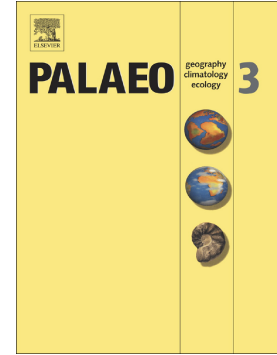


Accepted Manuscript

Eocene-Oligocene coals of the Gippsland and Australo-Antarctic basins – Palaeoclimatic and palaeogeographic context and implications for the Earliest Cainozoic glaciations

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PII: S0031-0182(16)30709-X
DOI: doi: [10.1016/j.palaeo.2017.01.035](https://doi.org/10.1016/j.palaeo.2017.01.035)
Reference: PALAEO 8174

To appear in: *Palaeogeography, Palaeoclimatology, Palaeoecology*

Received date: 11 November 2016
Revised date: 19 January 2017
Accepted date: 23 January 2017

Please cite this article as: G.R. Holdgate, I.R.K. Sluiter, J. Taglieri , Eocene-Oligocene coals of the Gippsland and Australo-Antarctic basins – Palaeoclimatic and palaeogeographic context and implications for the Earliest Cainozoic glaciations. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. *Palaeo*(2017), doi: [10.1016/j.palaeo.2017.01.035](https://doi.org/10.1016/j.palaeo.2017.01.035)

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EOCENE-OLIGOCENE COALS OF THE GIPPSLAND AND AUSTRALO-ANTARCTIC
BASINS – PALAEOCLIMATIC AND PALAEOGEOGRAPHIC CONTEXT AND
IMPLICATIONS FOR THE EARLIEST CAINOZOIC GLACIATIONS

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ABSTRACT

AUSTRALIA'S GIPPSLAND BASIN CONTAINS A SEMI-CONTINUOUS EOCENE-OLIGOCENE (41.5-28.4 MA) NEAR-COASTAL COAL RECORD THAT FORMED ADJACENT TO PACIFIC OCEAN. TRARALGON AND MORWELL FORMATION BROWN COALS INCLUDE 4 MAIN SEAMS (T2, T1, T0, M2). COAL SEAM PALYNOLOGY RECORDS SHOW LATE MIDDLE EOCENE (T2) COALS FORMED UNDER MEGATHERMIC CONDITIONS CHARACTERISED BY HIGH-GYMNASPERM CONTENTS, LATE EOCENE (T1) COALS FORMED UNDER MESOTHERMIC CONDITIONS CHARACTERISED BY REDUCED-GYMNASPERM CONTENTS AND EARLIEST INDICATIONS OF PALAEOCLIMATE COOLING. EARLIEST OLIGOCENE T0 COAL RECORD (33.9-31.5 MA) CONTAINS HIGH GYMNASPERM PALYNOLOGY PROFILE, VERY SIMILAR TO THE T2 COALS. THE EARLIEST INDICATION OF COOLER CLIMES ONLY BEGINS AFTER THIS COAL FORMED AS INDICATED BY LOW-GYMNASPERM HIGH-NOTHOFAGUS (SOUTHERN BEECH) POLLEN PROPORTIONS. WE SUGGEST IN GIPPSLAND THE EARLIEST EVIDENCE FOR MAJOR GLACIAL COOLING (BY INFERENCE THE O11 EVENT) BE PLACED IMMEDIATELY ABOVE THE T0 COAL SEAM WHERE EARLY TO LATE OLIGOCENE MORWELL FORMATION SANDS, CLAYS AND COALS CONTAIN LOW COUNTS OF GYMNASPERMS (<10%) BUT HIGH AVERAGE PROPORTIONS OF *NOTHOFAGUS* (50%). THIS IS THE MAIN DEFINITIVE INDICATOR THAT PALAEOCLIMATES HAD COOLED BETWEEN THE EOCENE AND OLIGOCENE. THIS AGREES WITH THE CURRENT OCEAN DRILLING POSITION OF THE EARLIEST (O11) GLACIAL EVENT SHORTLY ABOVE THE EOCENE-OLIGOCENE BOUNDARY.

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