

## **Vegetation and climate reconstruction from marine cores adjacent to southwestern New Zealand, over the past 500,000 years**

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Previous terrestrial palynological records of mid-latitude Southern Hemisphere interglacial periods are often fragmentary and poorly dated. Here, these problems are circumvented by extracting terrestrial palynomorphs from two giant piston cores (MD06-2990 and 2991) collected from the north levee bank of the submarine Hokitika Canyon, West Coast, South Island. These terrestrially influenced, high sedimentation cores enable stronger insights than were previously possible into marine and terrestrial climate in the southern mid-latitudes across the last 4-5 glacial-interglacial cycles. Chronological constraint is provided by  $\delta^{18}\text{O}$  stratigraphy, radiocarbon chronology, and the identification of two widespread silic tephra horizons (25.6 ka Kawakawa/Oruanui Tephra; ~345 ka Rangitawa Tephra), sourced from the central North Island.

During peak warmth, MIS 11 sea surface temperatures in the East Tasman Sea were ~1.5-3°C warmer than present. This corresponds with a notable expansion and dominance of the thermophilous shrub *Ascarina lucida* at the expense of the currently dominant tall tree conifer *Dacrydium cupressinum*. The MIS 11 forest composition in this highly humid region also contrasts markedly with reconstructions of forest conditions during periods inferred to be up to 1.5°C warmer than present in the early Holocene and Last Interglacial, when *D. cupressinum* remained dominant in the region. Southern beech forest is dominant during the penultimate interglacial (MIS 7), where SSTs reach ~1°C above present. These well-resolved marine

sequences of past vegetation change provide insight into the timing of sediment deposition captured in the adjacent record of vegetation-climate change from Okarito Bog, which potentially extends to at least 250,000 years.