Water Research Strategy

Foundation for Research Science and Technology
and Ministry for the Environment

New Zealand Government

This report may be cited as: Foundation for Research, Science and Technology and Ministry for the Environment. 2009. *Water Research Strategy*. Wellington: Ministry for the Environment.

Published in December 2009 by the
Ministry for the Environment
Manatū Mō Te Taiao
PO Box 10362, Wellington 6143, New Zealand

ISBN: 978-0-478-33242-1

Publication number: ME 976

This document is available on the Ministry for the Environment's website:
www.mfe.govt.nz

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1 Preface

Sound water management is not solely an environmental issue, it is also essential to the pursuit of sustainable economic development. Water is central to New Zealand's biologically based export economy and our competitive advantage and is of vital concern to Māori. Water needs to be sustainably managed to provide for New Zealand's economic development and growth and other values important to New Zealanders (including biodiversity).

New Zealand is approaching some water resource limits, which can be seen in areas with deteriorating water quality, where water demand outstrips supply, and where there are constrained economic opportunities.

As we approach water resource limits, conflict arising from differing values and uses will increase. Resolving this conflict increasingly requires more robust scientific information and decision-making processes. This research strategy recognises that to manage water effectively and efficiently we need information to support:

> "decisions about water management at the national, regional, catchment and land-use scales so they are based on sound knowledge of the resource itself, including its social, cultural, environmental and economic values, and so decisions deal with uncertainty and risk."

The research strategy has been developed jointly by the Foundation for Research, Science and Technology (FRST) and the Ministry for the Environment (MfE). It is intended to guide FRST and the science sector in delivery of the information and tools required to enable world-class management of water resources in New Zealand. The strategy is particularly targeted to guide investment in water research over the next 10 years. This is the timeframe for current and emerging science to be delivered and converted into the tools required for better water allocation and control, better water conservation and better water quality.

Existing sector-based environmental research strategies have been taken into account in identifying research needs. The strategy has been strongly influenced by government decisions on fresh water as well as being modified as a result of consultation.

There are many diverging, and sometimes conflicting, views on the values and uses of water. This document does not try to reconcile or prioritise these values, but recognises the diversity and notes that it is imperative for water managers to consider many, if not all, views.

This strategy sets out the current issues for water management. These are used as a basis for defining and prioritising research needs. It is intended that these will be updated as gaps in information are filled and new gaps emerge – it is, as such, a "living" document that will be reviewed.

2 Introduction

2.1 The importance of fresh water to New Zealand

Overall, New Zealand is not short of fresh water. Indeed, it is a vital input for the primary sectors and tourism upon which the New Zealand economy relies (approximately $29 billion in export earnings – 2006 to 2007 figures). However, in some regions and at some times demands for fresh water, particularly for irrigation and energy, are increasing and, in some cases, exceeding what is available and socially, culturally and/or environmentally acceptable. Given the range of interest in water (economic, social, environmental and cultural), it is important that all parties have the information and tools required to make water management decisions, while minimising the undesirable impacts.

This strategy is intended to inform research to support water managers in New Zealand including government, iwi, regional councils and land managers (both private and conservation estate), as well as farmers, growers, irrigation managers, power generators, tourism operators, manufacturers and individual New Zealanders.

Glossary

"Fresh water" is used to include surface and groundwater and lakes and estuaries as well as impacts on coastal zones, but not marine environments.

The term "management"* (national, regional, catchment, enterprise) refers to managing the use, development and protection of water in a way, or at a rate, which enables people and communities to provide for their social, economic and cultural well-being and for their health and safety while:

a) sustaining the potential of water to meet the reasonably foreseeable needs of future generations and

b) safeguarding the life-supporting capacity of air, water, soil and ecosystems and

c) avoiding, remedying or mitigating any adverse effects of activities on the environment.

* Adapted from the RMA (1991) definition of sustainable management.

Water is central to New Zealand's national identity. New Zealanders value water for its multiple uses and characteristics, including its natural aesthetic and life-supporting character, its use for drinking-water supply, stockwater, irrigation, industry processes, power generation and recreation. Not only is this identity important locally but it is also used in the promotion of products such as agricultural exports and tourism. Many New Zealanders value a holistic relationship with the environment, balancing economic aspirations with their cultural values and maintaining healthy natural resources for the benefit of current and future generations. For Māori, the environment and natural resources are central to identity, and their role as kaitiaki of the environment and natural resources is about securing and enabling the health and welfare of the community economically, socially, culturally and spiritually. In addition, Treaty settlements that have been reached for particular resources are changing today's landscape, putting Māori as co-managers of the key natural resources of land, water, forests and fish.

2.2 What we want to achieve from freshwater management

Government has highlighted the goal for New Zealand of getting the 'best value' for society from our water resources, now and for the future[1]. The concept of 'best value' needs to be determined by looking at economic, environmental, social and cultural dimensions, and by weighing up individual, local and national interests.

New Zealand's water resources are finite. It is impossible to fully meet all demands and expectations in all areas, at all times. The desired outcomes will only be realised by considering and achieving a balance across values, within a decision-making framework that sets limits and bottom lines.

It is expected that the long-term results are likely to be:

a) limits put in place to identify and protect valuable ecosystem services and basic ecological, social and cultural values in water bodies

b) most water bodies providing for most 'public values' and some level of use, which may impose constraints on economic development and land use

c) relatively few water bodies being highly protected in a pristine or natural state (although many will have some level of protection through being located within the conservation estate)

d) very few water bodies being degraded (in flow or quality) if it is agreed that the economic benefits are sufficient to outweigh the other costs (for example, the benefit of hydro-electric generation may, in a few instances, outweigh costs such as reduced stream flow).

This end-state may mean that some water bodies become more heavily used than at present, while others are rehabilitated to greater environmental health; reflecting that it is not, at present, economically feasible to restore every water body in the country to a high environmental standard. Setting of limits to determine the proportion of water bodies to go into each of those categories is essentially a difficult allocation decision, which requires balanced consideration of all values.

2.3 Filling science, technical, information and capability gaps

Delivering the long-term objectives described above requires good information and the tools to make the best use of this information. There are currently gaps in the information and science necessary to underpin good planning and decision-making to meet these objectives. Mātauranga Māori can also make an important contribution to the achievement of better outcomes for freshwater management.

[1] http://www.mfe.govt.nz/issues/water/freshwater/new-start-for-fresh-water-paper.pdf

An additional issue is the nature and speed of possible responses to achieving water management objectives. For example, in deciding on the timeframe within which a waterway might achieve better water quality, it will be important to consider the ability of various sectors to adjust their practices. Decisions about water cannot be made in isolation, without considering the impacts on other sectors. Similarly, impacts of technical advances and of changes in patterns of economic activity on water demand, use and quality need to be considered.

This research strategy is intended to improve alignment between national outcomes and water managers' needs on the one hand, and current research funding, prioritisation and research deliverables on the other.

It is recognised that any shortfalls in technical capacity and/or capability, and wider capability issues, across central and local government, businesses, the primary sector and our research science and technology sector, will limit the extent and uptake of the research. Strategies such as this are therefore vital to make research already limited in extent as relevant and accessible as possible to people who will make the best use of it.

2.4 The role of science in freshwater management

The role of science is to progress from knowledge gaps to delivery of solutions. The scientific community is relied upon to "support" development of the decision-making process – it can deliver potential solutions, but use and uptake is ultimately dependent on government, community and business.

Research also needs to inform the design of relevant and effective institutional arrangements, including regulations and policies designed to transfer rights, as well as broader regulatory interventions and decision-making arrangements. Additionally, ongoing evaluation is important as part of a wider monitoring capability. There will be a lot of learning required and uncertainty to be managed over the next decades and it will be important to see future decision-making better informed by more rigorous evaluations of experience.

Within this process it is important uncertainty is communicated to decision-makers so robust decisions can be made, for example, the uncertainty associated with the prediction of contaminant transport, transformation and attenuation arising from model selection and calibration, lack of data, and spatial variability (heterogeneity) of systems.

2.5 Background and purpose of the Water Research Strategy

2.5.1 What do we have already?

Significant research investment is made annually in the broad topic area of water, for example, FRST invests approximately $30 million per annum on "water". Over and above that, investment occurs in related areas of climate change, sustainable land management and production-focused research. Regional councils, and other government agencies, also undertake significant research and investigations for water policy development and management. For example, the Water Programme, led by the Ministry for the Environment and the Ministry of Agriculture and Forestry, includes a programme of research to identify Māori perspectives and tools that should underpin water policy. To optimise the benefits from this investment, clear direction is needed to focus research outputs and to enable improved linkages between research providers, the public, policy makers and water managers.

This research strategy recognises existing directions for water management and sector-based research strategies, including the regional council research strategy, *Research for the Environment*, FRST's *Water Domain Review*, the Ministry of Research Science and Technology's (MoRST) *Environmental Roadmap*, partnership initiatives such as the Clean Streams Accord and the Primary Sector Water Partnership, the ongoing Land and Water Forum and the iwi advisory process. Investment guidance in areas outside of the Water Research Strategy will be sought from relevant strategies, for example, science direction in biosecurity will be provided by the Ministry of Agriculture and Forestry's *Biosecurity Science Strategy for New Zealand*.

This strategy builds on and complements the *Research for the Environment* strategy. This is a research, science and technology strategy for regional councils (July 2008) endorsed by the Regional Councils Chief Executives' Forum. It recognises that regional councils are faced with making increasingly complex and critical decisions which balance conflicting expectations and viewpoints that require sound and well-informed science. The strategy's identification of freshwater science (including biodiversity) issues and needs have been recognised in the preparation of the Water Research Strategy.

The challenge to integrate and rationalise research effort was highlighted in the *Environmental Roadmap* published by MoRST in 2007. This Water Research Strategy is intended to ensure better integration of current research to achieve national outcomes and will require leadership and partnership across all sectors involved including government, iwi, industry, research and public.

2.5.2 What do we need in future?

The core of this research strategy is based on the premise that New Zealand needs to build an evidence base to enable:

> "decisions about water management at the national, regional, catchment and land-use scales so they are based on sound knowledge of the resource itself, including its social, cultural, environmental and economic values and so that they deal with uncertainty and risk."

The strategy sets out the information and knowledge needed to support this process. It lists knowledge gaps that are problem driven, rather than curiosity driven. It is intended the

Government and FRST will use this document to direct investment and so inform conversations between end users and researchers. However, the intended audience extends to research providers, local authorities, industry/research funders, iwi, central government, the education sector and those involved with infrastructure. This is the start of a process for identifying knowledge and information gaps for water and will be reviewed as required.

2.6 Policy links

Establishing a fairer and more efficient water management system is a priority for the Government. Regional councils are also faced with increasingly complex and critical decision-making which often requires a balance between resource management and conservation, and sustainable development.

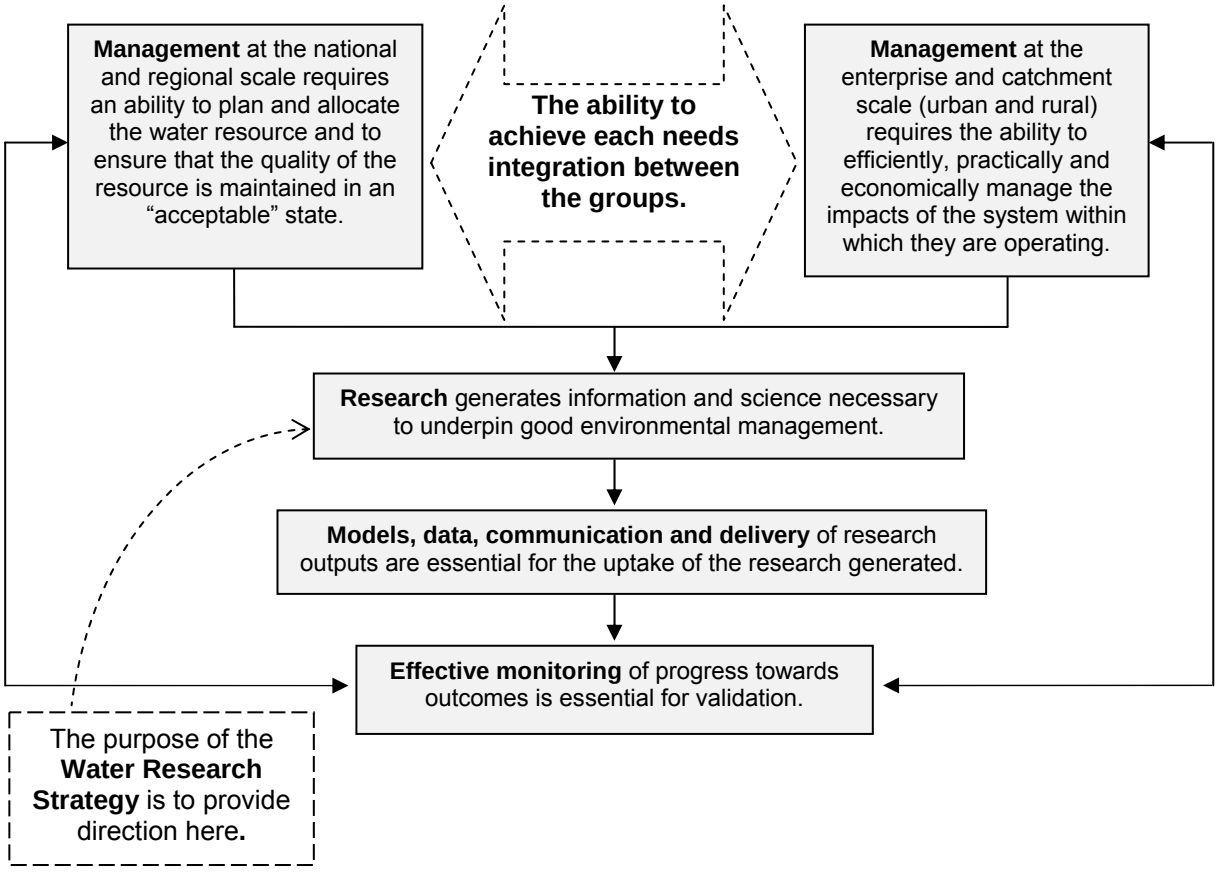
In June 2009 the Government announced its direction for water management in New Zealand in its strategy *New Start for Fresh Water*[2]. The strategy broadly covers the issues that need to be addressed; the direction for water management the Government wants to set; how issues will be tackled; and how the Government will engage with others on water management. It recognises the difficult role of regional councils in making water management decisions. Governance and decision-making options will depend on, and be linked to, any broader developments in local and central government responsibilities. This includes implementation of the Auckland governance reforms after the Government's consideration of the findings of the Royal Commission on Auckland Governance, creation of an Environmental Protection Authority and further development of co-management arrangements for natural resources in Treaty of Waitangi settlements redress.

A subsequent Cabinet paper will outline a programme of work to run until 2011 and beyond. The directions set out in this Water Research Strategy are consistent with the objectives of *New Start for Fresh Water* as well as linking with other policy processes.

This Water Research Strategy is intended to support development of national and regional regulatory mechanisms as well as provision of information to enable water managers to live within the limits these tools impose (Figure 1).

[2] http://www.mfe.govt.nz/issues/water/freshwater/new-start-fresh-water.html

Figure 1: Research is a part of what is needed to equip managers with credible and robust tools



In response to the issues discussed in this section the Water Research Strategy identifies and prioritises key knowledge needs (Chapter 3). In addition to research needs there are needs around models, data, communication and delivery of research outputs. These issues are discussed in Chapter 4.

3 Research Needs

The preceding chapters have outlined the need for an improved decision-making process and action at all scales. This section sets out the information and knowledge needed to support the process of building a robust, evidence-based freshwater management system and lists knowledge gaps that are problem-driven. The strategy is based on information needs in three key areas:

- understanding, valuing and managing water resources, including the life-supporting capacity of aquatic ecosystems
- monitoring systems to track progress towards outcomes
- management at the enterprise and catchment scale.

The research needs for each area are presented in Table 1, with Section 5 prioritising them in the context of what needs to be achieved over the next 10 years. Section 4 discusses research needs around models, data, communication and delivery of research outputs.

3.1 Understanding, valuing and managing water resources, including the life-supporting capacity of aquatic ecosystems

Decision-makers need to be able to characterise water resources in terms of biodiversity values, assimilative capacity, effects (both direct and cumulative) and tipping points (ie, critical levels at which change becomes irreversible). This includes determining the current state of water resources and understanding the differences that can be made over what timescales, for instance, the extent of the resource, its state, how effective interventions will be and what time lag applies. Water body characteristics will differ depending on the location, scale, ecosystem attributes, and in-stream values. This information need relates to freshwater quantity and quality, as well as the interconnection between the two. Although it is recognised that quantity and quality are strongly linked they are presented separately in Table 1.

Decision-making processes also need to evaluate and balance the multitude of values associated with water, recognising the values may relate to social, cultural, environmental, economic and/or ecosystem services. At times these values will be in conflict and may vary with time, flow and quality of the water body. The research needs in Table 1 are split into understanding water quantity, water quality, the life-supporting capacity of aquatic ecosystems and resource valuation and management, but it should be noted that many of the issues listed under the first two headings could have significant consequences for the value attached to water under different circumstances.

3.2 Monitoring systems, reporting and validating

Systems are required to track progress towards environmental outcomes and to validate progress in the effect of management actions, including economic outcomes. This includes making the best use of information systems already in place and linking monitoring of water quality, quantity and ecosystem services trends. There is also a lack of land-use and land management data (collected at the right scale) against which to report water-relevant environmental trends.

Systematic evaluation will be important to informing decisions on modifying or refining the implementation of the Water Research Strategy.

3.3 Management at the enterprise and catchment scale

To deliver on the water management outcomes for New Zealand, resource management must be strongly underpinned by development and deployment of best management practices that comply with water-use policy and regulation. Outcomes must also be supported by tools and management structures that help develop good water policy. Information is needed to support management at the enterprise and catchment scale to enable land managers to operate cost effectively within any set limits. This includes providing for efficient resource management and land-use flexibility in the face of land-use intensification and other pressures.

Table 1: Research needs

Key area	Subsection	Research needs
Understanding, valuing and managing water resources, including life-supporting capacity of aquatic systems	Understanding water quantity	• Volumes, locations and timescales of change, of New Zealand's water resources, including ungauged catchments. In all cases there is a need to better understand the groundwater and vadose zone (ie, unsaturated zone or zone or aeration) components. • Natural flows, including magnitudes and variations in the rates, location and mechanisms of recharge and discharge. There are significant gaps in understanding interconnections between various compartments of the hydrologic system, especially between ground and surface waters. • Flow requirements, including flow variability, to maintain intact freshwater and estuarine ecosystem integrity (especially with high-value fauna and flora), and other in-stream values including natural character and landscape values, and recreational and cultural amenity values. • Effects of weather and climate variability and change on water quantity and resources. • Time lags and cumulative impacts including potential impacts over time and across hydrologically connected systems. • The potential for storage and/or re-use capability to maximise utilisation of the resource. • Impact of withdrawing and damming of water for different activities, including impacts on fresh water and estuarine and coastal environments and their biodiversity. • Understanding of rights and interests in water including the interests of iwi and the implications of the Treaty of Waitangi. • Strategies for managing rural and urban supply and demand, including system and end-use efficiency gains. • The validity of commonly used modelling techniques that guide water decision-making such as models used to quantify the flow requirements of specific in-stream values.
	Understanding water quality	• Land-use effects on water quality (including fresh water and the impact of freshwater inputs to coastal marine environments). This includes the source, transport, transformation and attenuation of contaminants, for instance, through the vadose zone and groundwater system and into receiving surface waters. Mitigation options for reducing and/or intercepting nutrient, sediment and microbiological flows from land into freshwater systems are also needed. • Natural quality characteristics, including temporal and spatial variability, compared to changes in quality as the result of human activity. • Effects of water quality on the responses of in-stream communities with changes in flow. • Water quality levels required to maintain intact freshwater ecosystem integrity especially for high-value systems and habitats and their fauna and flora. • Impact, transport, transformation and attenuation of soluble and particulate associated nutrients (and emerging contaminants) and sediment from source through catchment to sea. • Time lags and cumulative impacts, that is, potential impacts over time and space and identification of tipping points at which a system can no longer maintain "normal" function. • Effects of degraded water quality in meeting the needs of human health (eg, effects of cyanotoxins). • Extent of emerging water quality issues from, for example, heavy metals, pharmaceuticals, endocrine disrupter chemicals.

Key area	Subsection	Research needs
	Understanding the life-supporting capacity of aquatic ecosystems	• Groundwater “ecosystems” and the effects of allocation and groundwater–surface water interfaces. • Resilience/vulnerability of aquatic ecosystems in the face of change. • Rehabilitation needs and mechanisms for water bodies including economic, social, cultural and ecosystem services. • The quality of water required for maintaining different types of ecosystems and the potential impacts for land-use activities of achieving the water quality requirements.
	Valuing and managing the resources	• Methods to describe, understand, and, where appropriate, quantify, compare and weigh up the economic, social, environmental, cultural and ecosystem services values of urban and rural fresh water, and application of these methods across all of New Zealand. • Development of processes to balance economic, social, cultural, environmental and ecosystem services values to achieve the optimal outcomes at all scales. • Methods to relate how decision-making leads to changes in the physical, chemical and biological characteristics of water and impacts on the resource value.
Monitoring systems, reporting and validating		• How, where and when to most efficiently monitor, including understanding and monitoring the pressures on specific water resources (eg, remote sensing, statistically sound monitoring networks and networks of local kaitiaki) to enable appropriate management of the resource. • How, what, where and when to most effectively measure environmental state. • How, what, where and when to most effectively measure and test trends and changes against the management actions.
Management at the enterprise and catchment scales		• Increasing the efficient use and reuse of water such as new or adapted irrigation technologies, predictive tools for appropriate water use and storage, technologies for urban managers or individual home owners to use water more efficiently. • Reducing the impact of water use or other activities on water systems and environments, for example, tools to reduce the impact of fertiliser use and animal activity, management of riparian margins to improve cultural and environmental health, and technologies to improve the economics and efficiency of waste management for rural, manufacturing and urban systems. • Managing water in the landscape – long-term, targeted restoration that improves baseflow, biodiversity and chemical and physical aspects.

4 Models, Data, Communication and Delivery of Research Outputs

Information and knowledge are an important part of the development of the decision-making process but effective communication and technology transfer is essential for successful implementation of research outputs.

Within the water-focused communities there are significant gaps between: scientists and policy makers; science/policy and implementers/land-use advisers; water-related disciplines; science providers and resource managers; and biophysical science and other knowledge bases (including those of iwi). Inherent in this are complexities around terminology, communication methods, expectation matching, value sets, and ability/capacity to adopt new knowledge and technology.

In terms of tools,[3] there is currently an incomplete knowledge of the range and application of existing models, for example whether they should be used alone or in combination with other models. The definition of models here is wider than just hydrological models and can include classification models (eg, River Environment Classification [REC], Freshwater Environments New Zealand River Classification Database [FWENZ]) and also models attributing other values such as biodiversity value (eg, Waters of National Importance [WONI] Rivers, Lakes and Wetlands). The scale of interest and application for models includes paddock to catchment or larger.

It is important to build on the large number of tools already available in New Zealand and worldwide for informing freshwater management and where possible improve their interoperability and applicability, and identify gaps. This requires a clear strategy for their testing, rationalisation, standardisation and maintenance to avoid continual reinvention. It is also important that new or combined models are developed collaboratively with land and water managers to ensure they will be capable of answering the relevant questions, testing plausible scenarios and/or providing robust predictions and forecasts.

In the water allocation area, there is plenty of room for improvement of existing models, exploration of the use of other models and decision-making processes if they are to be widely used in New Zealand. In addition, model use and output will continue to improve as uncertainty in the underlying information is reduced.

As models are only as good as the data used to inform them, it is essential that nationally important datasets are maintained and built upon (databases created and resourced). To answer key management questions, there needs to be improvements in the process of identifying nationally important datasets that need to be collated (ie, existing datasets) or collected (ie, new datasets).

[3] Instruments to allow end-users to understand, predict and manage water resources and land-water systems.

5 Prioritisation of Research Needs: What must be achieved over the next 10 years?

The research needs identified in Table 1 are wide-ranging. A subset of priority research needs is listed below to identify what must be achieved over the next 10 years.

- **Building on past research**: It is essential to achieve appropriate integration of both existing and new knowledge and, where applicable integration or interoperability of models.
- **Regional targeting of research**: There is a need for continued nationwide quantification of the amount and quality of surface and groundwater, including recharge and discharge. However, this research effort must be focussed on specific key regions over the next decade. Regional prioritisation should be based on the value of water in these regions to the economy and community, vulnerability of water-supported ecosystems, and sensitivity of the hydrologic system to changes and pressures (eg, climate change).
- **Understanding hydrological connections**: Research is required to improve understanding of the connectivity and time lags between soil water, groundwater and surface water at a range of scales. Reliable information on, and models of, the quantity and quality of both fresh water and marine habitats (estuarine and coastal) are also required.
- **Better understanding of cumulative pressures**: There is a need to understand the combined and cumulative pressures on water resources (quantity and quality) and on aquatic ecosystems and receiving waters (fresh water and coastal). This includes a need to understand the complex relationships between land, land-use type and intensity, and sustainability thresholds for water quality and quantity at a range of scales, as well as how some of those pressures could be alleviated (which may link to new ways of producing electricity, farming or storing water that place less pressure on water systems). Research is also needed to set realistic targets, for example the quality of water that is achievable for different land-uses and management practices.
- **Opportunities and strategies for rehabilitation**: There is a need to identify the specific locations where opportunities exist for rehabilitation of degraded hydrologic systems and aquatic ecosystems. In parallel, there is a need to develop rehabilitation techniques and strategies to address specific requirements and opportunities.
- **Tools for improving efficiency of management**: Techniques and technologies (including decision support tools) are required to improve the efficiency of water use at the enterprise and catchment scale. Techniques and frameworks for environmental forecasting are required to predict water availability and demand. Management systems and tools are also required to improve the quality of water at a variety of scales.
- **Valuing water**: Values described, compared and assessed for water at national, regional, catchment and land-use scales to aid management processes and decision-making. This includes approaches for integration of valuation models with biophysical models, and development of tools and regulatory frameworks for water management that are based on optimisation of value.

- **Improved institutional arrangements**: Information is required to support the development of world-class institutional arrangements and instruments to manage water.
- **Approaches for tracking progress towards sustainability**: Monitoring protocols and tools are required to track and validate the progress of management actions, including uptake of science outputs, towards achieving specified objectives and outcomes.

6 Next Steps ...

As stated in the introduction, this research strategy is intended to improve alignment between national outcomes and water managers' needs on the one hand, and current research funding, prioritisation and research deliverables on the other. The draft Water Research Strategy released in April 2009 was used by the Foundation for Research Science and Technology (FRST) during preparation for an investment process which will begin in 2010. The process requests proposals within the FRST portfolios 'Resilient, Functioning and Restored Natural Ecosystems (ECO)' and 'Maintaining Environmental Integrity for Sustainable Resource Use (SRU)'. FRST intends using this strategy for future Requests for Proposals for other relevant portfolios, such as 'Sustainable Production Systems'.

It is recognised that any shortfall in technical capacity and/or capability, and wider capability issues, across central government, local government, businesses, the primary sector and our research, science and technology sector, will limit the extent and uptake of the research.

The Government's strategy *New Start for Fresh Water* lists, amongst its aims, the need to address some of the scientific, technical, information and capability gaps that hold back improved water management. Defining mechanisms for improving science alignment, providing better understanding of capability gaps and, in turn, improved transfer of knowledge to policy-makers and end users will be an important element of this.

The Water Research Strategy will be reviewed as existing information gaps are filled and new gaps identified. Priority must be given to ensuring the decision support tools and required knowledge are both delivered and used by the different user groups; that they continue to build on existing knowledge and tools; and that the priority gaps are systematically identified and filled. Each of the research priorities described in chapter 5 are not mutually exclusive. Maximum value cannot be gained from research investment without aligning the direction of freshwater research and the needs of water management. This strategy is one part in this alignment. In addition, scientists framing their research to meet water management needs, while challenging, is a vital part of maximising the value of their research.

7 Advisory Group Membership

1 David Johns: Facilitator
2 Chris Arbuckle, Ministry of Agriculture and Forestry
3 Gary Bedford, Taranaki Regional Council
4 John Bright, Aqualinc
5 Chris Daughney, GNS Science
6 Clive Howard-Williams, National Institute of Water and Atmospheric Research
7 Suzi Kerr replaced by Howard Fancy, Motu Economic and Public Policy Research
8 Vera Power, Ministry for the Environment
9 Chappie Te Kani, Ministry for the Environment
10 Ian Turney, Foundation for Research, Science and Technology
11 David West, Department of Conservation

8 Consultation

During consultation on a draft of this document, in April/May 2009, submissions were received from:

1 Auckland Regional Council
2 Agresearch
3 Cawthron
4 Collective of Universities – joint submission from: Waikato University, University of Otago, University of Canterbury, Massey University, Auckland University, Lincoln University, Victoria University
5 David Renouf
6 Department of Conservation
7 ESR
8 Federated Farmers
9 Fert Research
10 Fish and Game
11 Gisborne District Council
12 Hugh Ritchie
13 Horticulture NZ
14 Irrigation NZ
15 Landcare Research
16 Lincoln Ventures Ltd
17 Meat and Wool NZ
18 Ministry for Economic Development
19 Ministry of Research Science and Technology
20 New Zealand Forest Owners Environment Committee
21 New Zealand Freshwater Science Society
22 Otago Regional Council
23 Plant and Food Research
24 Regional councils combined response
25 Tasman District Council
26 University of Otago
27 Victoria University
28 Waihora Ellesmere Trust
29 Water New Zealand
30 Watercare Services Ltd