Job Description: Assistant Professor (Research and Education)

Post title and post number	Assistant Professor (Research and Education) of Environmental Health Data Science (101769)
College/Budget Centre	College of Life and Environmental Sciences
School/Department	School of Geography, Earth and Environmental Sciences / Centre for Environmental Research and Justice (CERJ)
Full time/Part time	Full Time
Duration of the Post	
Salary	
Additional information	
Terms and Conditions	Academic Teaching & Research Staff
Closing Date	
Grade	8

Summary of Role

Recruiting talented faculty members affiliated with the School of Geography Earth and Environmental Science (GEES) and the Centre for Environmental Research and Justice (CERJ)

We are currently recruiting an Assistant Professor, who will join the highly interdisciplinary School of Geography, Earth and Environmental Sciences (GEES) and embed into a cross-university team of investigators to grow the Centre for Environmental Research and Justice (CERJ). The position offers a truly exciting opportunity for collaboration and teamwork to grow a successful career at a premier Russell Group University. This appointment arises at a critical time for the University of Birmingham to help transform toxicology and regulatory science into actions that defend people's rights to a healthy environment. The recruited candidate will grow their independent research programme while contributing to the **Partnership for the Assessment of Risks from Chemicals (PARC)**.

The University of Birmingham is an equal-opportunity employer wishing to recruit talented individuals from anywhere around the world. We encourage applicants from all sections of the community. As a new hire, you will contribute to teaching and supervising students, research, and administration. In addition, you will be expected to contribute to academic citizenship, through generous, mutually respectful, and supportive working relationships with staff and students.

Assistant Professor of Environmental Health Data Science

Understanding of how chemicals in the environment negatively impact ecosystems and human health is required to appropriately assess and manage the risks of pollutants via policy and regulatory interventions. Establishment of causal links between real-world chemical exposures and harm to humans and the environment needs the skills of a toxicological data scientist. Frequently, neither the exposure data nor the responses are available in high quality form. Therefore, data manipulation and inferential methods are needed to gain quantitative insights into exposure and effects. Additionally, the exposure and effect domains tend to work in isolation thereby limiting the potential for cross-pollination and data sharing. To overcome these challenges, GEES and CERJ are looking to recruit an Assistant Pofessor to grow a research group specialising in analytical approaches for integration of knowledge across "domain-specific" data sources (exposure, ecological, mechanistic effects) to enable new discoveries as part of a "One Health Toxicology" initiative for the protection of human health and the environment.

A key research activity is to develop data integration, data mining and modelling approaches to elucidate the exposure to and effects of chemicals in a range of organisms and environments. Relevant expertise may be in toxicology / ecotoxicology, ecosystem modelling, data science,

computer science and/or environmental epidemiology, and should include development and application of innovative methods to identify and quantify relationships from publicly available, literature curated or newly collected datasets. Although knowledge of mechanistic toxicology would help the post-holder identify causality from the discovery of associated data, this knowledge can also be obtained through collaboration with others within GEES and CERJ. The ideal post-holder would complement and enhance the "big-data" expertise within GEES and undertake advanced research on pollution exposure and effect modelling and mechanistic (eco)toxicology. A longer term aspiration would be integration of biomonitoring, exposure and hazard assessment knowledge to support next generation risk assessment and validation of new approach methodologies (NAMs) for regulatory use. A core part of the role in the first 5 years is to contribute to the EU-funded Partnership for Assessment of the Risks of Chemicals (PARC, https://www.eu-parc.eu/, which runs until 2029). This post is aligned with the PARC Data Hub which is developing structured workflows utilising harmonised metadata and data formats and schema, agreed ontologies and community agreed identifiers to enable FAIR (Findable, Accessible, Interoperable and Re-usable) data.

A key education activity is to teach students these data science skills, contributing to modules in the Environmental Health programmes in GEES (e.g., MSc Environmental Health, MSc Public and Environmental Health Sciences, MSc Health, Safety and Environment Management) and to the CERJ MSc degree programme in Human and Environmental Toxicology with law.

About the School of Geography, Earth and Environmental Sciences
Our School brings together expertise from across the physical, environmental and social sciences to advance understanding of the planet and its people - past, present, and future. Our interdisciplinary areas of activity include Sustainable Environments and Societies, Environment and Health, Dynamic Earth and Ecosystems, and Extreme Climates and Hazards. Our research spans four major themes:

- Environmental Health Sciences
- Earth Sciences
- Physical Geography
- Human Geography

The newly appointed Assistant Professor of Environmental Health Data Science will bridge across the School's existing expertise in environmental chemical exposure and effects assessment (e.g., POPs, microplastics, nanomaterials, air pollution, agriculture run-off and sewage waste etc.), our (eco)toxicology expertise (cell models, biofilms, daphnia, environmental omics etc.) which includes computational toxicology, and our water sciences theme which addresses the combined challenges of "too much, too little and too polluted" water access globally.

The University of Birmingham also has a strong record in leading the way on interdisciplinary education. GEES staff contribute their breadth of knowledge across multiple degree programmes offered by the university and host undergraduate and postgraduate research students.

About the Centre for Environmental Research and Justice (CERJ)
The Centre for Environmental Research and Justice (CERJ) combines modern science with law to make the environment safe from toxic chemicals via "action research". Collaboration and teamwork is at the heart of the Centre. Its mission is to help remedy harm to human health and the environment caused by pollution. A scientific objective of the Centre is to advance an emerging field called Precision Toxicology. Environmental justice is achieved by improving evidence-based governance interventions. Unlike traditional academic pursuits which oftentimes divide global problems into research silos, this transdisciplinary research centre creates conditions for people to proactively uncover – and ultimately break – the chains of cause and effect that link chemicals to their toxicity to humans and the environment.

We value diversity and inclusion at the University of Birmingham, and welcome applications from all sections of the community and are open to discussions around all forms of flexible working.

Main Duties / Responsibilities

Research

To pursue sustained research activity through original research and scholarship, including other research-related contributions through conference papers and presentations and/or consultancy projects and advice, including for example:

- contributing significant research that advances our understanding and prediction of the occurrence of chemicals in the environment and the health and/or ecological consequences of exposure to chemicals and their mixtures;
- offering leadership in development of new analytical, statistical and/or computational techniques for safe and sustainable design of chemicals;
- adapting current computational toxicology / ecological modelling / exposure modelling research to real world applications at scale, with potentially limited and noisy data, with a high consequence of error, and guiding the development of practical solutions;
- developing new knowledge related to modern data management (e.g., machine actionable Findable, Accessible, Interoperable and Reusable (FAIR) data) and computational techniques that optimize the use of high-dimensionality data and integration of disparate datasets aimed at closing data gaps of concern for human/environmental health;
- contributing directly (0.4 FTE) to the University's research as a significant player in PARC: The European Partnership for the Assessment of Risks from Chemicals with a focus on innovative data management and the PARC Data Hub, and supervising other research staff, students and professional service staff;
- leading successful funding bids;
- consistently publishing internationally excellent research, with some research regarded as world leading, that results in a sustained, reputation of international quality;
- supervising and examining PhD students;
- a commitment to providing expert advice internally and externally to stakeholders (e.g., policy makers, regulators);
- reviewing articles for peer reviewed academic journals and grant applications by research councils and/or other major funding bodies;
- leading sustained impact activity including public engagement and/or making a significant contribution to policy development at a national and international level.

Education

Over the first five years, you will build your contributions across the range of teaching and learning activities by addressing some of the following:

- making a significant contribution to the pedagogical knowledge of data management practices applied to environmental exposure and (eco)toxicology data that advances teaching through the enhancement of practice, the development of teaching resources and/or through practice-based research;
- training in statistical or computational methods applied to risk assessment, ecotoxicology, and/or data management as appropriate based on your disciplinary background;
- contribute to the development of innovative approaches to teaching and learning, including designing digital resources/environments and supporting their uptake;
- leading on curriculum design at the module level and contributing to programme level developments to ensure content is contemporary, inclusive, engaging and academically challenging;
- actively engaging students in curriculum design;
- playing an important and sustained role in the recruitment and admission of students;
- co-supervising doctoral students;
- contributing to the development of teaching, learning and assessment policies /strategies;

- leading sustained high value impact in knowledge transfer and enterprise (business engagement, public engagement) that enhances the student experience and/or employability;
- undertaking own teaching, which will include teaching and examining courses at a range of levels, planning and reviewing own teaching approaches, developing programme proposals, supervision, marking and examining. You will ensure that your teaching practice is informed by discipline-based research, through participating in the research culture of GEES / CERJ.

Management/administration

Build leadership over time in activities within the GEES and CERJ and representing these on committees or working groups. This is likely to include:

- making an important contribution to the development and running of the School and Centre, for example, leading activity on research and/or teaching assessment;
- contributing to the international engagement of the School and the Centre;
- developing and managing staff and resources in support of research and/or teaching activities;
- making important contributions to the development of the Centre's research and/or learning and teaching strategy, and its alignment with School strategies;
- contributing to the development and delivery of knowledge transfer, enterprise, business engagement and public engagement activities with sustained high value impact of manifest benefit to the School / Centre and/or the University;
- promoting a culture (including procedures) that embeds equality and values diversity and inclusion;
- leading, serving on and assisting the work of committees and task groups beyond the Centre/School;
- serving on external committees, e.g., those associated with public/professional bodies or delivery of activities for an external body at an appropriate level, e.g., chairing sub committees associated with large elements of work;
- making a sustained contribution to widening participation, outreach and/or public understanding of Environmental Health Data Science and Computational toxicology.

Citizenship

Contribute to a supportive environment across the School and the Centre. This is likely to include:

- identifying wellbeing issues within the School/ Centre and developing appropriate solutions to address these;
- taking collective ownership of challenges faced by the Centre, School or College and working with colleagues to develop solutions;
- mentoring and coaching of colleagues, particularly those at earlier stages of their career.
- actively supporting and promoting values of equality, diversity and inclusion across the Centre, School and College.

Person Specification

- A PhD degree and research experience in environmental science, ecology, toxicology / ecotoxicology, or data science / computer science.
- Experience of using large datasets and data processing workflows applied to environmental toxicology / environmental health (e.g., environmental pollution, epidemiology, ecotoxicology / toxicology), potentially for the purpose of risk assessment.
- Demonstrated experience in data curation and data management, including data deposition into established domain-relevant databases. Applicants with experience using Norman and/or GEMstat databases or equivalent are particularly encouraged to apply.
- Demonstrated excellence in Research, with competence in Learning and Teaching, and in Management and Administration.

Learning and teaching requirements

You aspire to provide an excellent education delivery and provide students with an outstanding experience. Evidence of success can include:

- Motivation to be an effective educator with a good understanding on how to develop teaching and learning excellence.
- Knowledge of appropriate teaching methods and assessment strategies that promote high quality learning, including learning that is flexible, distinctive and current and stimulates learners' natural curiosity.
- Contribution to one or more of the following: development of new programmes; approaches to learning; the development of learning resources.
- Contributions to fostering excellence in teaching activities.
- Ideas on how to create high value impact on the enhancement of the student experience, and/or employability.
- Mentoring and expert advice which develops the skills of colleagues in teaching and in fostering learning.

Research requirements

You have a national reputation and you are on your way to developing an international profile through significant original research work and a record of impact. Evidence of success can include:

- High level peer esteem as evidenced by excellent national and often internationally, reflected in high-quality output, level of innovation, impact on subject and recognition.
- An excellent record of peer reviewed research publications.
- Prior experience in the co-supervision of doctoral students.
- Well defined plans for obtaining sustained research income generation, e.g., through research grants, contracts, research consultancy or other external funding.
- Some evidence of impact knowledge transfer and enterprise.

Management and administration-related requirements

You aspire to make a positive impact for the Centre and School in management and administration-related activities, which may include leadership of activities/initiatives.
Evidence of success can include:

- Successful performance in administrative/managerial role(s) (e.g., exams officer).
- High quality innovative contributions to the management/administration of a unit.
- Contribution to the corporate life of a unit, displaying willingness to contribute actively to committees, collaborative teaching and administrative tasks.
- The promotion of equality and diversity to internal and external stakeholders and the use of data to identify equality and diversity issues.
- Experience of developing interventions to address equality and diversity issues.