

## **A chronological synthesis of natural and anthropogenic effects on Tamaki Estuary, Auckland, New Zealand**

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Tamaki Estuary is an arm of the Hauraki Gulf, situated at the eastern side of central Auckland. During the last few decades, Tamaki catchment changed from nearly a rural landscape to a heavily urbanised and industrialised area. Multiproxy analysis, including grain size, magnetic susceptibility, heavy metals, pollen, C14 and Cs 137, was carried out on four cores collected along the Estuary. The aim is to reconstruct the estuary's past history over the last ~ 8,000 years and trace any natural and anthropogenic effects recorded in the sediment characteristics. Glass shard analysis was used to establish key tephra time markers such as the peralkaline eruption of Mayor Island, ~ 6000 years BP. Radiocarbon dating and pollen analyses have been used to date and calculate the sedimentation rates. The rate of sedimentation was around 1.2 mm/year for the early pre-Polynesian period (~8000-6000 years BP). During that period, regional vegetation was podocarp/hardwood forest. The sedimentation declined to 0.23mm/ year for the period ~ 6000-700 years BP. Major Polynesian impact (commencing ~700 years BP) was associated with forest clearance as indicated by the increased sedimentation rate (0.4mm/ year) and the sharp decline in the pollen of forest taxa coinciding with an increase of bracken (*Pteridium-esculentum*) and grasses. Land clearance during European colonisation (commencing ~ 1850 AD) was accompanied by a sharp increase in the sedimentation rate (5mm/year) and the appearance of exotic pollen taxa such as *Pinus*. Heavy metal (Cu, Pb, Zn, and Cd) concentrations are higher in sediments deposited since European colonisation. Down- core variations of enrichment factors for the measured metals indicate that the older sediments are pristine and can be used as natural background levels for the heavy metals.