

Freshwater - Fresh Thinking

Enhancing impact assessment in water management



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The following material is provided courtesy of the author following presentation at the New Zealand Association for Impact Assessment 2013 Annual Conference.

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MANAGING OUR ENVIRONMENT



From Science to Policy and Back Again

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An aerial photograph of a river valley. A river winds through the center of the image, surrounded by green fields and rolling hills. In the distance, a wind turbine is visible on a hill. The foreground shows a grassy slope with some bare patches.

Integrated RPS and Plans

Gestation period - 9 years

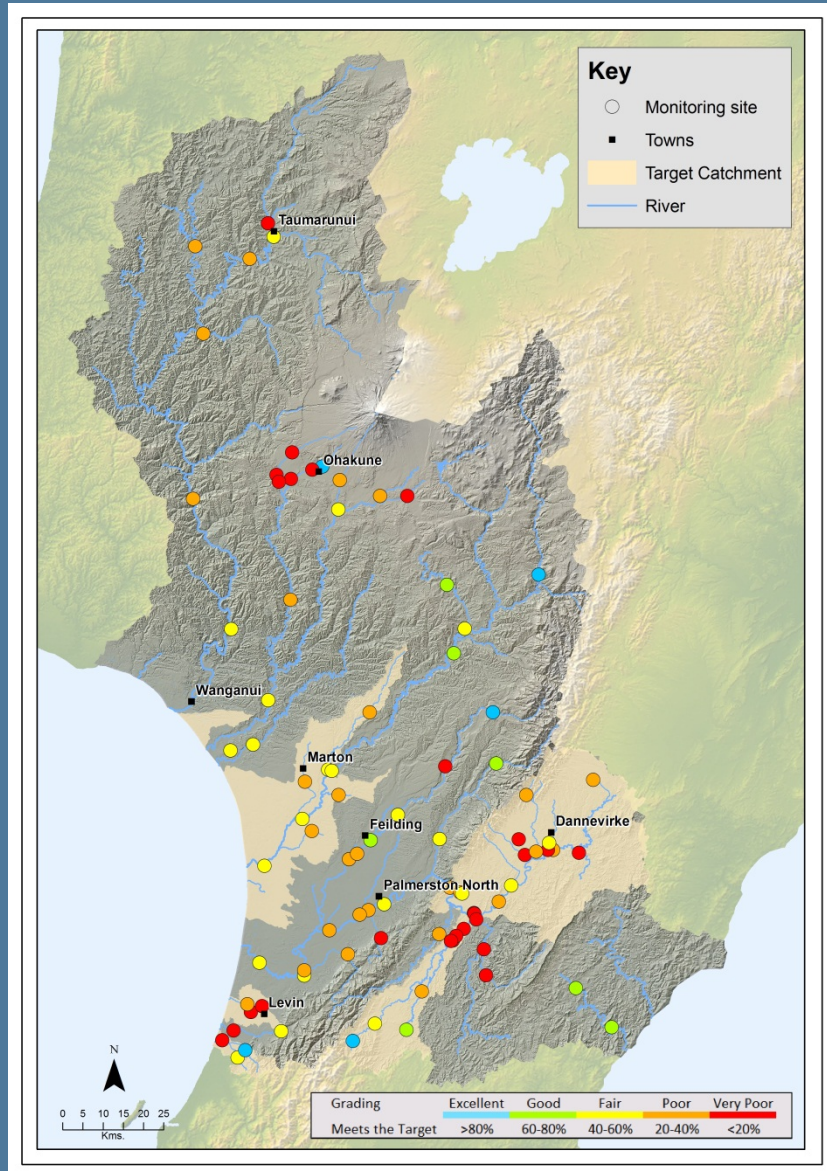
Cost of around \$10 million

Four major themes

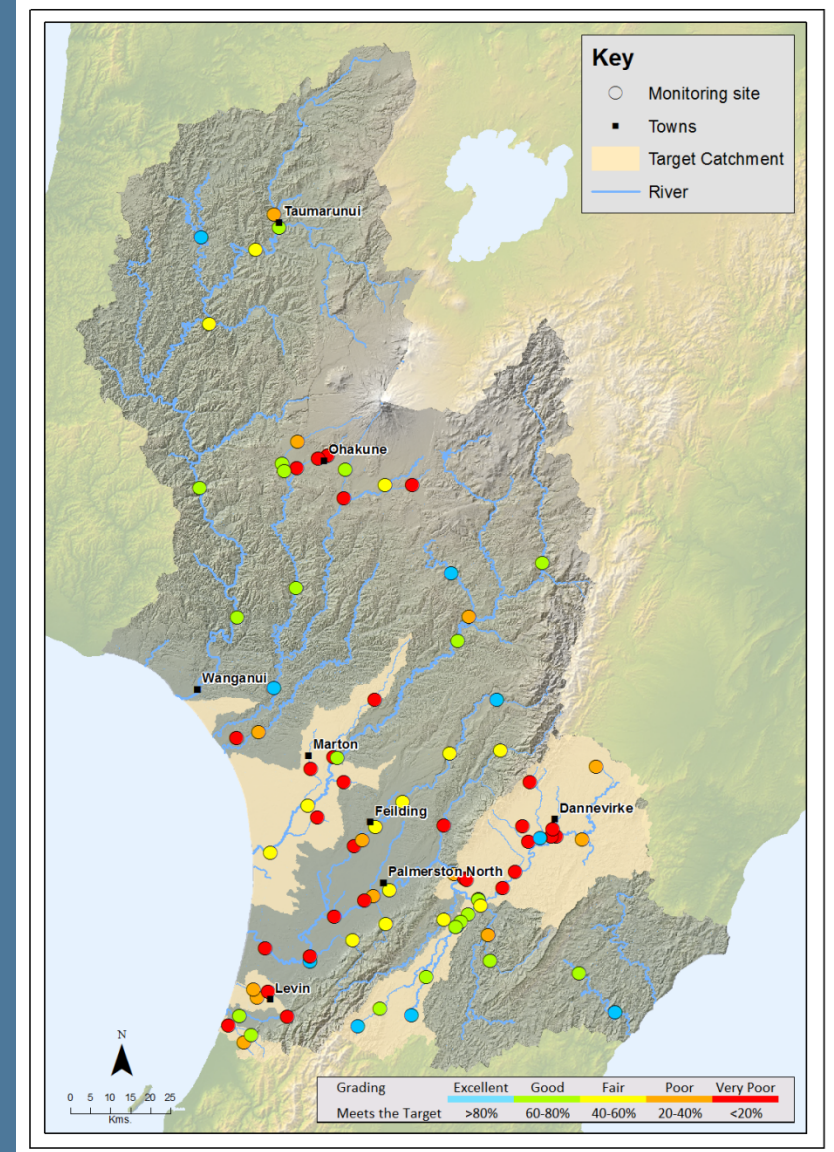
- water quality
- water quantity
- hill country erosion
- biodiversity loss

State

Soluble Inorganic Nitrogen

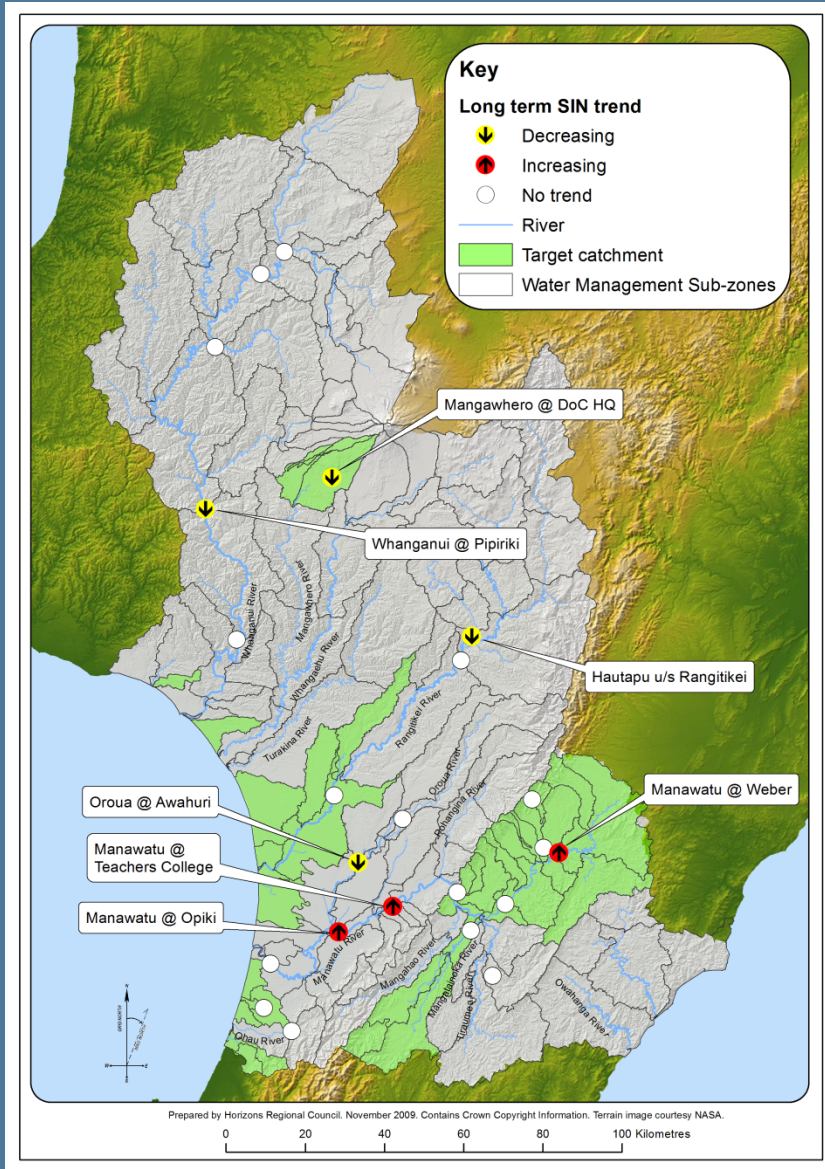


Dissolved Reactive Phosphorus

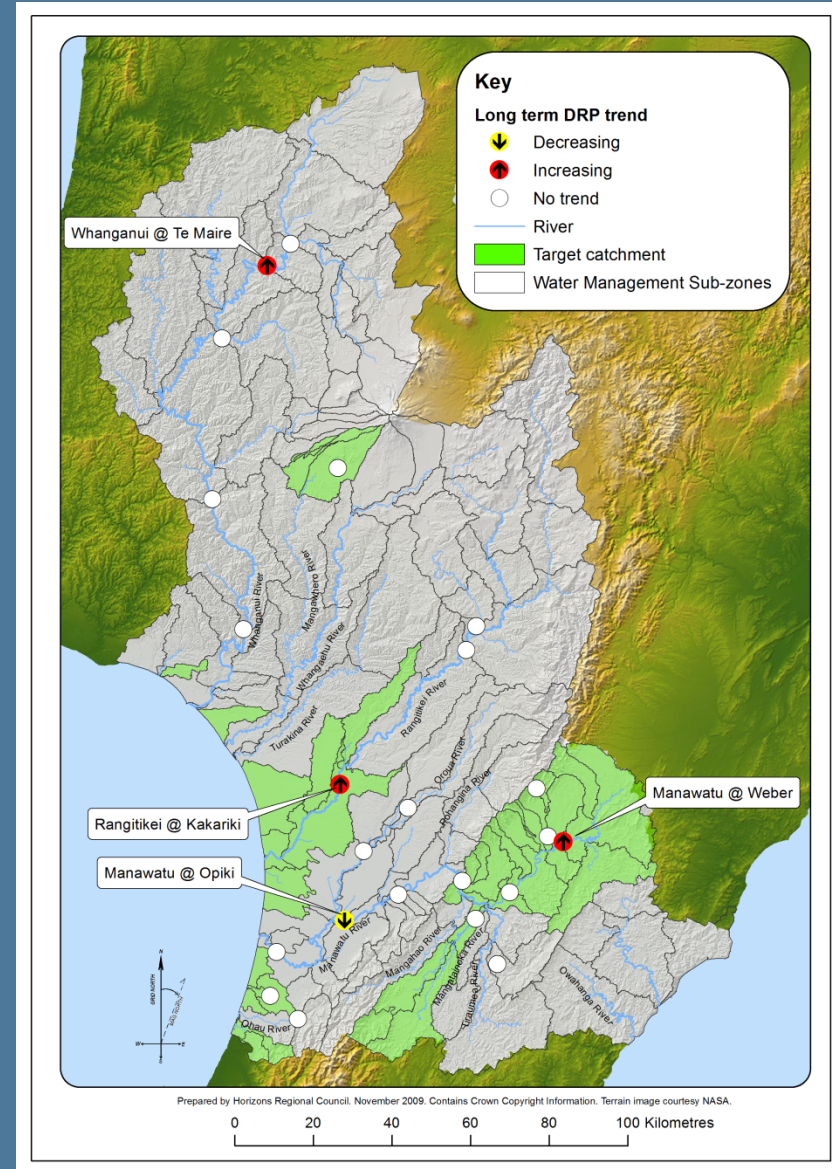


Trends for full data period to March 2009

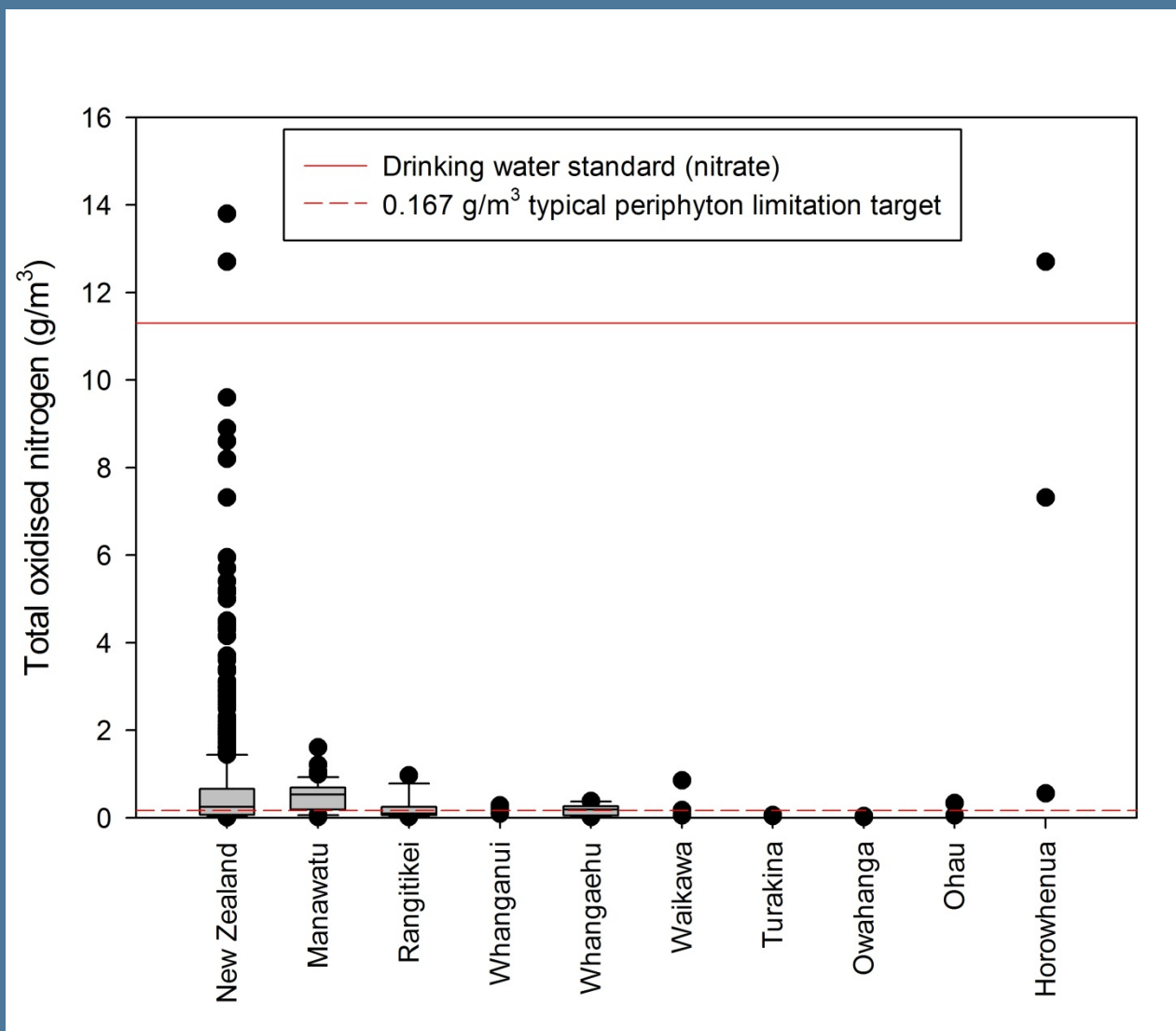
Soluble Inorganic Nitrogen



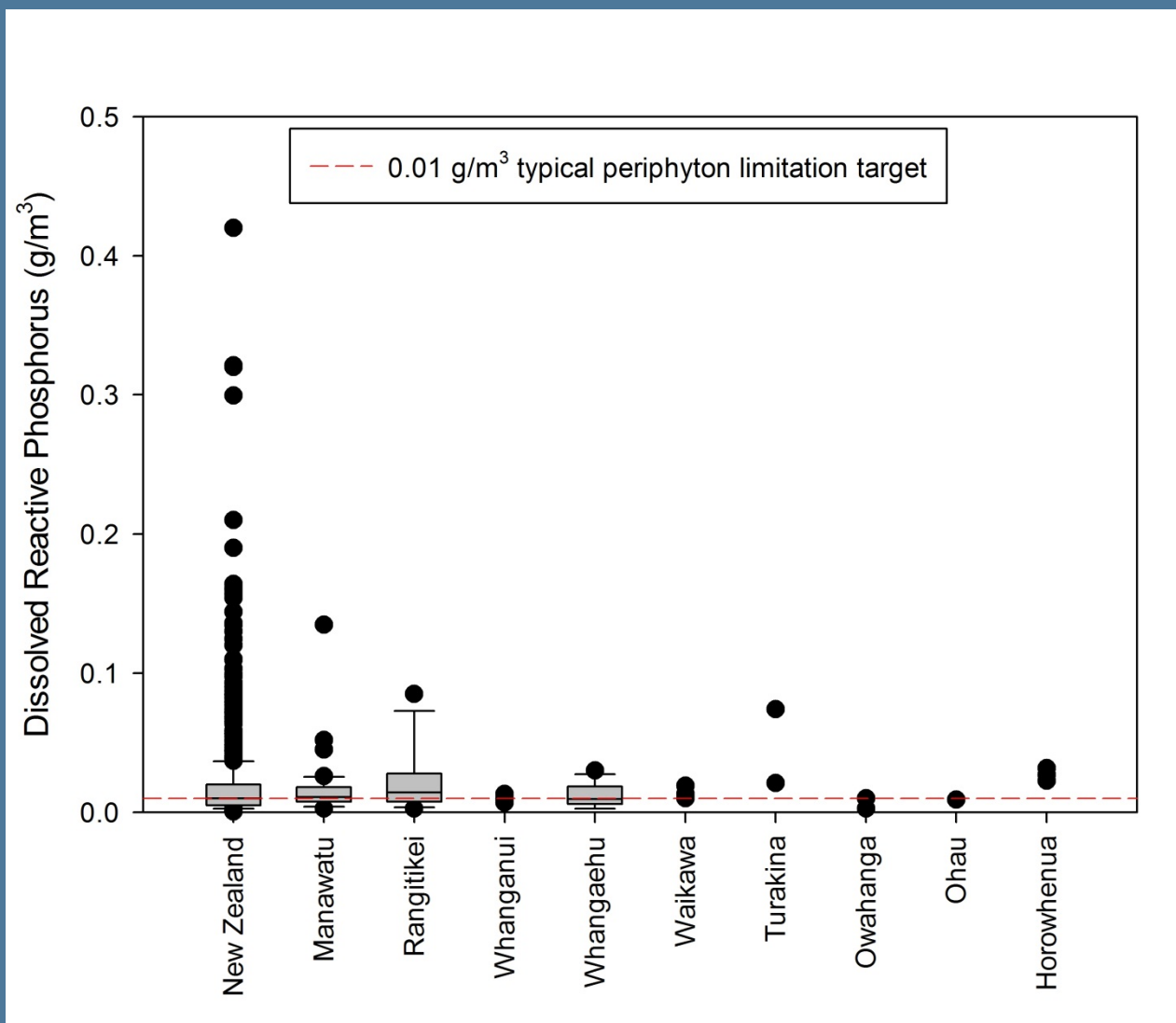
Dissolved Reactive Phosphorus



National picture total oxidised nitrogen



National Picture DRP



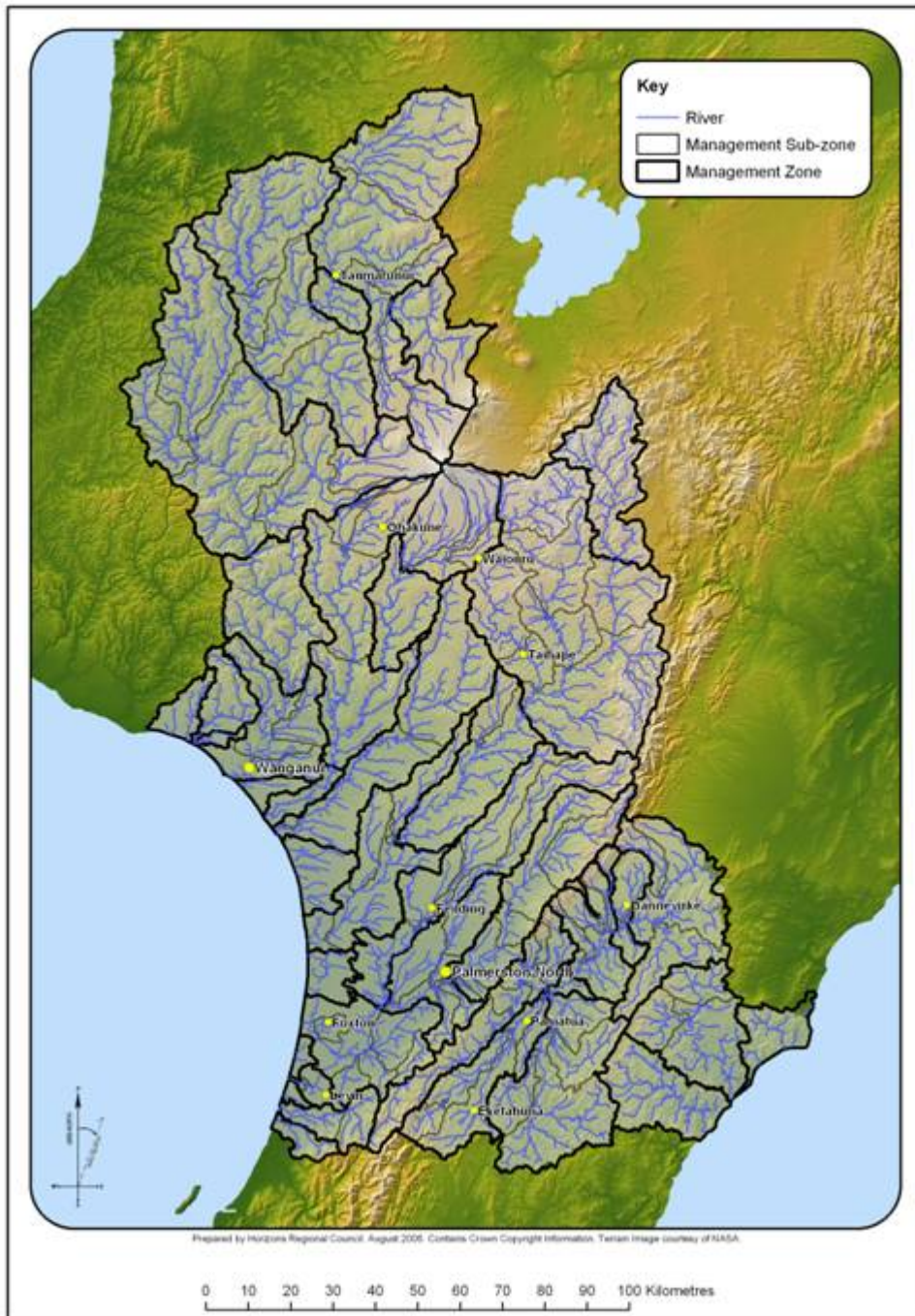
Water Management Zones

43 Water Management Zones

124 Water Management Sub-Zones

Base unit for management of

- Water allocation
- Water Quality
- Land Use
 - Erosion - SLUI
 - Nutrient, Bacteria
- Biodiversity Aquatic & Terrestrial



The One Plan Water Management Framework

Water Management Zones and Sub-zones are defined



Values are assigned to each of the sub-zones



Water quality targets are applied to protect the values

Determining the nutrient standards

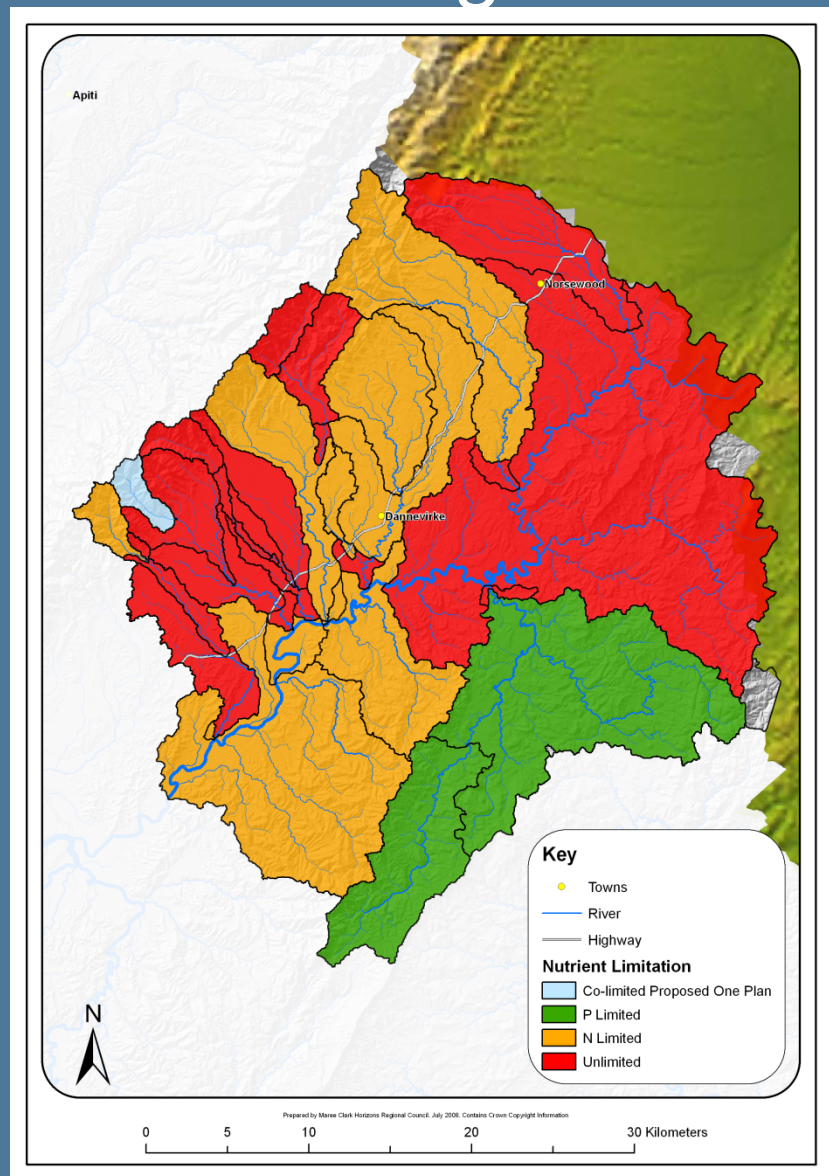
- Horizons and Hawkes Regional Councils asked many questions of water quality experts from NIWA and Massey.
- NIWA's report concluded there is a need to control both N & P in water ways - year round.
- Horizons used the recommendations from this report and others to establish nutrient standards for water quality based on the values associated with the waterways

NIWA report

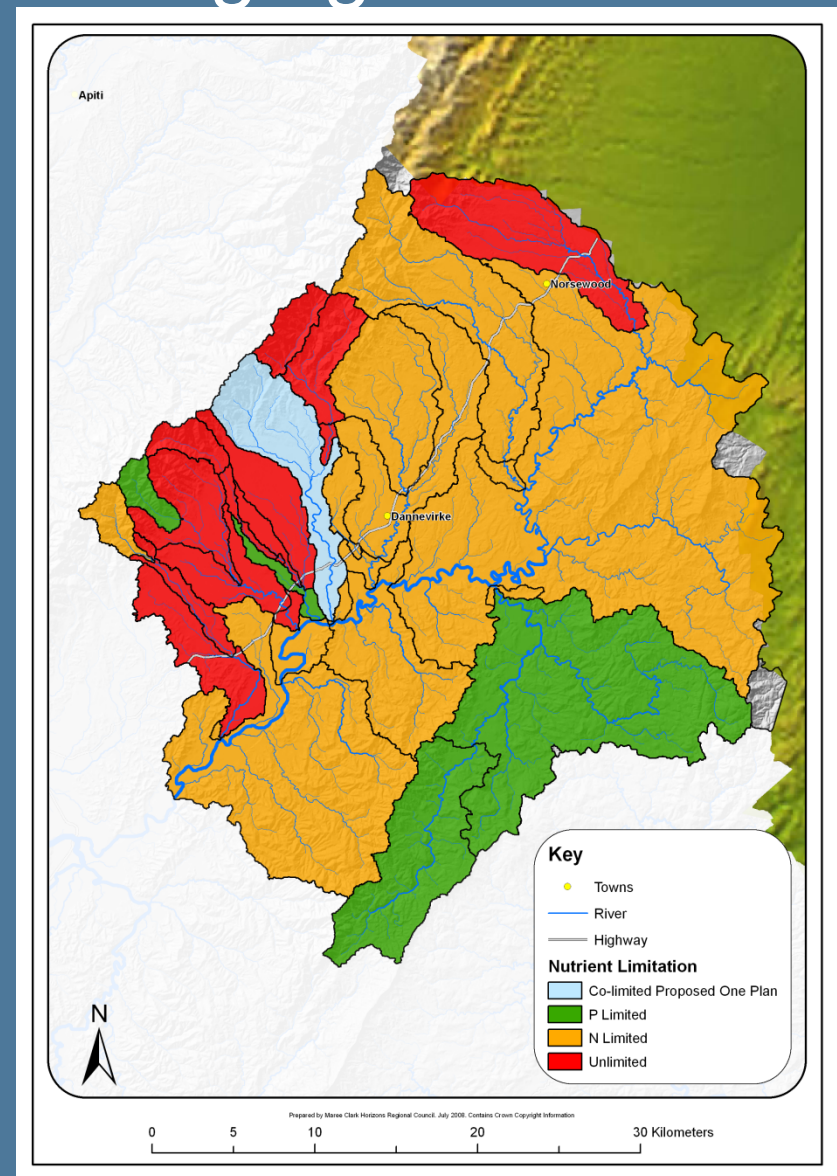
Wilcox, Biggs, Death, Hickey, Larned and Quinn. 2007. Limiting nutrients for controlling undesirable periphyton growth. NIWA client report prepared for Horizons Regional Council.

Rangitikei at McKelvies 10 Jan 2013

Limiting nutrients - Managing N or P



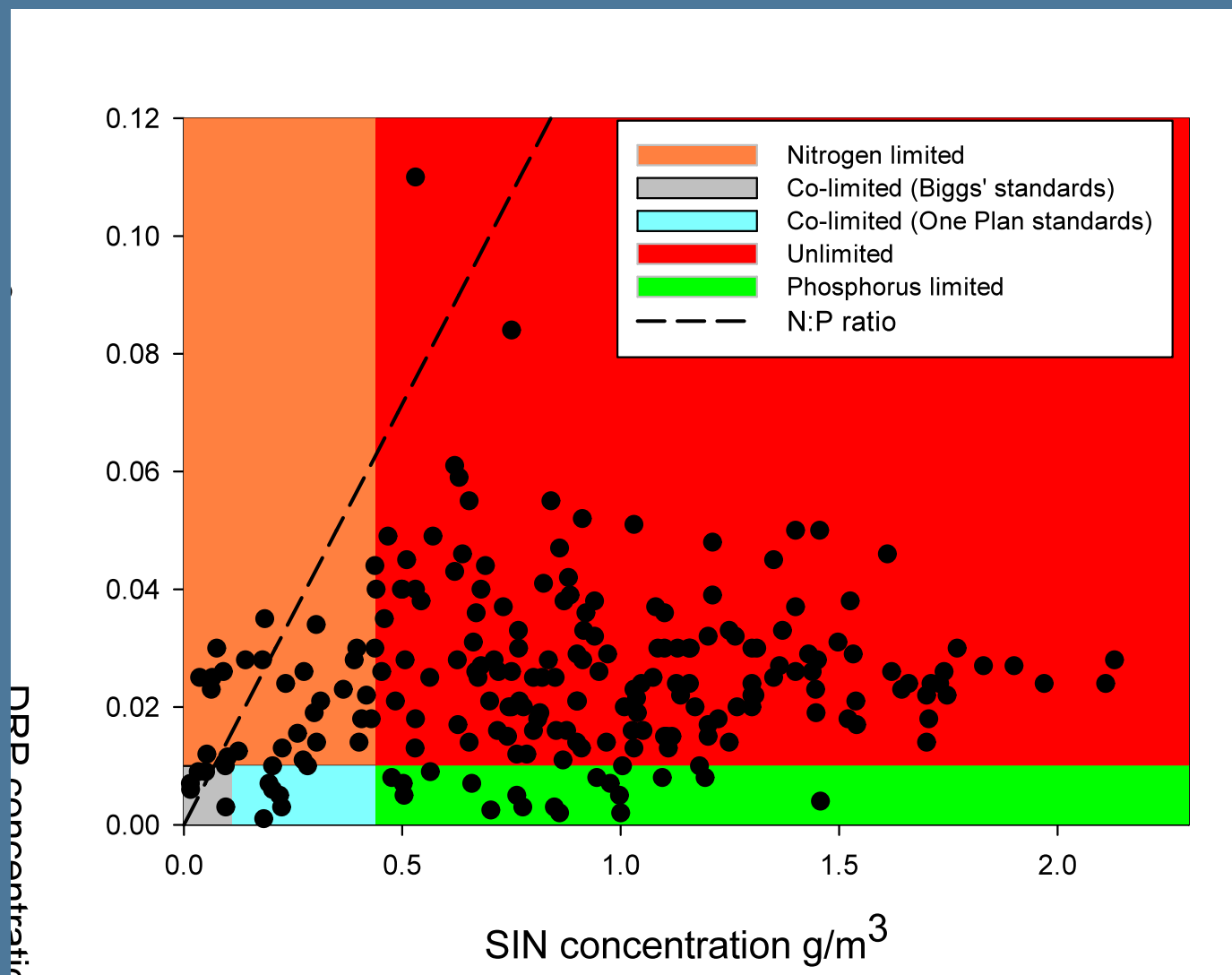
18th Jan 2007

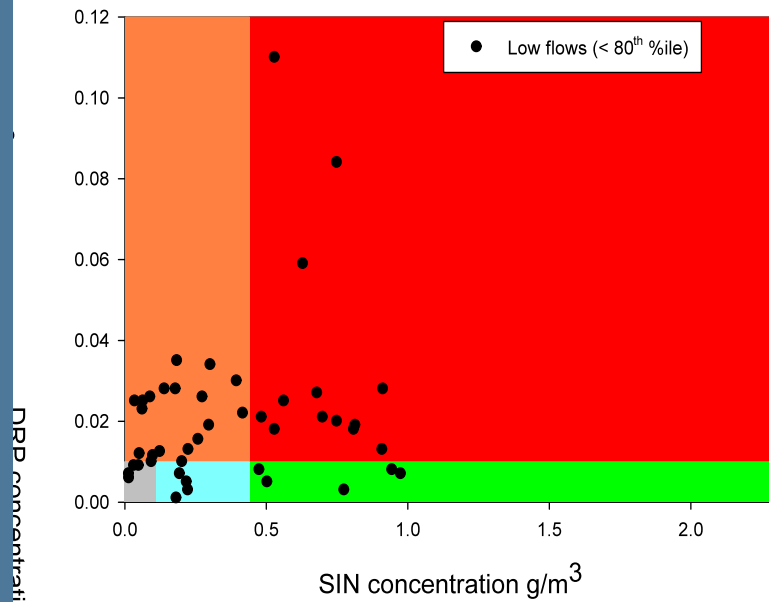


21st Feb 2007

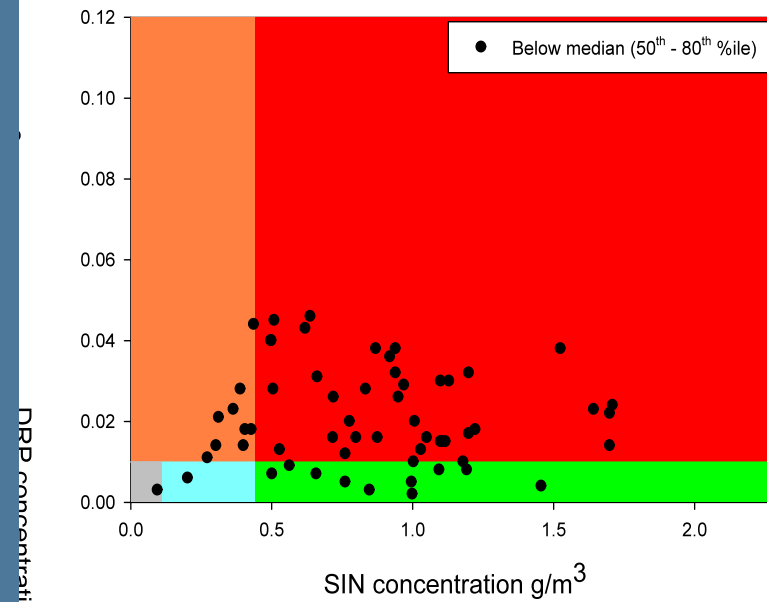

horizons
regional council

Manawatu at Hopelands all flows

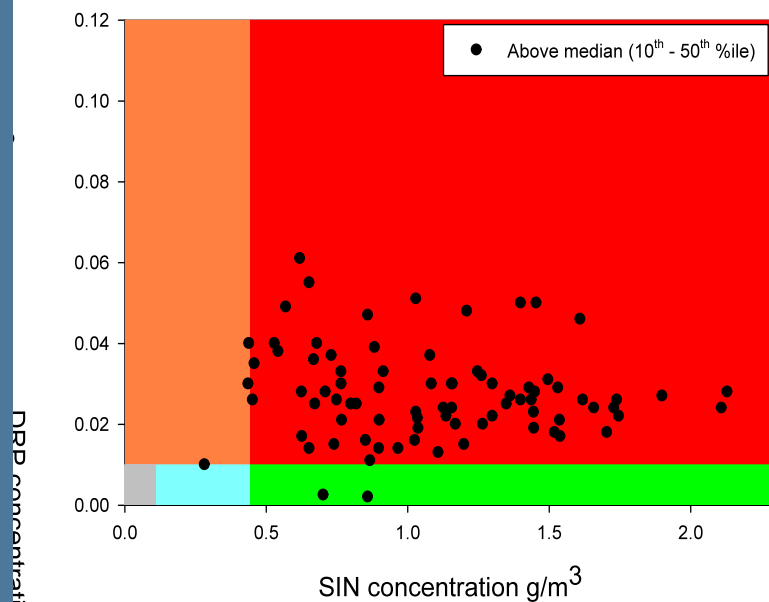




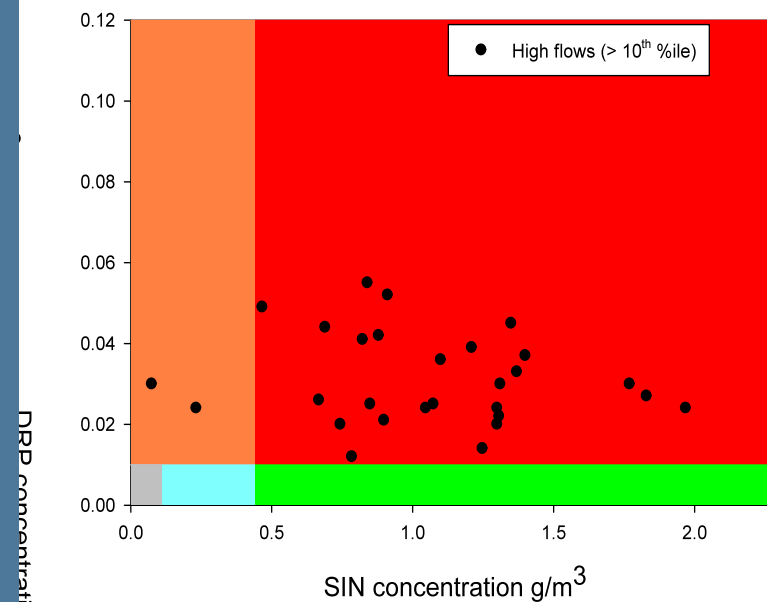
Low flows (<80th %ile)



<80th %ile to Median



Median to 10th %ile



Flood flows (>10th %ile)

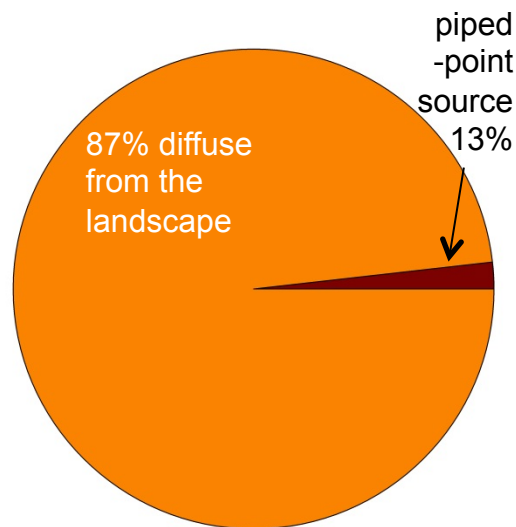
Where does the N & P come from?

All Flows

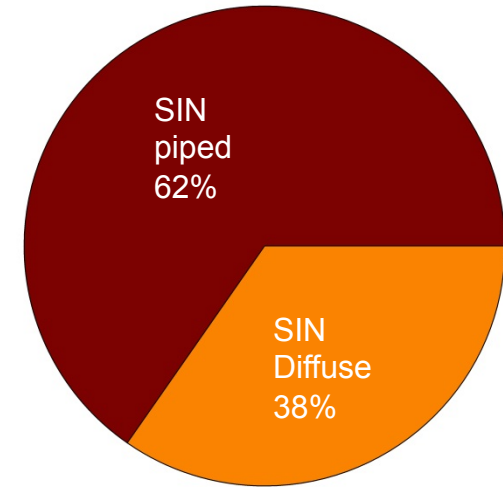
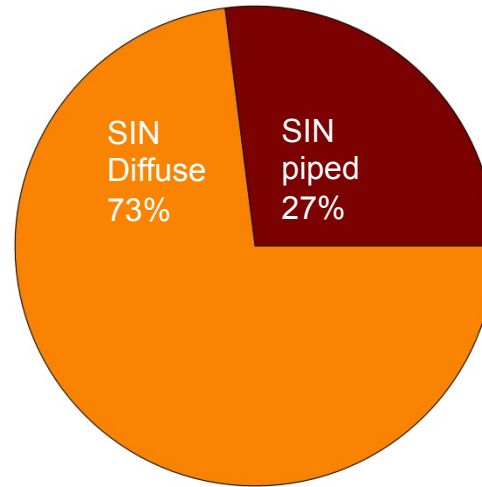
Below Flood Flows

Low Flows

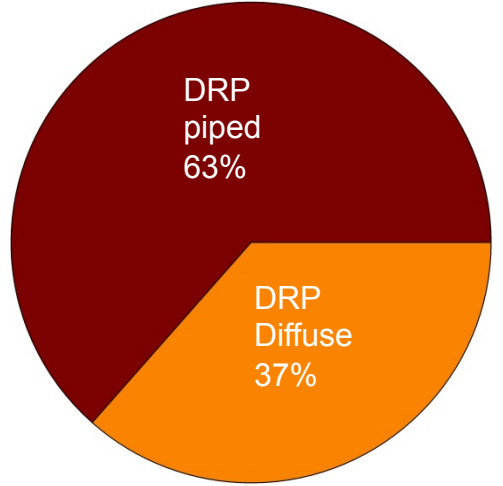
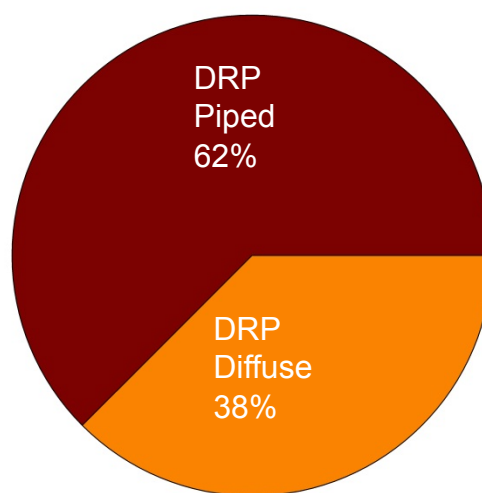
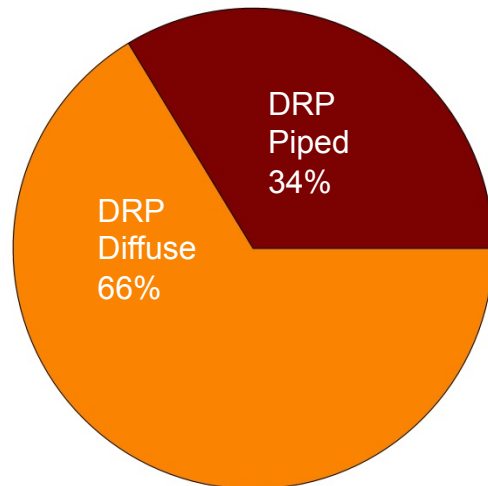
SIN



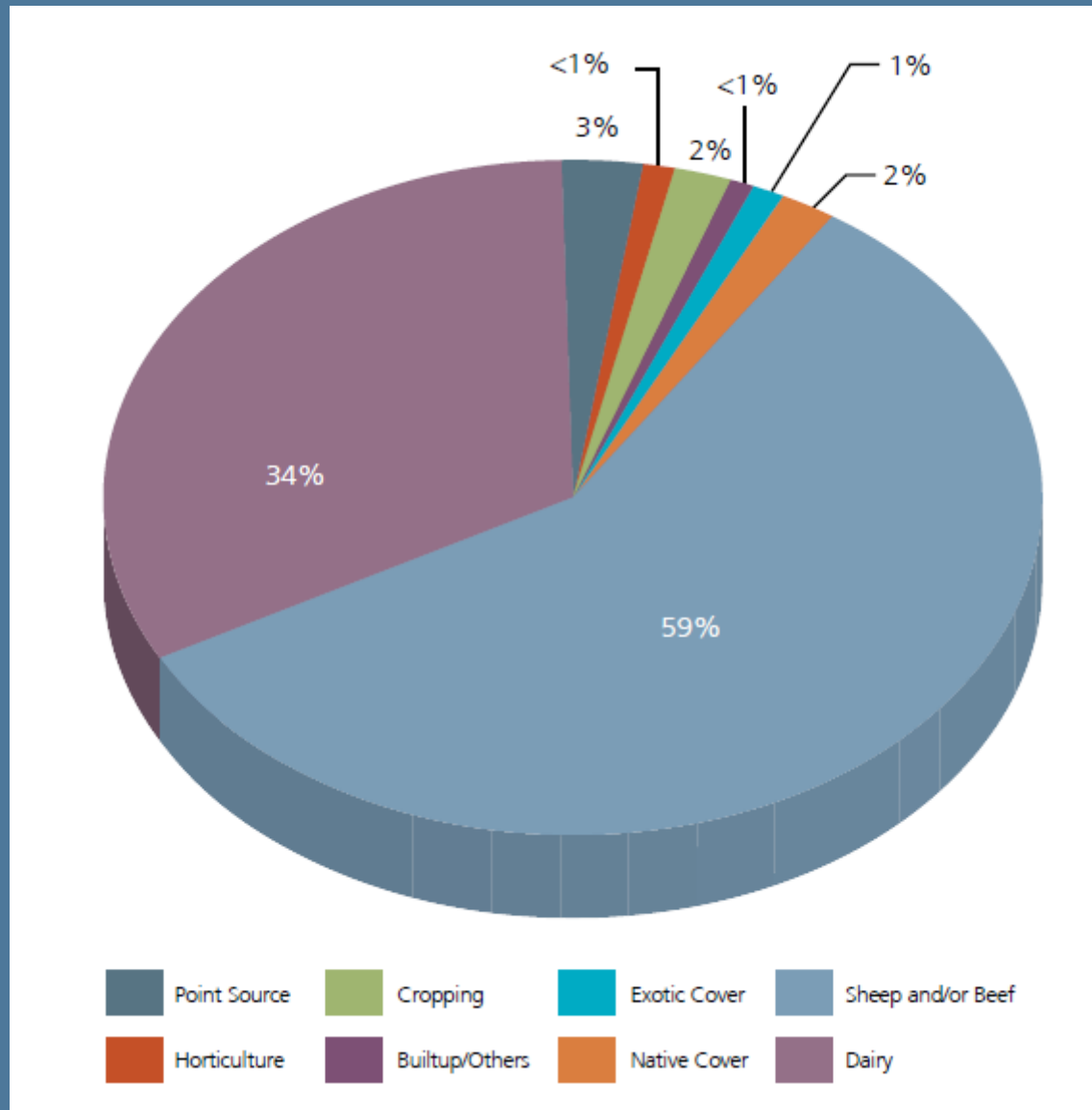
Example: Manawatu at Opiki



DRP



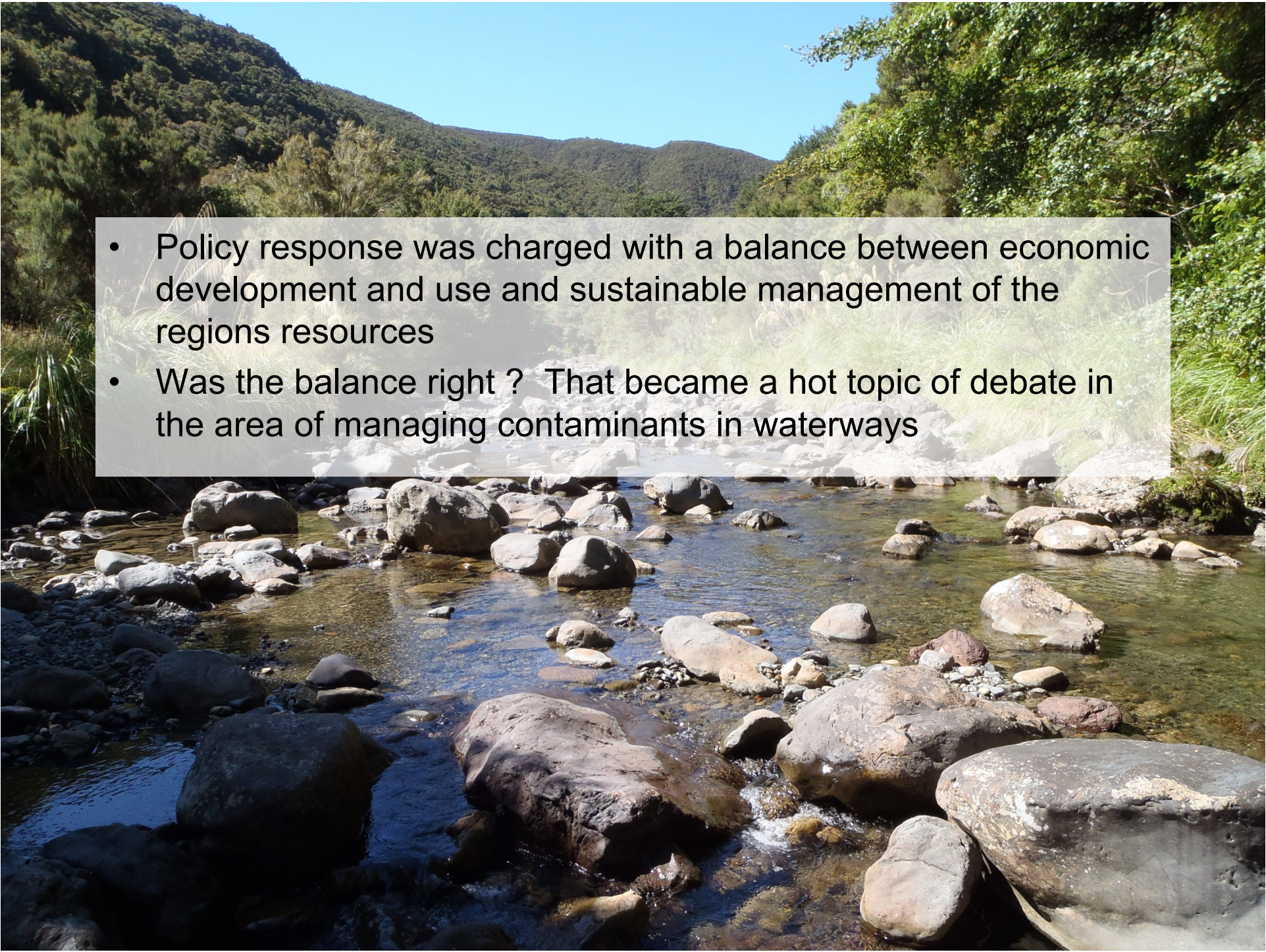
Relative SIN contributions Hopelands



Policy response

Water quality

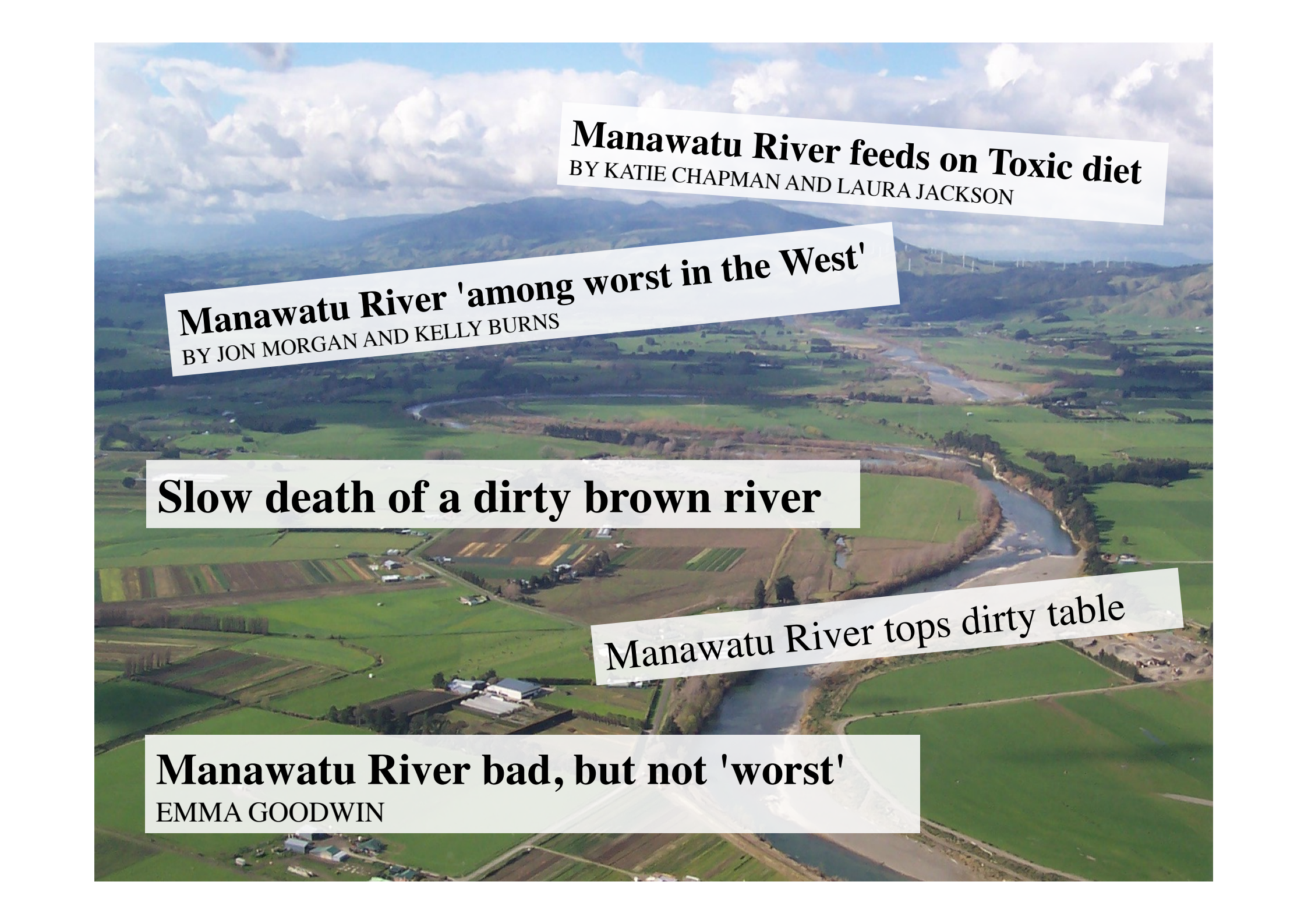
- Range of responses both regulatory and non-regulatory
- For example the plan
 - Sets limits on contaminants in the discharges from Wastewater P Treatment Plants (WWTP)
 - Encourages TAs to investigate land disposal of WWTP discharges
 - establishes monitoring programmes for point source discharges
 - set rules for cultivation of slopes to control sediment entering waterways
 - supports non-regulatory management of hill country erosion
 - Identifies target catchments for managing non-point source / diffuse sources of nutrients from intensive agriculture and targets and limits for doing that
 - Basis was maintaining or improving water quality

- 
- A scenic view of a river flowing through a rocky landscape. The river is filled with large, smooth, grey and brown boulders of various sizes. The water is clear and reflects the surrounding greenery. In the background, there are lush green hills and mountains under a clear blue sky. The foreground shows more rocks and some small pools of water.
- Policy response was charged with a balance between economic development and use and sustainable management of the regions resources
 - Was the balance right ? That became a hot topic of debate in the area of managing contaminants in waterways



A photograph of several cows in a grassy field. In the foreground, a black cow with a white patch on its chest and a brown cow are looking towards the camera. Other cows are visible in the background. The text is overlaid on the left side of the image.

Nutrient management
Highly contentious – hearings –
Env. Court – High Court



Manawatu River feeds on Toxic diet
BY KATIE CHAPMAN AND LAURA JACKSON

Manawatu River 'among worst in the West'
BY JON MORGAN AND KELLY BURNS

Slow death of a dirty brown river

Manawatu River tops dirty table

Manawatu River bad, but not 'worst'
EMMA GOODWIN



Report stirs up murky waters

The One Plan farming regime has potential to alter farming, especially in priority catchments of the Horizons region. **Laurel Stowell** asks Wanganui area farmers about their analysis.

One Plan will hammer farm output, says Carter

Horizons chairman calls for calm over One Plan

Horizons hotline pays off

One Plan from hell

Horticulture NZ, farmers want One Plan reheard

Government report confirms Horizons 'Farmergeddon'

Minister's meddling fuels One Plan hysteria among farmers

Blanket standards fuel fears

A new low in the fight for freshwater management

The Primary Industries Minister is falsifying One Plan's profit implications, charge **Gareth Morgan** and **Susan Guthrie**.

'Stop the blame game'

Economy, environment one and same

One Plan may ruin farmers – critics

'Farmergeddon' alleged

We'll be hands on over water – minister

- 
- An aerial photograph of a lush green field. A large herd of black and white cows is scattered across the middle ground. In the background, a dense row of tall, thin trees stands against a dark green forest. The foreground shows a grassy slope with some smaller trees and shrubs.
- **Plan development – Some collaboration & Negotiation**
 - **Hearings & Court – Mediation & Polarisation**
 - **Implementation – Rebuild trust – Collaboration & Negotiation**

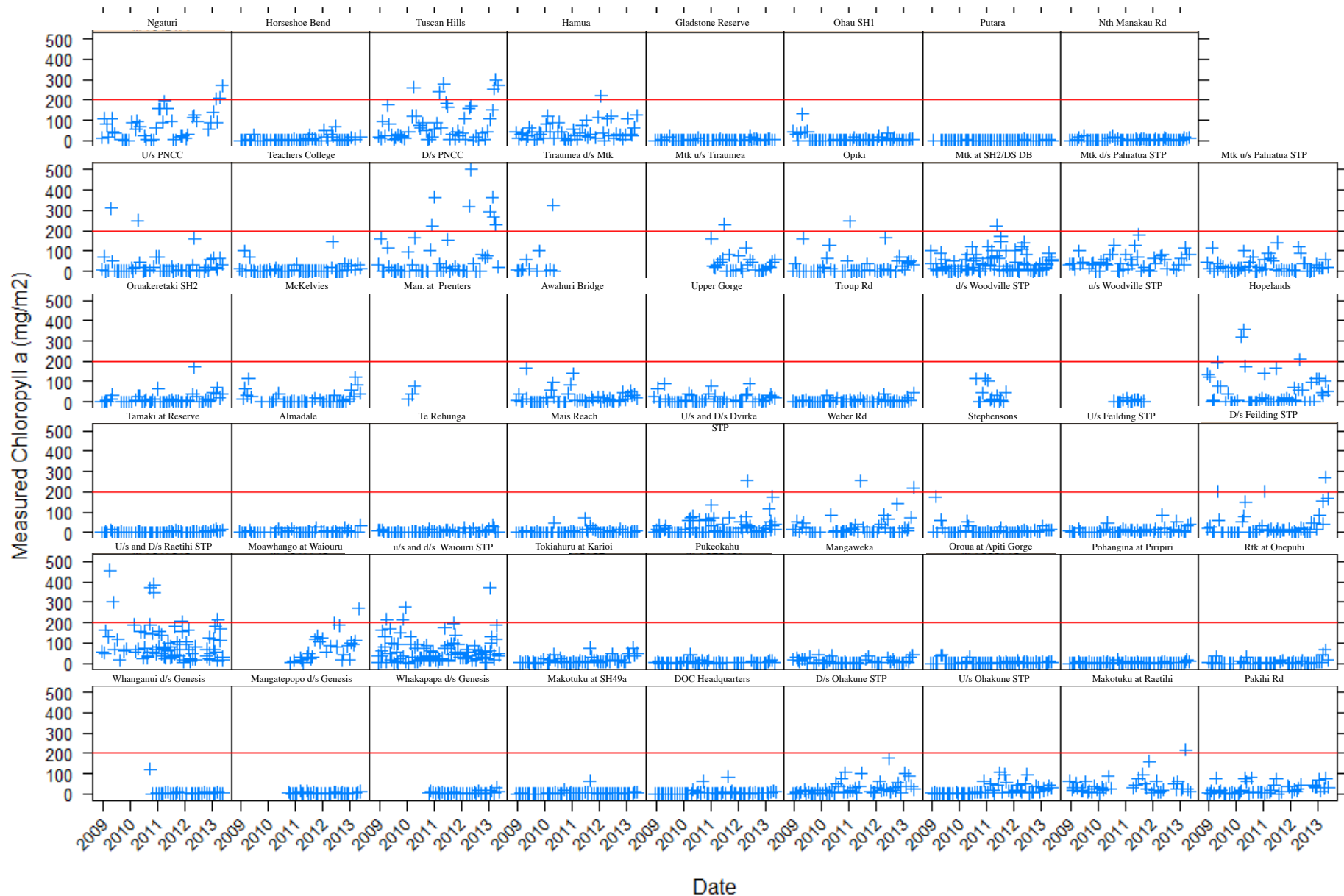
Outcomes of the diffuse nutrient management approach

- 19 scenarios modelled across a number of monitoring sites ranging from:
 - Do nothing
 - Single loss limits
 - Decisions version of the One Plan
 - Notified version of the One Plan
- Outcomes from the different policy options ranged from increasing SIN loads by 10% to Decreasing loads by 12%

Periphyton Monitoring Programme

Flood Frequency ↑	High	Mangawhero at DoC Pohangina at Piripiri Waikawa at Nth Manakau Rd Ohau at Gladstone Ohau at SH1 Tokomaru at Horseshoe Bend Mangatainoka at Putara	Mangawhero d/s Ohakune STP Mangawhero at Pakihi Rd Mangawhero u/s Ohakune STP Pohangina at Mais Mangatainoka u/s Pahiatua STP Makakahi at Hamua Makotuku d/s Raetihi STP Makotuku at SH49 Makotuku u/s Raetihi STP Mangahao at Ballance Kahuterawa at Johnstons Rata	Mangapapa at Troup Rd Mangatainoka d/s Pahiatua STP Mangatainoka at SH2 Mangatainoka d/s DB Breweries
	Medium	Rangitikei at McKelvies Rangitikei at Onepuhi Tamaki at Reserve Rangitikei at Mangaweka Rangitikei at Pukeokahu Oroua at Apiti Gorge Oroua u/s Feilding STP	Manawatu at Weber Oroua at Almadale Tiraumea at Ngaturi Tiraumea d/s Mangatainoka Makuri at Tuscan Hills Manawatu at Teachers College Manawatu u/s PNCC STP	Manawatu at Hopelands Mangatera d/s Dannevirke STP Mangatera at Timber Bay Mangatera u/s Dannevirke STP Oroua d/s Feilding STP Oroua at Awahuri Bridge Manawatu d/s PNCC STP Manawatu at Opiki Manawatu at Upper Gorge
	Low		Tokiahuru at Karioi Tamaki at Stephenson's	Oruakeretaki at SH2
<div> <div>Low</div> <div>Medium</div> <div>High</div> </div> <div>Nutrient Concentration →</div>				

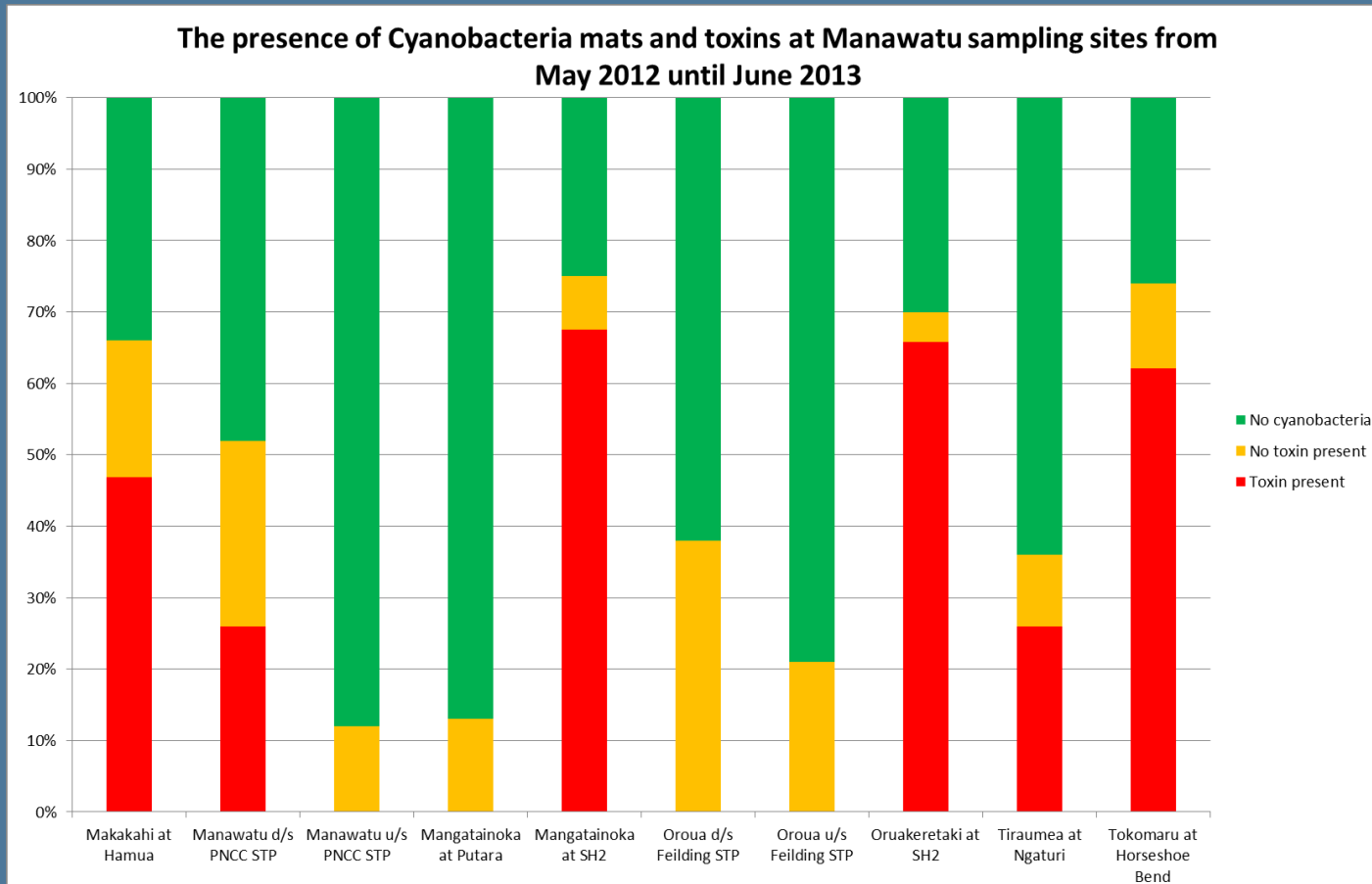
Periphyton Monitoring Data Timeseries

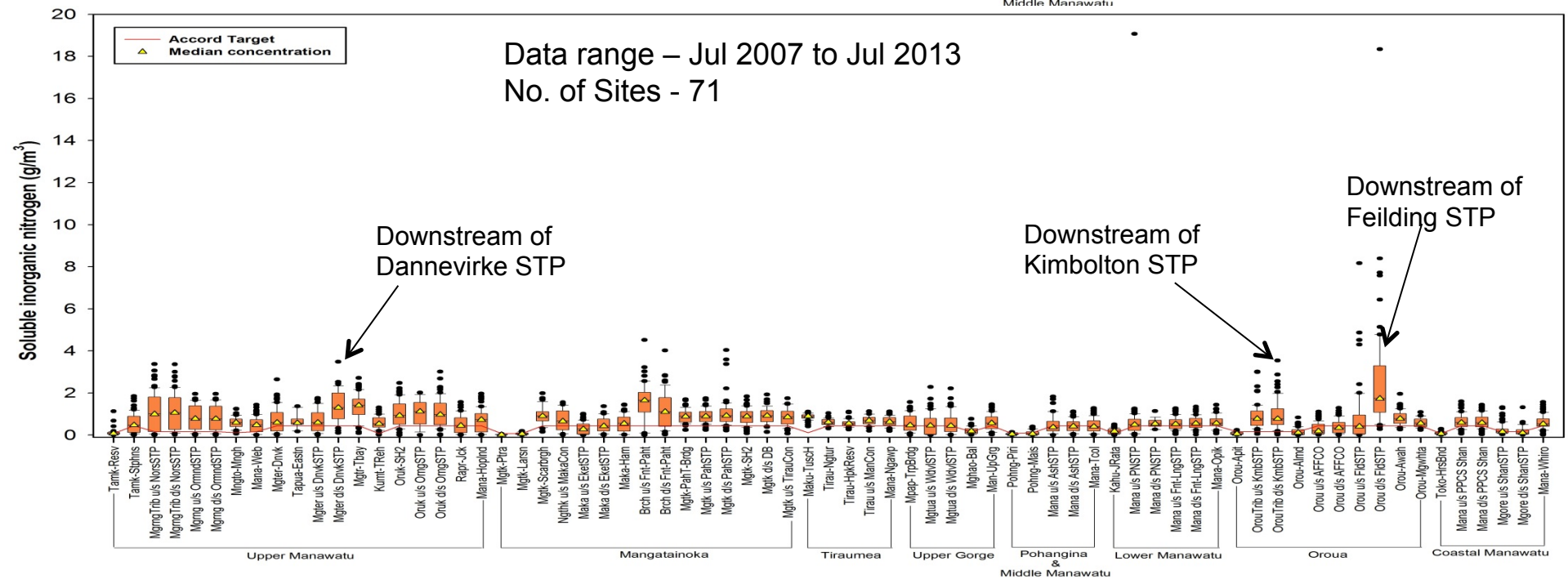
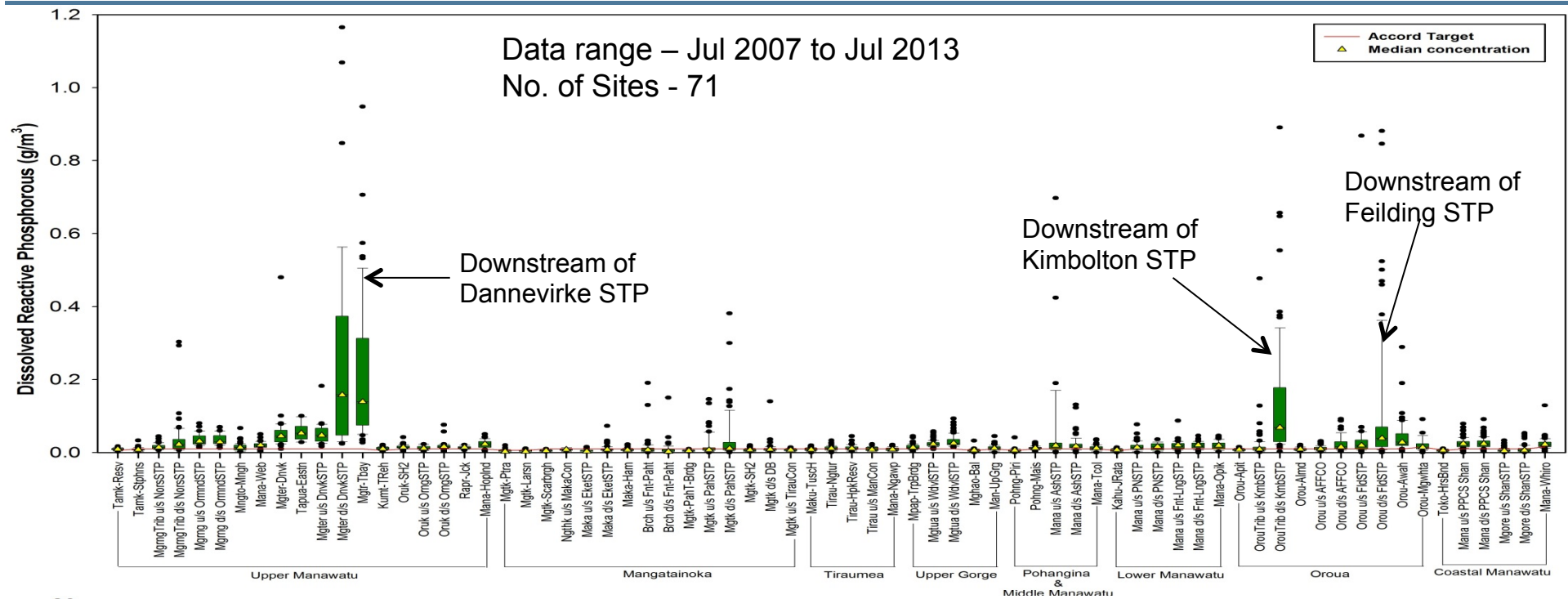


Cyanobacteria

Cyanobacteria toxicity in the Manawatu
From May 2012 to June 2013

Weekly monitoring has now ceased







Ministry for the
Environment
Manatū Mō Te Taiao

Fresh Start for Fresh Water Clean-Up Fund

OURS.
THE MANAWATU RIVER

- Wastewater treatment upgrades
 - Woodville, Dannevirke & Pahiatua (Taranaki DC)
 - Feilding & Kimbolton (Manawatu DC)
 - Shannon (Horowhenua DC)
- Stream Fencing
- Native fish and whitebait habitat restoration
- Environmental Farm Plans
- Community involvement




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