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Austin J.W. Hendy¹, Adam J. Vonk², Peter J.J. Kamp² (1) University of Cincinnati, Cincinnati, OH (2) University of Waikato, Hamilton, New Zealand

From Source to Sink—Linking Shelf and Slope Bioclastic Deposits in the Late Miocene-Early Pliocene Record of Wanganui Basin, New Zealand

Shell beds are conspicuous components of shelf-slope sedimentary successions in the late Miocene to early Pliocene Whangamomona Group (Matemateaonga, Kiore, and Urenui Formations) of Wanganui Basin in the North Island of New Zealand. The Matemateaonga Formation is a cyclothem unit that represents shelf sediments (topsets) of a prograding continental margin. It is characterized by the occurrence of uniformly thick (2-6 m) and laterally continuous shell beds, separated by 20-60 m thick successions of siliciclastic sediments. These shell beds represent the transgressive systems tracts of 6th-order depositional sequences. The Kiore and Urenui Formations represent slope deposits (slope-sets), and occur geographically and stratigraphically adjacent to the Matemateaonga Formation. The Kiore Formation is inferred to have formed in upper slope paleoenvironments and is characterized by a succession of laminated mudstone and sandstone, punctuated by laterally discontinuous bioclast-filled channels. The Urenui Formation accumulated in an upper-mid slope paleoenvironment and comprises massive to laminated mudstone with large allochthonous bioclast- and conglomerate-filled channels or canyons.

The concentrated and transported skeletal material observed in channels of the Kiore and Urenui Formation is inferred to have originated from the same inner shelf fauna that contributed to the contemporary autochthonous shelf shell beds of the Matemateaonga Formation. As the supply of concentrated skeletal material on the shelf is determined by the state of sea level (i.e. during transgressive systems tracts), the sequence stratigraphic framework established for the shelfal Matemateaonga Formation can be extended off the shelf and onto the slope.