UC EARTH AND ENVIRONMENT
Te Kura Aronukurangi

Understanding landslide dam formation processes in Aotearoa New Zealand

A large, long-lived landslide dam in North Canterbury formed during the 2016 Kaikōura-Hurunui earthquake

Landslide dams present a significant hazard globally, and particularly in Aotearoa New Zealand, where steep and narrow river catchments prevail and large earthquakes and rainstorms are common. These dams are often inherently unstable and present a substantial flooding threat to population and infrastructure both up- and downstream. Landslide dams that do subsequently fail, triggering an outburst flood, typically do so soon after formation, providing little time for detailed hazard and risk estimates. Conversely, those that survive present a complex long-term hazard that requires careful management.

Despite this, there are few suitable tools currently available to predict where a landslide dam may form in the future. Valley width is a key variable, with blockages mostly forming in narrow gorge settings, however the propensity for landslides in the first place, and the volume of any ensuing landslide are critical, but difficult to forecast. Similarly, understanding the potential longevity of any dam that forms is complex, but critical for understanding whether we face an acute or chronic risk. Developing an approach that can accurately identify where in the landscape future landslide dams could form, and the potential longevity of an ensuing dam, may allow for more proactive management of landslide dam hazard and risk, as well as provide a more detailed understanding of the processes and mechanisms involved in landslide dam formation.

This Ph.D. project aims to decipher the conditions necessary for dangerous landslide dams to form, and to develop an approach to identify and assess the locations where future landslide dams could occur. The project will involve a combination of field studies, geospatial and statistical analyses. Field studies will be conducted throughout Aotearoa New Zealand.

The project will be based in Christchurch, New Zealand, in the School of Earth and Environment | Te Kura Aronukurangi at the University of Canterbury | Te Whare Wānanga o Waitaha. The project includes full funding from the Mason Trust, covering Tuition and Enrolment fees and competitive annual stipend of NZ$32,000 for 3 yrs.

The successful candidate will have a first degree in Geology or Physical Geography with a strong background in Geomorphology. Field experience and a good grasp of Geospatial analyses, including GIS skills are necessary. Experience in computational/modelling processes is an advantage, but not a requirement.

Interested candidates should send through a CV along with a 1 page cover letter stating their interest and motivation for the described project to Dr Tom Robinson
thomas.robinson@canterbury.ac.nz