

IMPLEMENTING CHANGE: LOW-COST, HIGH IMPACT APPROACHES TO MEET WATER QUALITY TARGETS IDENTIFIED THROUGH AN IWRM PROCESS.

INTRODUCTION

Integrated Water Resource Management (IWRM) approaches such as the Canterbury Water Management Strategy (CWMS), result in “aspirational” targets. The challenge then becomes to effect change across a wide range of partners and stakeholders to achieve these targets. Many approaches have been attempted historically to effect change in the past with water quality in Canterbury on a piecemeal basis. Often there have been attempts to use either non-regulatory and regulatory approaches in isolation. This paper describes impacts of the early stages of a co-ordinated approach between non-regulatory and regulatory that has emerged to implement real change in both rural and urban practices. Regulatory approaches are carried out under the auspices of the Canterbury Regional Councils known as Environment Canterbury (ECan). This body works alongside ten Territorial Authorities that regulate some aspects of land use and supply “three waters” (water supply, wastewater and stormwater) services.

METHODS

Rather than attempt to give an overview of all aspects of the CWMS this paper describes how nonpoint source pollution is being addressed in rural and urban areas. The focus on nonpoint source pollution is important as it is one of the greatest current challenges in water management and requires approaches that are not only technically correct but which change the behaviour of individuals, businesses and local government.

It has been observed that three factors underlie much of what is occurring with water:

1. Complacency. Some issues have been identified for considerable time but have not been acted on. Examples in Canterbury include the rising level of nitrate in groundwater, the risk of pathogens in shallow groundwater wells used for water supply and the failure to put water quantity abstraction limits in place in a timely manner due to a mistaken belief that water supplies were large compared to potential demand.
2. Equitable treatment. Having recognised that a resource is overallocated or that emissions of contaminants (e.g. Nitrates) are too great, approaches must be developed that are viewed as providing equitable treatments of different individuals, groups, companies etc. Note the term “equitable” is widely used in respect of access to water and to widespread use of cooperatives in agriculture in New Zealand.
3. Cost and affordability. Correction of an “overshoot” in meeting economic and business goals is the responsibility of individual and commercial organisations, given the low level of government involvement in New Zealand. Given the importance of agricultural land use, changes in practices to meet environmental targets needs to be done in a manner that does not cripple business outcomes. The same applies to communities with limited resources from property taxes (rates) to provide community services and outcomes.

Considering the three factors above activities and approaches have been developed for rural and urban activities. Both sectors are subject to an evolving mix of regulatory and non-regulatory approaches that are being developed collaboratively. While collaboration is a complex concept the most important elements are coordination, cooperation and communication. A key component of the CWMS are committees drawn from the community that are active within 10 zones plus a regional committee.

For rural application, Environment flows are being updated and limits have been set to nitrates in different parts of Canterbury. The regulatory system sets limits through rules that are generally expressed as a maximum annual tonnage of nitrate from a catchment. At the same time as catchment limits are set, individual farms above a relevant threshold of scale are required to prepare a Farm Environment Plan (FEP). FEPs are developed by farmers to identify at risk areas on farms. FEPs also outline actions needed to improve management of nutrient, soils and water bodies including wetlands. The goal is to have all farms at Good Management Practice (GMP).

Urban areas face more complex issues with contamination coming from a mix of e-coli (canine, human, waterfowl), chemicals (including Polycyclic aromatic hydrocarbon (PAH)) and metals (including copper and zinc). The regulatory approach has been to make the operators of stormwater networks, which are local councils, progressively responsible for applying for a consent for a consent to discharge into waterways by 30 June 2018 and to take responsibility for what is entering their stormwater networks by 30 June 2025.

Results

Target 1 (2015): *Set environmental flows for surface streams, rivers and groundwater that are consistent with the fundamental principles of the CWMS. Set catchment load limits for nutrients for each water management zone that are consistent with the fundamental principles of the CWMS. Established and begun to implement a programme to apply environmental flows to existing consents.*

Outcome for Target 1 at 2017: Environment Canterbury has made significant progress towards setting environmental limits through the Land and Water Regional Plan (LWRP). The LWRP, effective from January 2012, sets environmental limits that require farmers and other land users to 'hold the line' and not increase nitrate losses.

The LWRP provides a region wide planning framework within which catchment specific plan changes (subregional chapters) are added which introduce local limits. Several catchment specific plan changes are either completed or underway in each zone. The sub-regional chapters are developed via a detailed and intensive community engagement and planning process. In addition to sub-regional plan changes, a suite of improvements has been made to the LWRP relating to improved biodiversity outcomes, protection of inanga (indigenous fish species) spawning habitat, storm-water management, drinking water source protection, and the exclusion of livestock from lakes and rivers.

The latest update to the LWRP will require farmers to reduce nutrient losses and manage their land in an environmentally sustainable way. Environment Canterbury has worked with the primary sector to define acceptable farming practices. These 'Good Management Practices' (GMPs) now provide farmers and council with a shared understanding of how to limit nutrient losses and manage environmental impacts. Zone committees are central to developing the planning framework, and are focused on a work programme to deliver a range of on-the-ground projects to improve water quality,

Target 2 (2020): *Review of environmental flows and catchment load limits in response to changing monitoring information, new understanding and technologies, and if requested by regional and Zone Committees.*

Outcome for Target 2 at 2017: Catchment loads and flows are being monitored by Environment Canterbury through the regular state of the environment monitoring programme. Water levels and river flows and water quality are monitored monthly and include over 100 recreational sites. Zone committees are regularly updated with this information which is used for decision making for the sub-regional plans.

Target 3 (2020): *Established and begun to implement a programme to review existing consents where such review is necessary to achieve catchment load limits.*

Outcome for Target 3 at 2017: Specific catchment load limits have been, or are being, set in sub-regional plans. Environment Canterbury continues to monitor and model catchment loads and work through zone committees to determine whether consent reviews are necessary to achieve catchment load limits. Because there have been several recent updates to the planning framework the approach has been to set consent durations to deliver on catchment load limits. Consent reviews are a substantial task that often ends in legal proceedings. Hence the need to build a strong evidence base through science is challenging as legal proceedings are expensive and uncertain with no guarantee science based information will prevail.

The overall outcome sought by 2040 provides an insight into expectations from advances in biophysical sciences and its application through a social science process as follows. *Review of environmental flows and catchment load limits in response to changing monitoring information, new understanding and technologies, and if requested by Regional and Zone Committees. Environmental flow and catchment load limits achieved in all water-bodies.*

Conclusion

Approaches to implement water quality targets set through an IWRM process are challenging and take time. To identify and implement low cost, high impact work with industry and community groups is essential. A key part of this is the use of "Good Management Practice" approaches that identify methods that high performing organisations use in each sector and to provide information on the methods and motivation to uptake to the rest of the sector,

While this paper focuses on rural issues, urban issues are following a similarly prioritised approach. For example, the difficulties with retro-fitting stormwater treatment point to "behavioural change" programmes as the most cost effective first step. This is due to the lack of performance information on installations to date, weaknesses in flow estimation methods making design problematic and diversion of scarce capital and maintenance resource to earthquake damage recovery.

Keywords: **IWRM, implement, water quality**