



## **Climatic implications of intermediate sized glacial advances in New Zealand valleys during OIS3.**

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Recent work has greatly increased the number of known glacial oscillations during the last (Otiran) glaciation in South Island, New Zealand. Here we present summary stratigraphic and age results from a tectonic basin in the upper Rangitata Valley and a trough fill in the Rakaia Valley in Canterbury, New Zealand. The deposits constrain a series of intermediate scale glacial advances during OIS 3 that are not recorded in terminal moraine sequences in these valleys. These records demonstrate that ice limits oscillated substantially during the last glacial cycle but that very significant advances occurred at times other than the LGM, with glacial extents 80-95% of the local last glacial maximum. The timings of these advances appear to coincide with fragmentary evidence for glaciation in some other settings in New Zealand and SE Australia, indicating that the advances represent regionally significant climatic events. In the talk, I will summarise the evidence for the better constrained advances, consider the climate forcing required to maintain extended ice in these valleys through much of the last glacial cycle and consider the impact of antecedent ice limits on the climatic conditions at the LGM.