



QLDC: Catchment Management Plans

# BALANCING ACTS: STORMWATER MANAGEMENT AMID BREAKNECK GROWTH

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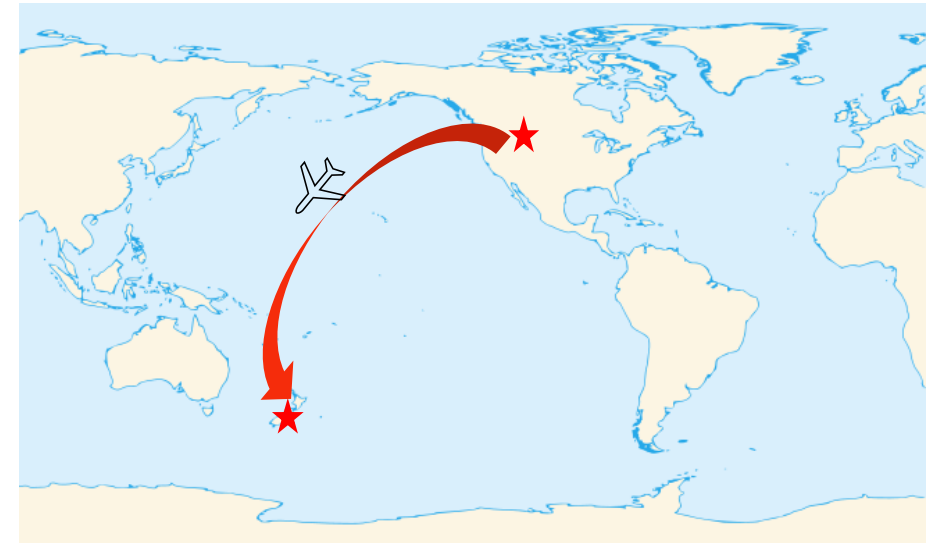
**Stormwater 2024**

15–17 May | Takina Wellington Te Whanganui-a-Tara

# Author - Disclaimer

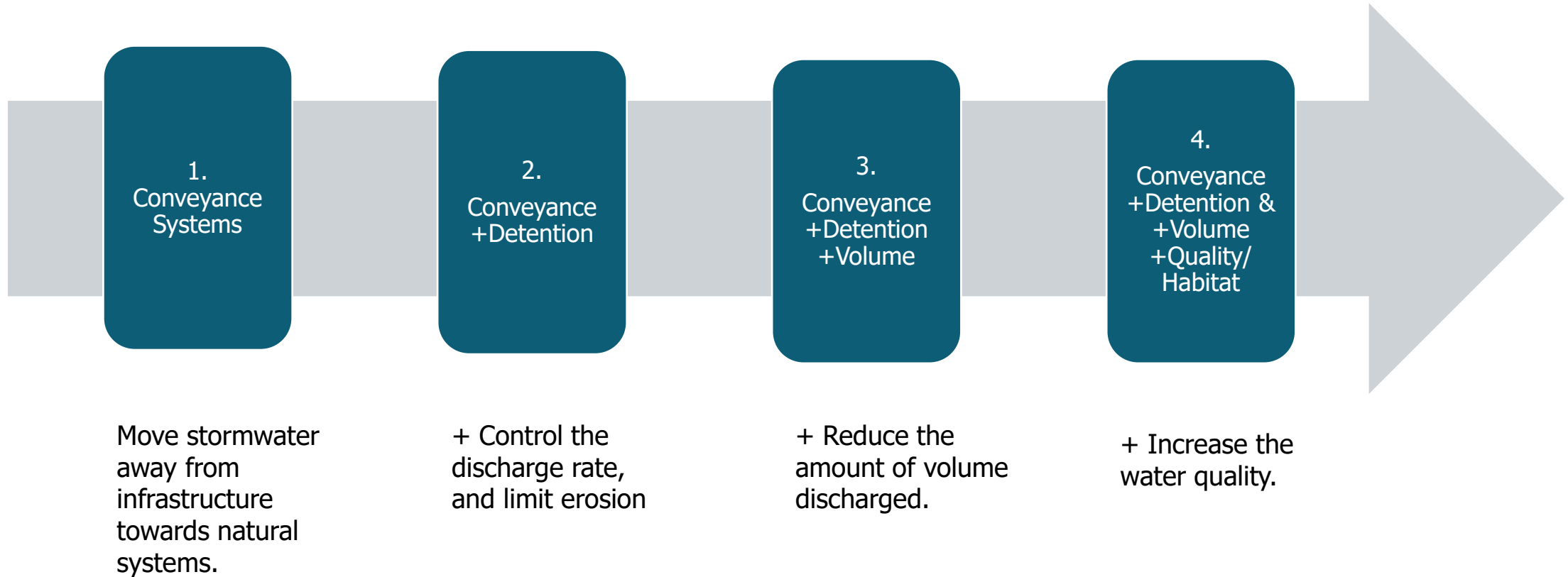


*I am an immigrant and am still learning about New Zealand's approach to stormwater and the mana of water. I am acutely aware that I have lots to learn and welcome any comments.*



# Hierarchy of Stormwater Management

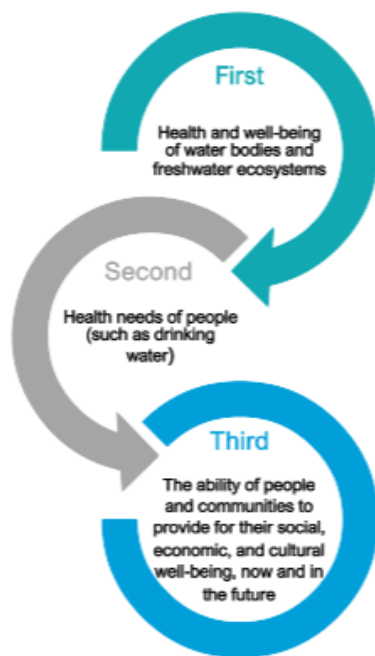
## Canada



# Hierarchy of Stormwater Management

## New Zealand

### HIERARCHY OF OBLIGATIONS IN TE MANA O TE WAI



### Te Mana o te Wai



# BALANCING ACTS: STORMWATER MANAGEMENT AMID BREAKNECK GROWTH

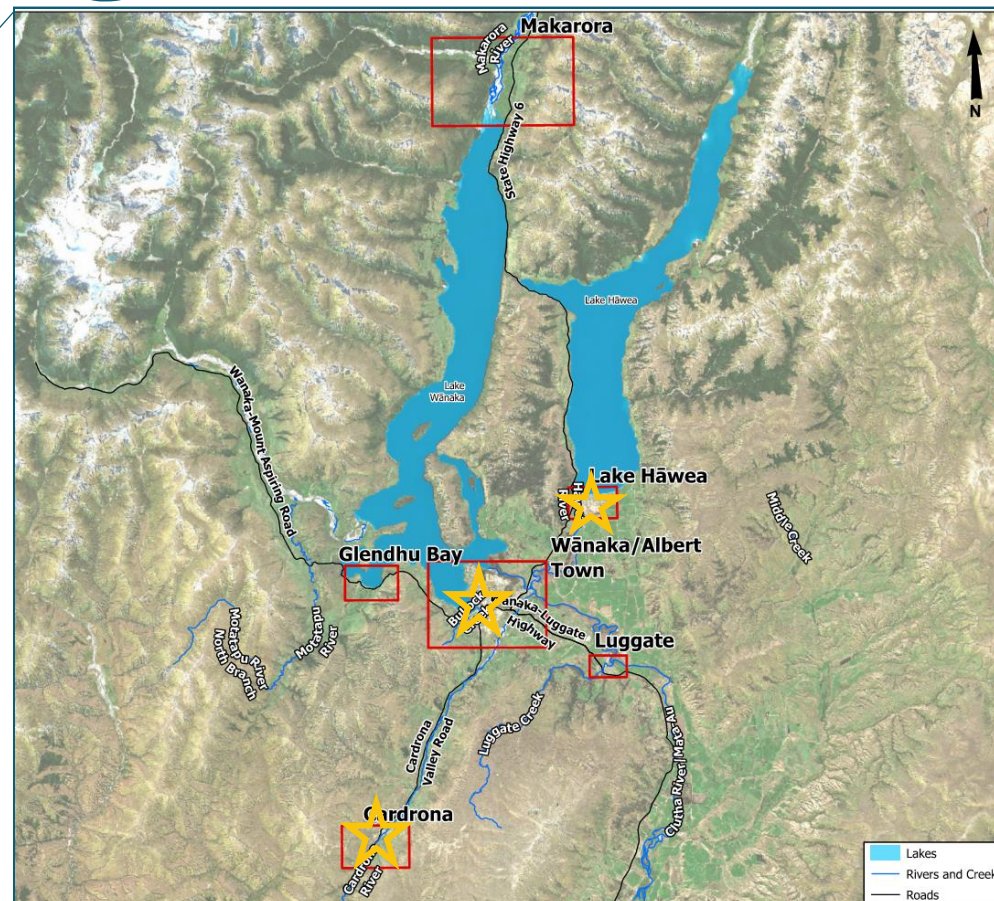
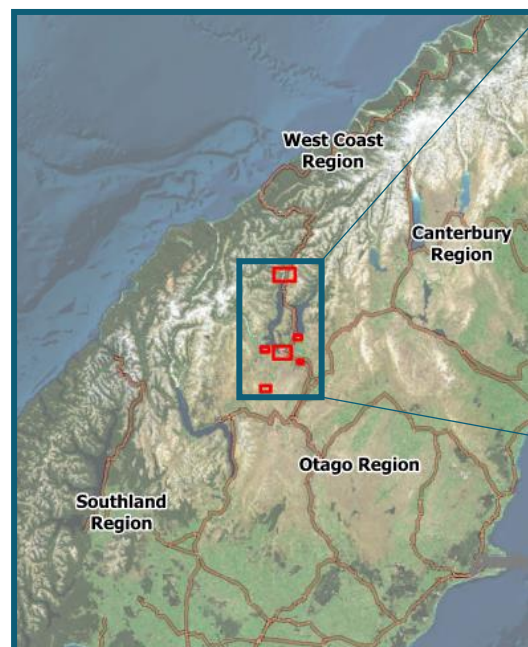
This presentation reviews the challenges for the development of a consistent CMP for the following areas:

- Wānaka
- Hāwea
- Cardrona

These three systems were selected as case studies to highlight the variation across the district in the stormwater systems, the receiving environments, and in the quality and quantity of the existing data.



# Stormwater in QLDC



# Area Summary

Characteristic	WĀNAKA	HĀWEA	CARDRONA
<b>Land Use and Cover</b>	Highest Density	Low Density	Very low Density
<b>Topography</b>	Mix of steep upstream catchments and relatively flat	Relatively flat	Steep upstream catchment
<b>Receiving Environment</b>	Lake Wānaka, Cardrona River, and Urban Stream Tributaries	Lake Hāwea	Cardrona River
<b>Population and Growth</b>	Highest population High growth expected	Medium population Medium growth expected	Low current population with lots of growth expected.

# Stormwater in QLDC

Key stormwater challenges in QLDC include:

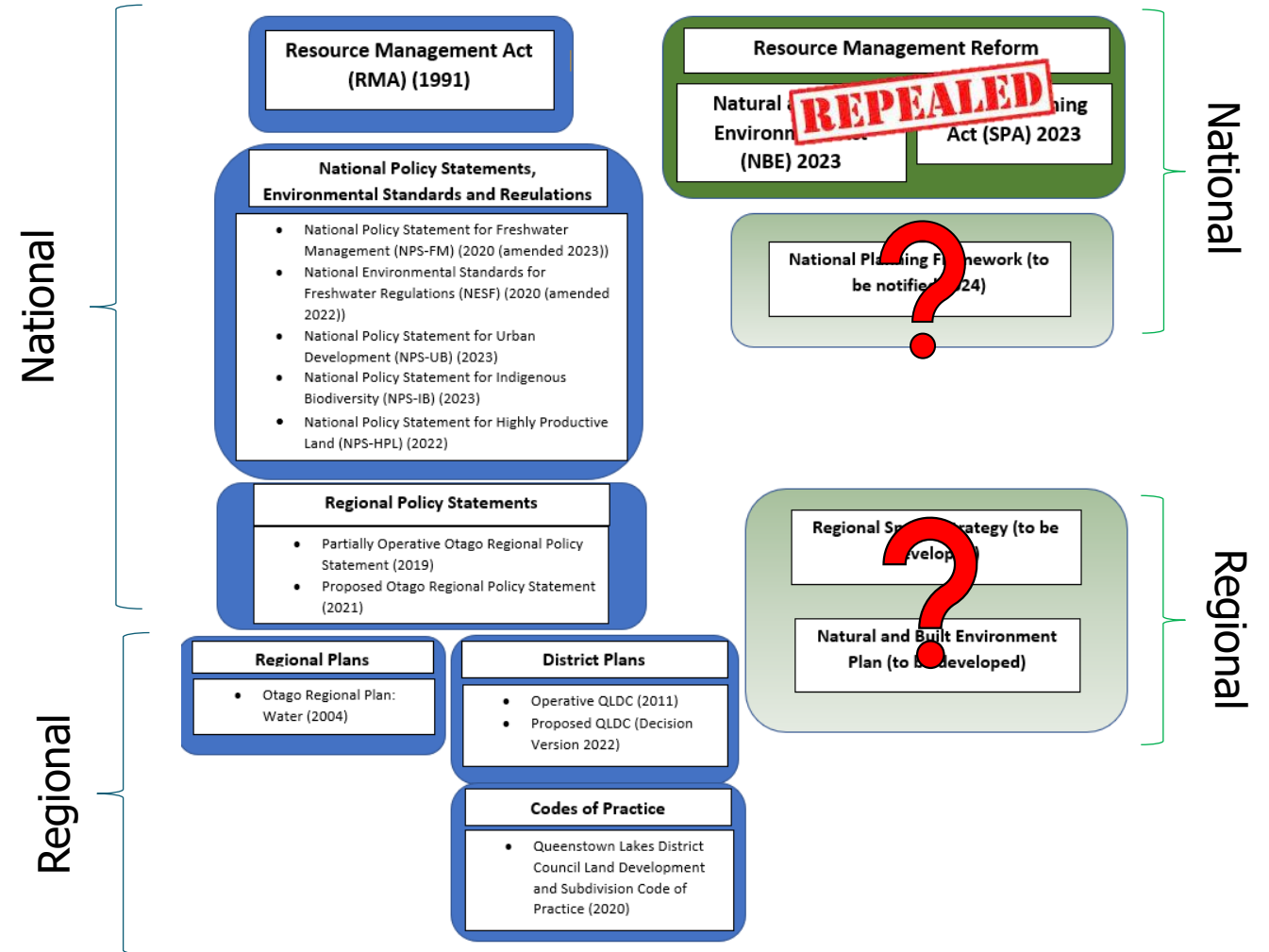
1. A volatile legislative environment
2. Pristine receiving environments with varying guidelines and targets
3. High growth leading to ad-hoc development driven by developers
4. Information variability in each area





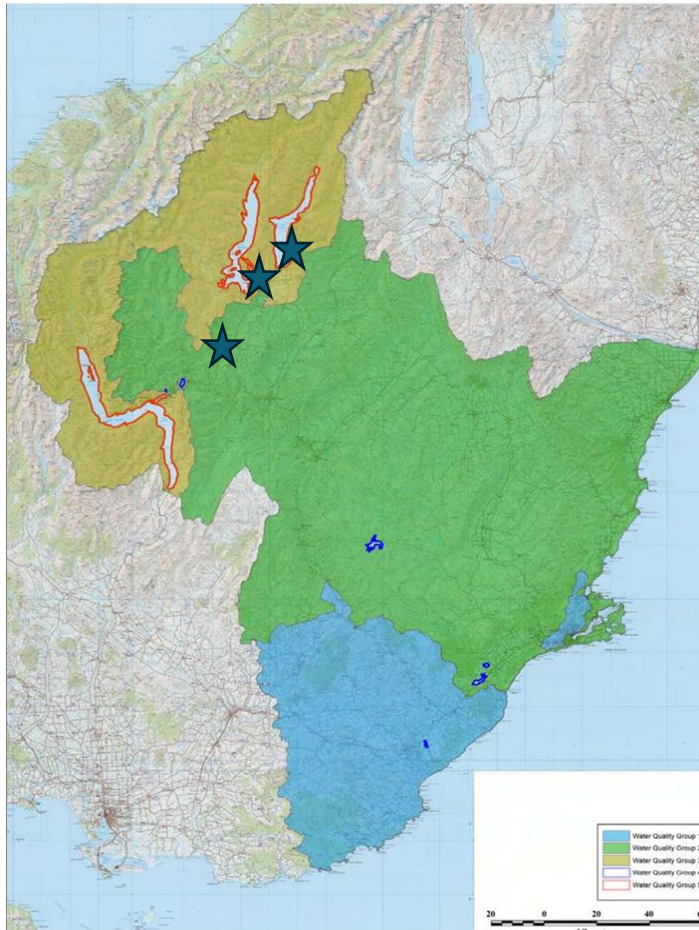
# Challenge 1: Legislative Framework

The legislative environment in QLDC is complex and contains draft, notified, and partially notified framework.

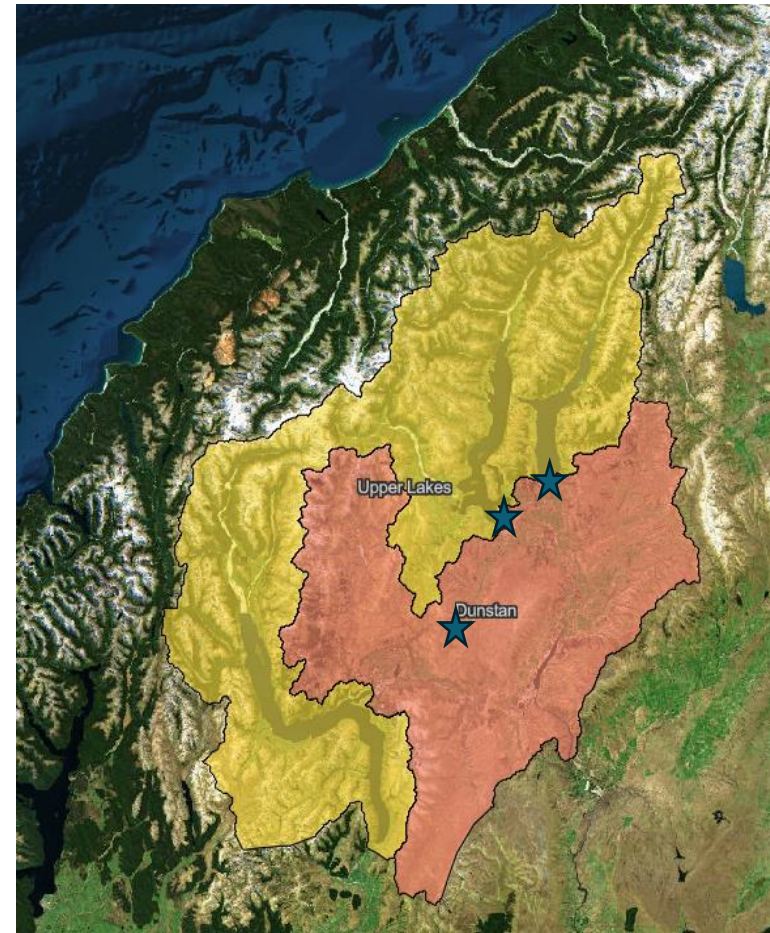


# Challenge 1: Legislative Framework

Water Quality Groups

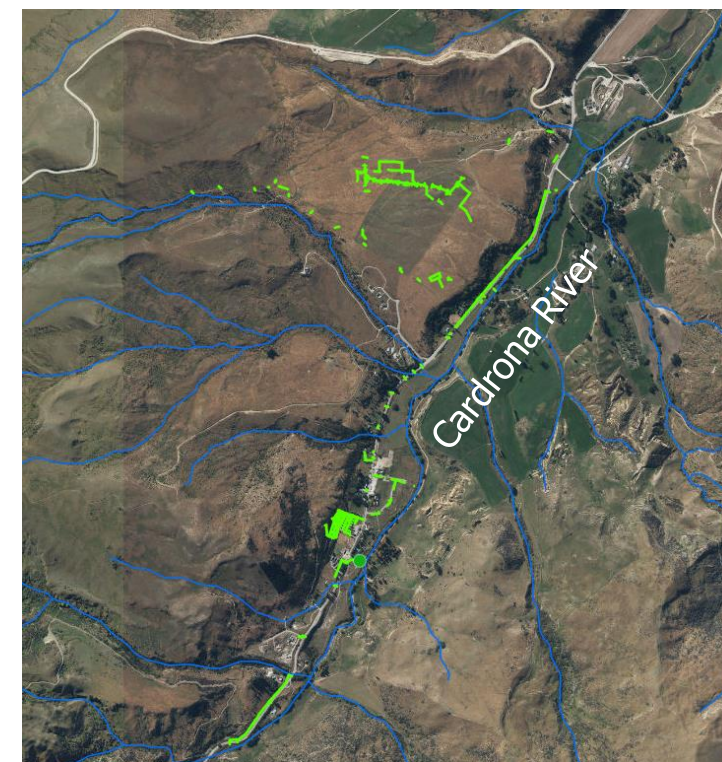


Rohe Boundaries

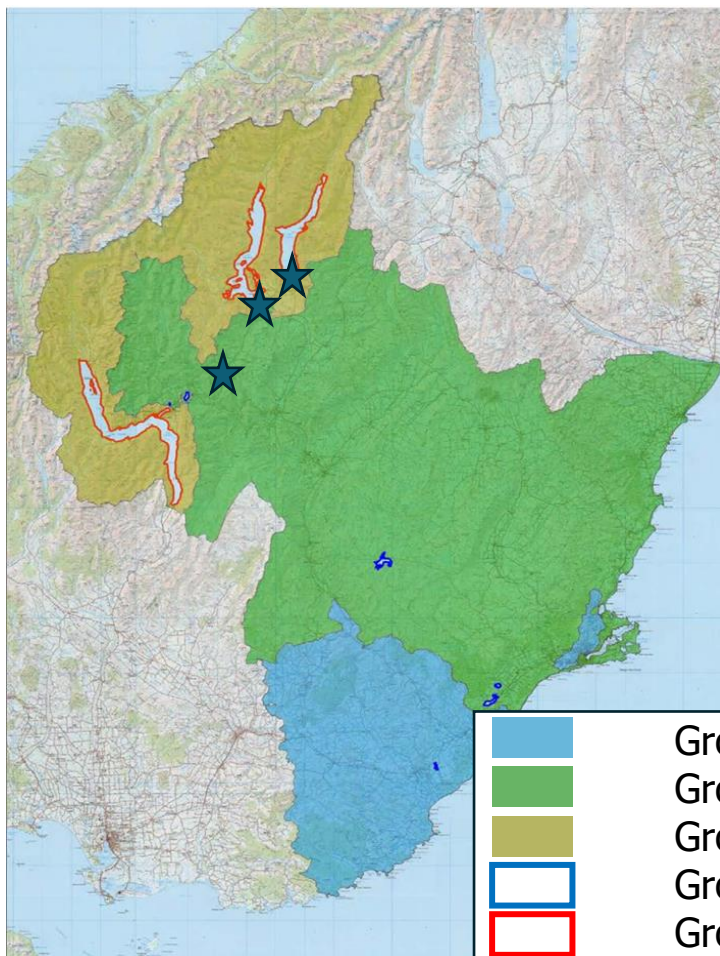


# Challenge 2

## Receiving Environments



# Challenge 2: Receiving Environments

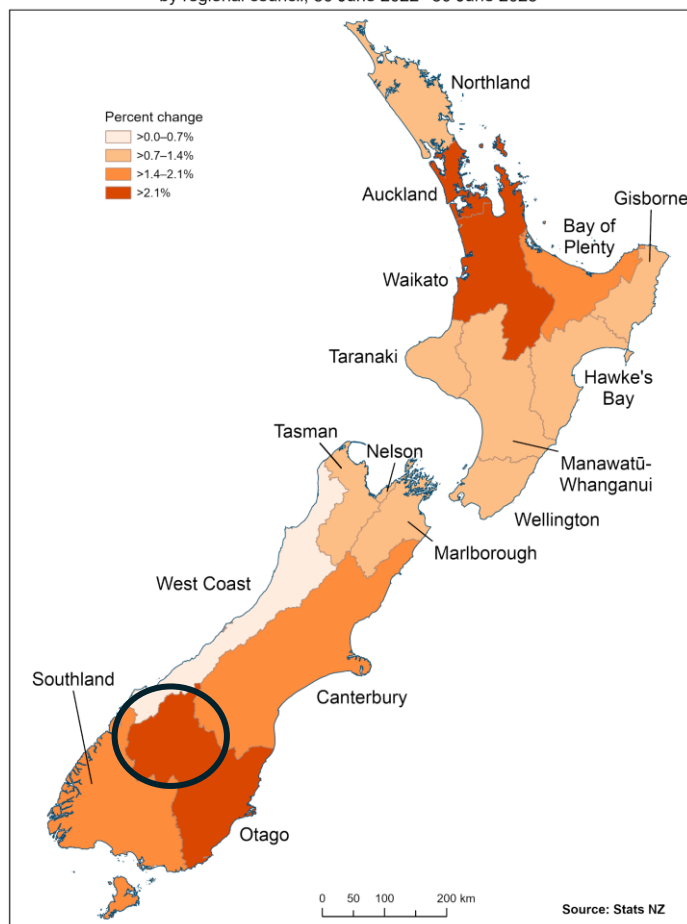


Relevant Area	Receiving Environment Group	Total Nitrogen (mg/l)	Nitrate-Nitrite Nitrogen (mg/l)	Total Phosphorus (mg/l)	Dissolved Reactive Phosphorus (mg/l)	Ammoniacal Nitrogen (mg/l)	<i>Escherichia coli</i> (cfu/100ml)	Turbidity (NTU)
N/A	1	-	0.444	-	0.026	0.1	260	5
Cardrona, Wānaka	2	-	0.075	-	0.01	0.1	260	5
Wānaka	3	-	0.075	-	0.005	0.01	50	3
N/A	4	0.55	-	0.033	-	0.1	126	5
Wānaka, Hāwea	5	0.1	-	0.005	-	0.01	10	3

# Challenge 3

## Growth

Estimated resident population change,  
by regional council, 30 June 2022–30 June 2023



	Wānaka	Hāwea	Cardrona
Population (2023)	10,610	2,000	790
Growth (2023 – 2033) (residents)	2.8%	3.6%	2.5%
Growth (2023 – 2033) (Average Day visitors)	5.0%	5.7%	11.4%

# Challenge 4

## Variability of Information

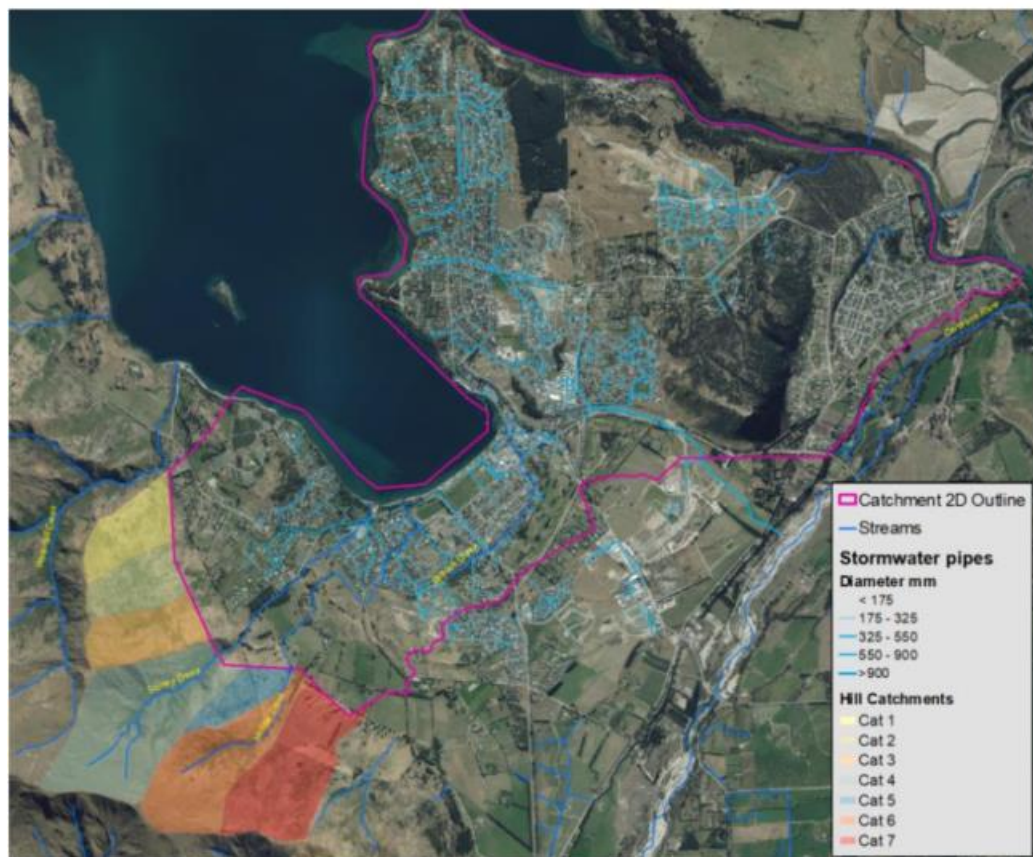
Water Quantity Information	Wānaka	Hāwea	Cardrona
Recently completed flood modelling data (completed by DHI)	✓	X	X
Previous versions of flooding modelling data	✓	✓	X
Service Request for flood complaints	✓	✓	✓
NZ Historic Weather Event Catalogue (NIWA, 2018)	✓	✓	✓

Water Quality Information	Wānaka	Hāwea	Cardrona
Water Quality Strategy (Beca , 2020)	✓	X	X
Recent stormwater monitoring data	✓	X	X
Annual contaminant load modelling (GHD, 2020)	✓	✓	X
ORC Monitoring Data	✓	✓	✓
Proposed land use based on QLDC's Proposed district plan	✓	✓	✓

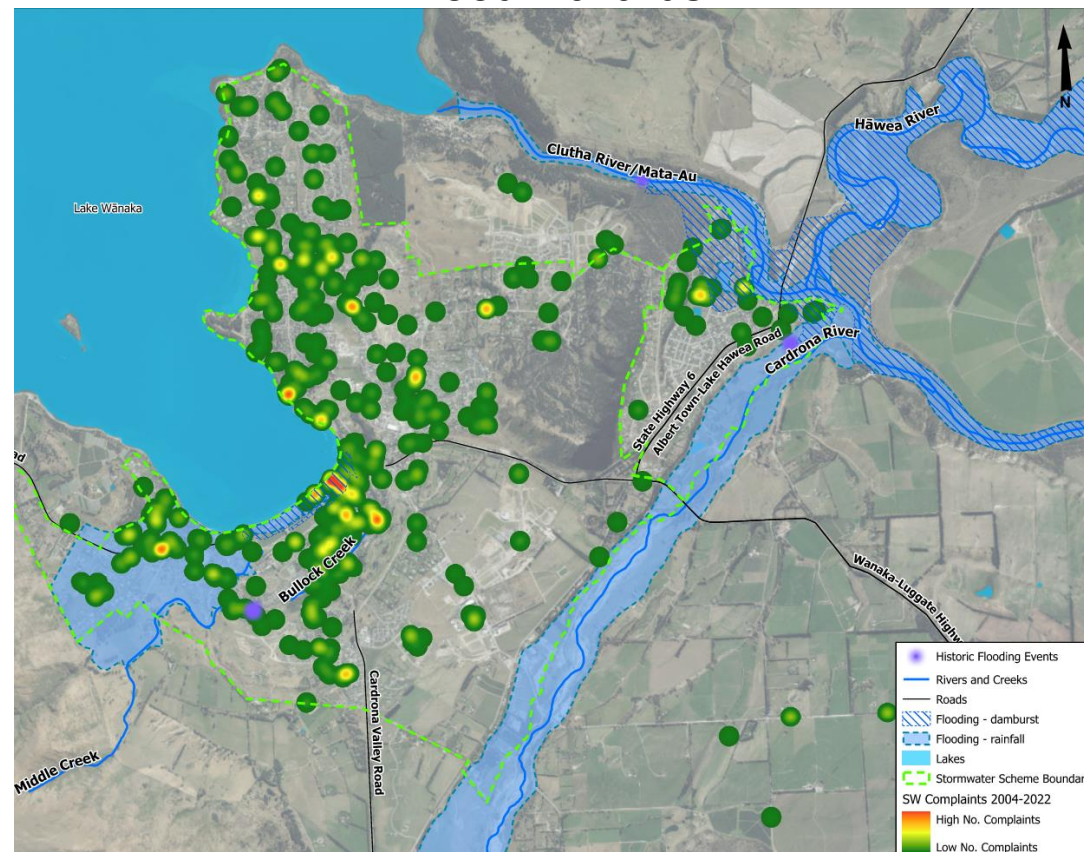
# Challenge 4

## Variability of Information - Wānaka

Boundaries of North Wānaka Model



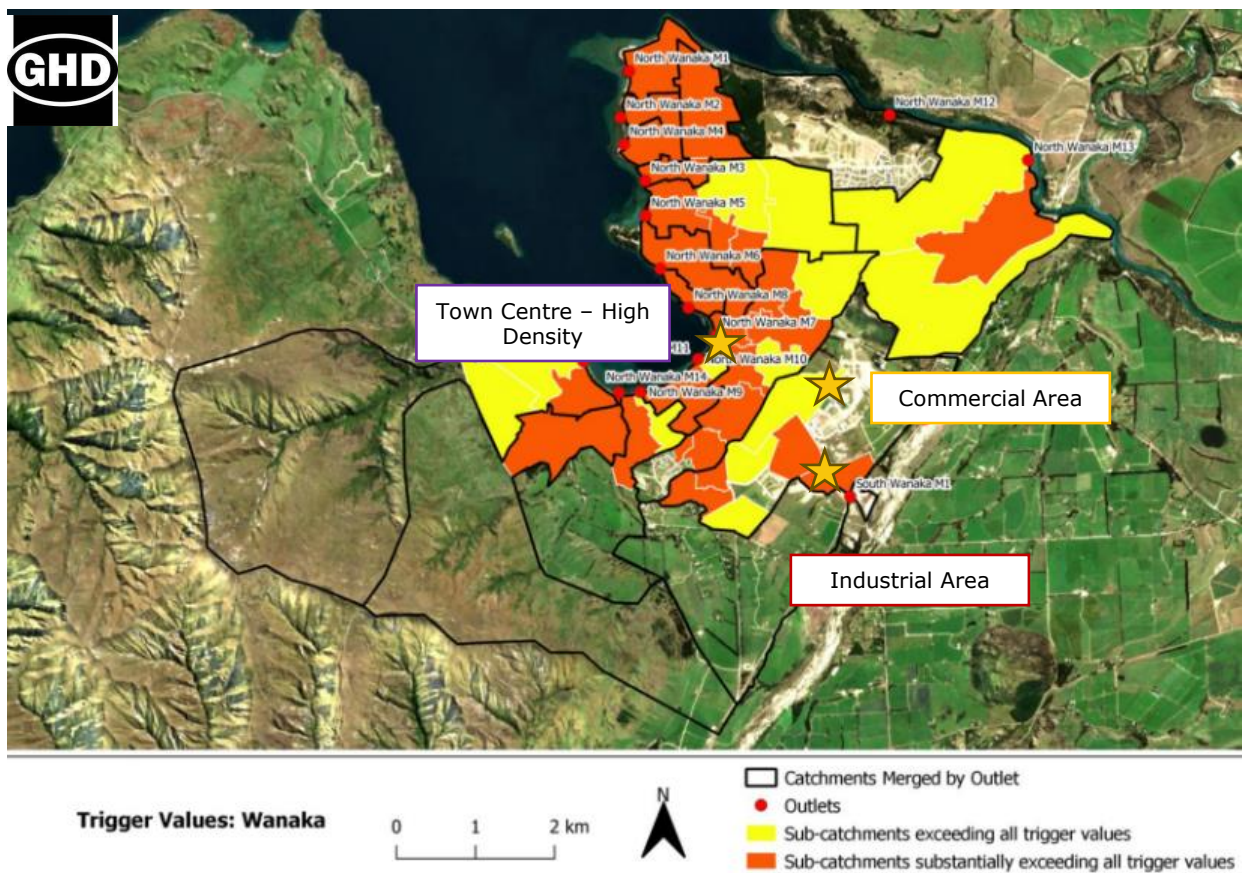
Flood Hazards



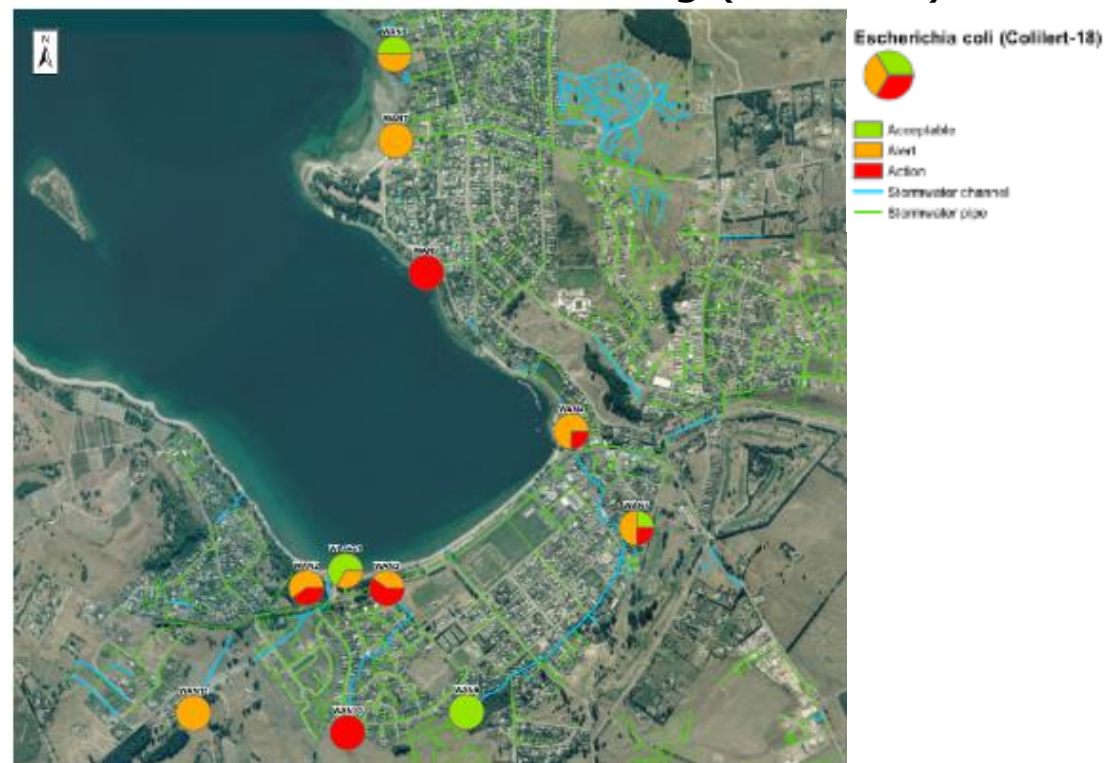
# Challenge 4

## Variability of Information - Wānaka

### Contaminant Load Modelling



### Stormwater Monitoring (For *E.coli*)

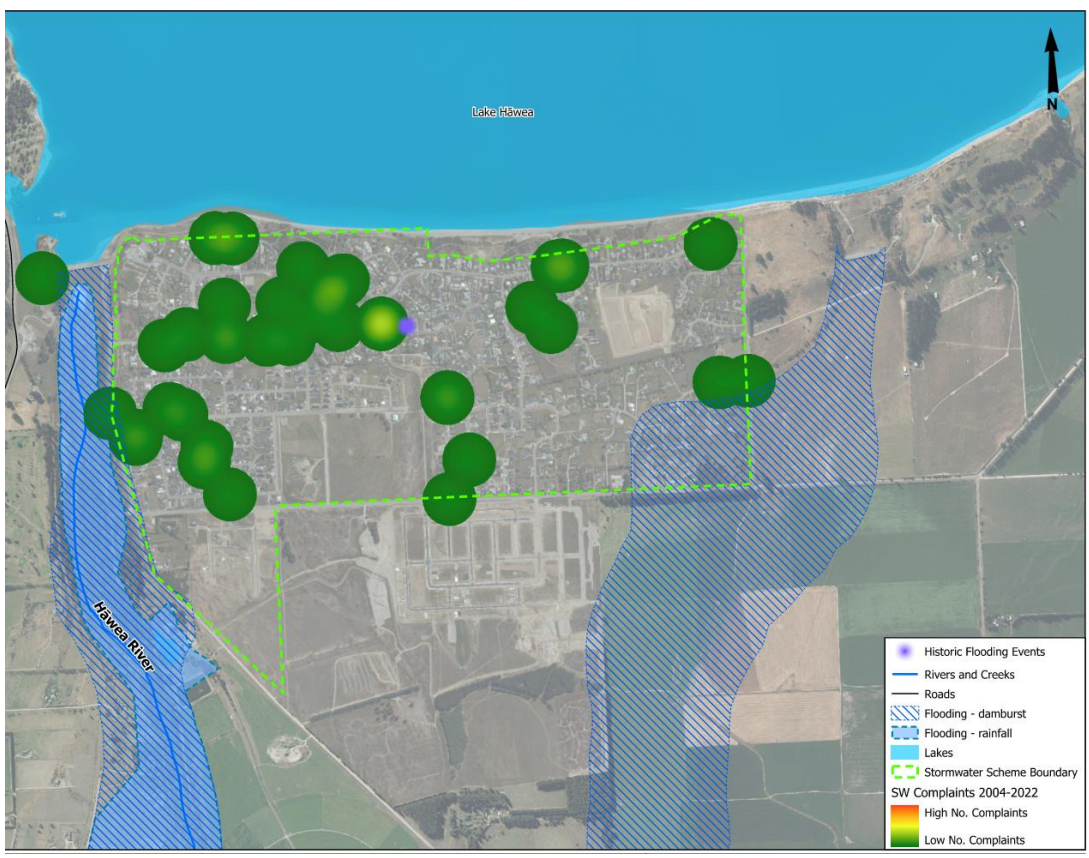




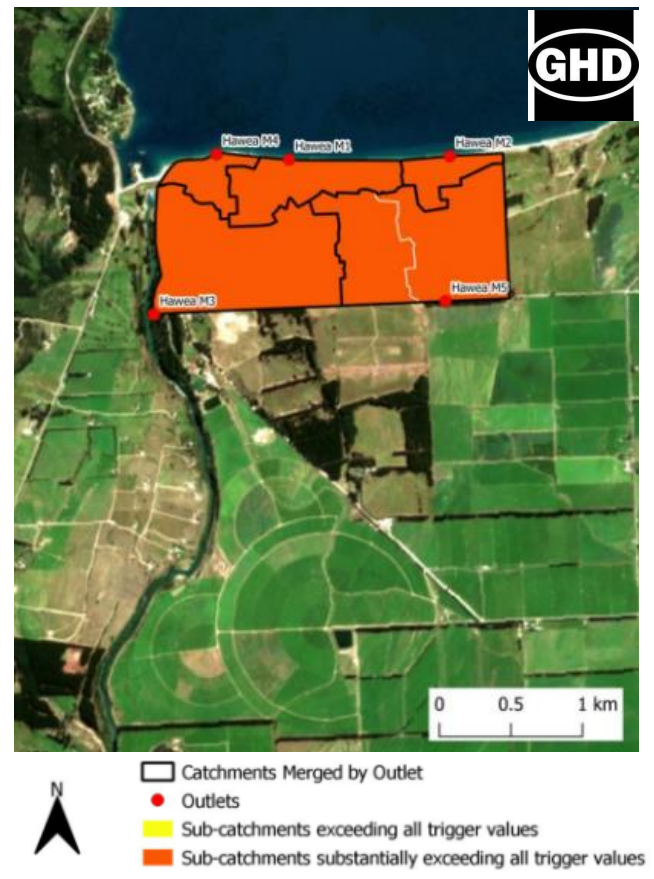
# Challenge 4

## Variability of Information - Hāwea

Flood Hazards



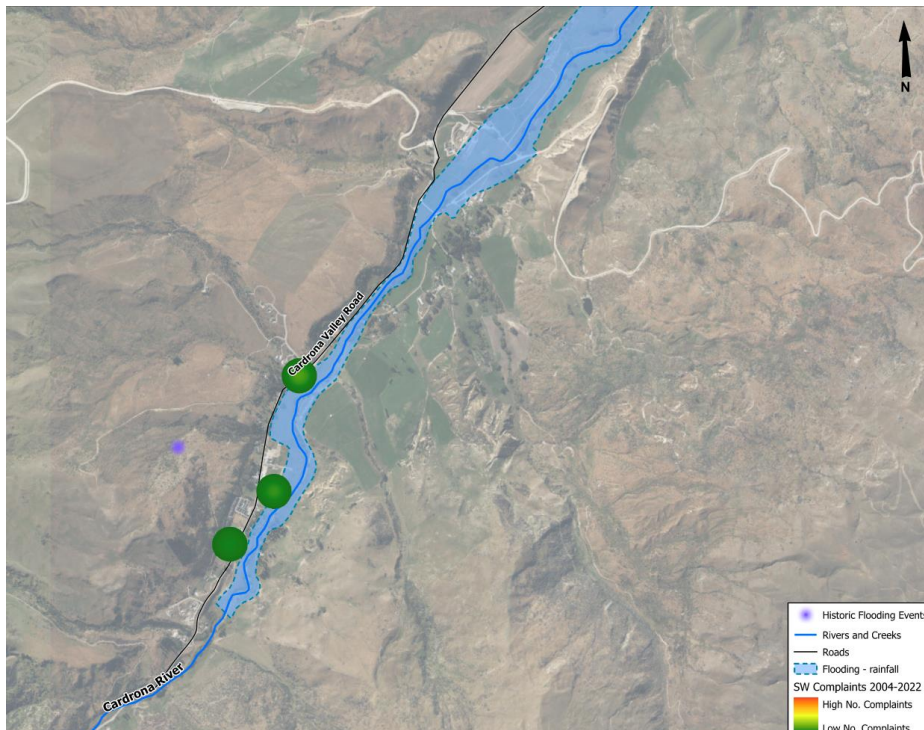
Contaminant Load Model



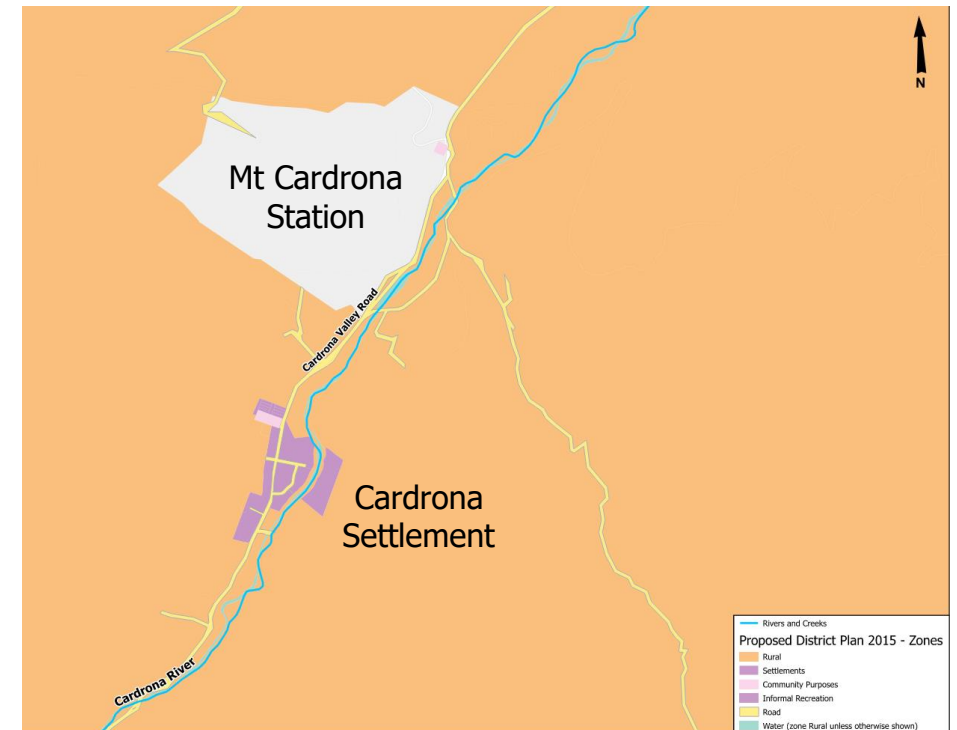
# Challenge 4

## Variability of Information - Cardrona

Flood Hazards



Proposed District Plan



# Now What?

- Doing nothing isn't an option
- Use the information you have
- Use best practices approach – especially at CMP level



# Risks – Stormwater Management

Threats	Location and Risk			Risk
	Wānaka	Hāwea	Cardrona	
<b>Volatile Legislative Environment</b>	High	High	High	Changing Rules
<b>Construction Sediment Loading</b>	Medium	Low	High	Sediment washing into stream with development.
<b>Stream Bank Erosion</b>	High	Low	Medium	Stormwater mobilising sediment, in small streams
<b>Contaminant Load – Industrial / Commercial</b>	High	Low	Low	Risk of contaminants entering receiving environment directly.
<b>Contaminant Load – Increased Density</b>	High	Medium	Medium	Risk of contaminants entering receiving environment directly adjacent. Risk of contaminants entering receiving environment (highest concern for E. coli)
<b>Sensitivity of Receiving Environments</b>	High	High	Medium	Consequence of impacting high value receiving environments is major.
<b>Information Gaps</b>	Medium	High	High	Risk of existing contaminants entering the receiving environments.
<b>Primary Level of Service</b>	Medium	<b>Unknown</b>	<b>Unknown</b>	Risk of properties flooding due to infrastructure having insufficient capacity.
<b>Secondary Level of Service</b>	Medium	<b>Unknown</b>	<b>Unknown</b>	Risk of properties flooding, unsafe transportation during floods and secondary system not being appropriately designed to safely convey water.

\*risk levels are in comparison to each other catchment.

# Summary and Next Steps

- Developing a flexible / robust prioritisation framework that can be tailored to the level of information available
- Developing capital projects based on this prioritisation framework to allow a “no regrets” approach to stormwater management
- Using the Urban Stormwater Management Principles to provide a foundation for nature based solution generation
- Considering a ‘live’ format for the catchment management plans to enable updates due to regulation change as well as asset changes due to fast growth
- Aligning CMPs across the district in a strategic way to unify the approach to stormwater

# Acknowledgements



**Thank you!**  
**Questions? Patai?**