

James Hardwick

Lecture in Earth Science, University of Stirling

EMPLOYMENT HISTORY

August 2025 – present: University of Stirling – **Lecturer in Earth Science.** *Key responsibilities:* Development and leading of teaching across all stages of undergraduate degree programs in environmental and ecological sciences.

May 2025 – present: Newcastle University – **Research Assistant on the internally funded project ‘Impact and engagement of climate adaption and resilience in the Kilombero Landscape, Tanzania.’** *Key responsibilities:* Development of coupled hydrological-biophysical model to track water flow, soil nutrients distribution and sediment loss; develop and deliver a short teaching course for in-country stakeholders including university academics and students to build capacity.

October 2024- March 2025: **University of Stirling – Research Assistant on the GERC-ISPF funded project ‘Climate Adaptation and Resilience: Rural agricultural communities and industries along the Kilombero River floodplain landscape, Tanzania.’** *Key responsibilities:* Co-project managing tropical catchment research; coordinating & carrying out international fieldwork; in-country capacity building; data management, modelling and analysis; first authored publication currently in prep.

December 2023 – March 2024: **Newcastle University – Research Assistant on the internally funded project ‘Exploring understanding and experience of responsibilities for marginalised fieldworkers’ safety and wellbeing.’** *Key responsibilities:* Systematic collation of fieldwork policies, risk policies and risk assessments across Newcastle University; document coding and data extraction; led groups in participatory workshops; Co-authored publication currently in prep.

April 2023-December 2023: **Newcastle University – Research Assistant on the internally funded ‘Assessing UK higher education institutions policy for fieldwork safety and inclusion.’** *Key responsibilities:* Systematic collation of UK higher education institutional fieldwork policies and risk assessments; document coding and data extraction. Co-authored publication currently under review at *Ecological Solutions and Evidence*.

EDUCATION

2022-present: **PhD in Biology, School of Natural and Environmental Sciences, Newcastle University,** internally funded by Newcastle University.

Title: The fluvial biogeomorphic impacts and feedbacks of riparian invasive non-native plant species.

2017-2021: **MGeol (Hons.) Geology (First Class), School of Geography, Geology and the Environment, University of Leicester**

- Master’s thesis: Disentangling the Influence of Invasive Plant Species on River Morphology.

TEACHING

I am currently working towards Associate Fellow of the Advance Higher Education. I have a range of teaching experience including residential field course group teaching, workshop demonstrating, supervising undergraduate dissertation students, the training of research field assistants and assessments – including formative and summative assessment.

Stirling University (Lecturer)

2025 ENVU1BP (Stage 1, Building Planet Earth) Taught a range of core geological concepts, developed field based skills including field sketching and rock identification.

2025 GEOU1PP (Stage 1, People and the Environment) Taught Anthropocene science and climate change and led practical classes to develop students numerical reasoning.

2025 SCIU3LS (Scottish Stage 3, laboratory skills for environmental science) Taught laboratory based practical classes using a range of analytical techniques and seminars, covering a wide range of applied environmental chemistry.

2025 SCIU1FI (Scottish stage 1, Fundamental of Science Inquiry) Supervised group-based field work centered around developing research strategy and hypothesis testing to understand how decomposition rates varied across different environmental settings. Provided both formative and summative feedback for the students assessed work.

Newcastle University (PhD demonstrator)

Residential field course teaching:

2022 BIO2032 (Stage 2 Residential field course, *Northumberland*) Taught freshwater macro-invertebrate sampling techniques and identification. Supervised group projects using field collected data to assess the role of different land cover, water chemistry and mining activity on invertebrate community diversity. I supervised students in data analysis and report writing and undertook the marking and provision of formative and summative feedback on their assessed work.

2023 BIO2040 (Stage 2 Residential field course, *Scotland*) Taught vegetation identification and surveying techniques. Supervised group projects using field data to assess the environmental drivers of plant community composition. Provided both formative and summative feedback for students' assessed work.

Workshop teaching:

2022 - NES8313 (MSc, Coupled Human and Natural Systems) Supervised group-based discussions with input from my personal expertise to aid student understanding of the links between human and natural systems. Provided summative feedback on exams.

2022 BIO3039 (Stage 3 Biodiversity Science and Management) Supervised group-based workshop and presentations on a range of topics from land conservation to managing habitats to alleviate human impacts. I also provided summative feedback for group presentations.

Practical sessions:

2022 BIO1021 (Stage 1 Diversity of Life: Form and Function) Led lab-based practical sessions on anatomical descriptions of invertebrate specimens and phylogenies. I also marked and provided summative feedback on students' practical exams.

RESEARCH SKILLS AND EXPERIENCE

Fieldwork: Extensive experience in diverse range of landscapes and ecosystems, including temperate woodlands, tropical rainforests and freshwater habitats. Experience in plant community surveying, water quality testing, sediment sampling, geotechnical measurements, geological lithological, structural mapping and sensor (e.g. water level and turbidity) deployment.

2025 – present	Water of Dye, North East Scotland
2022-25	Fieldwork to Kilombero Valley, Tanzania
2022-25	Repeated fieldwork across central Scotland and Northern England (PhD data collection)
2019	Independent mapping project (1 month) on Isle of Raasay
2017-2021	Structural and lithological geological mapping training (North Wales, North West Scotland, Peak District, Southern Spain)

Data processing and analysis: Advanced data manipulation and visualisation of large datasets in R. Proficiency in advanced statistical modelling techniques in R, including LMM, NMDS and Structural Equation Modelling, at a range of spatial and temporal scales and on a range of data (multivariate, species diversity, environmental). Experience with remotely sensed data in QGIS, and ArcGIS Pro and process-based earth systems models in C# and Python such as CAESAR-Lisflood, SWAT+ and Landlab.

Laboratory: Experience with setting up and running hydrodynamic experiments to assess grains fluvial behaviour, isotopic analysis using mass spectrometry to track environmental change, environmental chemical analysis, water chemistry testing, grain size analysis, anatomical dissection, rock thin section preparation and field based sensor development.

Project management: Skilled in managing and coordinating research projects, including planning and executing domestic and international fieldwork. Excellent time management and outstanding organisational skills, with adaptable communication to a range of technical and non-technical audiences. Experience with managing budgets for research projects. Regularly use version control systems, GIT, for collaborative research and code management.

People management: Experience with stakeholder collaboration and dissemination, including landowners, businesses, practitioners, policy groups and volunteers.

PUBLICATIONS

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Accepted:

1. Hardwick, J., Hackney, C., Keen, L., Fitzsimmons, C., Willby, N., Pattison, Z. (2025). The role of non-native plant species in modulating riverbank erosion: a systematic review. *River Research and Applications*. <https://doi.org/10.1002/rra.4420>
2. Mair, L., Hardwick, J., Mannion, N., Brauholtz, L., Carlin, B., Hopkins, P., Sikka, T., Pattison, Z. (2025). Improving university policies and risk assessment to support inclusive fieldwork. *Ecological Solutions and Evidence*. <https://doi.org/10.1002/2688-8319.70109>

Submitted:

1. Hardwick, J., Hackney, C., Law, A., Pattison, Z. (revisions submitted). *Invasive non-native riparian plants destabilises riverbanks*. *Biological Invasions*.
2. Keen, E., Hardwick, J., Novoa, A., Gómez, R., Willby, N., Mill, A., Pattison, Z. (submitted). Insights into the management of invasive alien plants in forests: a global perspective. *Journal of Applied Ecology*.

In preparation (<3 months until submission):

1. Hardwick, J., Hackney, C., Pattison, Z. (in prep). Evaluating the direct and indirect effects of invasive non-native riparian plant invasions on riverbank erosion. To be submitted to *River Research and Applications*.
2. Hardwick, J., Hackney, C., Robbins, C., Pattison, Z. (in prep). Fluvial seed transport modelling to predict invasion hotspot. To be submitted to *Ecohydrology*.
3. Mair, L., Jackson, K., Mannion, N., Hardwick, J., Hopkins, P., Howes, K., Maddison, J., O'Donnell, A., Scott, S., Sikka, T., Pattison, Z. (in prep). Exploring understanding and experience of responsibilities for marginalised fieldworkers' safety and wellbeing, at one English Higher Education Institution, with recommendations for more inclusive approaches. To be submitted to *Studies in Higher Education*.
4. Hardwick, J., Hackney, C., Shirima, D., Pfifer, M., Pattison, Z. (in prep) Evaluating the combined impacts of agricultural land use policy and near-future climate change on soil loss across a tropical catchment. To be submitted to *CATENA*.
5. Hardwick, J., Hackney, C., Shirima, D., Pfifer, M., Pattison, Z. (in prep). Evaluating the role of

agroforestry-based interventions on tropical catchment hydrology and sediment dynamics to improve small holder resilience, in the Kilombero Valley, Tanzania. To be submitted to *Water Resources Research*.

OTHER WRITING

1. **Hardwick, J.**, Pattison, Z., Galasso G., Brundu, G., Venter, T., Postigo J.L., Nunes, A. (2023) Management Measures and Cost Note: The Management of Cockayne (*Crassula helmsii*). International Union for Conservation of Nature (IUCN).

FUNDING APPLICATIONS

- 2025 **Co-I**, Aviva funded project on the Water of Dye (Northern East Scotland) to investigate catchment scale responses to river restoration following riparian and peatland interventions.
- 2024 **PI**, British Society for Geomorphology Postgraduate Research Grant (**£1020**) to fund a pilot study '*Roots and riverbank stability: effects of riparian non-native plant invasions on bank stability*'.
- 2024 **Co-I**, Scottish Funding Council through the UK Department for Science, Innovation and Technology international sciences partnerships fund (GERF-ISPF) (**£10,000**) grant for the project 'Climate Adaptation and Resilience: Rural agricultural communities and industries along the Kilombero River floodplains landscape'.
- 2023 **Co-I**, International Union for Conservation of Nature contract (**£3000**) to produce a Management, Measures and Cost Note for the invasive macrophyte *Crassula helmsii* (New Zealand Pigmyweed), on behalf of the European Union Commission.
- 2022 **PI**, Newcastle University Doctoral College Fund (**£1900**) to fund fieldwork in Tanzania, investigating the role sugar cane farming plays on catchment erosional processes.

PRESENTATIONS

- Sep 2024 Presentation at Neobiota Conference (Lisbon, Portugal): '*Seed transport and landscape modelling to predict riparian plant invasion hotspots*'
- April 2023 Presentation at the Scottish Freshwater Group (Stirling, UK): '*Unravelling the role of a non-native plant species, Impatiens glandulifera (Himalayan balsam), on modulating riverbank erosion*'

Poster presentations: American Geophysical Union annual meeting, San Francisco, USA (Dec, 2023); Symposium for European Freshwater Sciences conference, Newcastle, UK (June, 2023); British Ecological Society conference, Edinburgh, UK (Dec, 2022); British Society for Geomorphology, Newcastle, UK (Sep, 2022); British Sedimentary Research Group, online, (Dec, 2020)

QUALIFICATIONS, AWARDS, MEMBERSHIPS AND OTHER ROLES

Qualifications & Awards

- 2022 ITC level 3 Outdoor First Aid Course with incident management
- 2021 East Midland Geological Society Beryl Whittaker Prize award for the highest mark in the MGeol research project (University of Leicester)

Professional scientific society memberships

- British Ecological Society
American Geophysical Union
British Society of Geomorphology

Committee/volunteer roles

2022-2025	Postgraduate Research Representative on the School of Natural and Environmental Sciences field trip and off campus health and safety committee
2022 -24	Upper Calder Catchment Volunteer Coordinator for the Calder Rivers Trust, macro-invertebrate monitoring program
2017 – 2025	Duke of Edinburgh Gold award group residential field instructor for Hills Road Sixth Form College (UK KS5), Cambridge

COURSES AND TRAINING

Technical: Structural Equation Modelling for Ecologists (PR Statistics, March 2023); Programming with Python (Newcastle University, 2023); Species identification and field mapping (FSC, May 2022)

Teaching: Higher Education teaching practices (Newcastle University, January 2023); Introduction to Teaching and Learning in Higher Education (Newcastle University, April 2022)

REFEREES

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