Geophysical Research Abstracts, Vol. 7, 00015, 2005
SRef-ID: 1607-7962/gra/EGU05-A-00015

Landscape influences on water quality: Contrasting riparian and whole basin approaches

D. Ierodiaconou (1), V. Versace (1), F. Stagnitti (1), L. Laurenson (1), S. Salzman (1), M. Leblanc (2), C. Metcalfe (1), T. March (1).

1. School of Ecology and Environment, Deakin University, Warrnambool, Victoria, Australia, (2) School of Geosciences, Monash University, Clayton, Victoria, Australia (danielad@deakin.edu.au / Phone: +613 55633 224)

The Glenelg-Hopkins area is a large regional watershed in south-west Victoria, Australia, covering approximately 2.6 million ha. The region has been heavily modified for agricultural enterprise and the landscape comprises $<$13% remnant native vegetation cover. Extensive clearing of native vegetation for grazing has led to a decline in water quality including increased solute loads and salinisation. The relationships between patterns in land use and total in-stream phosphorus (TP), total nitrogen (TN) loads and salt concentration (indicated by EC) is investigated. Multi-temporal satellite imagery was interpreted and water quality data analysed from 5 available gauge stations within the region. Geographical Information Systems (GIS) were used to analyse spatial variations of land use for drainage areas of corresponding gauging stations at three spatial scales; the whole catchments and to 100 m and 500 m riparian zones around major streams. The *whole catchment* multiple regression analysis demonstrated that the variables *Dryland Pasture, Areas Subject to Inundation, Agricultural land on greater than 3% slope* and *the Ratio of Agriculture to Native Vegetation* were most strongly related to TP and TN loads. In contrast, the 100m and 500m stream buffer analysis demonstrated that *Areas Subject to Inundation, Agricultural land on greater than 3% slope* and *Urban areas* were the significant contributing explanatory variables in the regression. The significant predictors of salinity were *Native Vegetation* and *Dryland Grain Cropping* at all three spatial scales. This study shows strong relationships between water quality parameters and a selected set of watershed attributes easily determined from satellite images and emphasises the importance of managing land use at multiple spatial scales for different environmental outcomes.