Shortcut to the Sea: the link between river planform confinement and energy gradient, Waikanae River, Aotearoa New Zealand

**Jon Tunnicliffe1**, Steve Bielby2 and Sue Clearwater2

1 The University of Auckland School of Environment,

2 New Zealand Department of Conservation

# ABSTRACT

Imposed straightening of river course necessarily entails alteration of river gradient, as the amplitude of sinuosity is reduced and slope over the shorter course is steepened. The Waikanae River on New Zealand's North Island was a meandering-to-wandering coastal river that has been subjected to a variety of disturbances, at a range of intensities over time, including gravel extraction and channel re-alignment. This has led to a change in longitudinal bed profile, and therefore a change in stream power profile. In its current configuration, the river experiences persistent aggradation in the lower reaches and there is reduced diversity of river form. Local iwi and catchment community are looking at ways to re-establish sediment transport equilibrium channel complexity, and cultural connectivity while maintaining a suitable level of flood protection. In this presentation, we review potential options, leveraging a numerical model to provide insights into a potential new morphodynamic and ecological equilibrium regime.