



## **Eocene-Miocene dinoflagellate cyst assemblages from the Wilkes Land margin, Antarctica (IODP Leg 318): tracing greenhouse and icehouse dynamics of the Southern Ocean**

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IODP Leg 318 recovered an unprecedented, well-dated Cenozoic sedimentary record from the Wilkes Land Margin of Antarctica. Much of the record lacks carbonate and silicate microfossils, but well-preserved assemblages of organic-walled dinoflagellate cysts (dinocysts) allow for the reconstruction of major climatological and oceanographic changes.

Early Eocene (~53-51 Ma) dinocyst assemblages are dominated by cosmopolitan taxa, indicating warm, ice-free conditions, while mid Eocene (49-46 Ma) assemblages are characterized by endemic taxa coevally prevalent in the southwest Pacific Ocean. This suggests that a connection developed between the Australo-Antarctic Gulf and the Pacific Ocean, signifying a shallow-water opening of the Tasmanian Gateway around 50 Ma.

In the earliest Oligocene (33.6 Ma), low-diversity assemblages consisting exclusively of heterotrophic taxa replace the typically highly diverse Eocene dinocyst assemblages. The heterotrophic taxa are essentially identical to those dominating modern Antarctic sea-ice systems.

Late Oligocene and Miocene dinocyst assemblages show high variability, from oligotrophic to heterotrophic dominance, which may provide information on repetitive changes of Antarctic glacial advance-retreat and/or shifts in oceanic frontal regimes.