Community water quality testing
Why monitor stream health?

Is restoration working?

Provide evidence

Detect changes early

Minimise chances of reaching 'tipping point'
Community-based monitoring

- Supports local decision making
- Fills info gaps
- Local knowledge
- Increases public involvement

Source: NIWA
Indicators

Human influence:
- Impervious surfaces
- Deforestation
- Dams
- Livestock
- Stormwater/Wastewater

Stream function:
- Biodiversity
- Recreation
- Nutrient cycling
- Connectivity

Indicator:
- Macroinvertebrates (bugs)
- Water temperature
- Faecal microbes
- Nutrients
- Nuisance algae

Measure:
- Concentration eg. mg/L, cfu/100ml
- % cover
- Macroinvertebrate index
- Degrees C

Target:
- < 540 cfu/100ml
- Clarity > 1.6m
- Max 20% cyanobacteria cover
Human influence

Deforestation
Dams
Livestock
Stormwater/Wastewater
Fertilizer run off
Impervious surfaces

Stream function
Stream function

Biodiversity
Recreation
Nutrient cycling
Connectivity
Macroinvertebrates (bugs)
Water temperature
Faecal microbes
Nutrients
Nuisance algae

Indicator

Measurement
Measure

Concentration eg. mg/L, cfu/100ml
% cover
Macroinvertebrate index
Degrees C

Target
Target

< 540 cfu/100ml

Clarity > 1.6m

Max 20% cyanobacteria cover
Stream habitat

Riparian habitat

Rubbish

Stream bed composition
Water quality

Water chemistry
- dissolved oxygen, nitrate, phosphate

Temperature

Water clarity

E. coli
Stream life

Algae and aquatic plants

Bugs

Fish
What, when and how to monitor...

Monitoring plan

What are the issues in your catchment?

Form a catchment group

Select sites to monitor

What do you want to monitor and how often?

What streams and rivers are being monitored already?
What has the WCRCG been monitoring?

- Habitat
- Flow
- Macroinvertebrates
- Temperature
- Nutrients
- pH
- Clarity
Nutrients

Nitrate
0.1, 0.2, 0.4, 0.8 mg/L

Phosphate

Reference sample on top
Measurement sample (with reagents added) on bottom

NIWA
*E. coli*

*Escherichia coli* (*E. coli*) - bacteria found in gut of animals

**Indicator of faecal matter**

Can test for *E. coli* using 'selective media' and incubating the sample (35degC)
Bugs! ❤
(Macroinvertebrates)

Indicators of water quality - TIME
Indicators of water quality - 

Macroinvertebrates
So what have we found?

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And what does it all mean?

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Bank View

- OK-good clarity
- Slow flow
- Less in-stream habitat
- Willow aphid/honeydew influence
- Nutrients present but at low level (0.05ppm)
- Temp good - even in summer (less than 24degC)
- Really good bugs found this winter 👍
Kuamahanga

Very good clarity 😊
Same N as downstream
Gets a bit warm in summer (shade, shallow)
Really good bugs! 😊 😍

Surprising bug find! 👍

*** Upper catchment - shade and stability ***
Upongoruru

Good clarity (but not great)

Good bugs & fish habitat

Excellent temp (shade) 👍

Oxygen weed 😞

Cool bug! 😍
Whakatahine (Whakatamahine)

Variable clarity
Phosphate variable... 🤔
Some good bugs (indicators present)
Temp pretty good
High conductivity at times 🤔
Ngatahuna

Pretty good clarity 👍
Good bugs (indicators present) 👍
Weed (periphyton and macrophyte) increase 😞
Much lower conductivity... 😟
Variable phosphate... 😟

Fish! 😍😂
Glenlean

Great bugs (many indicators)
Excellent habitat
Cool temps - lots of shade
Low conductivity
Excellent clarity
Low or stable nutrients

Shade

👍