



## Newsletter

Autumn 2023



## News and Updates

We begin the autumn addition of the ECORISC Newsletter by welcoming our 3rd cohort of students to the ECORISC community. 14 new PhD students (and one affiliated student) are embarking on their PhD journey, with the support of academics from across the ECORISC institutions. Once again, we have a many stakeholders involved, including; Syngenta, Bayer, RSPB, Cefas, Defra, Fera, Natural Resources Wales and Welsh Water to name a few. Details of all the students, their backgrounds and projects can be found on the [ECORISC web pages](#).

The summer has seen a number of our cohort 1 students on placement, and once again students from both cohort 1 and 2 have been busy attending a host of different conferences and events. Cohort 2 have been on their 1st Challenge Event, working with the Rivers Trust and cohort 1 have travelled to Reckitt Benckiser for their Product Risk Assessment Challenge Event. Cohort 3 travel will come together for the first time in December at Brathay in the Lake District for their Induction Retreat.

The ECORISC team have also been busy supporting the next generation of potential PhD students. 6 undergraduate students from York, Sheffield and Exeter have been involved in Research Experience Placements funded by NERC.

## Research Experience Placements

Through funding from NERC the ECORISC CDT hosted 6 undergraduate Research Experience Placements. The aim was to provide students with an interest in a career in environmental science the experience of working on a small research project. The projects on offer aimed to address the quantitative skills gap in environmental sciences. Projects titles included; Pollution of Yorkshire's Rivers by Highway Runoff (York), Sunscreen pollution of coastal waters (York), Impact of UV filters and open-water swimming in the water quality of rivers in Yorkshire (York), Copper (Sheffield), Bacterial phenotypic adaptation to mechanical stress induced by nanoparticles at the single-cell level (Exeter) and Assessing levels of pharmaceutical pollution in Yorkshire at High Temporal and Spatial Resolutions (York).

### **Bacterial phenotypic adaptation to mechanical stress induced by nanoparticles at the single-cell level - Caitlin Heaton**

This project, supervised by Dr Fabrice Gielen from the University of Exeter saw Caitlin conducting experiments to understand the interactions between *Escherichia coli* BW25113 and spherical zinc oxide (ZnO) nanoparticles (NP) and how these might affect the functions of an ecosystem.



# Research Experience Placements

## **Bacterial phenotypic adaptation to mechanical stress induced by nanoparticles at the single-cell level - Caitlin Heaton (cond)**

Caitlin stated that “This placement was extremely beneficial to me as it expanded my knowledge on careers in research. I benefited from working independently in a professional laboratory with various technology, providing me with invaluable experience to prepare me for any laboratory work I carry out for my dissertation. Working with the Gielen research group and the NERC ECORISC mentors Francesca Molinari and Rohan Joglekar supplemented me with numerous connections, and I was able to learn about life as a PhD student firsthand. I practiced independence, self-reliance, and collaboration which I feel have better prepared me for my final year of undergraduate study and have motivated me to apply for additional internships”.

## **Pollution of Yorkshire’s Rivers by Highway Runoff - Heather Newman**

The aim of this project, supervised by Alistair Boxall (York) was to create a risk map using ArcGIS Pro to map out the concentrations of PAHs and metals across Yorkshire’s rivers with data extracted from the National Atmospheric Emissions Inventory (NAEI). By comparing the NAEI data with the Environment Agency (EA) data that is already available for pure river pollution in a regression analysis, it determined whether the NAEI data was an accurate representation of road river pollution. A flow accumulation model was used to display this NAEI data and highlight the most highly polluted rivers.

Heather summarised the experience stating “having used GIS throughout, there has been an increased understanding of this software which will be useful when it becomes relevant in future studies. A research career will now be considered much more than it would have been before starting this project after coming away with some useful and interesting results of personal research”.

## Events

### **Cohort 2 - Data Challenge Event (The Rivers Trust) - Gradbach Mill by Angel Ceballos Ramirez**

On a very rainy and cloudy day, the 16 students from the 2nd cohort of the ECORISC CDT made their way to Gradbach Mill in Derbyshire.



Prior to attending the cohort had split into groups and selected a project area to address, all varied and interesting, ranging from herbicides pollution linked to golf courses to a very interesting prediction of endocrine disruptors in surface waters in the north of England.

The first activity was to present the project themes to the group, explaining the ideas, framework and databases that would be used. An impromptu “walk” followed, the views from a rock halfway through the walk were worth all of the dirt on everyone’s clothes!

Day two began with with an in-depth exploration and processing of the data we chose to build our projects with, and a brief catch-up and presentation to personnel from the Rivers Trust. They provided interesting feedback and direction to each project and helped us navigate the challenges that arose from processing the databases we chose.

The afternoon saw a long hike up onto the top of the rolling hills and peaks, from which we could see the brewery in Danebridge, where we ended up walking whilst talking about life, PhDs and everything in between. Once there, a cold pint of beer gave us the energy to walk back to Gradbach following the River Dane, which we all agreed looked more like a particular dark fizzy beverage due to its peculiar dark-brown colour.

## Cohort 2 - Data Challenge Event (The Rivers Trust) - Gradbach Mill by Angel Caballos Ramirez (continued)

The work on the final day began and everyone wrapped up the data processing, ending with a final presentation where we displayed our results and reflected on the data gaps, challenges and learnings. I can confidently say that everyone gained valuable experience and insight into how Environmental Risk Assessments function, how to work around the limitations and adapt our project vision on the fly, depending on the availability of information. The event wrapped up with feedback on our experience and an overview of plans for the near future for the ECORISC students, which needless to say, seems exciting and full of learning opportunities.



Looking back, the data challenge was an extremely enjoyable experience, and seeing everyone again helped us strengthen the bonds we created last December. I will look forward to the next time I get to see them, welcoming the new cohort starting this year too and getting to meet all of the ECORISC students at the conference next year.

# Placements

## Isla Thorpe - JNCC Policy Placement

Having the opportunity to undertake a secondment with JNCC as part of the ECORISC CDT was a great experience. JNCC – the Joint Nature Conservation Committee – is the only statutory nature advisor to all four countries of the UK.

During the JNCC policy placement I was given the opportunity to work within the Environmental Pollution team and undertook a variety of tasks. This placement gave me a broader understanding of the implications of environmental research from a policy perspective whilst having the opportunity to develop multiple skills. In particular, it enabled the development of additional skills that would be difficult to gain whilst undertaking a PhD in academia alone.

Everyone within the Environmental Pollution Team at JNCC were very welcoming and I was completely integrated into the team which made the experience extremely enjoyable in addition to being a great professional development opportunity. In addition, I really appreciated when arranging the secondment, I was given the ability to have input into moulding my placement experience to ensure I gained any and all of the skills and knowledge I wanted to develop during the time.. This was cemented with having the opportunity to produce my own work plan for the placement, along with support from my line manager and technical manager, and having the opportunity to review this plan throughout my placement.

The main focus of my secondment was work associated with the System Level Indicator project, in which I assisted with the initial sections to be included within the supporting information for the project. This included undertaking a scoping review considering systems thinking, systems mapping and visual conceptual models. This enabled me to develop both fundamental researching skills but also gave me an in depth understanding of the systems thinking approach. The System Level Indicator project is being undertaken in collaboration with UKCEH therefore, this gave me a great opportunity to see how JNCC works with stakeholders.

During the placement I was also given the opportunity to undertake additional tasks such as helping to draft the Environmental Pollution Team's UK chemical pollution webpage; and assisting with the development of an



## Isla Thorpe - JNCC Policy Placement (continued)

animation to illustrate the concept within the Environmental Pollution team's infographic, which considers the interconnections between pollution, climate change and biodiversity, using a real-world example. These tasks gave me the opportunity to have an improved understanding of how communication plans are created and implemented within an organisation like JNCC. In addition, being given the opportunity to be involved in part of the planning process for the formation of the Inter-Agency Chemical Group and undertaking a course to improve my understanding on devolution, I developed my understanding of the collaborations between JNCC, its partners and different stakeholders across the UK.

Overall, I had a brilliant experience during my secondment within JNCC's Environmental Pollution Team. I would highly recommend any other PhD student within the CDT who has the opportunity to undertake their secondment within JNCC to do so!

Also recently completing placements;

**Lowenna Jones** - finished a 6 month part-time secondment as a Social Researcher in the Evidence Team of the Chemicals, Pesticide and Hazardous Waste (CPHW) Unit in the Department for Environment, Food and Rural Affairs (Defra). This role saw Lowenna work alongside her Defra supervisor Mags Bradley to plan, develop and undertake an essential piece of work on policy implementation.

**Charlotte Robison-Smith** - completed a placement with Natural Resources Wales, working on eel screen regulaton testing for the development of effective fish passes.

## News and updates

### Publications

**Charlotte Robison-Smith and Eve Tarring** - have recently had their work with the Bioscience and Chemistry Schools at the University of Cardiff published in the Science of the Total Environment. The article is entitled "[A Class of Their Own? Water-Soluble Polymer Pollution Impacting a Freshwater Host-Pathogen System](#)"

### Fieldwork

**Georgie Savage** - spent time in May and June on field work in the Galapagos, where she spent time collecting water, sediment and biota samples to try to map chemical and plastic contamination across the archipelago, along with trialling some rapid assessments tools, including passive samplers, for monitoring pollution.



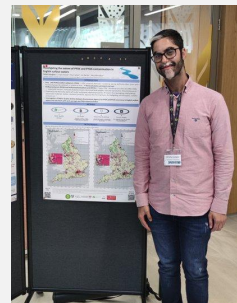
### Conferences

**Emily Durant** - attended the [1st European Healthy Soils Conference](#) in MuttENZ, Switzerland in September. Emily presented her talk "The impacts of veterinary pharmaceuticals on plant-mycorrhizal symbioses in the environment."

**Imogen Bailes, Ola Dosunmu and Rafael Georgiou** - attended [Fluoros23](#), a PFAS focused conference held in Idstein, Germany. Imogen presented a poster on PFAS in Antarctic seabirds. The conference covered topics including analytical tools, exposure science, toxicity, solutions and regulation policy.

## Conferences (Continued)

**Rafael Georgiou** - presented a poster at the Royal Society of Chemistry [EnvChem2023: Chemistry of the Whole Environment Conference](#)



**Lowenna Jones** -

- attended the [UK in a Changing Europe 'Living with the Neighbours'](#) ECR workshop at the Moller Institute, Churchill College, University of Cambridge
- attended the The Agile Initiative NERC funded ECR residential summer school '[Connecting environmental research with policy: a pathway to real-world impacts](#)' at the University of Oxford
- and presented at the [University Association of Contemporary European Studies \(UACES\)](#) annual conference in Belfast, Northern Ireland. Presentation title: UK Chemical Regulation post-Brexit: Is REACH a case study for regulatory divergence?

**Charlotte Robison-Smith** - was given the opportunity by [Fisheries Society of the British Isles](#) (FSBI) to present at this years symposium.

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