

Records of Holocene relative sea-level change in New Zealand: current state of knowledge, future directions, and research challenges

Clement, A.J.H.

Physical Geography Group, Massey University, Palmerston North, New Zealand

Over the past 30 years studies of the New Zealand coast have focused solely on the theory that postglacial relative sea-level (RSL) change around New Zealand was spatially uniform, and that RSL had been stable at its present level for the past 6,500 years. However, recent critical analysis has shown that this theory is built upon some invalid assumptions. New reconstructions of RSL change confirm that New Zealand experienced a mid-Holocene sea-level highstand, and show demonstrable spatial and temporal variations in RSL changes around the New Zealand coast during the Holocene. Postglacial meltwater loading on the continental shelf around New Zealand is hypothesised to be a significant driver of variation in the timing and magnitude of Holocene RSL changes, but the effect in a New Zealand context remains equivocal. Variability in RSL records may also be influenced by tectonics, coastal geomorphology, sediment compaction, and the marine reservoir effect. However, these variables are currently poorly constrained. Efforts to produce reconstructions of RSL changes around New Zealand, and thereby elucidate the impacts of these drivers of variability on RSL records, are hampered by a dearth of robust palaeo sea-level indicators: only 206 in the current New Zealand dataset. There are broad gaps, both spatially and temporally, in the current coverage offered by these palaeo sea-level index points. Future efforts should seek to fill these spatial and temporal gaps, and expand our understanding of the influence of drivers of RSL variability around New Zealand.