



Newsletter

Summer 2022



The University Of Sheffield.



UK Centre for Ecology & Hydrology

News and Updates

Welcome to the 1st ECORISC Newsletter!

Our 1st cohort of students have now completed year 1 of the course and many are now spending the summer completing field work. To find out more about our current students and their projects visit our [ECORISC webpages](#).

Recruitment for the 2nd cohort of students is now complete and we are excited to welcome 16 new students onto the programme in the Autumn. We are thrilled with the range of projects which vary from the rapid assessment of pollution in the Galapagos archipelago to understanding the impact of chemical pollutants on freshwater ecosystem services. We will be introducing all our new students and their projects in the next



newsletter. The summer is looking to be a busy time for the ECORISC team after we secured additional NERC funding to run a Summer Scholarship Training Scheme aimed at attracting students from non-traditional higher education backgrounds to consider studying for a PhD. Students will spend approximately 6 weeks with members of the ECORISC team where they will be introduced to the fields of environmental chemistry, ecotoxicology and environmental risk science as well as gaining specialist skills training in methods and techniques.

The programme kicked off on the 1st July with an induction event in Sheffield and will conclude with a residential event in York aimed at equipping scholars with the skills needed to develop a competitive PhD application.

Events

Brathay 2021 Residential Workshop

In December 2021 Cohort 1 spent four days in the Lake District. Students presented their projects, progress and spent some time exploring the potential interactions between the different projects.



There was a series of sessions covering issues around research quality, inclusivity, equity and science communication as well as a few fun activities including a wildlife photography competition.





Events

32nd European Conference of the Society of Environmental Toxicology and Chemistry (SETAC) by Loween Jones

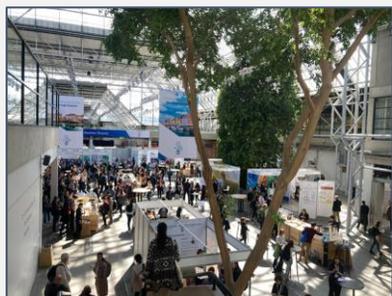


In May 2022, I (Lowenna Jones) joined fellow ECORISC PhD candidates Eve Tarring (University of Cardiff), Imogen Bailes (University of Lancaster) and Isla Thorpe (University of York) in travelling to Copenhagen (Denmark), to attend the 32nd European Conference of the Society of Environmental Toxicology and Chemistry (SETAC).

The main theme of this year's conference was 'Moving Towards a Reduced Pollution Society', which was chosen to give focus to the visions of the European Green Deal and the subsequent Chemical Strategy for Sustainability (CSS), formulated in late 2020 to set the framework for European chemical regulation in future years. The conference had a compelling scientific programme, featuring 79 different sessions, spanning multiple diverse tracks, topics and themes. With endless, and often too many, options to choose from it was a relief to know that sessions were available online via their platform to catch up and watch once the conference was over.



Each day, the conference featured a high-level keynote presentation from a leading scientist, academic or policy maker. Echoing concerns emerging from the scientific literature and industry stakeholders, key notes covered everything from 'Persistent and Mobile organic compounds (PMOCs)' and substances of concern (Hans Peter Arp, Norwegian University of Science and Technology), to ambitions of the 'EU Chemical Strategy for Sustainable use of Chemicals' (Cristina de Avila, European Commission) and 'Actionable Research to Bridge the Knowledge action Gap in Environmental Toxicology and Chemistry' (Janet Hering, ETH Zürich and the Swiss Federal Institute of Technology Lausanne). With Life Cycle Assessment (LCA) and the transition to a Circular Economy high on the agenda for the future of environmental toxicology and chemical regulation, George McLoughlin from the Ellen MacArthur Foundation's Plastics Initiative provided an inspiring demonstration of the innovative, planet positive actions businesses and corporations of all scales and sizes from across the globe are taking to their transition to a circular economic model.



Whilst it was impossible to attend every session, the Bella Copenhagen Conference Center provided a beautiful, light-filled space where more than 2000 delegates could catch-up or meet over coffee, share experiences and points of interest and explore the hundreds of posters on show around the centre across the five days. This also provided a fantastic opportunity to network and meet representatives from SETACs global partners dotted around the perimetry of the conference centre. Prior to attending the conference I had signed up to the SETAC mentorship programme where myself and two other early career academics within SETAC Europe were partnered up with a 'mentor' whom we met on the first full day of the conference. Alongside the other ECORISC PhD students Eve, Isla and Imogen it was a welcome relief to have a friendly face or two milling around the exhibition centre that you could enjoy lunch with or simply wave from a far. A number of ECORISC partners such as WCA, Fera Science and Cambridge Environmental Assessments were also exhibiting which provided the perfect opportunity to introduce ourselves and discuss potential partnerships as we move through our PhDs and beyond.

SETAC Copenhagen was a deep dive into my first European conference as an ECORISC PhD candidate, however its unique interdisciplinary representation, remarkable ambition and infectious energy will continue to inspire me for months and years to come. Next stop, SETAC Dublin 2023!

Charlotte Robison-Smith - Hidden costs of environmental pollutants: functional impacts on host-pathogen interactions



My project is currently focussing on benchmarking conventional petroleum– based plastics against alternative biomass– based plastics, known as bioplastics. I am investigating how microplastics formed from the two different types of plastic affect fish physiology and disease, comparing growth rate, metabolism growth rate, metabolism, feeding ecology, fecundity and disease susceptibility within a bioassay. I am also applying analytical chemistry techniques to gain a

comprehensive understanding of how alternative plastics may impact fish populations, with relevance for wild populations as well as the aquaculture industry.



Imogen Poyntz-Wright - Assessing responses to chemical exposure in invertebrate and fish populations and biodiversity across diverse UK aquatic environments

Over the past nine months I have conducted a thorough literature search for my literature review entitled: “Associations between Chemical Pollution and UK Freshwater Invertebrate Populations - A Critical Analysis”. Alongside this, I have started my initial research to identify which chemicals to focus my research on and where the impact of these chemicals on riverine invertebrate populations is likely to be strongest. Firstly narrowing down which chemicals out of the plethora of chemicals in English rivers are most likely to be harming freshwater invertebrates based on their toxicities and chemicals monitoring data. Pesticides were determined to be the most problematic group for riverine invertebrates, particularly pesticides which are designed to target and kill terrestrial invertebrates (e.g. insecticides, molluscicides and miticides). The top ten most innately toxic pesticides were chosen for future investigations. Next, I identified where in England these chemicals have had the greatest impact on invertebrate populations. The Anglian region was found to be the region with the greatest impact of pesticides on macroinvertebrate communities. I will next be identifying which species in this region are likely the most susceptible to the ten pesticides.

Ciara Sanchez-Paredes - Second Generation Anticoagulant Rodenticides (SGARs) impact the individual fitness and the population dynamics of the common Kestrel (*Falco tinnunculus*)



Update: Are there any differences in kestrel chicks’ body condition in relation to areas using and not using SGAR? I am currently in my first field season working with Dra. Georgia Jones and a local ringer (Jason Fathers); we are monitoring a kestrel population in Dorset during the breeding season (May – July). We are following 12 nest boxes, visiting them once a week before hatching and twice after hatching; the first is for checking the growth state

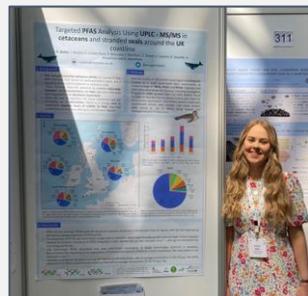
and the second for ringing the chicks where morphological measurements are taken. During each visit, we collect pellets, feathers, and prey remains; those samples will be analysed for SGARs residues. Until now, two boxes have been lost to predation, and 18 chicks were measured and ringed from 5 nest boxes.



Project News

Imogen Bailes - Lancaster - Understanding the exposure of wildlife to persistent chemicals in the UK and Antarctica

My project seeks to identify and quantify the burden of persistent pollutants in UK and Antarctic animals. For my first study, I'm working with one of my partner organisations, Cefas, on per and poly fluorinated substances (PFAS) in cetaceans and seabirds. In May I spent a lot of time doing the lab work for this work down at the labs in Lowestoft and I'll then finish that lab work off back in Lancaster over summer. I attended two conferences, SETAC Europe in Copenhagen, where I presented a poster, and then SETAC Non-Target 2022 virtually where I gained knowledge on techniques I'll use later on in my PhD. Currently I'm analysing the data from the lab work I've done, so I can present these initial findings at a conference in July. I feel in a good place with my PhD at the moment, and excited to get this lab work done so I can start writing the results up!



Training Updates

Our 1st cohort of students have now completed year 1 of the taught element of their course. Since October 2021 students have studied modules aimed at equipping them with an understanding of the fundamentals of environmental pollution science.

An Introduction to Environmental Chemistry focussed on introducing students to the sources and pathways of chemicals to the environment and the fundamental principles and processes which control exposure to wildlife and humans.

An Introduction to Ecotoxicology introduced students to the fundamental concepts of ecotoxicology, both regulatory and experimental, navigating between sub-organism and level ecotoxicology (mechanistic toxicology) and Organism Level Ecotoxicology.

An Introduction to chemical stress ecology equipped students with an understanding of effects of chemical stressors on the structure and functioning of populations, communities and ecosystems.

Environmental Risk concentrated on the Concepts and principles in regulatory ecotoxicology and environmental risk assessment and legislative frameworks.

Finally the year 1 students completed the **Cross-cutting and Professional Skills** module. This module allowed students to develop their understanding of R, concentration-response analysis, outliers and below detection limit issues, species sensitivity distributions (SSD) and chemical exposure distributions, and the CRED quality assessment approach



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