# Community-led collaborative water quality limit setting in Canterbury, New Zealand

**Ken Taylor, Environment Canterbury**

**Melissa Robson, AgResearch Ltd**

LuWQ2015
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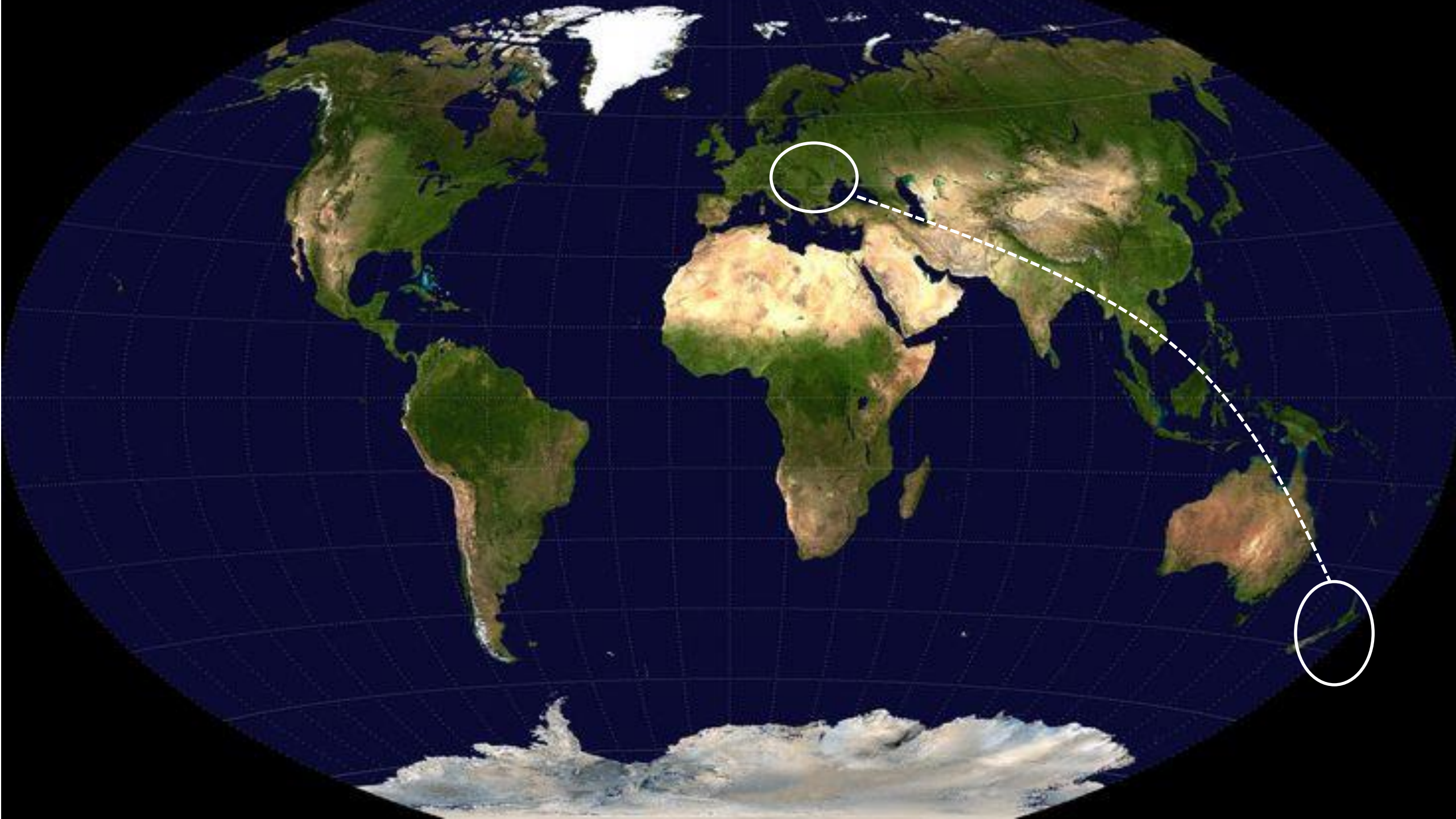

# Outline

- The New Zealand setting
- Drivers for environmental change
- The water resource management framework
- Collaboration and the genesis of the Canterbury Water Management Strategy
- Zone committees – the collaborative engine
- Setting resource limits and the role of scientists
- Some guiding principles

**Table 6.2.** Resource-based recreation participation.

| | Participated in 2007 (Standard error) | Mean days, all | Mean days, participants |
|---|---|---|---|
| Walking in a natural environment | 84.6% (1.3%) | 15.90 | 20.27 |
| Swimming in sea, lake or river | 53.9% (1.8%) | 6.09 | 10.48 |
| Boating on estuary or sea | 34.6% (1.7%) | 3.24 | 8.16 |
| Camping | 34.0% (1.7%) | 3.56 | 9.41 |
| Sea fishing | 33.8% (1.7%) | 3.13 | 8.04 |
| Tramping | 30.7% (1.7%) | 2.74 | 7.62 |
| Collecting shellfish | 23.9% (1.6%) | 1.70 | 5.37 |
| Off-road driving | 21.7% (1.5%) | 1.99 | 7.68 |
| Boating on a lake | 20.9% (1.5%) | 1.47 | 5.30 |
| Boating on a river | 18.9% (1.4%) | 1.22 | 4.54 |
| Surfing or body boarding | 18.4% (1.4%) | 2.09 | 10.40 |
| Freshwater fishing | 16.9% (1.4%) | 1.46 | 7.27 |
| Off-road mountain biking | 14.6% (1.3%) | 1.59 | 9.68 |
| Mountain or rock climbing | 12.6% (1.2%) | 0.91 | 5.53 |
| Skiing | 11.3% (1.2%) | 0.77 | 5.00 |
| Hunting for small game | 10.4% (1.1%) | 1.36 | 12.01 |
| Hunting for large game | 5.7% (0.8%) | 0.79 | 12.31 |
| Hunting waterfowl | 4.8% (0.8%) | 0.47 | 8.56 |
| Hunting game birds | 2.5% (0.6%) | 0.34 | 12.38 |

**New Zealanders are frequent users of water for active recreation**


NZ trades on its
environmental quality
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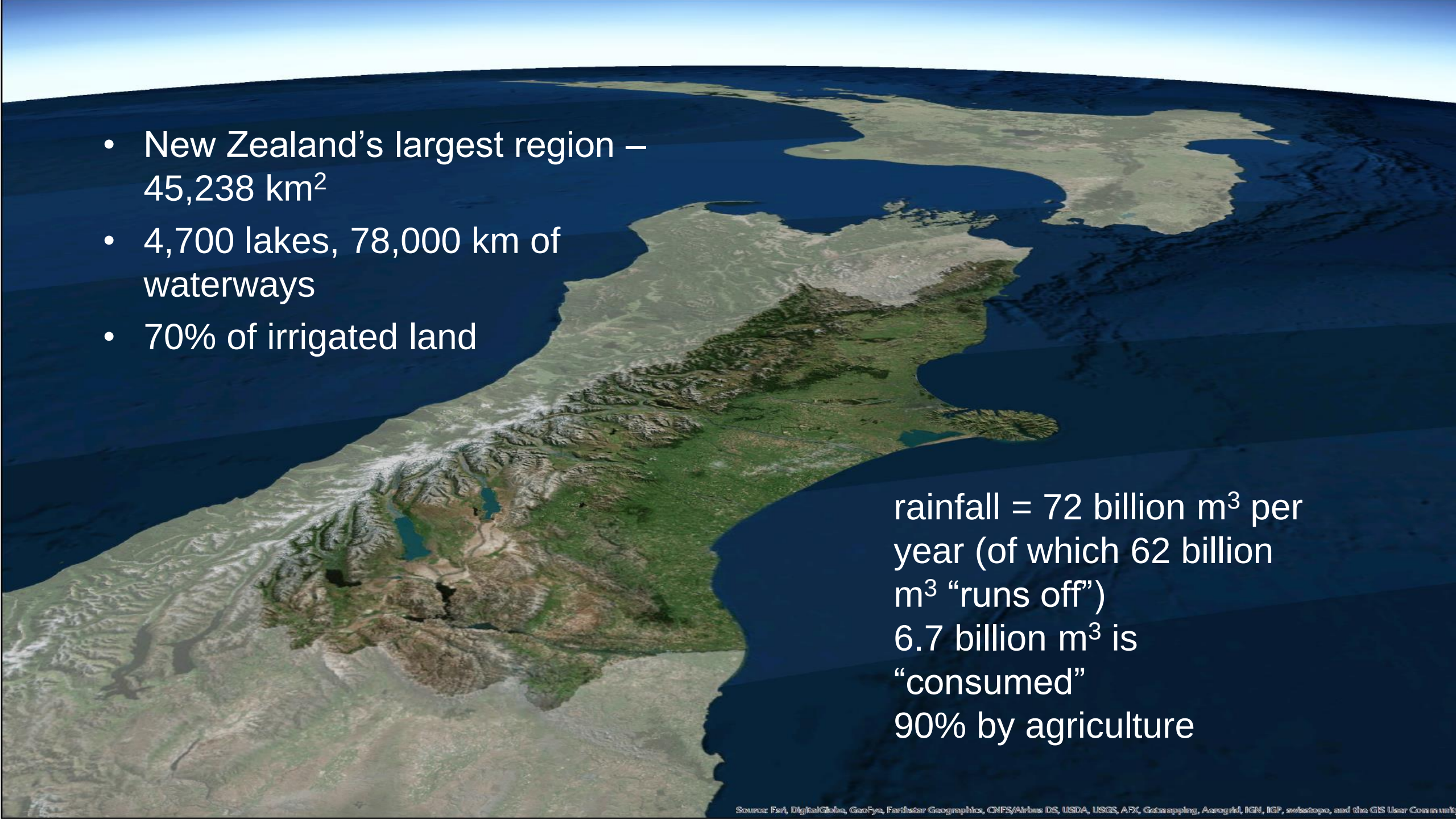
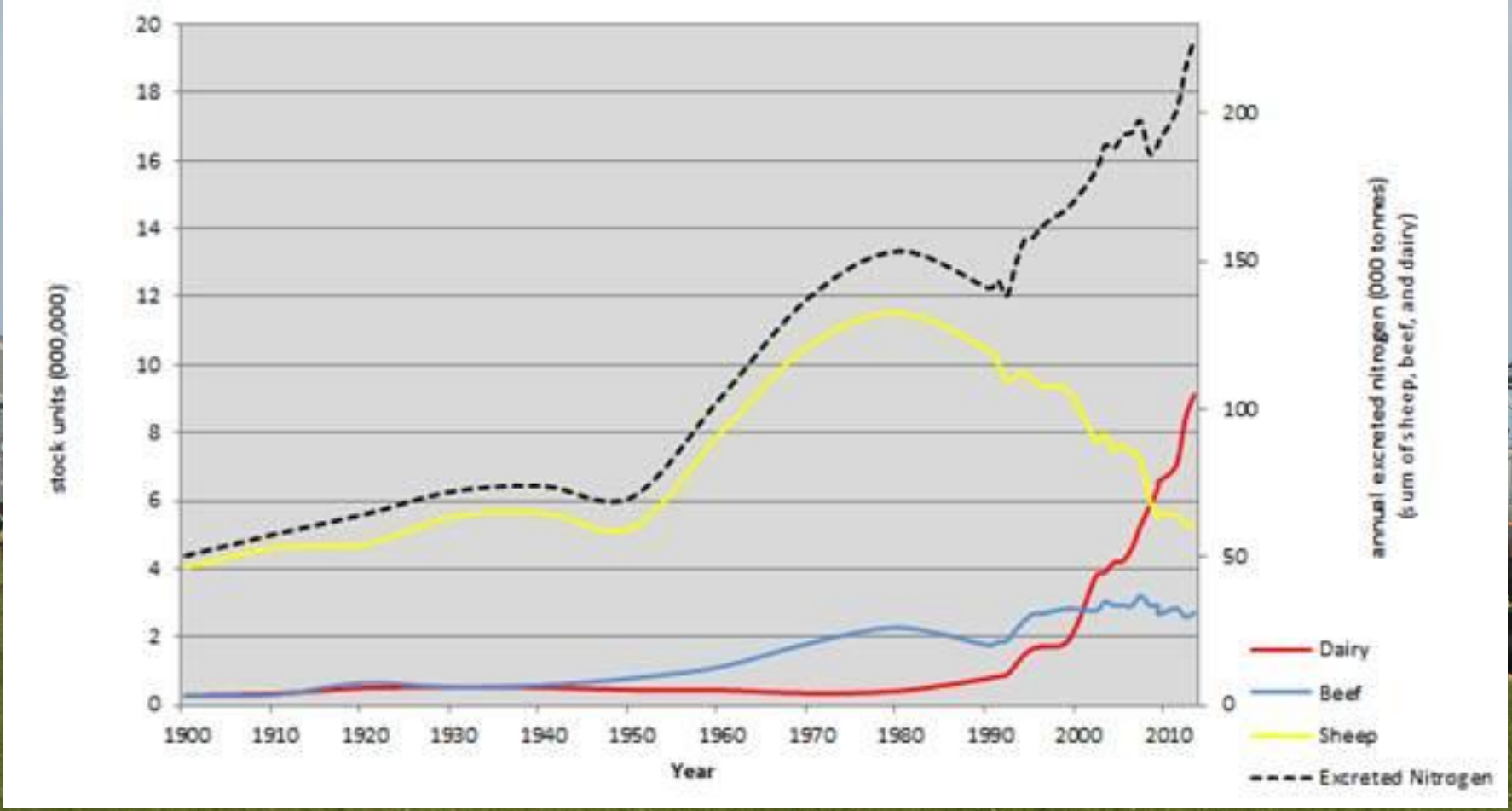
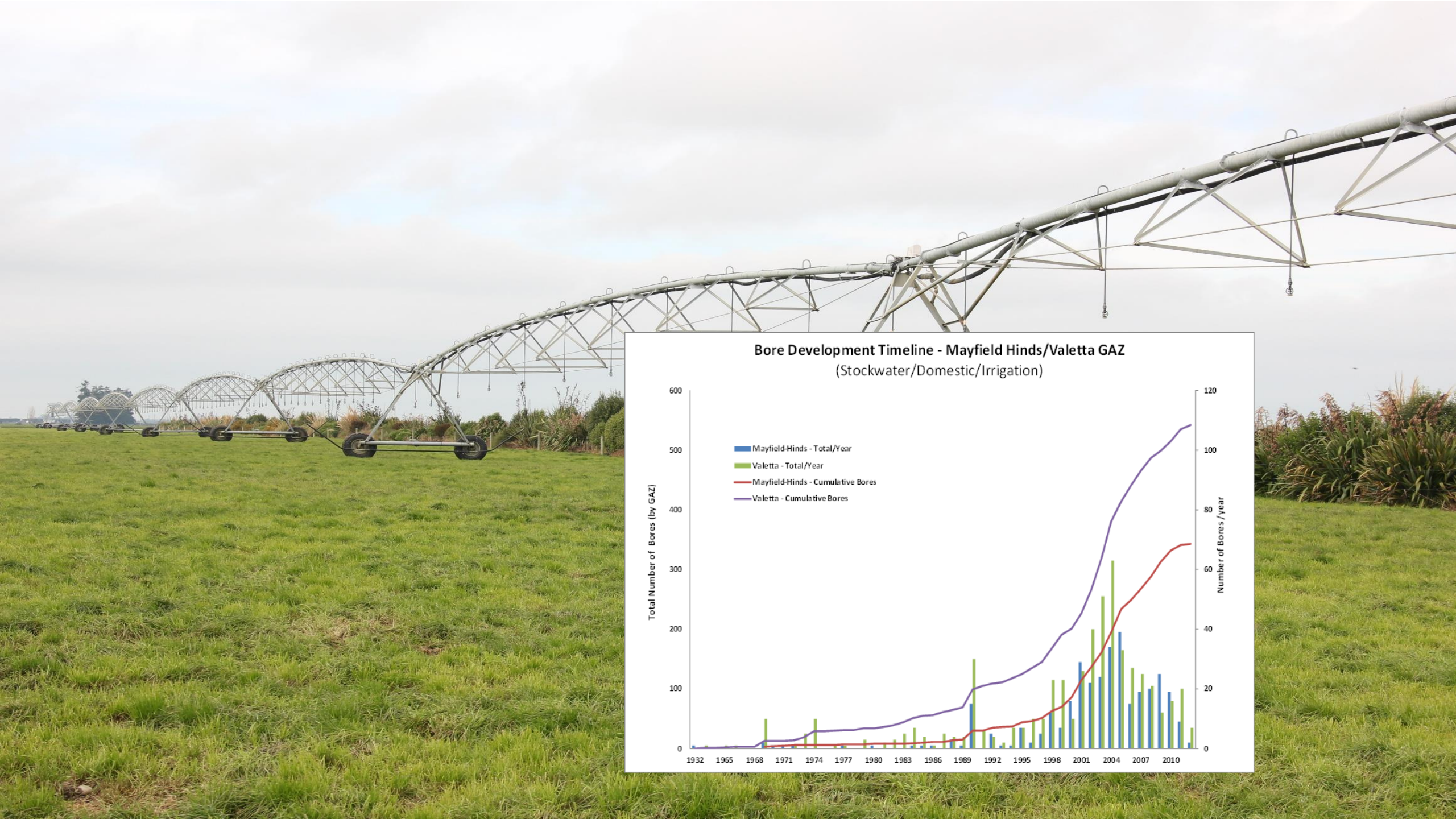


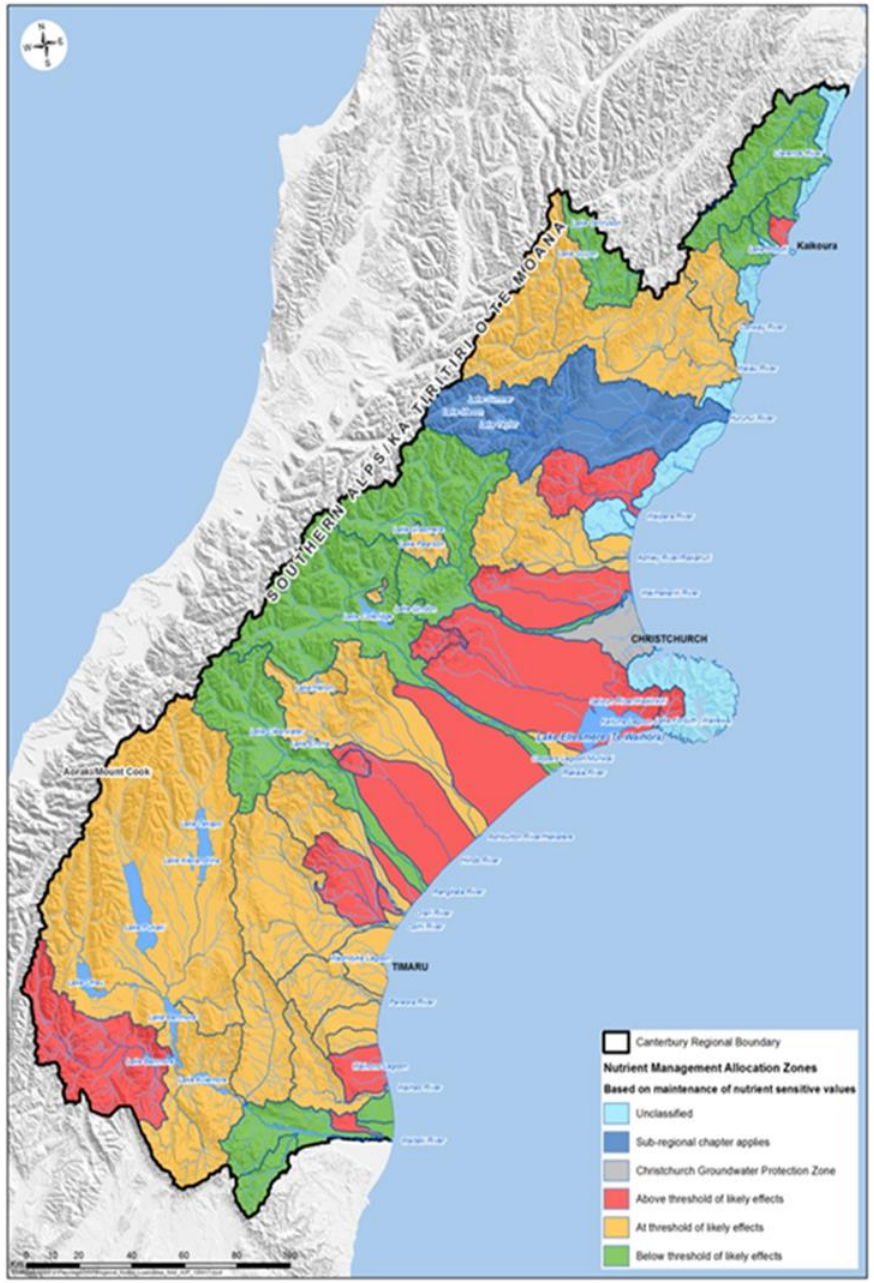

- New Zealand's largest region – 45,238 $km^2$
- 4,700 lakes, 78,000 km of waterways
- 70% of irrigated land

rainfall = 72 billion $m^3$ per year (of which 62 billion $m^3$ "runs off")
6.7 billion $m^3$ is "consumed"
90% by agriculture

## Changes in Canterbury land use in selected land use categories, 1900 to 2014




Bore Development Timeline - Mayfield Hinds/Valetta GAZ
(Stockwater/Domestic/Irrigation)
Total Number of Bores (by GAZ)
Number of Bores / year
Mayfield-Hinds - Total/Year
Valetta - Total/Year
Mayfield-Hinds - Cumulative Bores
Valetta - Cumulative Bores
0
100
200
300
400
500
600
0
20
40
60
80
100
120
1932
1965
1968
1971
1974
1977
1980
1983
1986
1989
1992
1995
1998
2001
2004
2007
2010




Map NAZ: Nutrient Allocation Zones

# Increasing risk…



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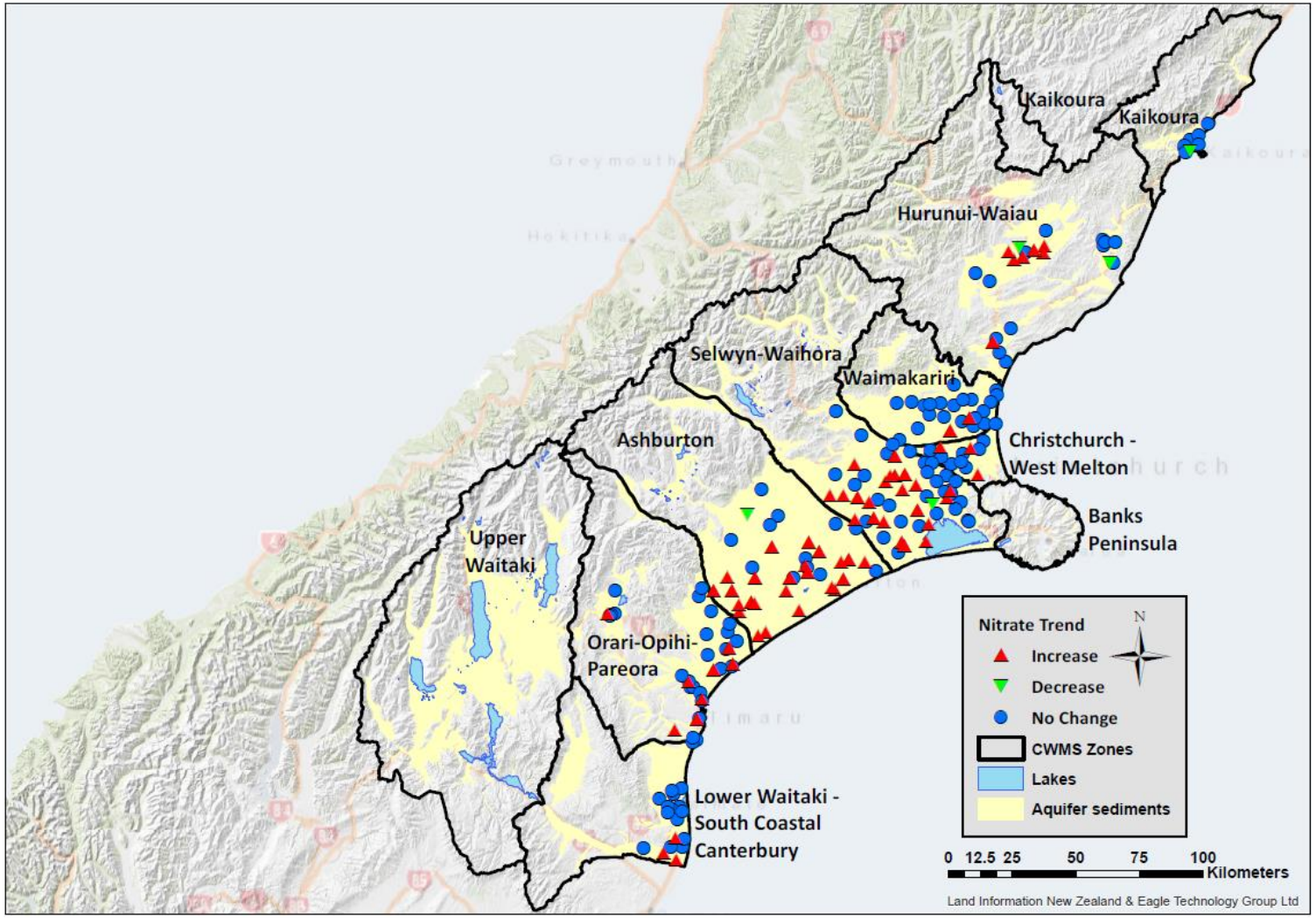
# Observable decline in groundwater quality…




Nitrate nitrogen trends in Canterbury groundwater 2005-2014

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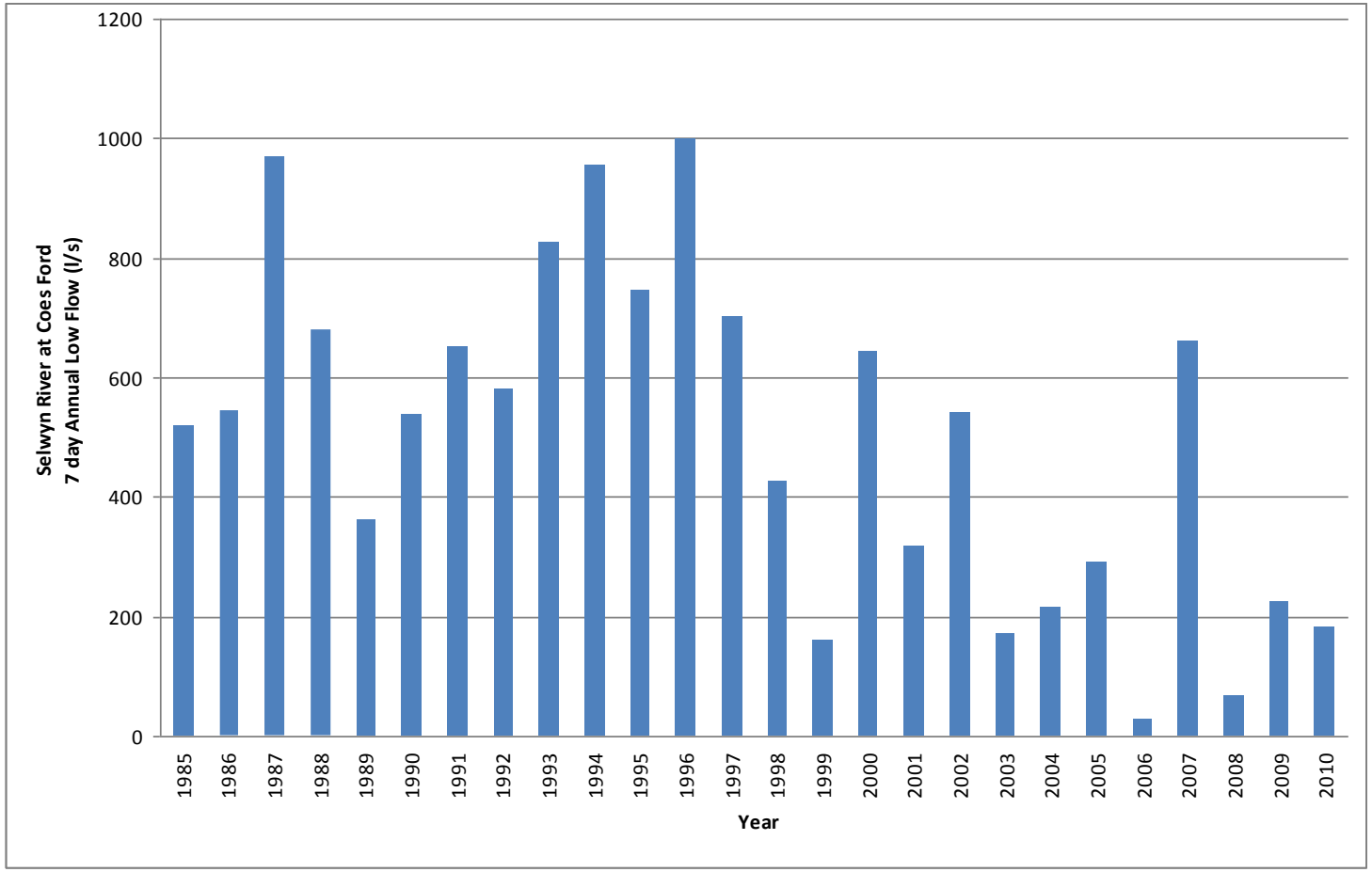
# Declining flows…




7dMALF Selwyn River/Waikirikiri at Coes Ford – 1985 -2010



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12 Sep 2015
Weekend Press
Author: Tim Fulton • Section: General News • Page: 1 • Item ID: 464174653
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# Polluted paradise

**Water quality in our High Country lakes is declining as farming intensifies**

Tim Fulton

Canterbury high country lakes once rated "clean and blue" are being fouled by nutrients and phosphorous from farming.

The purity of lakes from Lake Coleridge to the Rangitata River, including Lakes Selfe, Grasmere, Hawdon, Alexandrina and Ida has declined in the past 10 years, Environment Canterbury (ECan) monitoring shows.

On an ECan rating of 1 to 6, lakes that had been "clear and blue" are now mostly in "moderate" condition with nutrients and algae present.

ECan has been working with high country farmers on ways to control the amount of nitrogen and phosphorous seeping into alpine waterways. Such nutrients feed plant growth in the lakes, changing their ecosystems.

ECan classes "nutrient loading" as a major threat to the condition of 25 lakes, in the upper Rakaia Gorge, Ashburton Basin and along the upper Rangitata.

Water consultancy the Cawthron Institute last year reported to ECan and the Department of Conservation (DOC) on nutrient loading in the high country.

Changes in farming to more intensive practices, including dairy grazing, and growing crops for livestock created a risk of more nutrient going into lakes.

ECan had classified 25 lakes on its watch into "sensitive lake zone catchments".

A pilot study around the Ashburton lakes showed the shallowest were the most vulnerable to "further degradation", either from farming or pollution from bird droppings.

The Cawthron study said low-intensity sheep and beef farming was giving way to dairy support and crops like fodder beet. Irrigation usually made this possible.

At the time of the report, several properties in parts of inland Canterbury were seeking resource consents for dairying. These changes, which extended to areas like the upper Waitaki basin, would "almost certainly result in an increase in nutrient runoff".

The potential effects of this on freshwater environments were poorly understood, Cawthron said.

Federated Farmers senior policy analyst Lionel Hume said farm environment plans helped farmers to match their use of nutrients, like fertiliser, to what the land really needed. The plans

# Public reaction…



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# The management framework

**16 regional councils**

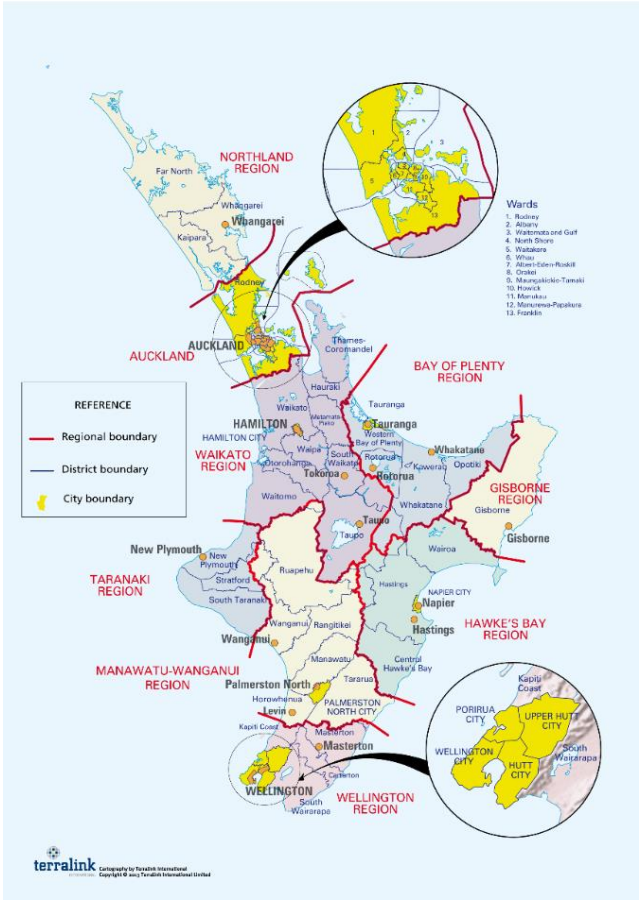
- **Responsible for management of water quality and quantity**

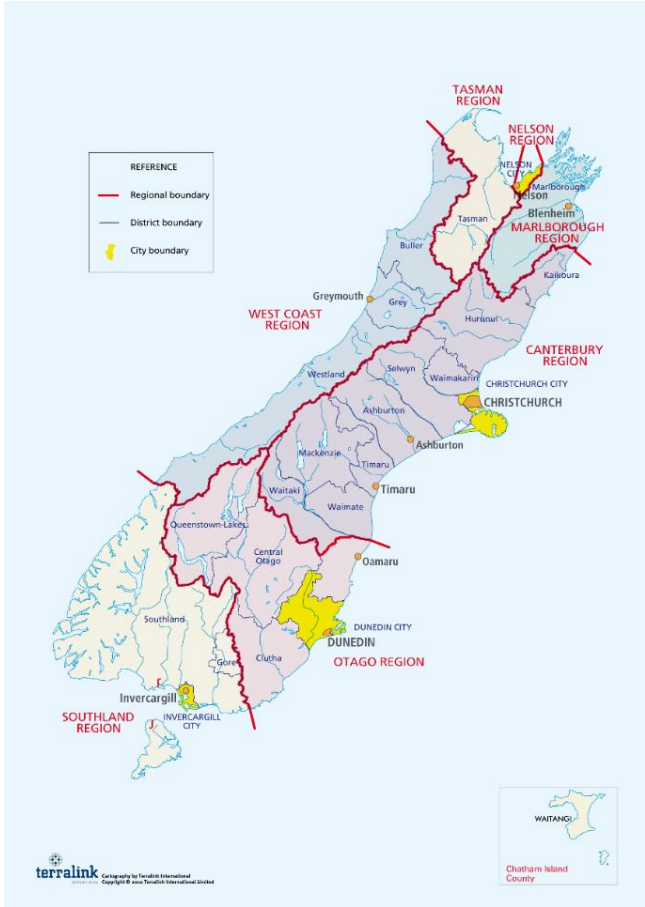
**Powers and responsibilities highly devolved**

**national policy agencies**

**69 district councils**

- **Primarily responsible for the management of activities on the land**



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# The Resource Management Act

- Legislative framework since 1991
- Sustainable management
- “Effects-based approach”
- Does not deal well with non-point source contamination
- Strong on formal decision-making processes
- Frequently amended – mountain of case law

# Consequences…

- “Decide and defend”
- Lengthy planning processes
- Acrimonious environment – winners and losers
- Poor decision-making
- Inefficiencies
- Dysfunctional relationships

= “hurting stalemate”

# The Canterbury Water Management Strategy

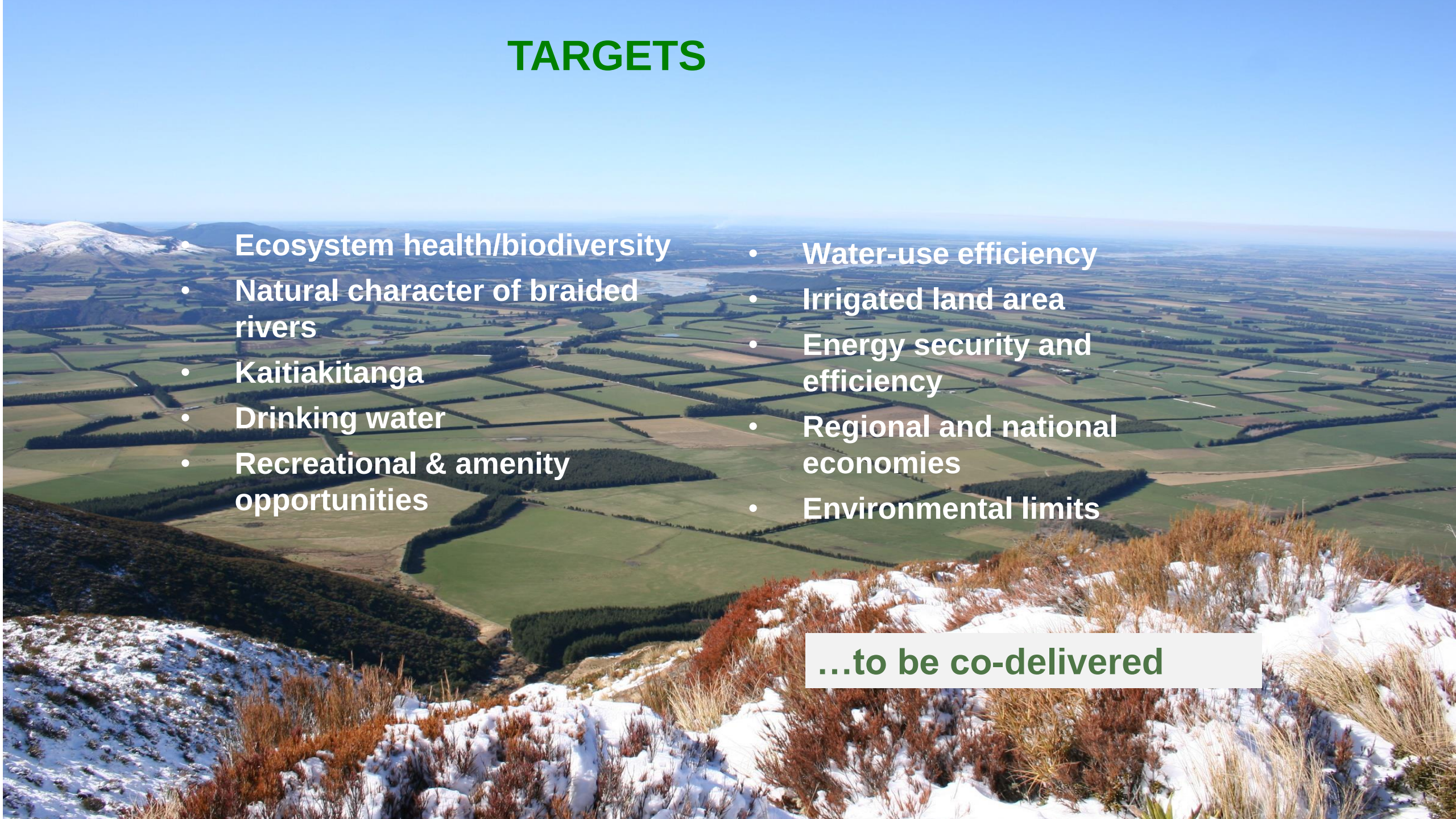
a 15 year conversation
with our community…

- Genesis as a hydrological study
- Emphasis on irrigation & water storage
- “the social licence”

# The Canterbury Water Management Strategy

- Vision for water management in Canterbury
- From individual to integrated
- Catchment-oriented
- Cumulative effects – abstraction & intensification
- Taking account of limits and climate variability
- Biodiversity, amenity & natural character

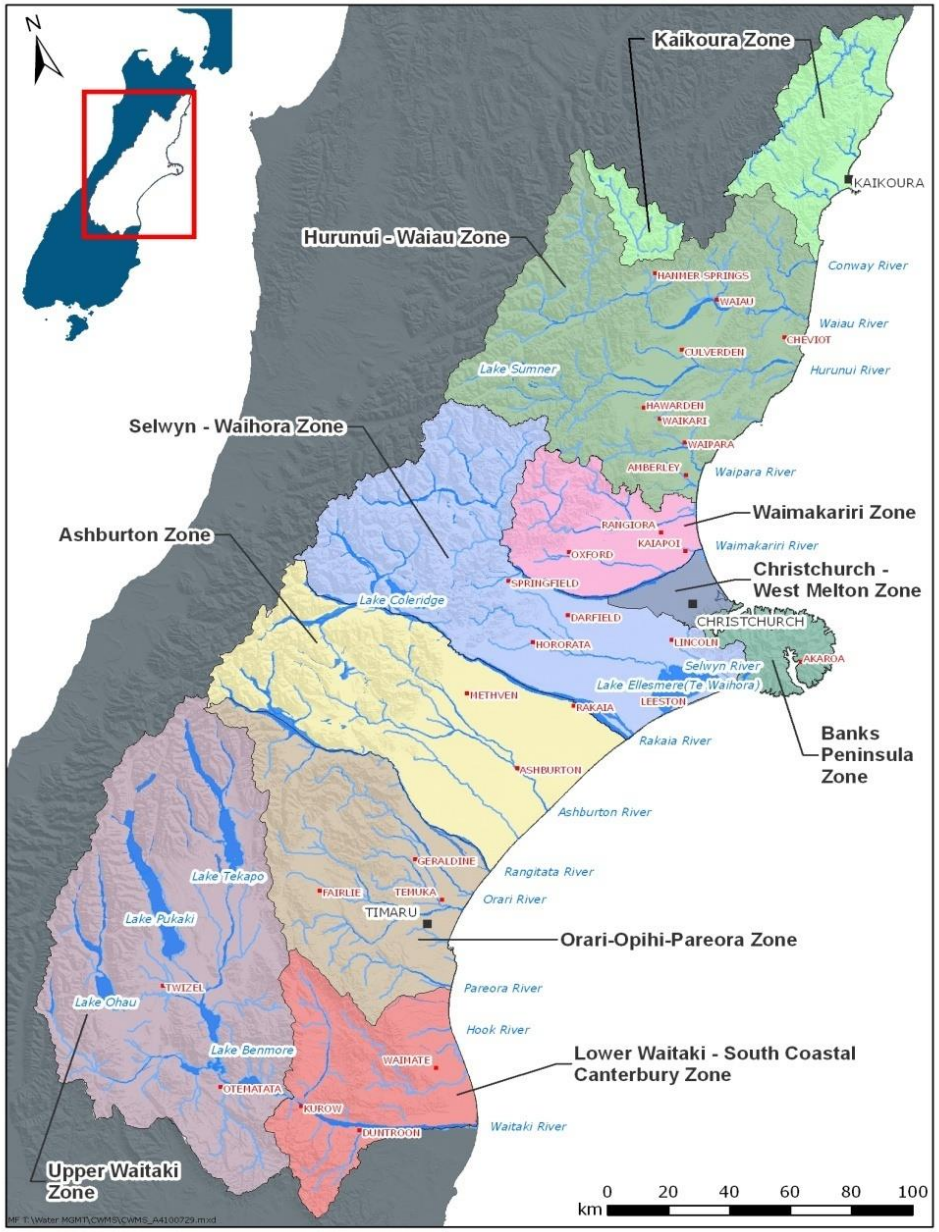
# TARGETS



- Ecosystem health/biodiversity
- Natural character of braided rivers
- Kaitiakitanga
- Drinking water
- Recreational & amenity opportunities

- Water-use efficiency
- Irrigated land area
- Energy security and efficiency
- Regional and national economies
- Environmental limits

**…to be co-delivered**




Canterbury Water Management Zones

# The Canterbury region is divided into 10 zones, each with its own zone committee

- Zone committees embedded in plan development
- regulators committed to translating zone aspirations into policies

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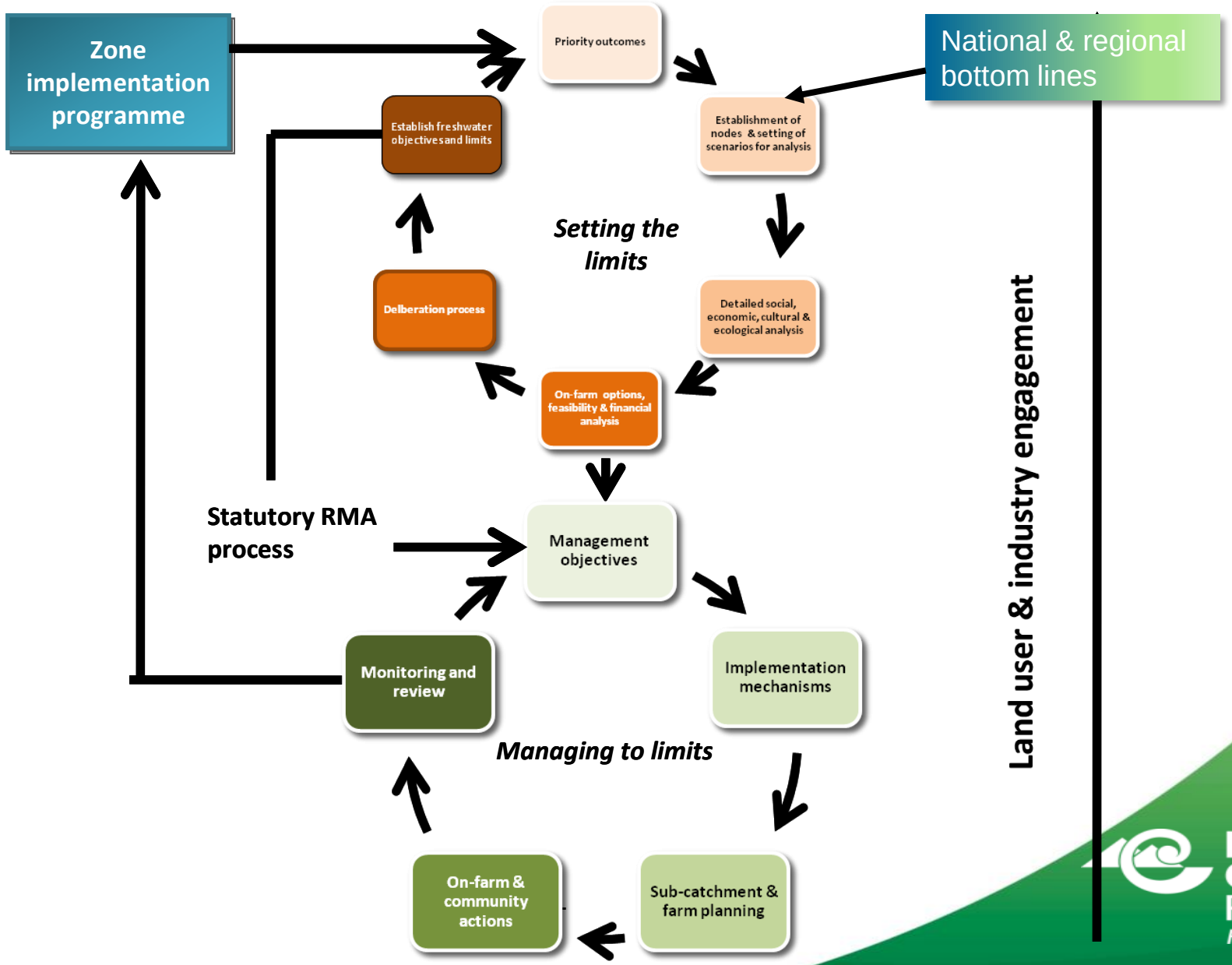
# The changing discourse

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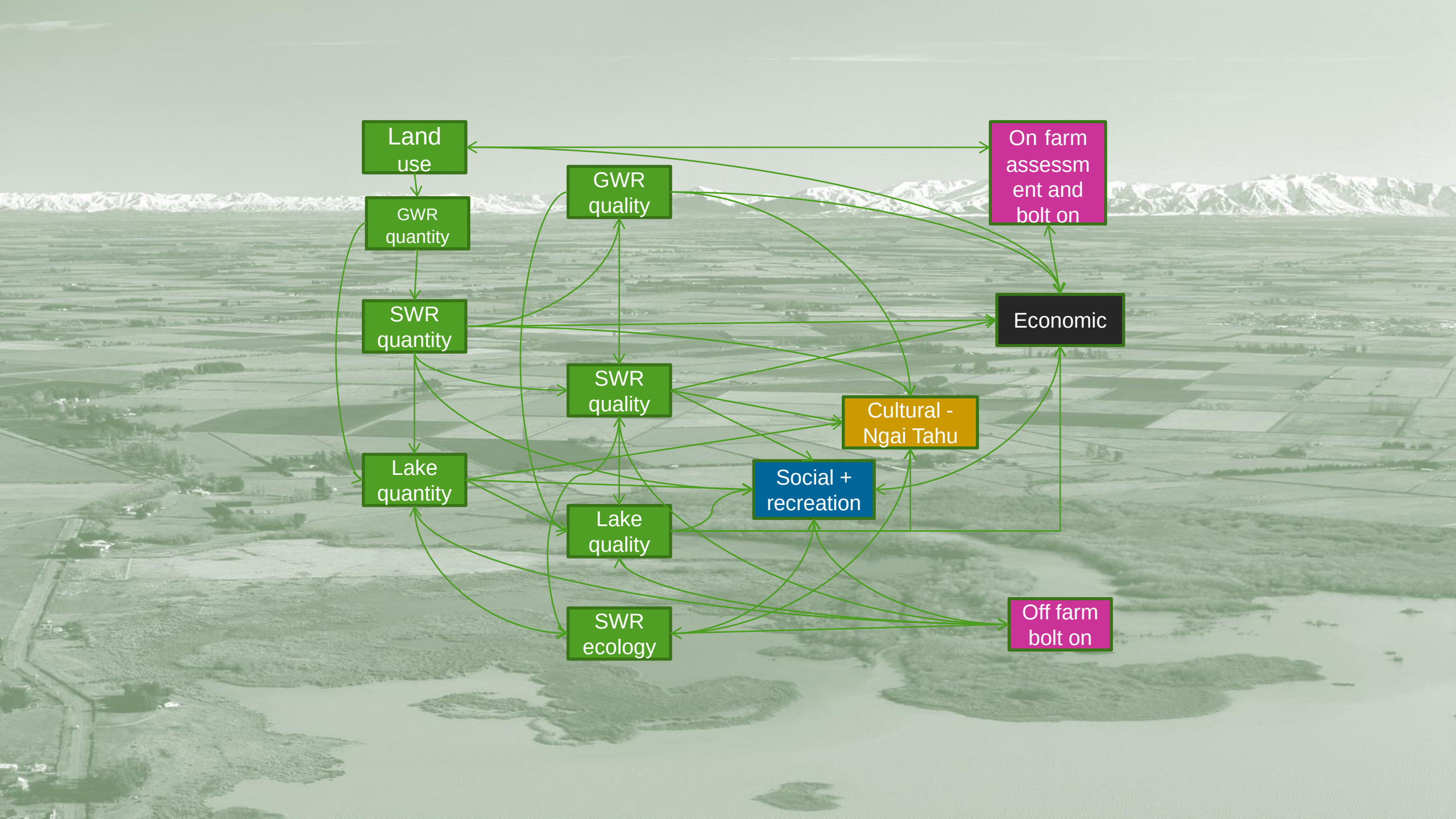
# The science challenge

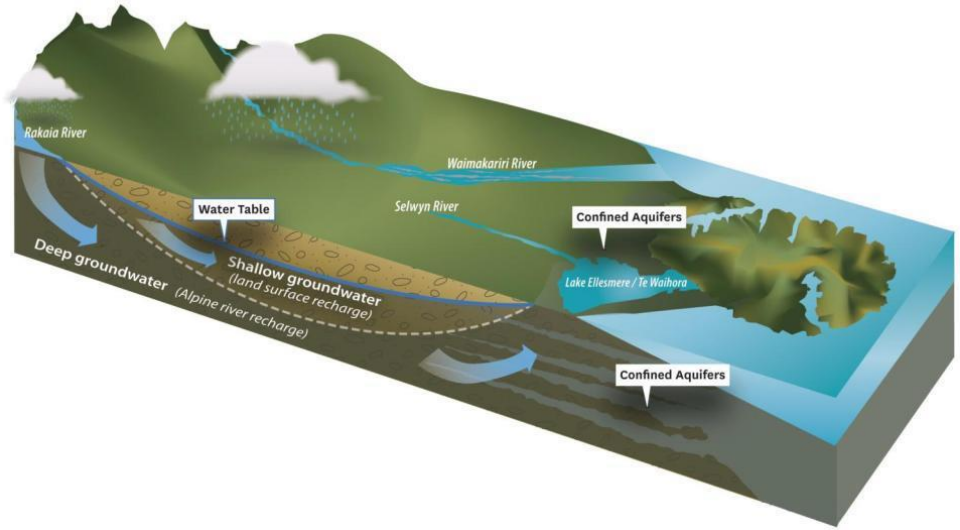
***Deciding the capacity for resource use is not a science process – it is a community process informed by science***

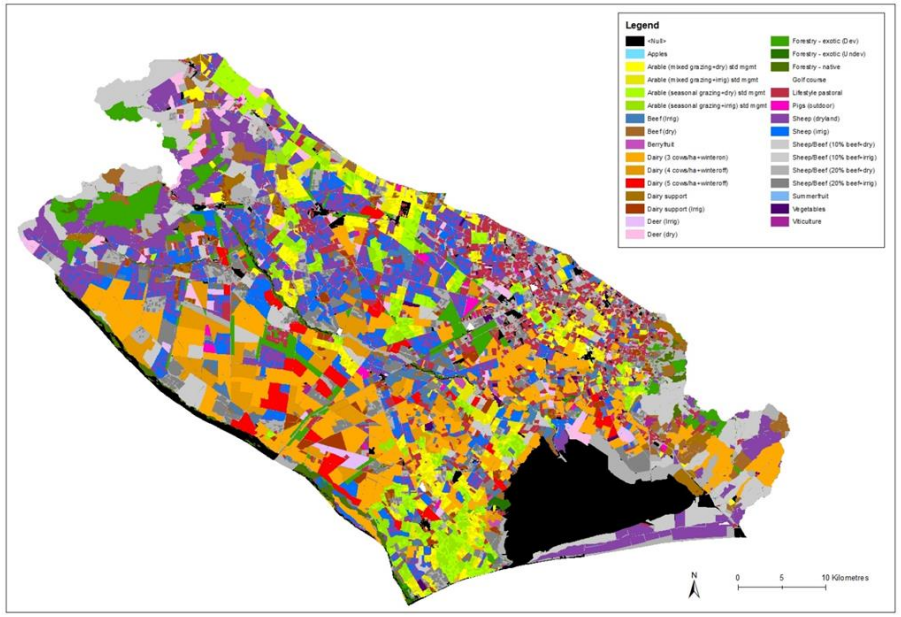
# The science challenge

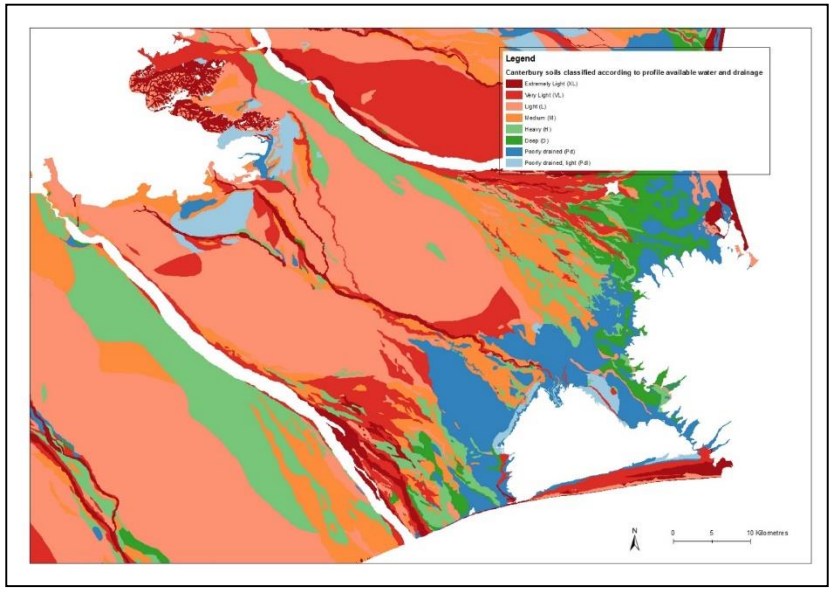
The **“socio-hydrological system”** – how relationships between parts give rise to the collective behaviours of the system

**“Transdisciplinary ”** – experts contribute their own specialised knowledge but also work outside their discipline, striving to understand the complexities of the whole project, rather than one part of it


Land use
GWR quantity
SWR quantity
Lake quantity
GWR quality
SWR quality
Lake quality
SWR ecology
On farm assessment and bolt on
Economic
Cultural - Ngai Tahu
Social + recreation
Off farm bolt on

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# For scientists

## a new way of working

- **Inform,** not make decisions
- Provide a **framework** through which consequences can be assessed
- To provide **knowledge free of agenda** for communities to discuss based on their values
- To make **transparent** the consequences of different futures
- To provide best possible technical assessment of impacts
- Communicate **uncertainty** & make sense of **complexity**

# What we are learning

- Have a mandate
- Think carefully about representation
- Skilled facilitation
- Consensus rule
- Be clear about what can be managed
- Paint pictures of plausible futures

# Lessons we are learning…

- Supporting information across all well-beings
- Adequacy of resources
- Timing is everything
- Explore adaptive management
- Find the balance between public good & the freedom to self-manage
- Authorising agency as servant of the process


Questions
ken.taylor@ecan.govt.nz