

Research Experience Placement (REP) Scheme Project

Project Supervisors:

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The project is also in collaboration with Chris Hackney (Newcastle University) and Alex Beer (Tübingen University, Germany)

Host Organization and Department (if applicable):

Geography, Durham University

Project Title:

Quantifying the form of bedrock rivers

Project Description:

It is common for rivers in upland areas to have exposed sections of bedrock in their beds and banks. However, we still do not have good methods for predicting how exposed bedrock affects flow and sediment transport through these sections. Part of the problem is that these bedrock sections can have multiple different forms; for example the bedrock can be smooth or rough, and could be covered with patches of sediment and/or boulders. In order to produce predictive methods that are applicable to all bedrock rivers, we need to start by understanding how their form can vary.

The aim of this project is to collect and analyse topographic data from a variety of different bedrock river channels. From this dataset, we can quantify the variability in their shape and identify the main controlling factors. The project team has been compiling a dataset that will form the basis for this project. The objectives of this placement are: to assist with collecting and processing field data from sites local to Durham and in Scotland; to review the rivers included in the dataset and explore other possible sources of topographic data; and to undertake the first analysis of the combined dataset using geostatistics. The particular focus of the project can be tailored to the interests and skills of the research student, for example a greater or lesser focus on the field data or on geostatistics.

Skills and Career-Development Opportunities:

The student on this placement will have the opportunity to develop a range of skills and analytical techniques. In the field they will learn how to collect data using terrestrial laser scanning and an acoustic Doppler current profiler. They will process and analyse the data using programmes including CloudCompare and Matlab, and will be given an introduction to different geostatistical methods. For all of these techniques, full training will be provided if necessary.

Throughout the placement the student will be given opportunities to discuss careers in research, including preparing for a PhD. Depending on the project outcomes, there might be the opportunity to present the results at the annual meeting of the British Society for Geomorphology or the European Geosciences Union.

Wider context of research:

The student will have the opportunity to take part in fieldwork to collect data for this project, both through day trips local to Durham, and a longer week-long trip to Scotland. This placement is part of an ongoing collaboration between the project team, and so the student will be involved in regular team meetings. The student will also be part of the

Catchment and Rivers research cluster in Geography, and will be invited to any cluster events that take place over the summer.

Project Timeframe:

The timing of this project is flexible. The only constraint is that the fieldwork in Scotland is expected to take place in the week beginning Monday 9th August. But, if the student was unavailable that week they could still complete the rest of the project, including the local field days.