

Te Kura Kairūri School of Surveying Lunchtime Seminar Series



Storms, earthquakes and landscape change: Decoding the sedimentary record in lakes

Sean Fitzsimons (Te Ihowhenua, School of Geography, University of Otago)

There is broad agreement that erosion processes in mountain environments is dominated by landslides which cause episodes of elevated sediment delivery typically triggered by high magnitude storms, seismic shaking or a combination of the two. Despite this agreement, tracking the impact of landslides on erosion rates remains a challenging proposition in mountain where instrumental records of sediment production are sparse and have very short durations. In this presentation I will describe the development of earthquake and storm catalogues from lake sediments in south Westland and western Southland, both of which record episodes of landslide activity. The proxy records have been developed from sediment cores retrieved using a Mackereth corer which have been analysed using a range of sedimentological techniques and dated using AMS radiocarbon dates from leaf macrofossils

preserved in the deposits. In South Westland lake sediments have yielded a 2000 year record of seismic events on the Alpine Fault which suggests that seismic shaking causes a threefold increase in sediment flux over a ca. 50 yr period following each earthquake. Lower accumulation rates in Southland lakes have permitted the development of a 10,000 year record of storm frequency preserved as rapidly deposited layers that record substantial variations in landslide activity through the Holocene. Taken together the records show that lakes are excellent environmental archives that permit the reconstruction and understanding of landscape change over decadal to millennial timescales. These records provide a record of landscape change that strongly diverges from records of erosion and landscape change derived from instrumental records alone.

Thursday 19th May 2022 (12pm – 1pm)

L1 Lecture Theatre | School of Surveying, 310 Castle Street

OR Join remotely: <https://zoom.us/join> (ID: 329 427 2033, P/W: 310310)