



Development of an integrated catchment and receiving water hydrodynamic model for Whaingaroa (Raglan) Harbour, New Zealand for community based land use planning and guidance.

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This paper aims to highlight the benefits and use of integrated numerical modelling tools for environmental planning. In a future of dwindling environmental stability and a decreasing margin for failure with environmental health, it is imperative to understand more precisely the human effects on the marine environment. Using numerical models, it is possible to simulate existing and potential land-use activities and their associated consequences in the marine environment. For this purpose, a three-fold model coupling was developed involving (1) a dynamic catchment model (defining freshwater, nutrient and mud inputs), (2) a receiving 3-dimensional baroclinic hydrodynamic model (for tidal, wind and density-induced circulation) and (3) a dispersal model (for effluent and pollutant dispersal), in Whaingaroa (Raglan) Harbour on the west coast of New Zealand. The Whaingaroa Harbour catchment area at this time is relatively undeveloped but is rapidly developing due to the expanding urbanization pressures from nearby cities. A unique community response in the form of a grass-roots effort to use state of the art technology has led to the development of this model. The combined model output is used as a tool for examining future and existing land use policies and coastal development planning. The potential uses of this model are broad, but include such examples as: managing catchment-wide land use patterns, understanding flood induced pollution dispersal from point sources such as dairy farm effluent and topsoil erosion during construction of residential subdivisions.