Climate change impacts on New Zealand glaciers

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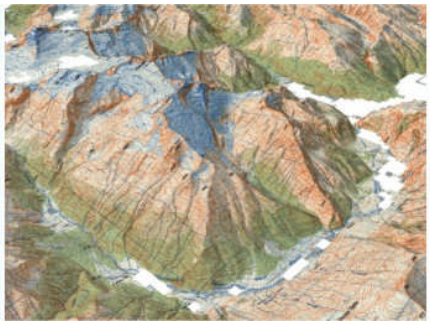
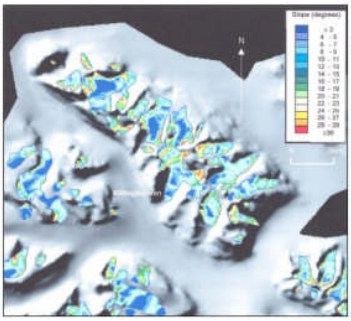


Project outline

A PhD student is sought to work on a cutting-edge investigation into the morphological response of alpine glaciers in New Zealand to climate change.

The successful applicant will be encouraged to combine world-class data to reconstruct the extent, thickness and other geometrical attributes of alpine glaciers in New Zealand in the past; for example at the Last Glacial maximum, and at the Little Ice Age.

These reconstructions will enable the dynamical regime and behaviour of the glaciers to be reconstructed, and for that to be compared to the present situation.

Overall, the student will firstly consider the alpine geomorphology of South Island, New Zealand, and use this to identify suitable moraines and trimlines from which glacier reconstructions can be made. The student will examine the spatial and temporal trends, patterns and anomalies in glacier extent and thickness changes and thereby to answer key questions such as i) the controls on glacier ice extent and volume changes, glacier contributions to sea level rise, likely future glacier changes.

We anticipate that there will be opportunities for overseas fieldwork for smaller-scale elements of the project, and collaborations with UK and overseas researchers will be essential.

Project rationale

Alpine glaciers are known to be highly sensitive to climate change, yet our measurements of changing alpine glacier morphology are generally limited to just a few glaciers and to just a few recent decades. This project will address that data gap.

In New Zealand glacier responses are partly due to regional atmospheric controls and partly to local topographic controls. This project will provide data to begin to unravel the balance between these two scales of control in space and time.

Predicting the catchment-scale response of alpine glaciers to future climate variability and change is particularly important for the provision of water for drinking, irrigation and power generation. This project will also inform landscape stability analyses.



Key skills: Full training in research skills and discipline specific skills will be given. However, it is desirable that the student has previous glacial geomorphology, GIS, computer modelling and/or fieldwork experience.

The successful candidate will benefit from inter-disciplinary training in hydrology and geomorphology as part of the River Basin Processes and Management research clusters in the School of Geography. Training at Leeds deals fully with the elements described in the Joint Research Centre statement on skills training for research students. PhD students take modules provided by the staff development unit (e.g. starting your PhD, small group teaching) and a 15-week faculty-training course (covering elements such as planning, critical reading and writing, oral presentations, writing research papers). Students present results and receive constructive feedback from peers in a Research Support Group, from colleagues in the River Basins research group, and at a university postgraduate research day.

The nature of the project means that the student will be trained in project specific research methods including stream hydrological analysis, numerical modelling, and applied statistics both internally and at external workshops. An additional important part of the training will be to attend national and international conferences to present results and gain feedback. The student will be encouraged to write and submit papers for publication during the project.

Applications

The prospective student should have, or expect to receive, a first class BSc or MSc degree in an appropriate discipline, and have interests and experience in most, if not all, of the following topics: cold environments, glaciers and hydrology. Successful applicants will be considered for full-time funding from a range of sources including NERC, departmental and university sources. Self funded students are also welcome to apply for the project. Informal enquiries should be directed to Jonathan Carrivick at j.l.carrivick@leeds.ac.uk. Further details can be found at http://www.geog.leeds.ac.uk/study/phd/apply.html