

Lake Ohau Climate History (LOCH) project: A 17,000 year-long annually-resolved paleoclimate record to decipher high frequency climate change in Southern New Zealand.

Vandergoes, M.,¹ Dunbar, G.,² Levy, R.,¹ Howarth, J.,³ and the LOCH team

¹ *GNS Science, Lower Hutt, New Zealand*

² *Antarctic Research Centre, Victoria University of Wellington, New Zealand*

³ *School of Geography, Environment and Earth Sciences, Victoria University of Wellington, New Zealand*

<https://geodiscovery.gns.cri.nz/Geodiscovery/On-Land/In-Lakes/Lake-Ohau-Climate-History>

Geological records that span millennia yet still capture paleo-environmental information at seasonal-annual resolution can make an important contribution to understanding the spatial and temporal variability of climate processes that vary at high frequency, such as the Southern Annular Mode (SAM), El Niño Southern Oscillation (ENSO) and the Interdecadal Pacific Oscillation (IPO). However, such records are scarce and are particularly rare in the southern hemisphere. Sediment cores up to 80m long recovered from Lake Ohau, New Zealand as part of Lake Ohau Climate History (LOCH) project yield mm-scale laminated sediments representing annually-resolved accumulation in the lake basin from ~17,000 years before present to today.

We outline continuing developments from the LOCH project, including radiocarbon and layer count chronology, the results of physical properties core scanning and the development of biological indicators of lake productivity, as well as palynological reconstructions of temperature change. We highlight the potential of the complete 17,000 year long record to decipher annual to centennial-scale climate variability in southern New Zealand and the mid-latitudes of the Southern Hemisphere.