



Late Paleocene- Early Eocene paleoenvironments in the Southwest Pacific (ODP Leg 189); revised stratigraphy and an Antarctic PETM record.

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We generated high resolution palynological, XRF, and stable isotope geochemical data from upper Paleocene to lower Eocene (~56 to 53 Ma) shallow marine sediments, deposited at ~65°S on the East Tasman Plateau (ETP) in the southwest Pacific, recovered during Ocean Drilling Program Leg 189 (Site 1172). Because the early Paleogene Southwest Pacific sea surface circulation was characterized by a clockwise gyre, Site 1172 was influenced mainly by Antarctic-derived surface waters. In contrast to previous reports, by increasing sample resolution we demonstrate that strata representing the Paleocene-Eocene Thermal Maximum (PETM) *was* recovered at this site after all, based on both the characteristic occurrence of the negative carbon isotope excursion (CIE), measured on bulk organic carbon, and the acme of (sub) tropical dinoflagellate cyst (dinocyst) species *Apectodinium*. Higher in the stratigraphy, close to the C24r and C24n magnetochron boundary and within C24n a second *Apectodinium* acme suggests the presence of younger Early Eocene hyperthermal events (such as ETM2, or *Elmo*), but negative CIEs have not yet been identified. The ETP dinoflagellate cyst assemblages across the PETM show remarkable similarities with those reported from other PETM sections worldwide. Relative *Apectodinium* abundances reach up to 44%, suggesting that subtropical conditions prevailed in the Southern Ocean during the PETM. Moreover, large abundances of fresh water tolerant dinoflagellate species alternate with *Apectodinium*, suggesting strong perturbations in the hydrological cycle.