Is the Motueka healthy?
Insights from Invertebrates

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Issue

Does geology and land use affect the health of the Motueka River as it progresses from the mountains to the sea?

Methods

- Stream health can be assessed using the invertebrates that live there

How

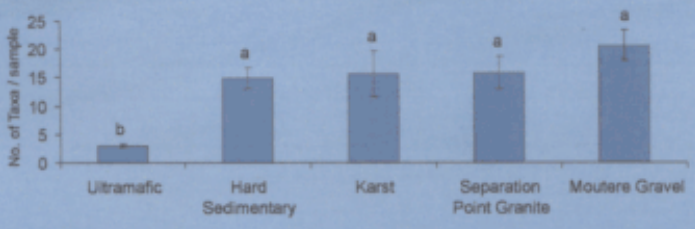
- Macroinvertebrate Community Index (MCI) and Quantitative MCI (QMCI)
- MCI assesses macroinvertebrate community health based on presence of macroinvertebrate taxa
- QMCI assesses macroinvertebrate community health based on presence and abundance of macroinvertebrate taxa
  - Sensitive species e.g. mayflies, some caddisflies - high scores
  - Tolerant species e.g. chironomids, snails - low scores
- Final community score provides an indication of stream health

Health	MCI	QMCI
Excellent	>130	>7
Good	120-130	6-7
Satisfactory	100-120	5-6
Health of concern	80-100	4-5
Poor health	<80	<4

- Sampling conducted at 46 sites covering small streams with different geology/landuse combinations, plus major tributaries and mainstem
- Examined macroinvertebrate communities in 3 native forest streams from the following geologies: Ultramafic, Hard Sedimentary, Karst, Separation Point Granite and Moutere Gravel
- In Separation Point Granite and Moutere Gravel geologies we compared macroinvertebrate communities from 3 native forest, 3 exotic forest and 3 pastoral streams

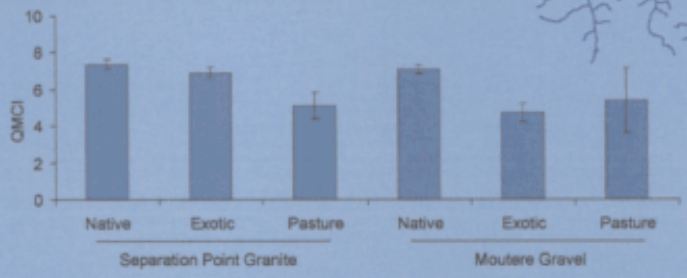
Results

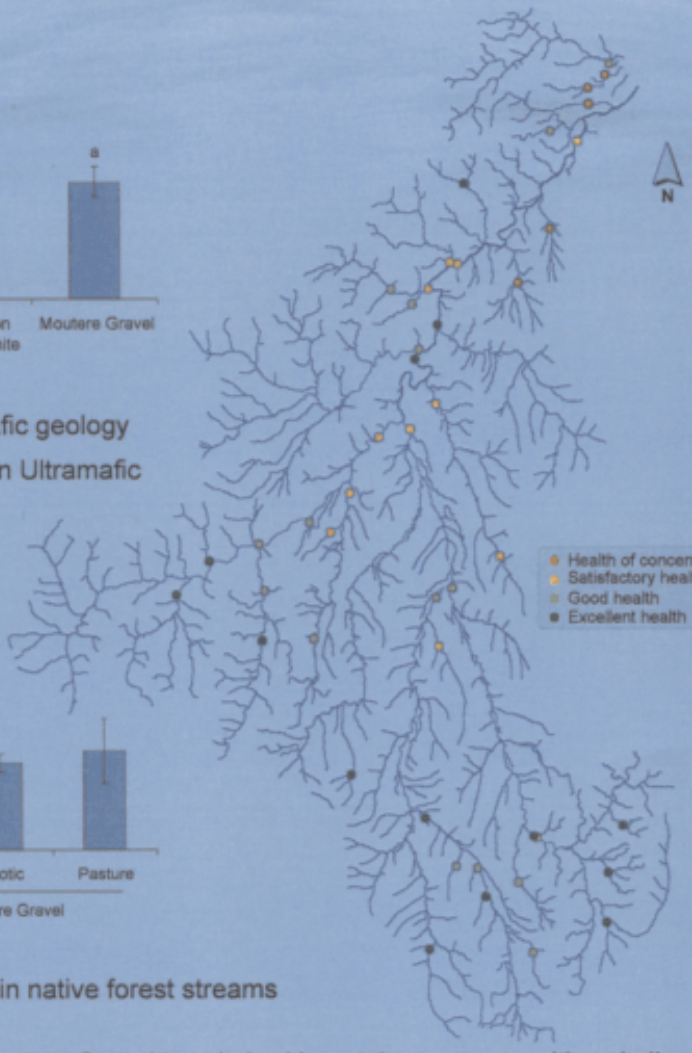
Effects of Geology



- Significantly fewer taxa found in the Ultramafic geology
- Number of invertebrates significantly lower in Ultramafic streams

Effects of Geology and Land Use





- In both geologies invertebrate communities in native forest streams were healthier than in pastoral streams
- Streams draining mature exotic forest on Moutere Gravel terrain had invertebrate communities similar to pastoral streams, while invertebrate communities in mature exotic forest streams on Separation Point Granite were more similar to native forest streams

Conclusions

- Geology and land use can influence the type and abundance of macroinvertebrates present in a river catchment
- Interaction between geology and land use important for determining effects on stream health (perhaps via sediment delivery and low flows)
- Macroinvertebrate communities indicate Motueka River is healthiest in the upper reaches, but of concern in the lowland tributaries
- The Motueka is relatively healthy compared to many other large rivers around New Zealand