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# Enviromagnetism and palaeomagnetism of Holocene sediments from Lake Ohau, New Zealand

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In early 2016, the Lake Ohau Climate History (LOCH) project recovered an 80-metre sedimentary sequence from Lake Ohau on the south island of New Zealand, containing a ∼17,000-year record of environmental and magnetic variability. The LOCH project aims to produce a detailed history of regional palaeoclimate and palaeoenvironment, which are strongly influenced by variations in southern-hemisphere westerly winds. Preliminary palaeosecular variation and relative palaeointensity results were presented at the EGU General Assembly 2017, and proved to be heavily affected by a presumed drilling overprint and gyromagnetic remanences. In order to better constrain and characterize these effects, and to investigate the enviromagnetic record of the Lake Ohau sediments, we are undertaking a detailed rock magnetic study of the 6-metre Mackereth core 6m_1a, retrieved from Site 2 in Lake Ohau preliminary to the main LOCH coring project. Our analyses aim at a thorough rock magnetic characterization of the sediments using measurements of hysteresis loops, temperature dependence of magnetic susceptibility, first-order reversal curves, remanent coercivity spectra, and stepwise IRM demagnetization. Previous NRM demagnetization and ARM acquisition studies on this core have already shown good potential for palaeomagnetic interpretation. Our rock magnetic studies will inform understanding of the palaeomagnetic results from both the 6m_1a core and the full-length LOCH-2A core obtained from the same site. In addition, they will provide a valuable enviromagnetic contribution to the ongoing multi-proxy palaeoenvironmental studies on the Lake Ohau cores. Initial studies have already shown that magnetic parameters in the 6m_1a cores are correlated with palaeoenvironmental proxies such as neodymium isotopes, and our full rock magnetic study will provide further insights into variations in sediment provenance, inflow events, and conditions at the sediment-water interface.