

Faculty News

Faculty of Natural Sciences

31 March 2023



Fungi and Forests living in harmony

A study by Paul Thomas, Honorary Professor in BES, has been published in [PNAS](#) (The Proceedings of the National Academy of Sciences), the prestigious journal of The National Academy of Sciences (NAS). He spent two years collating and analysing data from published sources, working in partnership with Prof Alistair Jump. The study found that growing edible mushrooms alongside trees can produce a valuable food source for millions of people while capturing carbon and mitigating the impact of climate change.

There is currently a significant global issue of land-use conflict between forestry and food production and, as a result, net loss of forest area remains high - demand for agricultural land is the biggest driver of global deforestation and this is forecast to accelerate. However, the research found that the cultivation of edible ectomycorrhizal fungi (EMF) in forests may sequester up to 12.8 tonnes of carbon per hectare annually and produce a nutritious food source for nearly 19 million people per year. Professor Thomas went on to say that the technology is emerging

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Other news



Ukraine water quality

Andrew Tyler is also the lead in the joint research project which will see remote water quality monitoring in Ukraine carried out using satellite technology. According to a preliminary assessment by the United Nations Environment Programme, the war

and much more needs to be done to realise these benefits. He has called on researchers to join the field and for support from relevant agencies: “This food production system is highly scalable, realistic and a potentially powerful route to sequester greenhouse gas. It would help with biodiversity and conservation globally, triggering rural socio-economic development and providing an incentive for increased tree planting rates with all the associated benefits that brings.”

[Read the full article here](#)



Celebrating World Water Day

In an article in [The Herald](#), Prof Andrew Tyler, Hydro Nation Chair, has spoken of the University’s work to mitigate the effects of climate change to mark the 30th anniversary of World Water Day. Water is the primary medium through which we in the UK are feeling the effects of a changing climate, and as a result we are witnessing increasing rainfall intensity separated by ever prolonged periods of drought - hydrological extremes that result in shocks to our natural and built environment. However, the natural diversity of our landscape presents opportunities to find nature-based solutions to help us adapt to and mitigate against climate extremes - and right here in Scotland intensive work is going on to do just that.

The first phase of SIEC is a regional scale living laboratory known as the Forth Valley Environmental Resilience Array (Forth-ERA) which will harness sensor networks and satellite technologies, as well as autonomous vehicles, coupling these with modelling and artificial intelligence capabilities to deliver a Digital Observatory of the Firth of Forth. [Watch the video here](#).

Managing Pest Resistance

has caused untold damage to water pumping stations, purification plants and waste water treatment facilities. This is likely to have caused contamination of ground and surface waters. Andrew is working with experts at Odessa State Environmental University to build expertise on enhancing and protecting water quality in post-war Ukraine.

[Read more](#)



Research Culture Awards

The Festival of Research 2023 programme will once again host the annual Research Culture Awards and [nominations can now be made](#) in any or all of 7 categories - see the full list and further details on the [Festival of Research webpage](#). Award nominations will remain open until Wednesday 19 April. First introduced in 2020, the Research Culture Awards are a way to recognise and encourage collaborative and supportive behaviour by celebrating staff members who demonstrate good role modelling across the career spectrum; increase visibility of efforts and place



Dr Matt Tinsley and Dr Rosie Mangan, BES, have published results of a study funded by a joint Newton Fund international partnership between the Biotechnology and Biological Sciences Research Council (BBSRC)

in the UK and the São Paulo Research Foundation (FAPESP) in Brazil, alongside the Swedish Research Council (Vetenskapsrådet). For more than 70 years, agriculture's response to pesticide resistance has been to seek new pesticides in an endless race to keep up with evolving pests.

They have proposed a new way to step off this treadmill by switching to biopesticides derived from natural organisms. The evolution of resistance to biopesticides - a crucial tool in the development of sustainable crop protection - has huge implications for food security worldwide as the global population grows. They suggest that farmers can help manage resistance risks by planting a wider diversity of crops and use multiple biopesticides. The full study is published in "[Trends in Ecology & Evolution](#)"

[Read the full article here](#)

value in often-hidden contribution; and to create a shared understanding of what we value at Stirling. If you have any questions about the Festival of Research 2023 contact ias@stir.ac.uk.



Lifespan Lab launch

A reminder of the Lifespan Lab launch event on **Tuesday 18 April**

2023 celebrating the opening of this new research lab in Psych as a safe and inviting space to conduct research with potentially vulnerable people. The day will include short research presentations by academics, tours of the lab itself, and demonstrations of some of the new research equipment (e.g., Biopac, eye tracker, camera traps and sound recording equipment). Please use [this link](#) to register to attend. If you would be interested in contributing a presentation please contact Dr Line Caes or Prof Christine Caldwell.

Inspirational Women!



At the Stirling Student Union ceremony held on 23 March 2023, a number of inspirational women were celebrated across the university. We have many nominees from within the faculty. With special mention to Sabine Matallana-Surget, BES, who was overall winner Women in STEM category for FNS.

[See the full list here](#)



An International Women's Day event held by the EDI Committee in IoA was a great success with five guest speakers across multiple disciplines.

[Read more](#)

Truffle cultivation in UK

Elsewhere, **Prof Paul Thomas** has written an article for [The Conversation](#) indicating that climate change may offer an opportunity for the re-emergence of truffle production in the UK.



Normally associated with Mediterranean countries, truffles have long been held in high regard by chefs and food connoisseurs. These fungi grow underground and are unearthed by specially trained dogs. European harvests slumped over the years due to habitat change, although new techniques allowed the industry to survive in France. These new techniques did not work in the UK, but by focusing on seeds and spores adapted to local conditions, the first farmed truffle was grown in England in 2015, swiftly followed by other UK nations. Summer drought and heat can be detrimental to truffle harvests, but the cooler, wetter conditions here can help boost production. In terms of the UK, climate change can be both a threat and an opportunity.



New Fellow of the Royal Society

Many congratulations and well done to **Prof Rachel Norman**, who has been named a Fellow of the Royal Society Edinburgh alongside Prof Leigh Sparks, Cathy Gallagher and Alan Simpson, former Chair of University Court. This is a prestigious recognition from an internationally-renowned organisation, which celebrates excellence across Scottish society. In her institutional role, Rachel is pivotal in the development, promotion, and enhancement of research culture across the University, and is actively involved in public engagement around research.

Welcome to the Faculty



Alastair Skeffington has joined BES as a Lecturer in Environmental Genomics. He did his PhD at the John Innes Centre in Norwich then spent seven years at the Max Planck Institute for Molecular Plant Physiology in Potsdam, Germany followed by a short period at the University of Exeter. Alastair is a



Sarah Greenwood is a new Lecturer in Global Change Biology in BES, joining us after 6 years as a Teaching Fellow at the University of Edinburgh. She is a global change ecologist with a special interest in the dynamics and function of forests and how these respond to climate change another other global drivers including pests and



Charlotte Lee, PhD student in IoA, will be presenting on marine plastic debris at the Marine Alliance for Science & Technology Scotland on 12 April as part of their [webinar series](#).

molecular biologist and bioinformatician. At Stirling he will work on algal biology and bloom formation and is looking forward to developing new collaborations with colleagues in BES and beyond!

Eilidh Forrest has joined us as PGR Administrator. She spent a few years in Australia where she worked in pre- and post-award research at the University of Murdoch, then briefly moved to Dubai where she was involved in opening the Murdoch Uni Dubai Campus. After a spell in social work in Edinburgh, Eilidh joined the University of Stirling where she has worked in pre- and post-award for almost 5 years. She has a daughter Katy, who is 3 going on 13 (!) who keeps Eilidh busy outside work.



disease. Sarah is also interested in research syntheses and inclusivity and accessibility in teaching. It feels like a return home for Sarah who completed her PhD and a couple of post-docs in BES.

On 10 May **Alexandra Pounds**, IoA, will be presenting on building capacity and drafting publications to bridge the interdisciplinary divides between aquatic animals, nutrition, and health outcomes.



SIAM Conference

Dr Wen-shin Lee (CSM) gave a talk entitled "Relaxing the Shannon-Nyquist constraint for antenna design" and co-organised (with Prof Annie Cuyt) a mini-symposium "Superresolution in exponential analysis" at the SIAM conference on Computational Science and Engineering (26 February-3 March, Amsterdam) in the framework of the [EXPOWER project](#). This is the biennial flagship conference of the Society for Industrial and Applied Mathematics (SIAM) Activity Group on Computational Science and Engineering. These conferences bring together experts worldwide to seek and enable in-depth technical discussions on a variety of major computational

Natural Gas concerns

Dr Jen Dickie is lead researcher for Stirling on a project which found that the degree to which people believed climate change to be serious and evidence on climate change to be reliable determined the strength of their opinions about natural gas production. The researchers contributed to the design of a questionnaire and 1,000 people were surveyed in the UK in April 2019 and asked the same questions again each year for four years. The group were asked to what extent they believed climate change is serious, and the degree to which they thought the evidence on climate change is reliable. They were also asked to give their opinion on extracting natural gas in the UK.



With each annual survey, climate change beliefs increasingly affected views on natural gas development. Believing climate change is serious predicted opposition to gas extraction eight times more strongly in 2022 compared to 2019. The results suggest climate change beliefs increasingly predict opposition to natural gas. The findings were published in [Nature Climate Change](#).

[Read the full article](#)



Living Lab for growing food

The university has joined forces with Clackmannanshire Council to set up a community-led food growing project using renewable energy. The Living Lab will transform derelict land next to Alloa's Forthbank Recycling Centre, with work scheduled to begin in the spring. Initially, the project will see the installation of a modular building for mixed methods in growing produce, along with solar panels to help grow the food and a rainwater capture system. It

problems in science and engineering.



AMR Workshop

Drs Darren Green and Andrew Desbois, IoA, hosted a 2-day workshop at Scotland House in London on Antimicrobial Resistance (AMR) in aquaculture. Darren and Des were joined by colleagues based in the Netherlands, Sweden and the UK, and the workshop was made possible by a BBSRC International Partnerships Award. For more information, please contact Darren or Des.



Happyr Health has been awarded the Innovate UK's Design Foundation Grant to revolutionise the way they support young adults with chronic pain. Happyr Health is a UK-based digital health company and one of the 3 project partners alongside Psychology at Stirling and the National Migraine Centre. The 6-month project will see the founders who themselves live with chronic pain take their product portfolio

will also provide learning opportunities and food growing opportunities for people in the community. This project builds on a long term collaboration between Rachel Norman, Sandy Brownlee, Jason Adair and Sarah Thomson, CSM, Jen Dickie, BES and Andrew Desbois, IoA as well as linking to City Region Deal through SIEC.

[Read the full article here](#)

to a new level, creating a high-fidelity prototype of a digital pain clinic building on their self-management app 'Tamer' and an online parent course.



Welcome Saoirse

Congratulations to Anthony Lee and partner who have welcomed their daughter Saoirse Lee Lamb into the world.



Aqua placement

Silvere Santos, Animal Care Technician, recently completed a placement at the Palavas Experimental Aquaculture Research Station (PEARS) Palavas les Flots, South of France as part of the AquaExcel 3.0 technician transnational mobility program. A diary report of the placement has now

been published: [link here](#).



Land restoration visit

Dr David Oliver, Dr Zarah Pattison, Dr Alan Law and Dr F-X Joly from BES visited Moi University in Eldoret, Kenya, where they were hosted by Dr Carol Munyao, Dr Bernard Malakwen and colleagues from the School of Public Health, School of Information Sciences and School of Agriculture. The visit builds on a recent MoU established between the two universities. The team were shown key sites in the Cherangani Hills and met with county government officials, NGOs and local farmers to understand current land management approaches. This trip enabled further discussion about research collaboration, with land restoration strategies in the region and associated decision-making processes and community engagement seen as a key priority. Funding was provided via a NERC Disciple Hopping award.



Partnership Workshop

Dr David Oliver, Prof Richard Quilliam, Chisha Mzyece and Bridget Rusk hosted colleagues from Wageningen University (Environmental Systems Analysis Group) and Teagasc (Ireland's Agriculture and Food Development Authority) for a 4-day workshop (6-9th March) on 'floods, droughts and pathogens'. The interdisciplinary workshop, part of a BBSRC international partnership grant, brought together a range of expertise spanning environmental microbiology, soil science, environmental modelling, catchment science and water resources management. Development of a roadmap of research priorities linked to pathogen pollution and subsequent risks to human health from hydrological extremes is now underway and the team are exploring opportunities for future collaborative funding.

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GHG sampling Vietnam

Richard Newton, IoA, recently travelled to Vietnam to collect Green House Gas (GHG) samples from pangasius fish ponds. Pangasius (often known as “basa”) is a major traded fish species to Europe and an important economic species for Vietnam. Recently there have been several high profile publications that have estimated large GHG emissions from freshwater fish production, but few have taken direct measurements, instead relying on modelling assumptions that can be subject to large degrees of uncertainty. Richard’s work will aim to contribute one of the few sources of primary data regarding direct GHG emissions that can inform on Life Cycle Assessments of freshwater aquaculture systems.

Fuel to Pot event

The Fuel to Pot (F2P) project led by Dr Isabelle Uny, funded by the GCRF Arts & Humanities Council Grant is a collaboration between the University of Stirling, Mubas (Malawi) and KEMRI (Kenya) with the aim of building a partnership of community members, stakeholders and researchers interested in the issue of cooking using solid fuels in informal



settlements. On 23 March, the team presented their work to Stirling colleagues by means of a presentation and gallery walk showcasing the methods and results of the F2P project, as well as the future directions the project findings and community engagement events identified. This well-attended presentation and gallery walk was also an ideal opportunity to further strengthen the collaborative relationship. Line Caes, Psych, is pictured with Isabelle and colleagues from Malawi and Kenya.

[Read more on the project here](#)

Malawi Tilapia Study



STIRLING- MZUZU GCRF PROJECT

Through funding from Innovate UK-GCRF Agrifood Africa, **Dr Amina Moss and Dr Almas Gheyas**, IoA, along with Dr Kumbukani Mzengereza from Mzuzu University, conducted a pilot study in Malawi to investigate the use of yellow mealworm grown on pre-consumer organic waste (carrot trimmings) as a protein source for two species of tilapia. An all-female team from Nepad Regional Fishnet SanBio at the Lilongwe University of Agriculture and Natural Resources (LUANAR) successfully reared the insects, Dr Mzengereza and Dr Moss formulated different diets for the fish, while staff and students at Mzuzu University set up experimental tanks to test the tilapia's

growth rates. Check out the video above with highlights from the project.

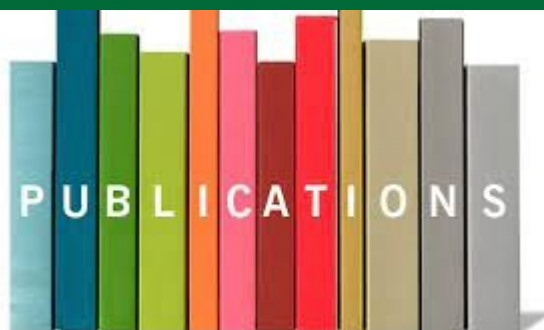
[Read more](#)



New tool for nutrition deficiency

Prof Dave Little, IoA, has collaborated with Universities of Glasgow, Aberdeen, Copenhagen and the Noakhali Science and Technology University and the International Centre for Diarrhoeal Disease Research in Bangladesh on a project which has developed a new tool to identify girls in developing countries who are at risk of nutritional deficiency. He used the resource to discover that adolescent girls in Bangladesh are particularly vulnerable with higher nutritional needs relative to energy requirements than other adult household members, and at the same time likely to have restricted access to food. The findings are published in [BMC Public Health](#).

[Read the full article here](#)



Luisa M. Vera, Gonzalo de Alba, Silvere Santos, Tim M. Szewczyk, Simon A. Mackenzie, Francisco J. Sánchez-Vázquez, Sònia Rey Planellas, 2023. Circadian rhythm of preferred temperature in fish: Behavioural thermoregulation linked to daily photocycles in zebrafish and Nile tilapia, [Journal of Thermal Biology](#).

Cunningham, KB., Rogowsky, RH., Carstairs, SA., Sullivan, F., Ozakinci, G. (in press). Progressing social prescribing with a focus on process of connection: Evidence-informed guidance for robust evaluation and evidence synthesis. Public Health in Practice.

Lim, J. (2022) Broad toxicological effects of per-/poly-fluoroalkyl substances (PFAS) on the unicellular eukaryote, Tetrahymena pyriformis. Environmental Toxicology and Pharmacology, 95, 103954. - My first sole authored paper.

Sabockyte, A., McAllister, S., Coates, C. J. & Lim, J. (2023) Effect of acute ultraviolet radiation on Galleria mellonella health and immunity. Journal of Invertebrate Pathology, 107899. - Both Ausrine and Sam were my UG dissertation students and contributed towards this work.

Copplestone, D., Coates, C. J. & Lim, J. (2023) Low dose gamma-radiation induced effects on wax moth (Galleria mellonella) larvae. Sci Total Environ, 876, 162742

Van AP, Bron JE, Desbois AP. (2023) Antimicrobial action of chromatin extracellular traps released by neutrophils of rainbow trout, Oncorhynchus mykiss (Walbaum, 1792). [Fish Shellfish Immunol](#)

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Contributions for next edition

The next Newsletter will be published on **Friday 28 April**.
Please submit contributions at least 3 days in advance to Diane Davidson:
FNSDeanPA@stir.ac.uk