

Cause & Effects – Farming practices & water quality in New Zealand

Pasture Summit 2021

Dr David Burger, DairyNZ





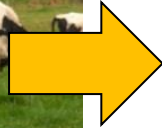
Practices



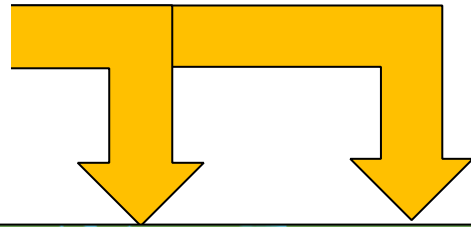
Environment



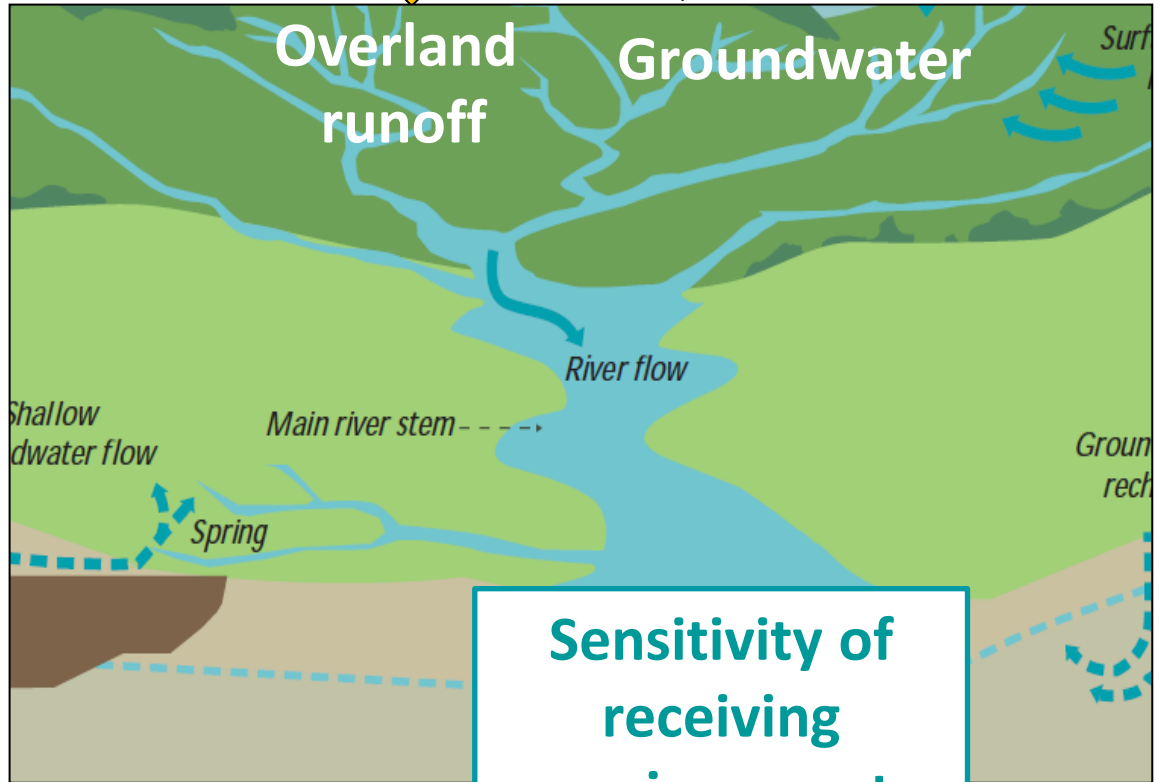
Intensity



Nutrients
Sediment
Bacteria

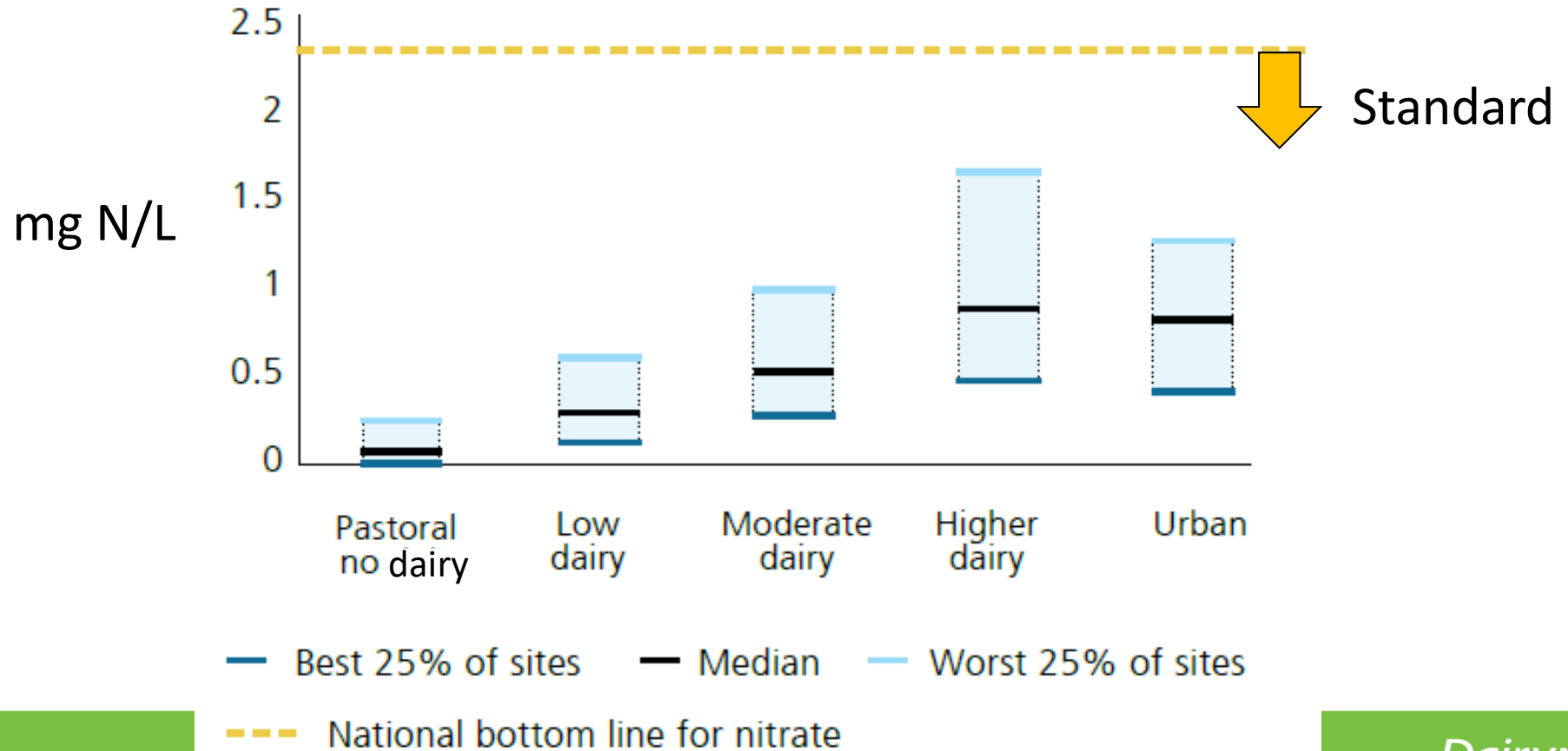


Attenuation
Lag



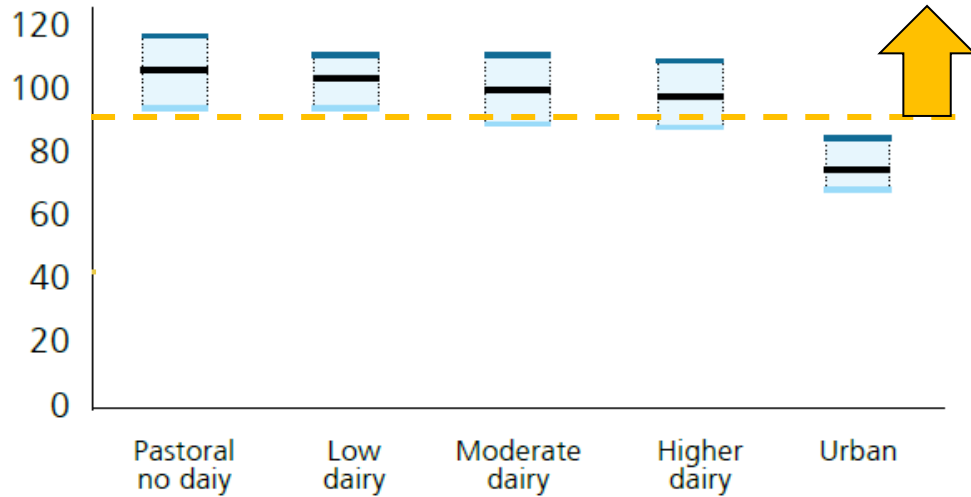
Sensitivity of
receiving
environment

River nitrate state NZ dairy catchments

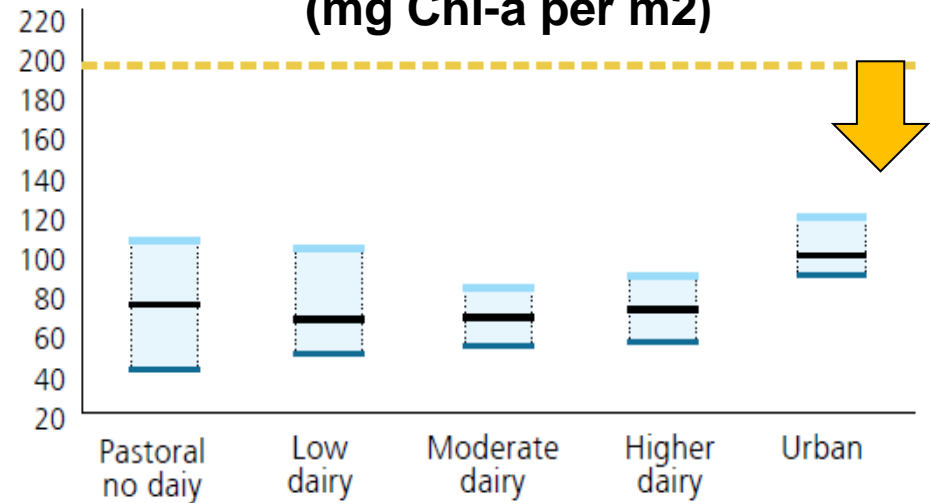


Ecosystem health NZ dairy catchments

Aquatic health index (MCI)



Periphyton biomass (mg Chl-a per m2)

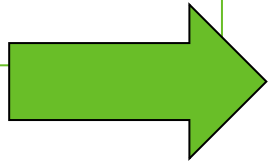


— Best 25% of sites — Median — Worst 25% of sites
- - - National bottom line for periphyton

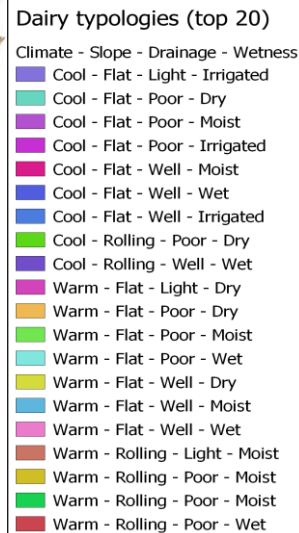
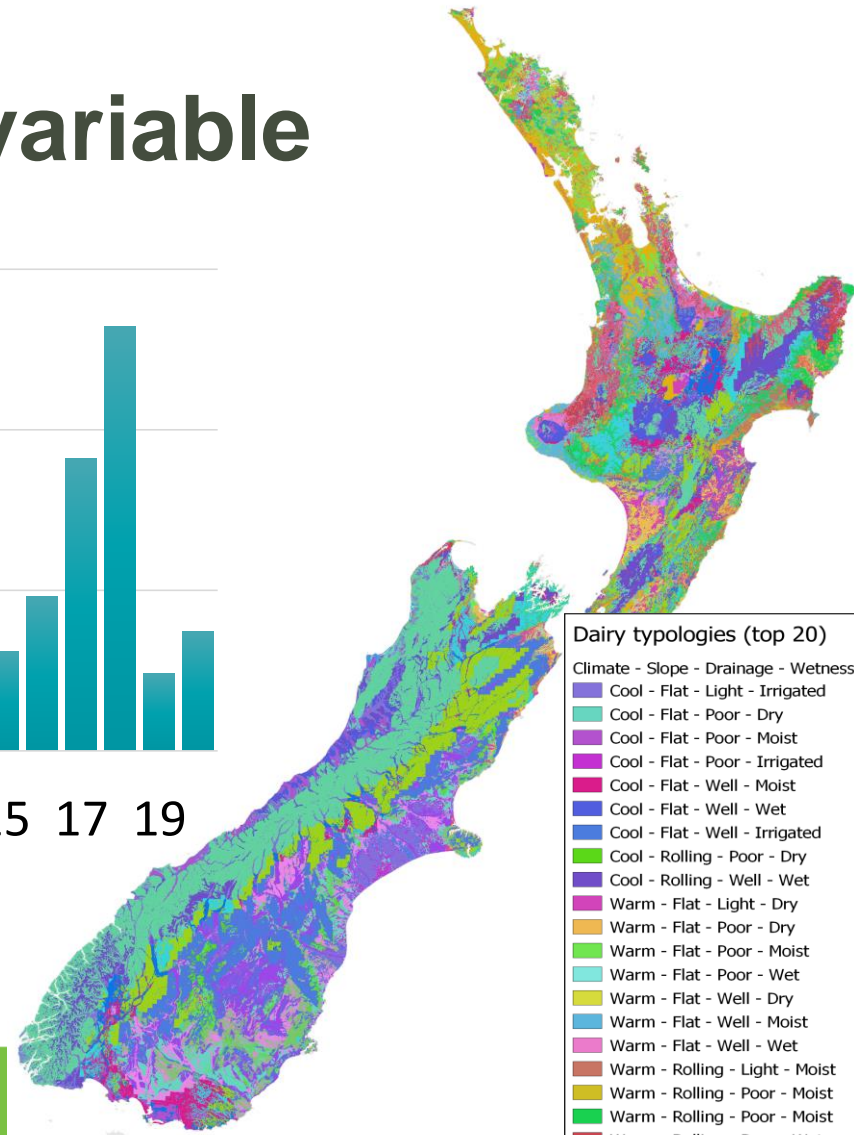
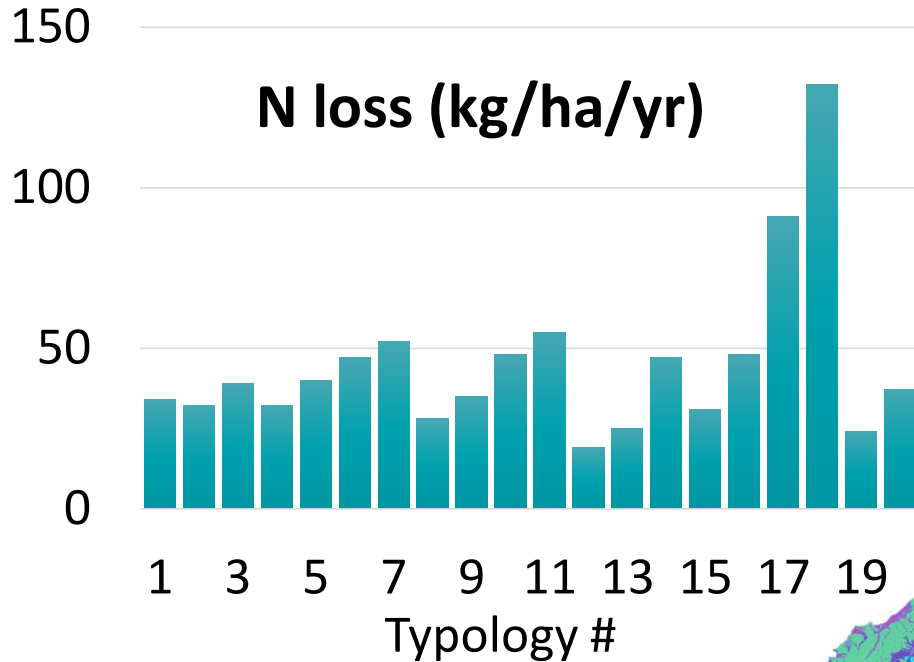
Contaminant loss highly variable

Drivers:

Temperature
Wetness
Soil/Drainage
Slope



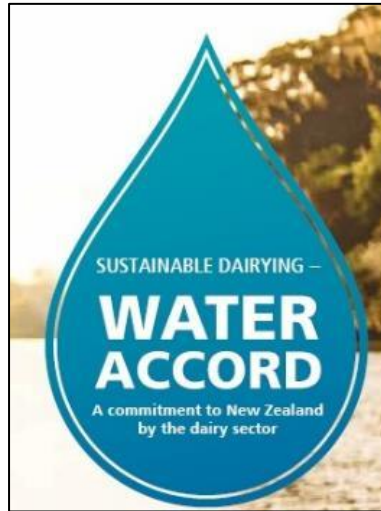
20 typologies



Significant action already undertaken



Effluent



Dairy Accord

DairyNZ Sustainable Milk Plan

Farm details		Name:	Date:
Farm & Supply Number		Physical Address	
Catchment	Upper Waikato	Business Type	Other
Farm area	Total ha	Peak cow numbers milked	
	Effective ha	Production 11/ 12 in MS total	in kg MS/t
Effluent Application area (ha)		Production 10/ 11 in MS total	in kg MS/t
Support / Runoff block (a) ha		Operating Profit (\$/ha)	
Water's run on support block:		DairyNZ Farm System: 1-5	
KgN/ha/yr applied (arhole / farm ave)		Farm Working expenses (\$/kg MS)	
Farm contour (% Flat / Rolling / Steep)		Cow efficiency (kg MS/kg LWT)	#DN/yr
Milking platform soils		Effluent storage volume (cubic metres)	
Support block runoff soils		Water use around shed (L/cow/day)	
Winnering (Cows on or off farm; numbers and duration)			
Imported supplement Type and amount: (t DM)			

Nutrient management indicators: Upper Waikato

Median = 34

N Conversion efficiency (%)

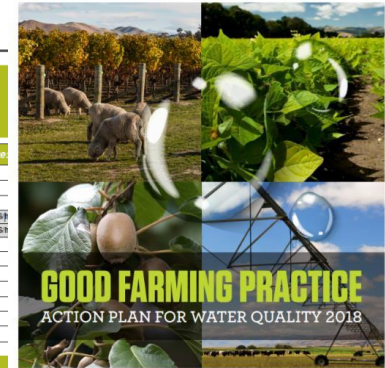
Median = 36

N loss (kg N/ha/yr)

Median = 3.4

P loss (kg P/ha/yr)

N Conversion efficiency (%)		N Leached (kg N/ha/yr)		P loss (kg P/ha/yr)	
Date of Nutrient Budget		Version of Overseer used		P loss risk	



Farm plans

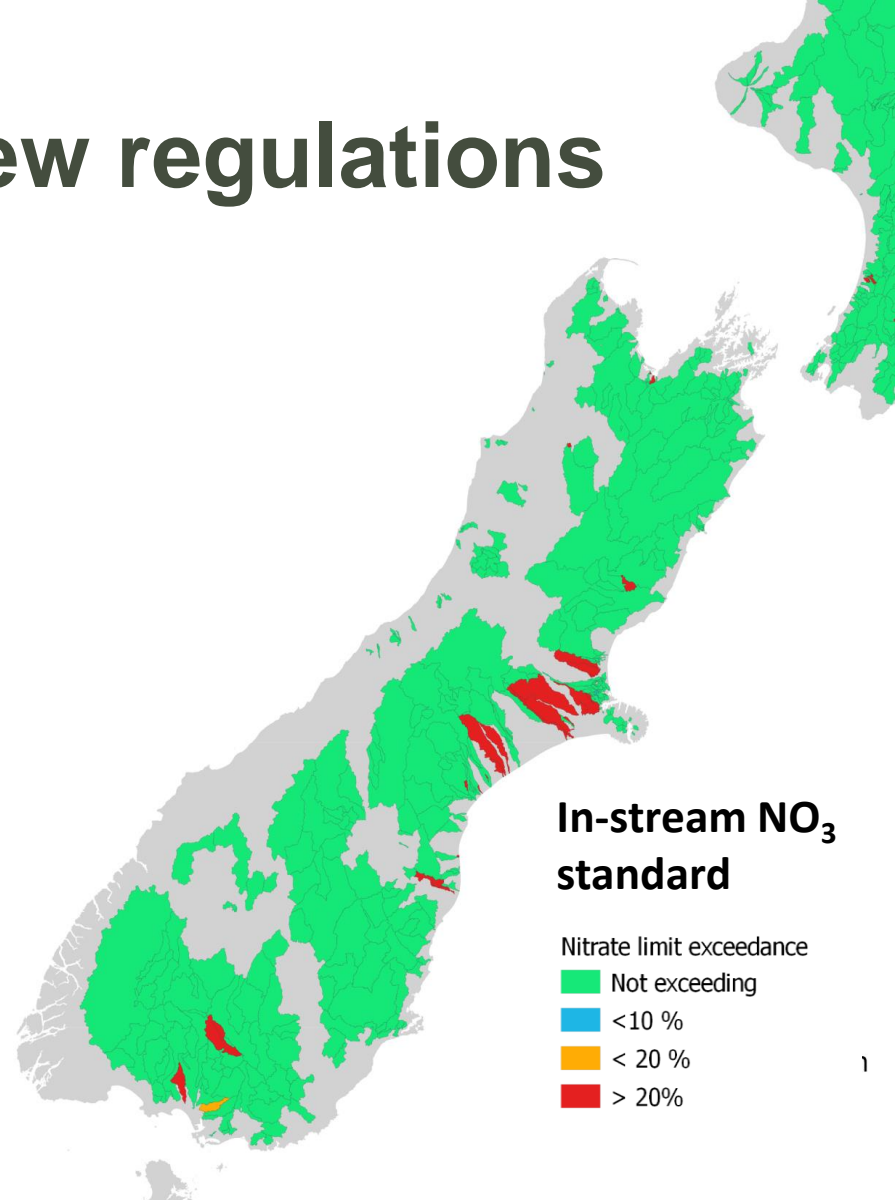
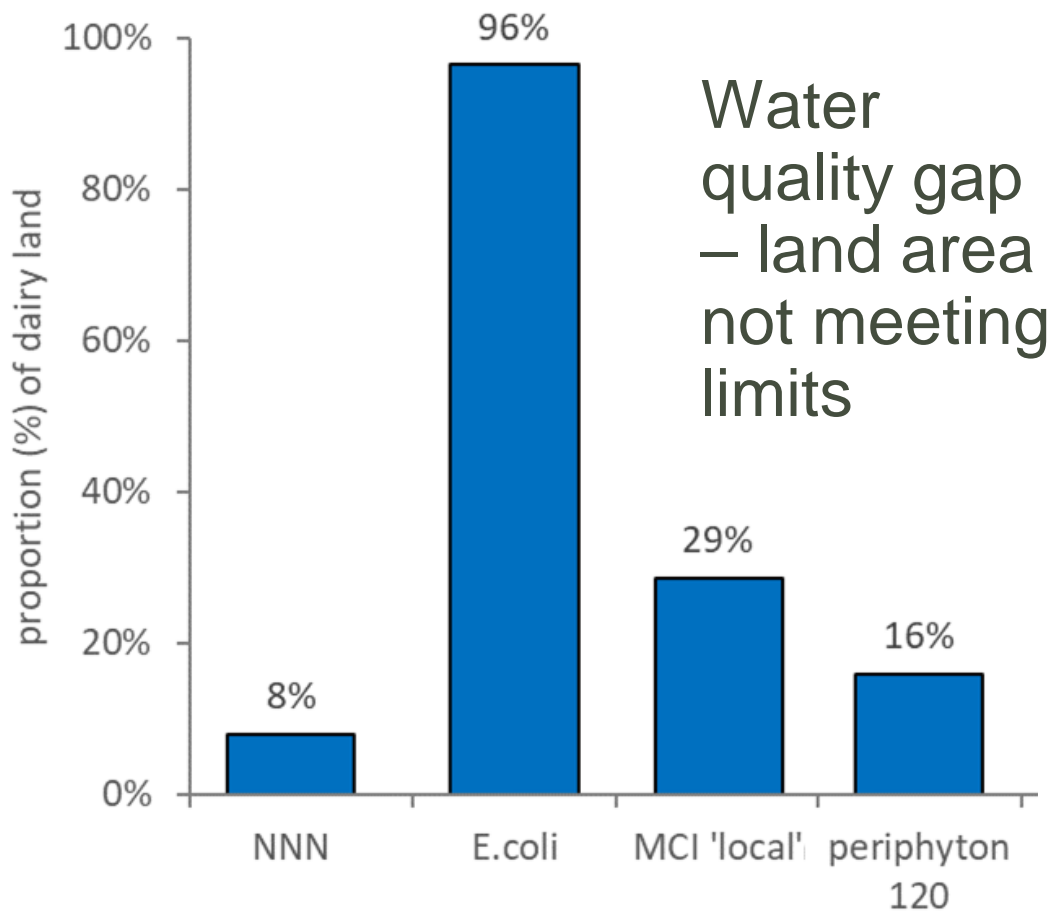
Good Farming Practices



Significantly more nitrogen (+45%) and phosphorus (+98%) would have entered rivers from dairy-farmed land between 1995 and 2015 if farmers had not adopted better practises

-Monaghan et al. NZJAR, 2020

More required to meet new regulations



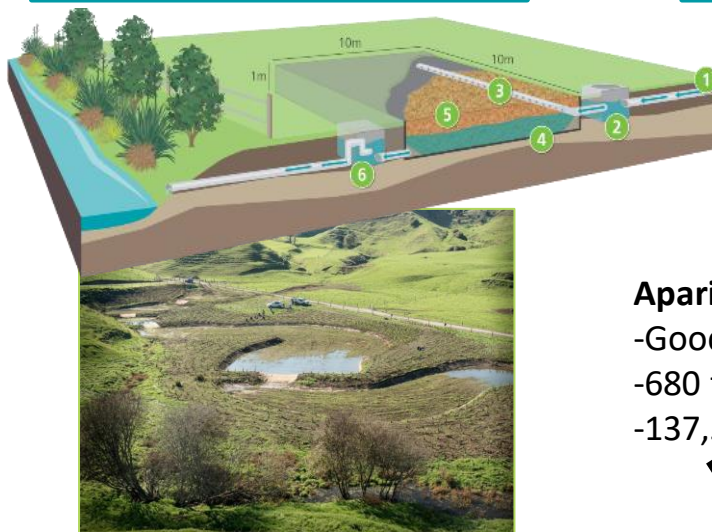
We continue to invest in solutions

1. Farm systems



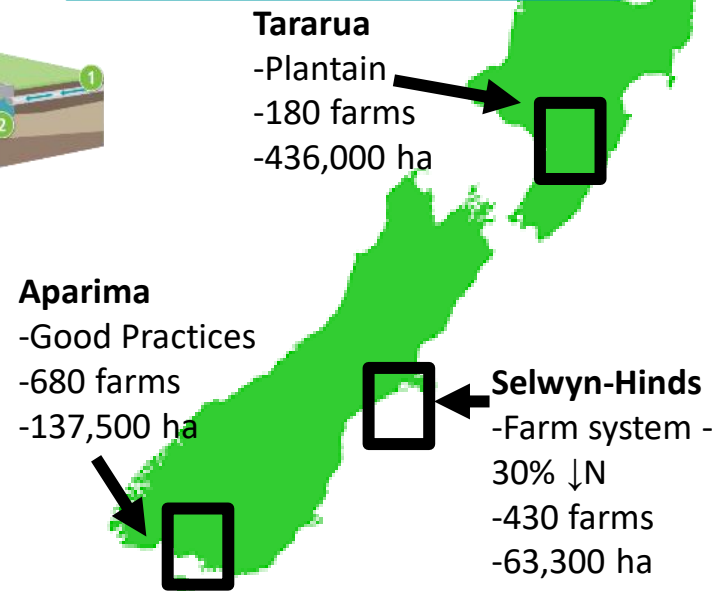
- Plantain/forages
- Wintering
- Low N cows

2. Edge of Field



- Riparian buffers
- Wetlands
- Bioreactors
- Detainment bunds

3. Priority catchments



4. Sector change

Farm plans
Good farming practice

Questions

