PROJECT TITLE: Resistance, resilience, recovery and reorganization: how do species and ecosystems respond to environmental change

Project Science Theme: Evolution and Biodiversity
Project keywords: Palaeobiology, palaeoecology, environmental change, plankton

Lead Institution: University Bristol
Lead Supervisor: Professor Daniela Schmidt, Bristol, Earth Sciences
Co-Supervisor: Carrie Lear, Cardiff University, School of Earth and Environmental Sciences
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Project description:

Resilience in ecological contexts is often considered as resistance to disturbance, such as environmental change. However, this view is now changing from the immediate response to disruption to a broader definition that includes capacity for recovery, adaptation, and reorganization. A better understanding of resilience and vulnerability is crucial for understanding, and mitigating, possible future detrimental changes to life on Earth. It raises the question how will you distinguish ecosystem resistance, resilience, recovery and reorganization, given that the marine geological record offers discontinuous observations rather than direct trajectories of ecosystem dynamics?

This broader perspective bridges multiple biological scales and forms the basis of the research program which you will co-develop. Our vision is that you will explore these questions by gathering data on the response of populations and communities both at the base of the food chain (marine plankton) and marine consumers, drawing on our combined expertise. The time interval of choice will be jointly determined drawing on the information you will gather in the first months of the PhD.

You will be trained in labs with long-standing collaborations and experience in co-supervision to combine disparate data from: computed tomography to determine trends in morphological plasticity; estimates of taxonomic richness (both novel and drawn from existing databases) to determine the responses of individual and groups to environmental change; and trace element analysis to reconstruct past environments.

By doing this project at the Universities of Bristol and Cardiff and the Natural History Museum, London you will have access to world leading labs and research environments. Picture yourself in different labs where we will support you to extract information from CT scans, learning taxonomy, R based statistical analysis, and clean room geochemistry. You will build a unique skillset understanding the organisms, challenges of combining novel and historic data, coding and geochemistry.

Useful recruitment links:

For information relating to the research project please contact the lead Supervisor via: d.schmidt@bristol.ac.uk

Bristol NERC GW4+ DTP Prospectus:
https://www.bristol.ac.uk/study/postgraduate/research/great-western-four-doctoral-training-partnership-nerc/

How to apply to the University of Bristol:
http://www.bristol.ac.uk/study/postgraduate/apply/

The application deadline is Thursday 7 January 2027 at 2359 GMT