The Oligocene–Miocene Transition in the Tasmanian Gateway: A Palynological Examination of ODP Site 1168

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High-resolution foraminiferal stable-isotope records from the Late Oligocene through Early Miocene indicate multiple transient glaciations within an otherwise moderately warm global climate. The most prominent excursion in $\delta^{18}O$ and $\delta^{13}C$ values occurs at ~23.8 Ma (Berggren, 1995) and is known as the Mi-1 event (Miller et al., 1991; Zachos et al., 2001). Ocean Drilling Program (ODP) Site 1168 (Leg 189, Tasmanian Gateway), located ~70 km off the coast of Western Tasmania (42ºS/144ºE) at middle bathyal (2463 m) depth, contains a well-preserved sequence of the Oligocene-Miocene (O-M) transition. The calibrated age-model indicates relatively high sedimentation rates (~7 cm/kyr) of predominately nannofossil clays from ~23.9 through ~23.3 Ma. Our study of Site 1168 aims to reconstruct the Mi-1 event in the surface and deep waters of the Tasman Sea by integrating benthic foraminiferal stable-isotopic records with lithological (i.e., wt% coarse-fraction, wt% carbonate, clay mineral assemblages) and paleoecological (i.e., palynomorphs and nannofossils) records. While our presently low-resolution Site 1168 stable-isotopic records have yet to identify a prominent Mi-1 excursion comparable to other sites (e.g., Site 26, Zachos et al., 2001; Site 1090, Billups et al., 2002), our age-model-predicted depth for Mi-1 is associated with a slight increase inwt% coarse-fraction and an ~200-kyr-lagged decrease in wt% carbonate. High-frequency cyclic variation in both of these lithologic records may allow independent age-model construction via astrochronological tuning (sensu Shackleton et al., 2000). The dinocyst assemblage shows cyclic variations in abundance and is dominated by the cosmopolitan species Spiniferites ramosus Operculodinium centrocarpum. A decrease in these cosmopolitan taxa and an increase in inner neritic taxa (e.g., Apteodinium australiense and Eocladopyxis sp.) coincide with the aforementioned decrease in wt% carbonate. Species richness remains fairly constant through the sequence, probably due to a consistent but variable influx of relatively warm and oligotrophic surface waters.