accelerate changes in policy and practice by combining knowledge with advocacy.

Nowhere is the biodiversity crisis more acute than in freshwater ecosystems. The WWF Living Planet Index has documented an 83% decline in freshwater vertebrate species populations since 1970, more than twice the decline on land or in the oceans. Meanwhile, water scarcity and pollution threaten human water security worldwide.

The UN Sustainable Development Goals promised action to address unsustainable water management. The recent agreement by 196 nations of the Kunming-Montreal Global Biodiversity Framework provides a platform for urgent action to halt and reverse biodiversity loss, including in "inland waters". The private sector too is mobilising through initiatives such as the Alliance for Water Stewardship and the Courtauld 2030 Water Roadmap. But how can governments, companies and citizens know whether these promised actions and investments are resulting in healthier freshwater habitats?

In this seminar, we will outline how freshwater scientists have stimulated recognition of the twin freshwater biodiversity/water security crises and describe the responses from public and private sector actors. We will share insights from recent work to establish frameworks for monitoring river health at nested scales, building on fundamental and applied science. And we will share thoughts on how the academic community can equip a new generation of activist scientists that can drive a freshwater transition for the Anthropocene.

Register Interest

THE INSTITUTE FOR GLOBAL INNOVATION

October 2023

Water Challenges in a Changing World

THEME MEETING

This month we held our Water Challenges sandpit event at BISCA. It was a great turn out with many members of the theme attending in person and online.

We kicked off the meeting with a presentation from Prof. David Hannah, covering sustainability across the campus, followed by the build up to the Birmingham Institute for Sustainability and Climate Action (BISCA) and ending with what BISCA will do moving forward. More details will be made available in the future about affiliations with the institute, project priming activities and new management practices to quickly adapt to the changing and challenging research environment. Please refer to the BISCA website https://www.birmingham.ac.uk/bisca

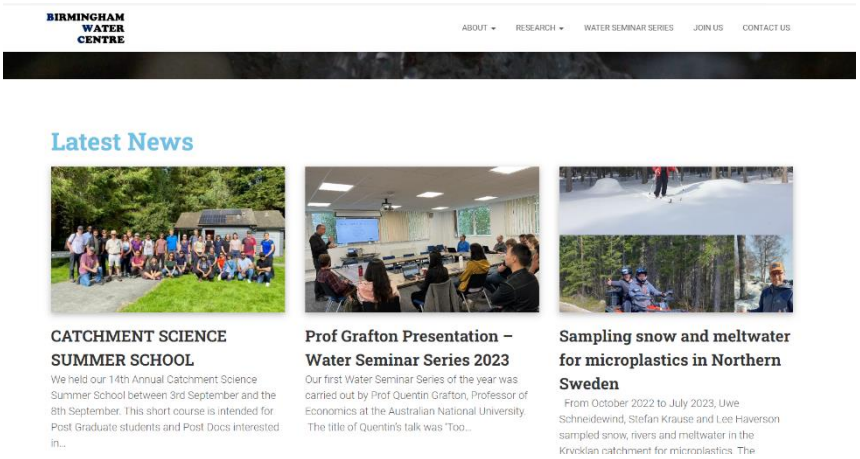
Following questions on this and about getting involved with BISCA moving forward, we then had an overview from Stefan on the Water Challenges theme and what we might consider moving forward as we transition from being in the IGI to independent research centre.

The next meeting will take place on **21st November, 3 – 5pm** at BISCA, Elm House, Room G08.

Water Challenges in a Changing World

BIRMINGHAM WATER CENTRE WEBSITE

We are pleased to announce that the ***Birmingham Water Centre*** Website is now live! The website is very much in development and new pages will be released as they are available. We welcome any feedback for the website and have also requested all involved in the water theme to provide details so that we can create personal profiles. Please complete the following form to ensure that your profile is included on the website: https://forms.gle/Vx7RZXJSwCxiA2udA



Our aim is to have researcher profiles at all levels and then draw links to those profiles between projects and research groups.

UOB GAME CHANGING IMPACT AWARDS

Congratulations to Chris Bradley, Kieran Khamis and David Hannah who have been awarded the **'Outstanding Impact in Innovation and Commercialisation**' award at the Game Changing Impact awards from the University of Birmingham. This encompasses benefits, effects or changes on production and commerce and the economy.

Chris, Kieran and David have developed a field-deployable fluorescence monitoring platform to identify organic pollution in surface waters in real-time. As well as generating profits for their industrial partner, the sensors purchased by water companies are acting as an early warning of polluting organic releases, protecting rivers from further ecological degradation.



Big congratulations to all three!

Water Challenges in a Changing World

DAVID HANNAH APPOINTED DEPUTY PRO-VICE CHANCELLOR OF SUSTAINABILITY

We have more great news this month about Prof. David Hannah being appointed the Deputy Pro-Vice Chancellor of Sustainability. As well as being the theme stream lead for 'Water Resources under Change' for the Water Challenges theme, David is a Professor of Hydrology in GEES and the Director of the Birmingham Institute for Sustainability and Climate Action. He is also a Chair-holder for the UNESCO Chair in Water Sciences and is listed in the Reuters Top 100 world's top climate scientists.

Prof. Hannah says: "***I am excited to take on this new role at a time when the University of Birmingham is committed to achieving ambitious sustainability goals. As an institution, we have a responsibility to address the sustainability challenges we face through our research, education and as a responsible organisation. It is my hope that through our research and practices, we can create positive change within the University and beyond***."

Congratulations to David for this excellent achievement. Read the full UoB news article here.

Water Challenges in a Changing World

GOODBYE TO VISITING SCHOLAR, JING LIU

We say goodbye to the lovely Jing this month who had been with us for the last year as a Visiting Scholar from China.

Read about Jing's experience in the group:

During my visit to the University of Birmingham, I fully experienced the excellent academic environment of the Water Science Group. Participating in the team retreat, group meetings, and the Water Science Seminar Series facilitated my rapid understanding of the latest research achievements and academic developments, significantly broadening my academic horizons. Professor Stefan's expert guidance greatly contributed to the successful completion of my research project. Additionally, interacting with team members from around the world allowed me to appreciate the charm of diverse cultures. This was a great experience to face academic challenges together, shared experiences, supported one another, and forged deep friendships. This period of studying abroad will remain a cherished memory in my life and continue to positively impact my future research. I feel incredibly honoured and grateful for the friendly support I received from Professor Stefan and the team. I miss everyone dearly and look forward to the possibility of future reunions, whether in the UK or China.

Water Challenges in a Changing World

WATERFLEAS HOLD KEY TO CLEANER ENVIRONMENT

We have some amazing news to share from Prof. Luisa Orisini and her team of experts who have harnessed Daphnia to provide a scalable low-cost, low-carbon method removing pharmaceuticals, pesticides, and industrial chemicals from wastewater – avoiding the toxic byproducts typically associated with current technologies. They have discovered a way that that tiny waterfleas could play a pivotal role in removing persistent chemical pollutants from wastewater – making it safe to use in factories, farms and homes. You can find the paper that was published in the journal 'Science of the Total Environment' here.

Luisa and the team were featured in 89 outlets around the world. As a result of this, they were approached by 3 companies to discuss partnerships. See The Guardian article link below:

The Guardian

Scientists use water fleas to filter pollutants out of wastewater

Tiny crustaceans described as 'the bioequivalent of a Dyson vacuum cleaner for wastewater'

The technology is supported by key fundamental research, some of which was led by Xiaojing Li from the water theme. Also published recently was the hologenome of the sentinel species Daphnia, used for the technological applications (https://doi.org/10.1093/nar/gkad685).

THE INSTITUTE FOR GLOBAL INNOVATION

October 2023

Water Challenges in a Changing World

COP28

How Can Literary Studies Contribute To A Just Transition To Sustainable Society?

Location Online
Dates Thursday 2 November 2023 (09:30-14:00)
Register Here

An online symposium organised by the University of Birmingham (Birmingham, UK, and Dubai, UAE) and the Commission on Science and Literature (DHST/IUHPST)

Two of the designated themes for COP28, to be hosted by the United Arab Emirates in November and December 2023, are a 'Just Energy Transition' and 'Youth, Education and Skills'. Science is fundamental to our understanding of climate change, while technology will have a key role to play in addressing it. At the same time, Arts and Humanities subjects such as literature have a vital contribution to make. Literary studies can help to foster empathy with those on the front line in the climate crisis, to process emotional responses to the changes happening to our world, to focus attention on the value of nature and our part within it, and to imagine the sustainable future we need to create together.

This online symposium brings together early career scholars and research students from around the world to present case studies showing how research and education in literature can contribute to a just transition to a sustainable future.

GREEN WEEK

Join us at the University of Birmingham to celebrate all things ecofriendly for Green Week. From Monday 13th to Friday 17th November.

Programme updated regularly here: Green Week 2023 - University of Birmingham

Water Challenges in a Changing World

UPCOMING GRANTS

Akademie Schloss Solitude – Fellowship
Deadline to apply: 30/10/2023
Award amount: €14.4k
The Akademie Schloss Solitude invites applications for its fellowship. This enables international artists, scientists, scholars and business representatives to attend the Akademie Schloss Solitude to devote themselves to their research projects

UKRI Creating Opportunities Evaluation Development Fund
Deadline to apply: 31/10/2023
Award amount: £100-250k
Apply for up to 12 months of funding to undertake evaluation activities that improve our understanding of interventions that increase opportunities and reduce disparities in economic, health and social outcomes for people and places across the UK.

Columbia University: Postdoctoral Fellowship in the Earth and Environmental Sciences
Deadline to apply: 03/11/2023
Award Amount: $73.5k
Researchers at the Observatory work to understand the dynamics of the Earth's chemical, physical and biological systems, from the core to the upper atmosphere, including Earth-human interactions. Our scientists lead research in the fields of solid Earth dynamics; ocean, atmospheric and climate systems; cryospheric dynamics; paleoclimate; biogeoscience; and solutions to air, water or soil contamination impacting communities.

European Space agency: Natural Capital
Deadline to apply: 11/11/2023
Award Amount: €60k
The European Space Agency invites tenders for its natural capital call. This aims to foster new state-of-the-art services combining space-based assets to enhance the natural capital management and monitoring. Key focus areas are:
nature based interventions - land use change; nature based interventions - water marine environment

[BBSRC: Sustainable Aquaculture Partnerships for Innovation]
Deadline to apply: 14/11/2023
Award Amount: £750k
This collaborative research funding opportunity aims to build and strengthen partnerships between academia and industry and enable the co-development of innovative solutions to key environmental sustainability challenges. This funding opportunity will support the productivity of UK aquaculture in current and novel systems.

[Env: Advanced environmental solutions prize]
Deadline to apply: 24/11/2023
Award Amount: £200k
Eni invites applications for its advanced environmental solutions prize. This recognises a researcher or a group of scientists who have achieved significant research and development results in the field of environmental stewardship, including climate change adaptation, mitigation and remediation strategies.

[EU-tender: Development of the circular economy approach in the basin of the lakes Tanganyika and Kivu]
Deadline to apply: 30/11/2023
Award Amount: €4M
The global objective of this call for proposals is to improve water quality in the basin of Lake Kivu and Lake Tanganyika through sustainable and inclusive economic practices. The priorities of this call for proposals are: - The development of/ support to circular economy initiatives to reduce the polluting impact on the waters of the basin of Lakes Tanganyika and Kivu. - The spread of sustainable and inclusive economic practices that promote the socio-economic development of the countries bordering Lakes Tanganyika and Kivu.

[Foodshot Global: Water Call]
Deadline to Apply: 01/12/2023
Award Amount: $500k
FoodShot Global invites applications for the water call. This offers a prize to rising stars working in research, early stage entrepreneurship, or advocacy on water-related topics.

[Pre-announcement: NERC strategic capital funding opportunity 2023]
Deadline to apply: 05/12/2023
Award amount: £350-£750k
*Call opens in September. Apply for funding to improve the environmental research landscape through new or improved equipment.

Water Challenges in a Changing World

[Innovate UK - UK - Singapore Collaborative R&D Call Sustainability and Net Zero]
Deadline to apply: 06/12/2023
Award amount: £750k
UK registered organisations can apply for a share of up to £5 million as part of a collaboration with a Singapore partner for industrial research projects that develop sustainable technologies helping reduce emissions and achieve a net-zero future.

[US - Postdoctoral and Visiting Research Scientist Program]
Deadline to apply: 08/12/2023 (forecast)
The Atmospheric and Oceanic Sciences program provides a stimulating and supportive environment for career development of both early career and established researchers. Postdoctoral and visiting research scientists have access to collaborators from a pre-eminent government laboratory in NOAA-GFDL, as well as Princeton University research collaboration and training opportunities.

[UK Space Agency – Climate Services]
Deadline to apply: 30/12/2023
Award amount: £10k
The UK Space Agency is looking to provide small grants to help the UK develop business-viable ideas that use space data in a climate-related application.

[MDPI – Water Journal Travel Award]
Deadline to apply: 31/01/2024
Award amount: CHF 800
This supports PhD and postdoctoral researchers in presenting at an international conference relating to water.

[International IGB Fellowship Program in Freshwater Science]
Deadline to apply: 01/03/2024 (forecast)
The Institute invites excellent postdoctoral and senior scientists to apply for a fellowship at IGB. Positions are offered to enable postdoctoral scientists to further their scientific development. Senior scientists are supported for up to 12 months to contemplate and pursue new inspiring research ideas in collaboration with scientific staff at IGB.

Water Challenges in a Changing World

Open Calls with no closing date:

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.

We welcome your contributions and suggestions for the newsletter. Please feel free to email Liam and Suman – l.kelleher@bham.ac.uk / s.hira@bham.ac.uk