

Limiting diffuse pollution: an approach to science informed policy development

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The need to set limits for managing the cumulative effects of diffuse pollution on water quality has been widely discussed recently in New Zealand, and is a challenge worldwide. Setting such limits requires multiple disciplines including the natural, physical, social and cultural sciences, economics, law and policy, and is difficult for many reasons. A key challenge is bringing together multidisciplinary science knowledge in such a way that environmental, economic, social and cultural values, which are often in tension, can all be fairly evaluated within the limit-setting process.

In this paper we describe an evolving approach to limit setting that addresses this challenge by providing a conceptual framework for science knowledge integration, and by clarifying the roles of science information provider, community participator and decision-maker. The approach includes seven interrelated elements:

1. Recognising that good decisions require well characterised options: science knowledge can inform the community and decision-makers by providing options so that necessary value judgements can be made between competing values;
2. Using technical relationships from science research to develop a range of options for measurable environmental objectives, and related limits such as water quality standards and catchment contaminant load limits;
3. Using equivalent technical analyses to identify consequences of the same options for economic, social and cultural values;
4. Undertaking a participatory community process to deliberate the options and their consequences, thus assisting decision-makers to select a preferred option;
5. Accounting for spatial variability of water bodies in developing the options;
6. Managing multiple sources of uncertainty in knowledge in a risk-based way;
7. Implementing limits strategically, with increasing specificity from national to regional and local levels of the resource management policy hierarchy.

A similar approach is currently being used by some regional authorities in New Zealand to prepare regional policy and catchment water plans to manage the tension between the cumulative effects of land use on water quality and the developmental aspirations of the agricultural sector. We examine these case studies to identify strengths and weaknesses of the approach.

We conclude that while numerous challenges remain and the approach is evolving, the potential benefits are significant; limits provide a basis for managing cumulative effects and thus provide increased clarity about future resource availability and the future state of maintenance of environmental, economic, social and cultural values.