Integrating science and policy to inform management approaches to manage non point source nutrient impacts on lowland river systems in Manawatu-Wanganui Region of New Zealand

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Background

The Manawatu-Wanganui Region of covers 2.2 million hectares (8.1% of New Zealand) in the lower part of the North Island. The primary land use is pastoral production, with 51% of the region utilised for sheep and beef farming, 31% in native cover and 7% utlised for dairy farming.

Under New Zealand's guiding environmental legislation the Resource Management Act 1991 (RMA), the Manawatu-Wanganui Regional Council (Horizons Regional Council or Horizons) is responsible for sustainably managing natural and physical resources, and of particular relevance to this subject, have functions which include the control of land use for the purposes of maintaining and enhancing water quality and the control of discharges into or onto land or into water.

Water quality targets to maintain identified social, cultural, economic and environmental values have been established by Horizons (in consultation with the community) in the 'One Plan'. The One Plan is a combined Regional Policy Statement and Regional Plan developed under the RMA. These water quality targets include targets for both nitrogen and phosphorus.

Problem

Water quality in the Manawatu River is rather poor when compared with national data, with nitrogen and phosphorus concentrations in the Manawatu River are among the highest recorded nationally (Ballantine and Davies Colley, 2009). Nutrient concentrations in the Manawatu catchment exceed the targets set in the regional plan regularly. Under suitable environmental conditions, unchecked nutrient enrichment of waterways can lead to proliferations of plant and algal material collectively known as periphyton. Nuisance growths of periphyton can adversely affect the ecological, recreational, aesthetic and cultural values of rivers and streams (Biggs 2000, Wilcock et al. 2007) by changing the physicochemical properties of the water, reducing the availability and quality of aquatic habitat and covering the substrate with unsightly biomass. In severe cases, periphyton induced changes in physicochemical and habitat properties of a river can be lethal to invertebrates and fish.

In order to meet the water quality targets set in the regional plan, the regional council had to consider what mechanisms it needed to put in place to manage sources of nutrient into the region's waterways. To inform these policy decisions, a number of questions needed to be asked, and answered, from both a scientific and policy perspective. There also needed to be a high degree of interaction between the scientists and policy developers to ensure that the information being sought and provided was 'fit for purpose".

Findings and results

The key questions of the combined science and policy research process will be discussed in this paper and are summarised below.

1. What are the sources of nutrients entering the river?

2. What are the relative contribution of point source, and non point sources of nutrients?
3. For diffuse sources of nutrients, what are the relative contributions of different land uses?
4. For each of the contributing land uses, what are the range of contributions, and the reductions in contribution that can be achieved using currently available management practices and technologies?
5. Where nutrient loss reductions are identified as feasible, what should be the method of setting nutrient loss targets or limits?
6. What will be the environmental and economic outcome of imposing various nutrient loss targets or limits on contributing land uses?
7. What is the most effective and efficient method of ensuring the nutrient loss reductions are met?

The result of this work was the incorporation of a rule into the proposed regional plan, that regulated the identified intensive land uses, in catchments of the region with an identified nutrient management problem. This required those farms to comply with nitrogen loss limits based on the natural capital of the land they farm, and to implement other best management farming practices (such as good management of irrigated effluent, and exclusion of stock from waterbodies).

This rule was the subject of public submissions and public hearings were held in 2009-2010. Decisions on those submissions were released in mid 2010. These decisions incorporated some aspects of the policy and science research outlined above, and excluded some other aspects. The outcomes of those decisions are now the subject of an appeal to the Environment Court by a number of interested parties.

Impact of presentation on the topic of the conference

This paper provides a topical case study which touches on several of the conference themes (agricultural diffuse pollution (conference topic A), nutrient and eutrophication issues (topic C) and use of policies and education to control diffuse pollution (topic G)) within a lowland river systems in the North Island of New Zealand. This paper provides an example of one regional authority's approach to management of effects of diffuse pollution on river and lake systems. The importance of integrating science with policy thinking to achieve appropriate management of resources will be emphasised. An update on the progress of the Environment Court appeals will be presented at the conference to update delegates on the most recent thinking and likely outcomes of the ongoing science and policy debate on this issue.

References

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