PUBLIC HEALTH COMMUNICATION CENTRE AOTEAROA

ECan’s ‘Nitrate Emergency’: Good step but here is a more robust path for region’s drinking water

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Summary

The regional council in Canterbury, Environment Canterbury (ECan) has just voted to declare a regional “nitrate emergency,” citing rising nitrate trends in most monitored groundwater sites (see Appendix 1). The declaration is an official and public acknowledgment that groundwater quality is deteriorating and that faster action is needed to protect drinking water sources and public health.

While the declaration is a step in the right direction, ECan needs a robust path to address the severe nitrate contamination of the region’s drinking water sources to make decisive progress. Indeed, Central Government is removing or weakening many of the policy and regulatory tools councils need to protect drinking water sources from nitrate contamination. Despite this, those who are elected to council in October need to consider the steps outlined in this Briefing if the region is ever going to meaningfully reduce nitrate contamination. More broadly there is an ongoing need for Central and Local Government to do more toward source water protection by addressing the excessively high densities of dairy cows in parts of the country.

How bad is the problem?

Across Canterbury, nitrate and microbial contamination have increased with land-use intensification. ECan’s 2025 Annual Groundwater Quality Survey found 10% of wells exceeded the nitrate maximum acceptable value (MAV) for drinking water (11.3 mg/L as NO_3-N), with 62% of long-term sites showing increasing nitrate trends.[1] Recent exceedances in the Lower Waihao rural scheme in Waimate have forced short-term “do not drink” responses and long-term acceptance of elevated nitrate levels.[2] Likewise, a recent survey of domestic self-supplied bores in the Selwyn District also found widespread nitrate contamination beyond the drinking water MAV, consistent with wider environmental monitoring (Figure 1).

The predominant source of nitrate in Canterbury is dairy cattle (Figure 2), which have increased in population from 113,000 in 1990 to 1.25 million in 2022 (nearly a 10-fold increase; see Figure 3). Other sources of nitrate contamination can include septic tanks and other land use, which can cause localised contamination of water. At a regional level, however, dairy cattle are the main source.

Figure 1: Nitrate-nitrogen leached from livestock in 2017 as reported by Statistics New Zealand

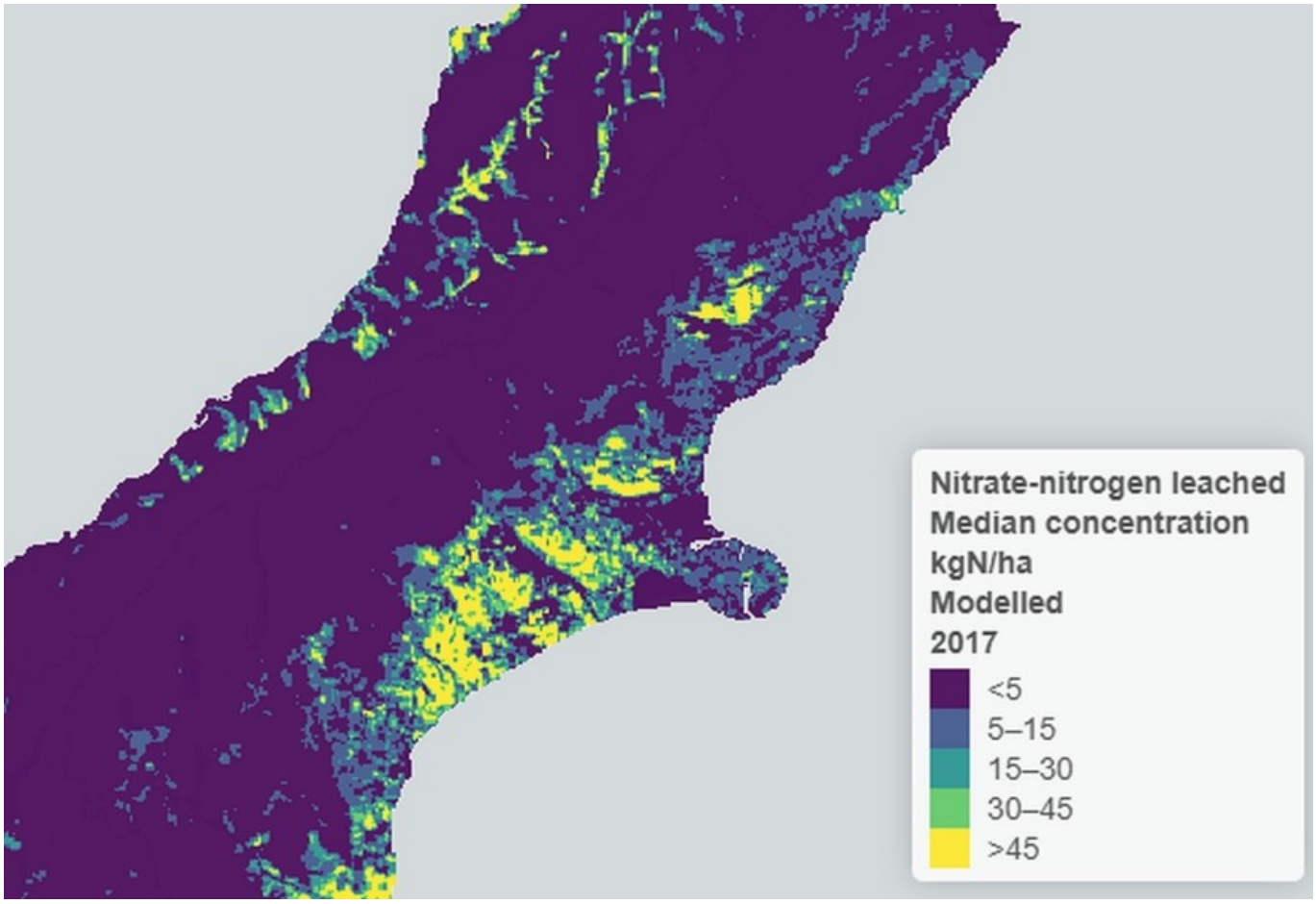


Figure 2: Agricultural land use in Canterbury/Waitaha in 2019 by dairy density (blue) and sheep, beef & deer density (purple) as reported by Environment Canterbury (ECan)

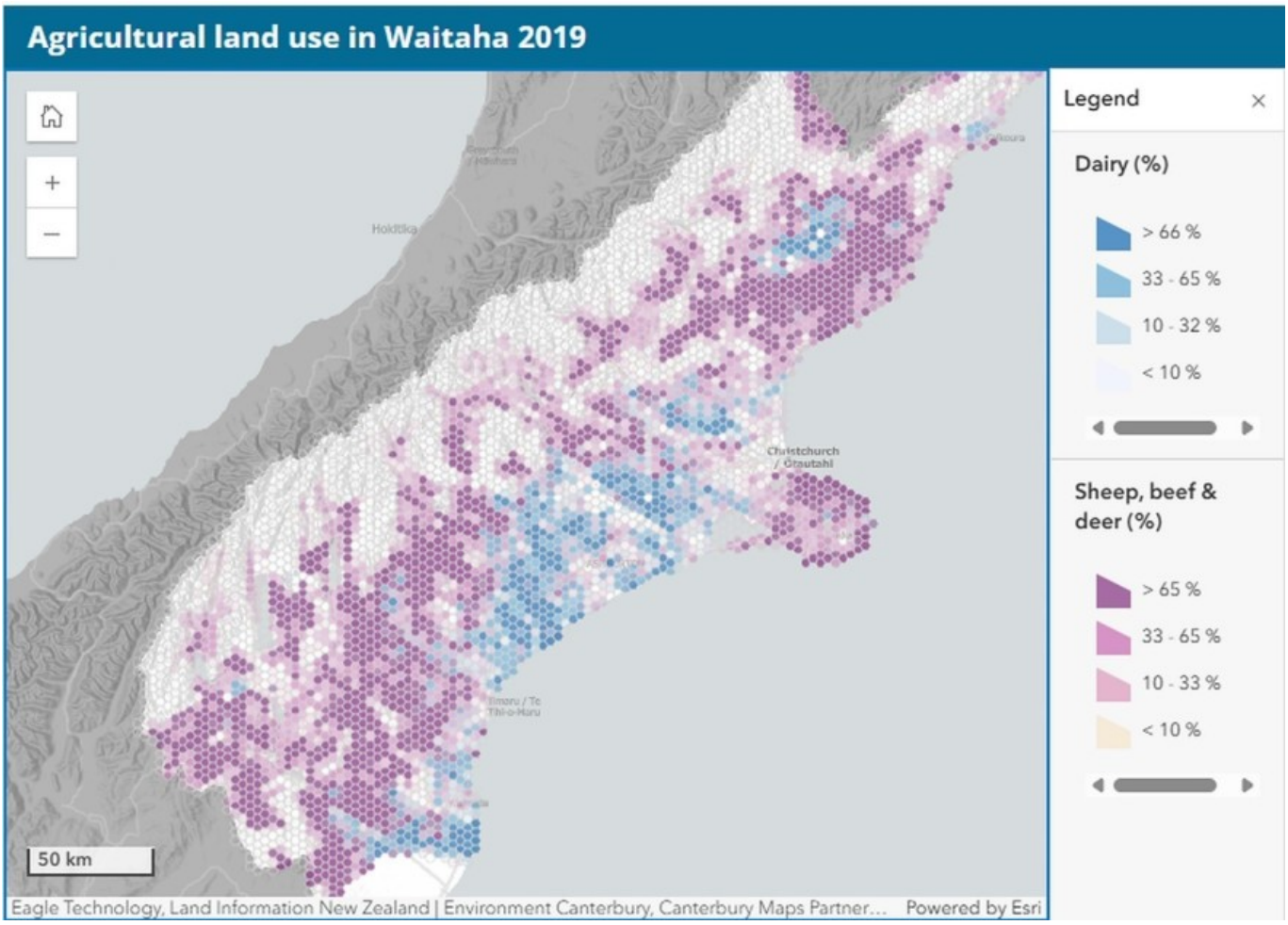
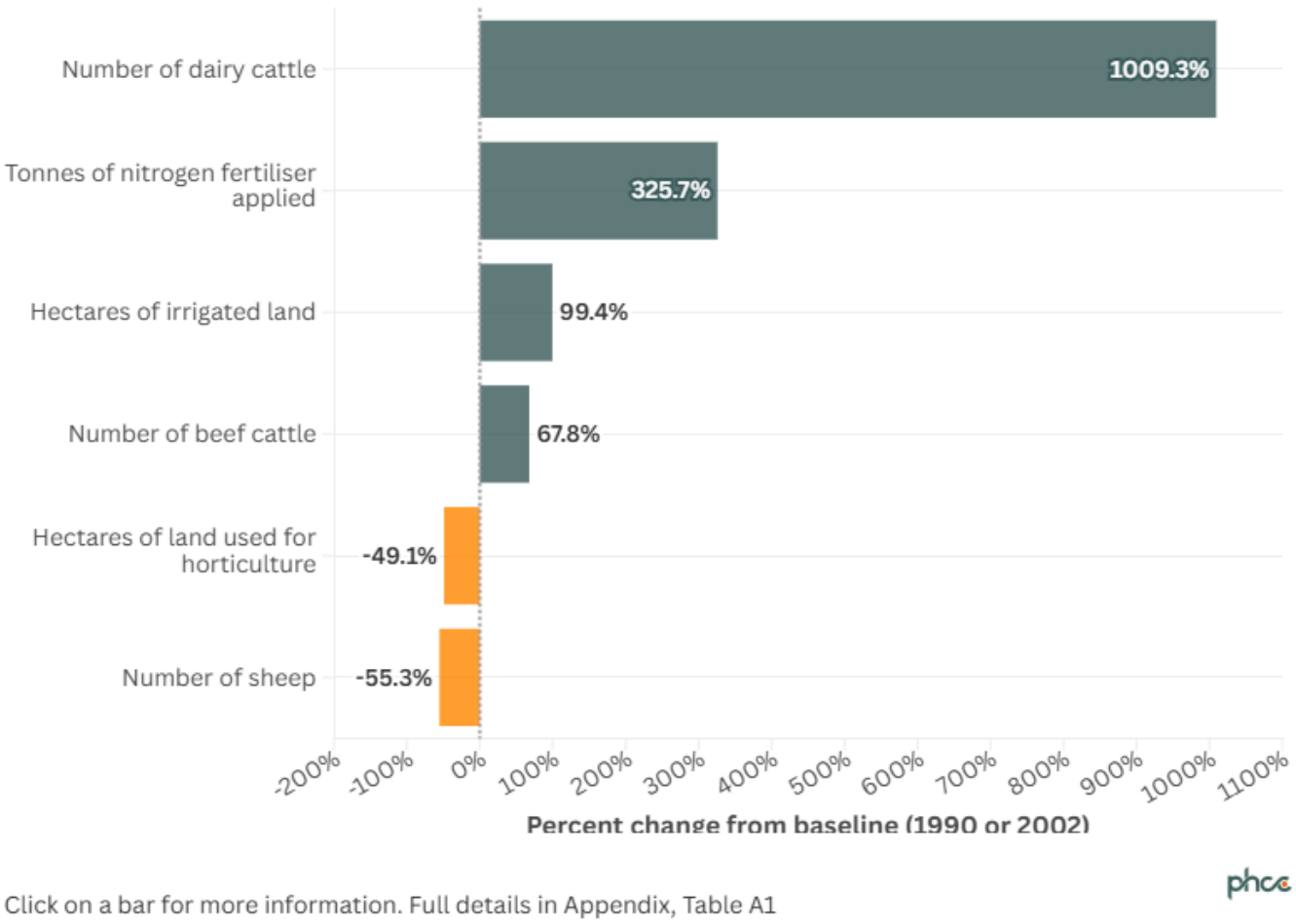


Figure 3: Percent change in land use factors from baseline to current state in the Canterbury Region



What is ECan responsible for?

Source water protection is a core part of drinking water safety and is central to reducing risk from both chemicals, like nitrate and pesticides, and human pathogens such as Cryptosporidium, E. coli, and Campylobacter.[3] In its review of national drinking water supply systems, the Government's Havelock North Drinking Water Inquiry affirmed that source water protection "provides the first, and most significant, barrier against drinking water contamination and illness."[3] As the regional authority, ECan is responsible for managing land and water use under regional plans, setting limits for pollution, issuing and enforcing resource consents for activities impacting water quality, and designating drinking water protection zones. As such, ECan is the key regulatory agency responsible for the protection of source water used for drinking water in Canterbury.

Treatment of water is unlikely to be a viable long-term solution. Nitrate removal from drinking water is technically feasible but expensive and complex to build and run, with waste brine disposal and ongoing costs (see Appendix 3).

What are the emerging potential health concerns?

The current MAV for nitrate protects against "blue baby syndrome" (methaemoglobinaemia), which can be fatal in bottle-fed infants less than 6 months old.[4] However, emerging epidemiological evidence indicates other health risks may occur below this contamination threshold. A set of studies has found elevated colorectal cancer (CRC) risk at relatively low nitrate in drinking water,[5] including a national study in Denmark over many decades.[6] For pregnancy outcomes, epidemiological studies have observed

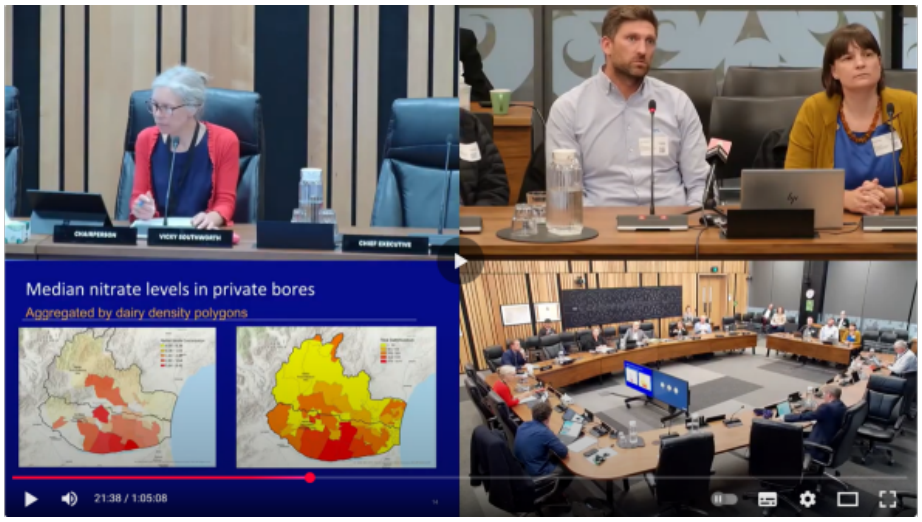
associations between drinking-water nitrate and preterm birth and certain congenital anomalies,[7] although uncertainty on causality and the magnitude of the effect remain. Overall, the weight of the emerging scientific evidence supports precautionary reductions in nitrate exposure, especially for pregnant people and infants. Today, several authorities are actively re-examining health risks associated with nitrate (outlined in Table A2).

Is the Central Government helping or hindering ECan's work on nitrates?

Agricultural Minister Todd McClay said of Ecan's declaration that it did a "disservice to an important issue the Government is focused on getting right". However, the Government has removed or is proposing to remove, weaken or delay many of the policy and regulatory tools regional councils have to address drinking water source pollution.

Despite the Government removing hard-won protections for drinking water sources, ECan and its elected councillors are not without power. The motion includes useful actions but, in our view, are insufficient to make decisive progress.

In March this year, we provided a briefing to ECan councillors on the extent of nitrate contamination to drinking water sources and potential ecological and health impacts (see full presentation here).



Our briefing concluded with recommendations for ECan that could be acted upon, regardless of any central government policy changes, which are reproduced here (with minor adjustments):

- Commission an independent evaluation of drinking water source protections, with the research question: *Can existing plans and rules achieve existing limits for drinking water sources?* This evaluation must be independent (ie, external) and peer-reviewed to ensure its rigour and overcome any bias.
- A complementary review of data availability, suitability and collection: Does ECan have access to the necessary data to make informed decisions to protect and improve drinking water sources?
- Request Auditor-General review of conflict-of-interest processes for councillors and council staff: There is a high risk that conflicts-of-interest could undermine responsible decision-making on drinking water quality and Cantabrians need confidence that conflicts are not compromising decisions on their drinking water which might impact

their health and possible risk of cancer.

What is new in this Briefing?

- ECan has declared a regional “nitrate emergency" in response to increasing nitrate contamination of groundwater.
- While a positive step, more concrete action from local and central government is required to meaningfully reduce nitrate in drinking water. This is especially so given the emerging evidence for potential health risks beyond the known “blue baby syndrome” and which include preterm birth, certain congenital anomalies, and colorectal cancer.

Implications for policy and practice

- ECan should commission an independent evaluation of drinking water source protections as well as a review of data availability and suitability.
- The Auditor-General should review of conflict-of-interest processes for councillors and council staff.
- More broadly Central Government needs to address the excessively high density of dairy cows in parts of the country and health authorities need to keep investing in research to better clarify the risk of nitrates in drinking water and potential adverse health effects.

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Appendix 1: Motion to declare a nitrate emergency - passed by ECan in September 2025

That the Council:

1. Declares a ‘Nitrate Emergency’ and recognises that Canterbury Regional Council should take a leadership role to urgently address the issue of groundwater pollution impacting drinking water sources and supplies.
2. Requests that staff bring a workshop to the next term of Council to outline the scale, causes, spatial distribution, latest lag time research, and current and predicted impacts of nitrate pollution in Canterbury to enable a well-informed discussion and development of key steps Council can take to make more rapid progress on nitrate reduction in groundwater
3. Requests advice on the indicative cost to drinking water suppliers and private well

owners (nitrate receivers) of treating nitrate-enriched groundwater or finding alternative low-nitrate sources, and considers options to reallocate costs via a targeted rate, levy, or other mechanism, such that nitrate polluters contribute to the costs of nitrate removal from drinking water

Appendix 2: Land use data

Table A1. Changes in land use in Canterbury from 1990 to 2022.

Land use factor*	Percent change (%)	Baseline	Current
Dairy Cattle, n	1009	113,000	1,253,500
Nitrogen applied as Fertilizer, Tonnes	326	38,700	164,700
Land under Irrigation, Hectares	99	240,700	479,900
Beef Cattle, n	68	319,500	536,000
Land used for Horticulture, Hectares	-49	12,400	6,300
Sheep, n	-55	10,421,600	4,662,200

* Dairy, Beef, Sheep changes are from 1990 to 2022 - Statistics New Zealand; Nitrogen Fertilizer, land under irrigation and land used for horticulture are changes from 2002 to 2019 https://www.stats.govt.nz/indicators/livestock-numbers-data-to-2023/; https://www.stats.govt.nz/indicators/irrigated-land-data-to-2022/; https://www.stats.govt.nz/indicators/agricultural-and-horticultural-land-use/; https://www.stats.govt.nz/indicators/fertilizers-nitrogen-and-phosphorus/

Appendix 3: Can we treat our way out of this problem?

Nitrate removal from drinking water is technically feasible but expensive and complex to build and run, with waste brine disposal and ongoing costs. For example, Selwyn District Council has estimated the cost of establishing the new source for their communities' supplies could be ~$400 million. Point-of-use devices, like benchtop nitrate removal units, can lower costs but shift the burden to households and not all families will be able to afford this. Environmental costs of this level of nitrate pollution are also extremely high. In short, treatment can protect health but at high capital and ongoing costs, and without the co-benefits of reducing nitrogen pollution in the wider environment, which strengthens the case for preventing contamination at source.

Appendix 4: International developments

Table A2. Examples of international developments in the assessment of the human health risk associated with nitrate in drinking water

Country	Organisation	Year	Notes

International	World Health Organization (WHO)	2016	New Zealand sets most of its drinking water standards in line with the WHO guidelines. However, it should be noted that specific water parameters within the WHO guidelines are only updated sporadically. For example, nitrate was last reviewed in 2016 based on studies up until 2015. Nitrate is not on the upcoming list of contaminants for rolling revision, so an assessment is unlikely in the short to medium term.
USA	United States of America Environmental Protection Agency (EPA)	2017-ongoing	In 2017, the U.S. EPA announced it was assessing its nitrate drinking water limit for the first time since 1991 due to emerging evidence on cancer risks (But cancelled/interrupted by successive Trump Administrations). This initial assessment document stated "for these health effect categories [inc Cancer and Reproductive effects], the available epidemiology and experimental animal studies are likely to be sufficient for drawing conclusions about human hazard".
France	French Agency for Food, Environmental and Occupational Health & Safety (ANSES)	2022	Concluded that there is an association between consumption of nitrate in drinking water and colorectal cancer and, in light of new epidemiological and toxicological data, the relevance of the quality limit of nitrates in drinking water be assessed.
Denmark	Danish Minister for the Environment	2023-ongoing	In 2023, the Danish Minister for the Environment announced the establishment of an International Expert Advisory group to review the drinking water limit for nitrate (expected Nov 2025).

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