

PROJECT TITLE: Forests on the edge: examining vegetation recovery following climate extremes

Project Science Theme: Climate Change and Risk

Project keywords: carbon-cycle, drought, heatwaves, photosynthesis, climate

Lead Institution: University of Bristol

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Project aims and methods:

Climate change is rapidly transforming the growing conditions of terrestrial ecosystems, with widespread evidence of more frequent, intense, and prolonged droughts and heatwaves. There is abundant evidence of these extreme events reshaping ecosystems. Understanding how forests respond and recover from these abiotic stressors is critical, offering crucial insights into tree species' resilience in a warming world. Gaining an improved understanding of the response of trees as conditions become more extreme is essential for accurately simulating future changes in the carbon and water cycles and predicting shifts in species distributions.

This project will focus on the post-stress recovery dynamics of trees. The student will generate new, process-orientated insight into how trees recover from drought and heat stress. By integrating observations such as eddy covariance measurements, experimental data, and satellite data with novel model-based hypotheses – examining factors like stored carbohydrates and the legacy of hydraulic damage – this PhD will advance our ability to predict forest responses to shifts in temperature, humidity, and water availability.

The project will focus on developing JULES (<https://jules.jchmr.org/>), the UK's community land surface model in the Met Office Unified Model.

CASE and Collaborative project partner

The Met Office will provide office space and IT support for the student whilst based in Exeter. They will be supported in learning how to use and develop the JULES model throughout the PhD. They will also provide research supervision and guidance on use of the JULES modelling, particularly in relation to temperature responses.

Useful recruitment links:

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

The application deadline is Monday 13 January 2025 at 2359 GMT.