

Taphonomy and sedimentology of Neogene shelf and slope bioclastic deposits, New Zealand: Sequence stratigraphic and paleoenvironmental implications

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The goal of this project is to demonstrate that: 1) bioclastic-rich, channelized deposits, common to the Whangamomona Group, accumulated as a result of late Neogene glacio-eustatic sea-level oscillations; 2) that a paleogeographic gradient exists in the taphonomic and sedimentologic characteristics of these deposits; and 3) that such deposits form an important linkage between contemporary shelf and slope to basin floor systems tracts, thereby establishing sequence stratigraphic interpretations to be applied in outcrop across the full shelf to basin profile.

Shell beds are conspicuous components of shelf-slope sedimentary successions in the Whangamomona Group (Matemateaonga, Kiore, and Urenui Formations) of Wanganui and Taranaki Basins. The Matemateaonga Formation is a cyclothemic unit, representing shelf sediments (top sets) of a prograding continental margin, and is characterized by thick and continuous shell beds (transgressive systems tracts of 6th-order sequences). The Kiore and Urenui Formations represent slope sets, and are punctuated by laterally discontinuous bioclast-and-conglomerate filled channels. The concentrated skeletal material observed in these channels is inferred to have originated from the same fauna that contributed to the contemporary transgressive deposits of the Matemateaonga Formation.

This is one of the first examples of an apparent process link between bioclastic deposits accumulated in shelf settings and those on an adjoining continental margin resulting from high-frequency sea-level oscillation. This will be significant as the sequence stratigraphic model derived for Plio-Pleistocene shelf sequences of Wanganui Basin will be applied to coeval and adjacent slope systems, where conventional concepts have formerly been based on low-order sequence and seismic stratigraphic models.