

Assessing time-correlativity of the Late Miocene-Early Pliocene Biogenic Bloom across multiple divergence regions using bulk sediment carbon and oxygen isotopes

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The Late Miocene-Early Pliocene Biogenic Bloom describes the phenomenon whereby, between approximately 8 and 4.3 Ma, biogenic accumulation on the seafloor (and presumably primary productivity in surface waters) increased 2-4 times at divergence zones of the Indian and Pacific Oceans [1]. High-resolution stable isotope records from multiple Eastern Equatorial Pacific (EEP) sites demonstrate remarkable high amplitude, short frequency time-correlative variations across the Biogenic Bloom [2]. At issue is whether such variability occurs in other regions.

Here we report high-resolution bulk stable carbon and oxygen isotopic ratios of deep marine sediment samples obtained from DSDP Site 590 located on Lord Howe Rise and beneath the Tasman Front north-east of New Zealand. This information is placed on a common biostratigraphic framework [3], alongside data from IODP Sites U1338 and 573 from the EEP [2]. Preliminary results indicate that long-term trends and short-term variations in stable isotope records from the southwest Pacific and the EEP can be tied together. We suggest the Biogenic Bloom was a complex phenomenon that, in detail, involved rapid changes in ocean circulation and nutrient delivery across multiple sites throughout the Indian and Pacific oceans.

- [1] Dickens & Owen (1999) *Marine Geology*, **161.1**, 75-91.
[2] Reghellin et al. (2015) *Paleoceanography* **30.10**, 1261-1286. [3] Gradstein et al. (2012) eds. The geologic time scale, *Elsevier*.