

Erosion hotspots and carbon loss from upland peatlands

(Fully-funded NERC Industrial CASE Studentship)

Durham University (UK), Departments of Geography and Earth Sciences in collaboration with the North Pennines Area of Outstanding Natural Beauty Partnership are seeking well-qualified student for a fully-funded NERC PhD Studentship commencing October 2016.

Project Context and Rationale

Over the last 20 years peatlands have undergone a transformation as a restoration culture has begun to pervade the management of these landscapes. As a result many eroded and bare peat landscapes have begun to repair and vegetate leaving increasingly fragmented areas of bare peat. Such areas are the focus of continued erosion, are hard to restore and often difficult to access. These hotspots of erosion continue to threaten the overall carbon balance of the landscape and limit the efforts of restoration. Therefore it is important to ask whether the effort, and expense, required to restore these small, often disparate, areas has a significant benefit or should such areas be left alone as their impact on the restored ecosystem services of the uplands is negligible compared to the cost of further restoration?



Figure1. Examples of bare peat in the North Pennines. From left to right, a revegetated gully floor, a deeply-incised peat gully and an eroded and active peat flat.

Objectives

The objectives of the project are to:

- 1) Understand the distribution, size, and connectedness of bare peat hotspots and how this has changed in the historic past within a spectrum of upland peat catchments.
- 2) Undertake field experiments to understand the dynamics of bare peat patches and how the size, shape and organisation of patches across the landscape changes and impacts on erosion.
- 3) Develop a management strategy for the restoration of erosion hotspots and devise techniques that will yield greatest benefit to the local community / economy.
- 4) Test possible interventions to target and restrict the impact of erosion hotspots.

Research Training: The student will receive bespoke specialist training in field data collection, laboratory methods and geomatics. In addition, the student will also be enrolled in a graduate training programme at Durham University. Geography is part of IAPETUS, the North East England and Scotland multidisciplinary Doctoral Training Partnership (DTP) for the environmental sciences, funded and accredited by NERC. The Department of Geography was recently ranked 1st in the United Kingdom based on Research Power (REF 2014) and has a large and vibrant postgraduate community, with regular departmental seminars and paper discussion groups.

Supervisors and Project Partners

The research will be supervised by Dr Jeff Warburton (Department of Geography) and Prof Fred Worrall (Department of Earth Sciences), Durham University. The main CASE partner will be the Peatlands Programme of the North Pennines Area of Outstanding Natural Beauty and our study will focus on the Moor House and Upper Teesdale National Nature Reserve to take advantage of ongoing research projects and an unparalleled archive of historical data. Work at Moor House will dovetail with the UK Environmental Change Network coordinated by NERC Centre for Ecology and Hydrology and Rob Rose the Environmental Change Network Manager at the site.

Funding

This is a fully-funded NERC Industrial CASE studentship based in the Department of Geography, Durham University in partnership with the Peatlands Programme of the North Pennines AONB. The studentship covers full UK/EU fees and is open to UK students or EU students who meet the UK Research Council's residency criteria. The studentship provides a maintenance stipend or c.£15k per year for 4 years and research expenses. RCUK stipend and fee rates for the 2016/17 academic year will be finalised in May 2016.

To apply

Please send the following documentation by email to geog.pgadmissions@durham.ac.uk with the reference "NERC Peat CASE", by the **deadline of 3rd March 2016 (5pm GMT)**: 1) A current CV; 2) A cover letter (2 pages A4 max) which describes your motivation for applying for the project and your previous research experience; 3) Letters from two references (these can be sent directly to geog.pgadmissions@durham.ac.uk by referees if preferred); 4) Transcripts of your previous qualifications.

Your application will be reviewed and a shortlist for interview will be drawn up. Interviews will take place in the week of the 14th March 2016. Applicants will be notified if they are successful by 31st March 2016. The candidate will be expected to start in September/October 2016. If you have any questions about the research project, please get in touch with Dr Jeff Warburton (jeff.warburton@durham.ac.uk). If you have questions about the application procedure, please contact geog.pgadmissions@durham.ac.uk.

Background Reading

Evans, M. G. and Warburton, J. 2007. *Geomorphology of Upland Peat: Erosion, Form and Landscape Change*. Blackwell Publishing, Oxford, 262p.

Worrall, F., Burt, T. P., Rowson, J. G., Warburton, J. and Adamson, J. K. 2009. The multi-annual carbon budget of a peat-covered catchment. *Science of the Total Environment*, 407, 4084-4094.