Reconstructing past climate change using glaciers

Level: MSc and/or PhD

Summary: There are many possible projects available under this general topic, which can either be designed for a smaller MSc thesis or scaled to broader program of research at PhD level.

Some emerging research questions worthy of investigation:

- Are glaciers now smaller than ever before?
- What role did past changes in seasonality play in driving past glacier advance/retreat?
- What are the main drivers of glacier and climatic change during the Holocene?

Background Information of Project: Advance and retreat of mountain glaciers is closely connected to climate. Evidence for pre-historic changes in glacier length, recorded in the landscape, thus provides a window into past climatic conditions.

VUW has expertise and laboratory facilities (e.g. cosmogenic nuclide laboratory) that enable more accurate and precise characterization of the timing and rates of past glacier change. Furthermore, the glaciology group at VUW has developed number of physics-based computer models that simulate glacier response to climate change. Such models represent useful tools with which we can quantify the past climatic conditions recorded by geological records of past glacier extent.

Expressions of interest are invited from students interested in developing new chronologies of glacier change and/or new model-based constraints of past climate change.

See some of our recent work:

- Eaves, S.R. et al. 2024. Coupled atmosphere-ocean response of the southwest Pacific to deglacial changes in Atlantic meridional overturning circulation. *Earth and Planetary Science Letters*, *641*, p.118802.
- Muir, R. et al. 2023. Late glacial climate evolution in the Patagonian Andes (44–47° S) from alpine glacier modelling. *Quaternary Science Reviews*, *305*, p.108035.

Position available: Several (either MSc. or PhD)

Skills Involved/Required: Undergraduate/postgraduate degree(s) in a relevant science subject (e.g. Earth Science/Physical Geography/Physics/Chemistry).

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