

WATER WE WAITING FOR?

WATER QUALITY AND QUANTITY ISSUES IN CANTERBURY.



ACHIEVEMENT STANDARD 1.6 (AS 91012)
Version Three

DESCRIBE ASPECTS OF A CONTEMPORARY NEW ZEALAND GEOGRAPHIC ISSUE

RESOURCE BOOKLET.

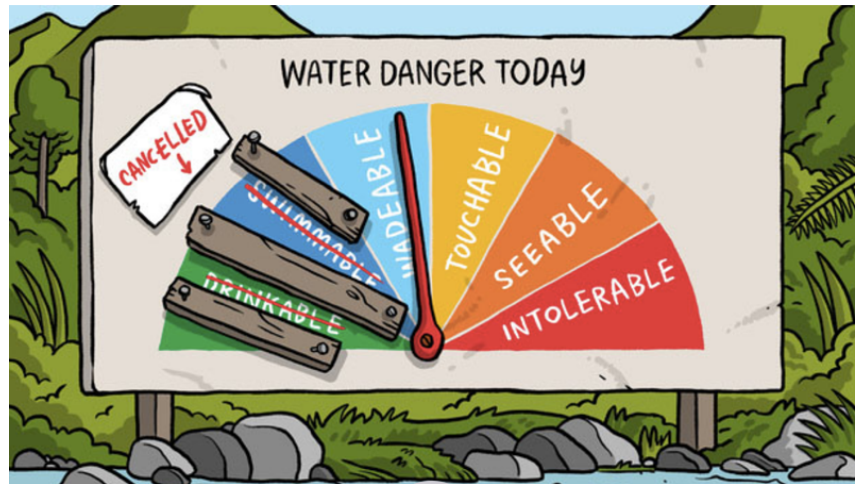


These resources give background information regarding water issues in New Zealand and Canterbury.

INTRODUCTION:

New Zealand's water resource is an important taonga for all New Zealanders to appreciate and use. It is therefore, important that we look after our water to ensure it remains viable for generations to come.

The Canterbury coastal area has seen many land use changes (urban and agricultural) over the years, and this has played a significant role in the water quality/quantity issues the region is experiencing.



The issue of water use and conservation has been debated for decades in New Zealand and Canterbury. The issue of ownership and guardianship (kaitiakitanga) has become more heated in the last few years with the loss of parts of the Selwyn River/Coe's Ford and the toxicity of Lake Ellesmere (Te Waihora) and Lake Forsyth (Wairewa).

Watch together the video from the 'Sunday' Documentary "The shameful state of our waterways."

PERCEPTIONS TOWARDS WATER IN NEW ZEALAND: THE WHANGANUI RIVER EXAMPLE.

http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11818858

<http://www.news.com.au/lifestyle/real-life/news-life/river-granted-person-status-and-legal-rights-its-strange-to-give-a-natural-resource-a-personality/news-story/cdb312497a141ce2880a4ca6d487563>

<http://geographical.co.uk/places/wetlands/item/2174-india-s-ganges-and-yamuna>



AOTEAROA, WE HAVE A PROBLEM:

What is the problem regarding water quality/quantity in New Zealand and Canterbury? These resources will provide information outlining what the problems are and some of the reasons why we have these problems.

WATER QUALITY IN NEW ZEALAND, LAND USE AND NUTRIENT POLLUTION.

<http://www.pce.parliament.nz/media/1275/pce-water-quality-land-use-web-amended.pdf>

<https://www.stuff.co.nz/environment/119979800/schools-hospital-among-providers-of-drinking-water-thats-not-demonstrably-safe>

<http://www.newshub.co.nz/home/new-zealand/2017/02/special-report-how-polluted-are-new-zealand-s-rivers.html>

<http://www.noted.co.nz/archive/listener-nz-2015/river-stance/>

<http://www.stuff.co.nz/environment/91418638/top-scientist-fixing-freshwater-issues-an-enormous-challenge>

<https://www.stuff.co.nz/environment/113679923/canterbury-water-could-be-undrinkable-in-100-years>

The following resources outline the water quality/quantity issues in Canterbury and provide help with investigating the *geographic nature of the issue*.

CANTERBURY CASE STUDY:

1) LAKE FORSYTH: WAIREWA.

Lake Forsyth (known to Māori as Te Roto o Wairewa) is a lake the Canterbury region of New Zealand.

It is fed by the Takiritawai River, a short arm of the Okuti River, and exits via a gravel bank into the sea in the vicinity of the small community of Birdling's Flat.

State Highway 75 leading to Akaroa and part of the Little River Rail Trail follow the north-western shore of the lake.

Wairewa was an important for providing tuna (eel) as food for the Ngai Tahu tribe (indigenous Maori people of South Island). It is the only Ngai Tahu customary lake. Wairewa Runanga one of the 18 Ngai Tahu Runanga are the guardians or kaitiaki of the lake.

However, deforestation of the surrounding hills has led to erosion and silting up of the lake.

The lake is hypertrophic, leading to eutrophication with corresponding poor water quality. This decline in water quality has been known since the early 1900s. So far, attempts of opening up the lake to the ocean to rectify the problem have had limited success. In 2016, after a spell of dry weather, the water quality deteriorated and recurring algal blooms made the water toxic. Animals, including pets and sheep, died after drinking the water.

<http://www.stuff.co.nz/environment/79201011/canterburys-poisonous-lake-forsyth-kills-sheep-full-of-green-slime>

This is very high powered stuff! You don't have to look at this in detail, unless you want some real extension.

<https://nzresearch.org.nz/records?utf8=%E2%9C%93&text=LAKE+FORSYTH>

2) LAKE ELLESMERE: TE WAIHORA.



Lake Ellesmere/Te Waihora is located in the Canterbury region of the South Island of New Zealand. It is actually a broad, shallow lagoon located directly to the west of Banks Peninsula, separated from the Pacific Ocean by a long narrow sandy spit called Kaitorete Spit, or more correctly Kaitorete Barrier. It lies partially in extreme south eastern Selwyn District and partially in the south western extension of the former Banks Peninsula District, which now (since 2006) is a ward in the city of Christchurch.

The lake holds high historical and cultural significance to the indigenous Māori population and the traditional Māori name *Te Waihora*, means *spreading waters*. It has officially had a dual English/Māori name since at least 1938.

In a 2010 report on lake water quality, Lake Ellesmere/Te Waihora was deemed the second most polluted lake in New Zealand in terms of nutrient content and algal growth. Algal blooms are a regular summer occurrence and toxic algae bloomed in the lake in 2009. Furthermore, most tributaries to the lake exceed the contact recreation guidelines for faecal coliforms and levels of faecal coliforms in Boggy Creek and Doyleston Drain frequently exceed the stock-drinking water guideline value.

Results for E. coli levels are also poor with 42% of sites associated with the lake failing national recreational guide standards for water quality. No sites achieved the shellfish/food gathering standard or were fit for drinking. However, there is some debate over the definition of the trophic status of Lake Ellesmere/Te Waihora. Although the lake has high nutrient and phytoplankton values that place it in the category of hypertrophic (extremely enriched) the lake does not exhibit many of the characteristics of such a classification. For example, it does not regularly undergo severe oxygen depletion, nor does it produce unsightly toxic algal blooms or fish kills, unlike other lakes in the area with the same trophic status. Furthermore, it supports abundant fish and bird communities.

Recently, it has been recognised that the combination of abstraction and climate was causing adverse effects on groundwater levels that in turn adversely affected the spring fed stream discharge into Lake Ellesmere/Te Waihora. The dependency of the lake on the ground water system in its catchment cannot be reduced, but it is to be hoped that by managing groundwater abstractions during times when the inputs to the aquifer system are low, the output system to the lake will be maintained at a level that ensures the protection of Lake Ellesmere/Te Waihora.

Being a low land lake Lake Ellesmere/Te Waihora not only receives inputs within the immediate vicinity of the lake but also from the wider catchment across the plains to the foothills. The quality of lake tributaries reflects the intensive land use surrounding them, with elevated nutrients and bacteria found in many sites. This has implications for the scale of management issues. The dependency of Lake Ellesmere/Te Waihora on groundwater sourced input has resulted in local authority Environment Canterbury implementing a restorative programme for lowland streams. Riparian protection around the lake margin and tributaries will greatly help reduce some contaminant inputs such as sediment and phosphorus, but catchment wide nutrient and water allocation management will be needed to reduce nitrates and improve freshwater inflows to the lake.

<http://www.stuff.co.nz/the-press/opinion/68314058/editorial-lake-ellesmere-has-a-future-again>

<http://www.stuff.co.nz/the-press/business/68674419/lake-ellesmere-cleanup-deal-explained>

<http://www.stuff.co.nz/the-press/news/6615350/Stock-in-lake-photos-spark-council-action>



3) SELWYN RIVER/COE'S FORD:

The **Selwyn River/Waikirikiri** flows through the Selwyn District of Canterbury in the South Island of New Zealand

The river has its source in the foothills of the Southern Alps and flows east for 80 kilometres (50 mi) before emptying into Lake Ellesmere / Te Waihora, south of Banks Peninsula. Terrace cliffs above the river's upper reaches gave the town of Whitecliffs its name.

For much of its course the river flows through wide shingle channels. In drought years, the river can disappear beneath this bed and seem to dry up completely. This frequently occurs where State Highway 1 crosses the river at the settlement of Selwyn, about 20 kilometres (12 mi) upstream from its outflow into Lake Ellesmere.

In the foothills, the Selwyn flows year-round. On the plains, the riverbed is highly permeable, and the river overlays a deep and porous aquifer. As soon as the river reaches the plains, water begins leaking down through the bed and into the aquifer. In most months, all river-water disappears within 5 kilometres (3 mi) of leaving the foothills. The next 35 kilometres (22 mi) of the river remains dry for most of the year, apart from a small section around the confluence with the permanently flowing Hororata River. About 15 kilometres (9 mi) upstream from Lake Ellesmere shallow groundwater rises back to the surface, and the Selwyn becomes permanent again.

Disappearing river flows have significant ecological effects: when the river's surface water disappears, so does the habitat for many aquatic plants and animals. In response to loss of surface water, aquatic invertebrates and fish must disperse, seek refuge in remnant aquatic habitats, or die. Aquatic plants, algae, and bacteria must form resting stages or die. The dry central reaches of the Selwyn River also constitute a significant barrier for dispersal of invertebrates and for fish migrating between Lake Ellesmere and the headwaters.



<http://www.stuff.co.nz/the-press/news/mid-canterbury-selwyn/74348061/health-warning-for-popular-camping-spot-coes-ford>

<http://www.stuff.co.nz/environment/84116972/No-longer-swimmable-A-community-mourns-its-lost-river>

<http://www.stuff.co.nz/environment/89159663/swimming-hole-on-canterburys-selwyn-river-reaches-record-low-and-nearly-stagnant>

<http://rivers.greens.org.nz/selwyn>

<http://tvnz.co.nz/seven-sharp/mike-thorpe-dipping-my-toes-into-selwyn-river-debate-6517152>

<http://www.stuff.co.nz/environment/86992441/Road-or-river-Barren-Selwyn-reaches-new-low-swimming-spot-stagnant>

<https://ecan.govt.nz/data/riverflow/sitedetails/68002>

<https://ecan.govt.nz/data/riverflow/sitedetails/68003>



GROUPS/INDIVIDUALS INVOLVED IN THE ISSUE:

These resources provide information on many of the *individuals/groups involved* in the Canterbury water issues debate and their *viewpoints/opinions/perspectives*.



IWI AND RUNANGA:

- **NGAI TAHU:**

<http://ngaitahu.iwi.nz/wp-content/uploads/2015/06/ngai-tahu-freshwater-policy.pdf>

http://ngaitahu.iwi.nz/our_stories/enhanced-water-monitoring-one-step-closer/

http://ngaitahu.iwi.nz/our_stories/ngai-tahu-farming-wins-water-quality-award/

<https://www.stuff.co.nz/environment/104351892/i-am-ashamed-a-rivers-pollution-starts-a-cultural-debate>

- **WAIREWA RUNANGA:**

<http://www.wairewamarae.co.nz/about/te-roto-o-wairewa/>

Te Roto o Wairewa was probably named after the fluctuations in water levels due to the tides. It is presently one of only two customary lakes in Aotearoa - the other being Lake Horowhenua in Te Ika a Māui. In 1986 the tuna (eel) fishery was designated as being exclusively for Ngāi Tahu whānui.

When Makō claimed the land, foreshore and lake he was also referring to the resources available

in the takiwā (area) which would prove vital to the well-being of his people. Tuna from Te Roto o Wairewa allowed these people to sustain themselves comfortably through bitter winters and became sought-after treats for guests. Barter between neighbours and relations for goods and services was common, mahinga kai was only one of many early industrial enterprises available to local Maori.



Early European visitors to Wairewa reported sleepless nights because of the bird noise. But the spectacular ancient tōtara and pine forests which grew down to the water's edge were removed to make way for settlers and farms and the birds had no home. The taniwha (water spirits) and the last of the ancient mythical people who inhabited Horomaka left and the indigenous ecosystems and natural environment (their home) were destroyed. Indigenous ecosystems became destabilised through introduced unsustainable practices, degradation became impossible to ignore but nobody wanted to take responsibility. But for over a decade now, the Wairewa Rūnanga has led the grass roots effort with regard to planning and initiatives in addressing what can only be described as 150 years of neglect. Furthermore, they are working alongside several government entities and community groups to address the concerns of all stakeholders in an effort to find positive outcomes.

GREENPEACE:



<http://www.greenpeace.org/new-zealand/en/blog/new-zealands-clean-rivers-damned-by-industria/blog/56167/>

ENVIRONMENT CANTERBURY: ECan

Canterbury Regional Council is the regional council for Canterbury, the largest region in the South Island of New Zealand. It is part of New Zealand's structure of local government. It uses the promotional name Environment Canterbury, frequently abbreviated to ECan.



The area of its jurisdiction consists of all the river catchments on the east coast of the South Island from the Clarence River, north of Kaikoura, to the Waitaki River, in South Canterbury. The region includes the Canterbury Plains, north and south Canterbury, the major braided rivers of the South Island, (the Waimakariri River, the Rakaia River and the Rangitata River) the Mackenzie Basin and the Waitaki River.

The Canterbury Regional Council is responsible for a wide variety of functions including public passenger transport, regional biosecurity, river engineering, environmental monitoring and investigations, regional policy and planning and for considering applications for certain resource consents - land use consents (including beds of waterbodies), coastal permits, water permits, and discharge permits. Canterbury Regional Council has strategic responsibilities for air, water and transport.

Christchurch often has temperature inversions which trap pollutants causing air quality issues. Ecan set up the Clean Heat Project in 2002 and it ran until 2011 to assist with cleaner burning home heating and extra home insulation.

<https://ecan.govt.nz/>

<https://ecan.govt.nz/get-involved/news-and-events/2016/new-online-guide-to-safe-swimming-launched/>

<https://ecan.govt.nz/get-involved/news-and-events/2016/new-online-guide-to-safe-swimming-launched/>

<https://ecan.govt.nz/data/riverflow/>

<https://ecan.govt.nz/data/irrigation-restrictions/>

<http://www.stuff.co.nz/business/farming/81191467/Millions-of-litres-of-water-illegally-taken-Is-ECan-doing-enough>

LOCAL CANTERBURY FARMERS:



<http://www.stuff.co.nz/the-press/news/90375877/waters-local-solutions-are-canterbury-farmers-finding-fixes-to-water-quality>

<http://www.canterburywater.farm/>

<https://www.youtube.com/watch?v=mjbzs7D7qVQ>

<https://www.stuff.co.nz/business/farming/113605689/the-race-to-future-proof-our-farms?cid=app-iPhone>

You may like to watch the 'Sunday' Documentary episode (Google Classroom) regarding the perspective of farmers.



IRRIGATION NEW ZEALAND:

<http://irrigationnz.co.nz/>

RECREATIONAL USERS:

- FISH AND GAME NEW ZEALAND:



<http://www.fishandgame.org.nz/>

<http://www.fishandgame.org.nz/newsitem/fish-game-urges-government-act-water-quality>

<http://www.fishandgame.org.nz/newsitem/water-quality-time-talk-over>

<http://www.fishandgame.org.nz/newsitem/fish-game-critical-weak-government-response-poor-water-quality>



- SELWYN HUTS COMMUNITY:



<http://www.stuff.co.nz/environment/84116972/No-longer-swimmable-A-community-mourns-its-lost-river>

<http://www.stuff.co.nz/environment/88188743/just-not-good-enough-summer-slow-at-polluted-canterbury-river>

POSSIBLE SOLUTIONS TO THE ISSUE:

Use these links and your own research, to find out how the water quality issues of Canterbury may be addressed.



You will need to suggest a *suitable course of action* to address the issue, fully *justifying* why this particular course of action is the most appropriate.

These courses of action/solutions include:

1	<i>Completely stop and eliminate all agricultural practices across the Canterbury Plains including dairying, sheep, and cropping.</i>
2	<i>Leave things as the status quo and let natural/cultural processes take their course.</i>
3	<i>Cap the number of dairy cattle, their proximity to fresh waterways and limit irrigation usage, particularly in times of drought in the Canterbury region.</i>

The relevant *strengths and weaknesses* of each solution should be addressed as part of your argument.

You need to describe, in depth, why this preferred course of action is *better than other options* through direct reference to at least one of the alternatives.

<http://www.sustainablechristchurch.org.nz/resources/water/resolving-freshwater-quality/>

<https://www.niwa.co.nz/publications/wa/water-atmosphere-1-july-2010/how-clean-are-our-rivers>

https://www.sbc.org.nz/_data/assets/pdf_file/0005/99419/A-Best-Use-Solution-for-NZs-Water-Problems.pdf

https://en.wikipedia.org/wiki/Dairying_and_Clean_Streams_Accord

https://en.wikipedia.org/wiki/Canterbury_Water_Management_Strategy

<https://www.nbr.co.nz/opinion/true-cost-wadeable-rivers-gm>

