

Technical Theme: Coast and Marine Assets

Abstract Title:

GIS-based environmental vulnerability mapping of coastal settings, with application to southeast Queensland

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Abstract

Increased nutrient and metal loads resulting in degradation of natural streams, estuaries and marine waterbodies represent a growing environmental issue that has received significant attention in recent years. A specific concern has been in relation to outbreaks of *Lyngbya majuscula* in the northern parts of Moreton Bay. Many factors have been proposed to contribute to outbreaks of this and other nuisance algae, and an integrated assessment is not straightforward.

The GIS-based multiple criteria analysis (MCA) approach has therefore been proposed and is designed to evaluate the potential for nutrient and/or metal export from catchments to waterways. The methodology is presented for a series of freshwater streams in southeast Queensland. Various land use are considered including urban, agricultural (crops, plantation forests and horticulture) and animal production. The MCA was developed using several criteria including terrain (DEM, geology) and hydrological attributes, in addition to land use.

In this method parameters (criteria) are ranked in terms of their relationship to nutrient/metal export. The final solution of the analysis provides an integrated subcatchment-based evaluation of the potential of various terrains and/or activities to impact on surface water quality. The output also consists of a map incorporating the combined effect of all parameters considered. The analysis does not preclude the use of more sophisticated models but can precede them, and also highlight areas of concern where further investigation is required. The approach is easy to use and relies on widely available datasets. The datasets and assessments can readily be updated when more information becomes available.