



From the greenhouse to the icehouse in the Antarctic Wilkes Land margin: IODP Expedition 318

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IODP Expedition 318 drilled seven sites in two transects across the Wilkes Land margin of Antarctica. The objective was to obtain a long-term record of the Cenozoic Antarctic glaciation, including the greenhouse-icehouse transition, and its intimate relationships with global climatic and oceanographic change. Expedition 318 recovered ~2000 m of middle Eocene–Holocene sediments spanning ~53 million years of Antarctic history. The cores reveal the history of the Wilkes Land Antarctic margin from an ice-free “greenhouse” Antarctica, to the first cooling, to the onset and erosional consequences of the first glaciation and the subsequent dynamics of the waxing and waning ice sheets, all the way to thick, unprecedented “tree ring style” records with seasonal resolution of the last deglaciation that began ~10,000 y ago. The cores also reveal details of the tectonic history of the Australo-Antarctic Gulf from 53 Ma portraying the onset of the second phase of rifting between Australia and Antarctica, to ever subsiding margins and deepening, to the present continental and ever widening ocean/continent configuration.