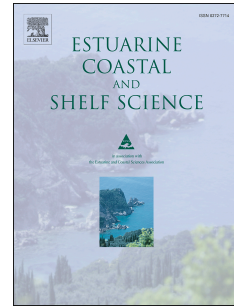


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Sediment dynamics of an artificially deepened mesotidal coastal lagoon:**An environmental magnetic investigation of Tauranga Harbour, New Zealand**

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Abstract

Tauranga Harbour, New Zealand's largest barrier-enclosed coastal lagoon, comprises two sub-basins with separate catchments, inlets and tidal channel systems. This study sets out to assess and investigate the sediment dispersal system of Tauranga Harbour using standard environmental magnetic and sedimentological methods. Compilations of rock magnetic and grain size data of surficial sediments collected from inflowing rivers, various estuarine environments (estuaries, tidal flats and tidal channels) and the adjacent nearshore mirror the net and differential sediment fluxes into and through the two sub-basins of this lagoon. For all studied depositional environments, the magnetogranulometric ratios SIRM/ κ and ARM/ κ are positively correlated with magnetic mineral content (SIRM, ARM, χ) in the sense that larger magnetic particles are associated with higher magnetic enrichment. Grain-size analyses show that magnetic enrichment during particle transport and deposition can result from grain-size as well as from grain-density fractionation. The periodically changing accumulation/erosion conditions provide for a selective retention of specific grain sizes and an enhancement of the heavier magnetic mineral particles. Magnetic crystal size and

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