



## **The onset of Antarctic glaciation and the Eocene – Oligocene transition; cooling, sea level or both?**

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Latest GCM experiments predict intrinsic links between declining atmospheric CO<sub>2</sub> concentrations, the onset of, and steps in Antarctic ice sheet development, ocean circulation changes, global cooling, and benthic 'Oligocene isotope event 1', near the Eocene – Oligocene (E-O) transition. Yet, several climatic proxy studies deny global cooling and attribute the entire magnitude of the Oi-1 shift to ice sheet expansion and sea level fall while others suggest a more prominent role of global cooling. Again other studies do record sea level change as well as cooling episodes, but at differing levels, and/or in distinct steps.

Analysis of organic walled cysts of surface dwelling dinoflagellates at marginal marine sites allows reconstruction of both temperature as well as sea level change, unraveling these interrelated signals. Examples include the type section of the latest Eocene Priabonian Stage, where two distinct steps of both cooling and sea level fall mark the E-O transition; a corollary of results is the questionable placement of the E/O boundary GSSP, and the important role of the IODP drilling offshore Wilkes Land, planned for January '09.