

## **Eocene–Oligocene calcareous nannofossil assemblages and palaeoenvironmental changes in the northern South China Sea**

**Ruigang Ma, Chuanlian L. Liu, Qianyu Li, Xiaobo B. Jin**

Tongji University, State Key Laboratory of Marine Geology, Shanghai 200092, China; maruigang@tongji.edu.cn, liucl@tongji.edu.cn, qli01@tongji.edu.cn, 386jinxiaobo@tongji.edu.cn

Numerous models have been proposed to explain how the South China Sea was formed, yet Palaeogene palaeoenvironmental research has been hindered by the paucity of long, continuous, well-dated geological records. In this work, Eocene to Oligocene nannofossil biostratigraphy and assemblage changes were studied from a sediment section from the northern South China Sea in order to shed light on these issues. We established an age model that confined the studied section to between ~40 and 22 Ma based on 17 calcareous nannofossil datums. The age model enabled us to date the most prominent seismic reflector T<sub>60</sub> (~26.8 Ma), a regional tectonic event interpreted as corresponding to the ‘ridge jump event’ in the early phase of South China Sea spreading. Changes in nannofossil abundance and assemblage compositions infer a continuous transgression and deepening of the water depth from the Late Eocene to the Early Miocene. During the Late Eocene, the studied area was a neritic sea with relatively eutrophic conditions that supported abundant specimens of the *Reticulofenestra lockeri* group and *Coccolithus pelagicus*. From ~34 Ma to ~27 Ma, during the Oligocene, the earlier neritic environment was replaced by the relatively warm and oligotrophic conditions of a shallow sea, as indicated by higher concentrations of *Cyclicargolithus floridanus*, *Sphenolithus* spp. and *Helicosphaera* spp. Since ~26 Ma, pelagic conditions again prevailed, small *Reticulofenestra* (<5 μm) became dominant, and *Discoaster* spp. also increased in response to the deepened water depth.