PROJECT TITLE: Tracking the dynamics of forest landscapes in a rapidly changing world

Project Science Theme: Climate Change and Risk
Project keywords: Forests, climate change, remote sensing

Lead Institution: University Bristol
Lead Supervisor: Professor Tommaso Jucker, Bristol, School of Biological Sciences
Co-Supervisor: Paulo Bittencourt, Cardiff, School of Earth and Environmental Sciences
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Project description:

Forests play a vital role in regulating life on Earth, absorbing vast amounts of carbon and providing habitat countless species. Yet despite their importance, there is currently considerable uncertainty about how forests are responding to rapid climate change and shifting disturbance regimes. This project will take a radical new approach to tackling this question, using repeat airborne LiDAR surveys from forests across the world to determine (1) what local and regional-scale factors constrain forest dynamics and (2) are forests shifting from a carbon sink to a source as rates of disturbance rise.

To achieve this goal project will leverage the Global Canopy Atlas – a collection of thousands of harmonised airborne LiDAR surveys of forests – and combine this with the growing archive of spaceborne LiDAR from the GEDI mission. It will also integrate ground data from forest plot networks and explore the potential of incorporating these empirical data streams into models of forest dynamics.

The student will be embedded within a larger team of researchers working towards a shared goal of understanding how the world's forests are responding to rapid environmental change and will have the opportunity to work closely with collaborators at the University of Cardiff, Exeter, Munich and those involved in the GEO-TREES consortium. These collaborations will significantly enhance the student's research experience by complementing the expertise of the primary supervisor, including forest ecophysiology (Cardiff), satellite remote sensing (Exter, GEO-TREES), forest dynamics and land surface modelling (Munich, Exeter).

The student will have the opportunity to co-develop the core research questions and methods of the project and will receive targeted training in a broad suite of research and applied skills, including computational skills (e.g., R, Python), geospatial data analysis, advanced statistics (including hierarchical Bayesian modelling), high-impact paper writing, and science communication and outreach (e.g., via partners at GEO-TREES).

Useful recruitment links:

For information relating to the research project please contact the lead Supervisor via: t.jucker@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