

# OUR LAND AND WATER SYMPOSIUM

Kia Mauri Ora te Whenua



FUTURE LANDSCAPES

## Sources & Flows

Diana Selbie & MS Srinivasan

(plus Richard Muirhead & Chris Tanner)



## FUTURE LANDSCAPES

In the future landscapes contain mosaics of land use that are more resilient, healthy and prosperous than today.

### Strategic Area 1

*Be able to see what diversity is possible and match land use to what it is suitable for.*

### Strategic Area 2

*Understand and model the management of land and water quality.*

### Strategic Area 3

*Provide the novel production systems that use healthy land and water to generate high-value products.*



## INCENTIVES FOR CHANGE

New Zealand's primary producers are well-rewarded for producing high-value products in sustainable ways.

### Strategic Area 4

*Capture and share with the producers more of the value consumers associate with our products.*

### Strategic Area 5

*Increase and share value based on mechanisms that rewards sustainable land use and high-value products.*

### Strategic Area 6

*Enable communities to identify and adopt sustainable land use practices.*



## CAPACITY FOR TRANSITION

We understand what it will take, and have the tools to help us, transition to resilient, healthy and prosperous futures.

### Strategic Area 7

*Increase our social capital so that we can have well informed debate about alternative futures.*

### Strategic Area 8

*Act as kaitiaki, being responsible for our actions within enterprises, in a catchment and beyond.*

### Strategic Area 9

*Manage pressures and remove the barriers to a transition.*

# What is the problem?



Knowledge gaps  
Info is piece-meal  
Scale inappropriate

Will proposed  
solutions  
actually work?

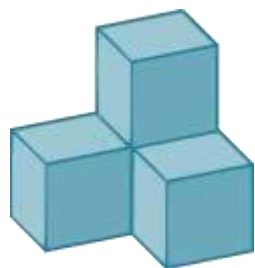


FUTURE  
LANDSCAPES



@OurLandandWater  
#OLW2019

# What is the solution?



Knowledge  
synthesis

New  
methods



Will it  
make a  
difference?

How much **progress**  
have we made  
**mitigating** nutrient  
losses?

Where will  
mitigations place  
us in **future**?

Research  
priorities



FUTURE  
LANDSCAPES



## Framework for assessing fate and transport of contaminants

**Future use:** nationally-applicable 'screening tool' for assessing water quality impact at catchment scale

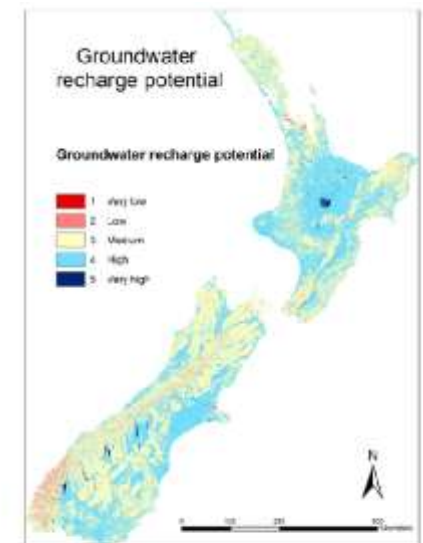
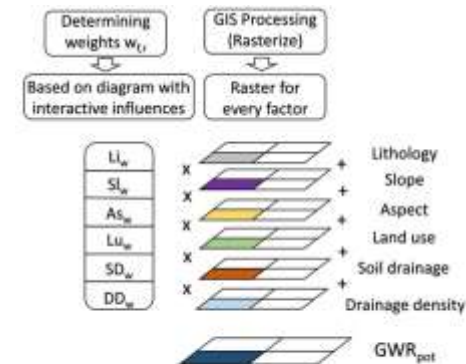
Knowledge synthesis

New methods

- Built based on existing knowledge/tools
- N, P, E.coli (no sediment)
- Applied in 4 test catchments: Aparima, Oreti, Waiotapu, Waitangi

### Strengths:

- Flow splitter approach
- Generated load estimates – typology approach
- N attenuation estimates



### Further development:

- Expert knowledge in catchments is critical
- Further development needed: lag times, social/cultural/economic factors



# Mitigating the impacts of pastoral farming on water quality....

Will it  
make a  
difference  
?

## What have we achieved?

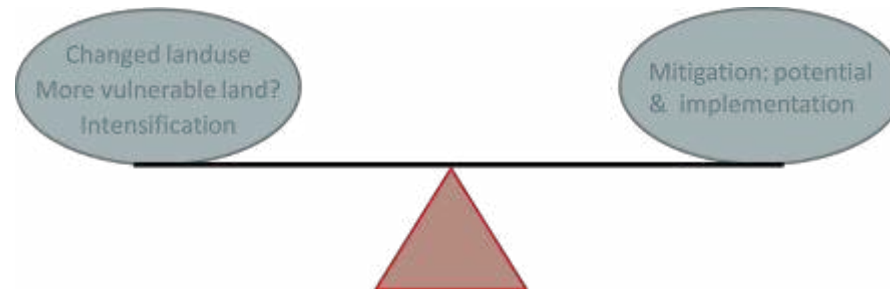
Most effective mitigations for N & P

- ★ Stock exclusion
- ★ Improved effluent management
- ★ Improved water irrigation practices

However... mitigation has not been enough to off-set greater N losses

Estimated 30% decrease in sediment loss

- ★ Afforestation
- ★ Stock exclusion
- ★ Soil conservation works

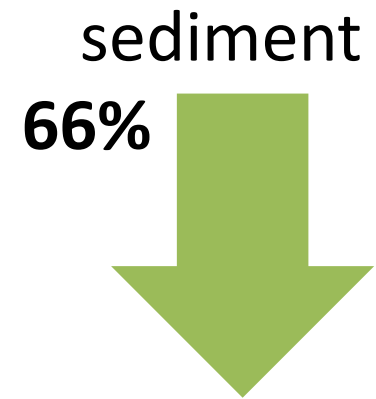
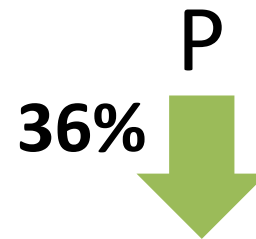
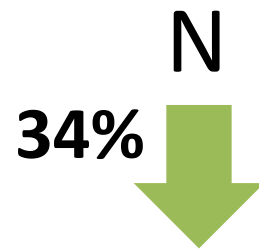


## Mitigating the impacts of pastoral farming on water quality....

### What could be achieved (by 2035)?

Will it  
make a  
difference  
?

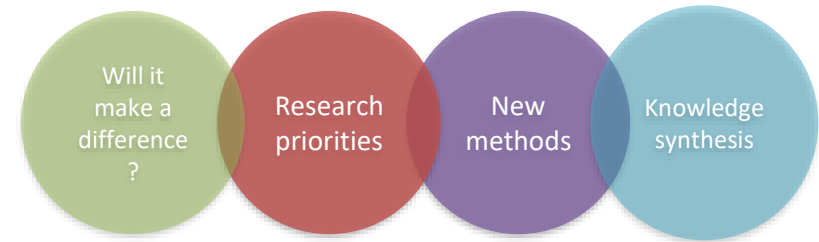
Applying all known mitigations....



In some areas, changes in land use or intensity of land use needed to meet quality objectives



## Where to next?



- Framework components developed further
- Research priorities – N attenuation, legacy & lag effects
- New methodology and maps for redox zones
- Mitigation assessments can be used to:
  - test whether water quality objectives can be achieved
  - inform whether land use change is required



FUTURE  
LANDSCAPES





# Collaborators & Contributors

## Collaborators



Manaaki Whenua  
Landcare Research



LINCOLN  
AGRITECH™



NIWA  
Taihoro Nukurangi

Gail Tipa &  
Associates



GNS  
SCIENCE  
TE PŪHĀO



āta mātai, mātai whetū



Profitability. Sustainability. Competitiveness.

Regional Councils

## Core team

Phil Abraham

Laura Banasiak

Les Basher

Murray Close

Annette Semadeni-Davies

Megan Devane

John Drewry

Hans Eikaas

Sandy Elliot

Mike Friedel

Arman Haddadchi

David Houlbrooke

Richard McDowell

Andrew Manderson

Ross Monaghan

Uwe Morgenstern

Richard Muirhead

Chris Palliser

Diana Selbie

Shailesh Singh

MS Srinivasan

Roland Stenger

Chris Tanner

Gail Tipa

Scott Wilson

## More Information

[ourlandandwater.nz/sf](http://ourlandandwater.nz/sf)

Talk to a friendly scientist!