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#Presenting author

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Another piece of the Southern Hemispheric puzzle: Developing a high-resolution climate record for multiple glacial cycles in eastern Australia

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Understanding likely climate change and subsequent environmental responses is critical to our long term ability to manage and mitigate such changes. Investigations of previous responses to notable (either abrupt or large scale) climate change provides boundary conditions and targets that can be used to both validate and parameterize the climate models used to predict future change. High-resolution records from the Southern Hemisphere lag considerably behind available data from the Northern hemisphere, and are particularly sparse in Australia. Given that most (>80%) of Australia's population, industry and agriculture lie in the mid-latitudes between Southern Queensland and Tasmania, one might expect that past climate changes from this region are well understood, but this is not the case.

Long, high resolution records are needed to address this gap. An 11 m core has been collected from a permanent swamp/lagoon (Mountain Lagoon), in the Blue Mountains west of Sydney, which appears to span at least one complete glacial cycle. This is potentially the most continuous record recovered from this part of SE Australia. Much of the record is at least moderately organic and preliminary sedimentary and Itrax data indicate that significant environmental changes are recorded. Multi-proxy investigations including pollen, diatoms, charcoal and phytoliths are planned and the chronology will be underpinned using OSL and radiocarbon dating. The focus of the investigation will be to develop climatologies for the Sydney region during the last glacial cycle. The Mountain Lagoon project will consequently contribute to understanding how climate systems in SE Australia respond to large scale global change on Milankovitch time scales. By determining the climate response in Australia to these changes we will help predict future response in rainfall and temperature to human-induced and natural climate change.