

## Untreated groundwater supply and the Christchurch coastal aquifer system

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### ABSTRACT

Christchurch, in the south island of New Zealand, is the country's second largest city. The population of around 380 thousand people is completely reliant for water supply on untreated groundwater taken from aquifers beneath the city. As far as we know, Christchurch is the only city in the world in terms of size to implement such a supply scheme. The vital aquifers that allow this to happen comprise a multi-layered coastal groundwater system, formed by alternating strata of alluvial sediments and fine-grained marine deposits, recharged from alpine braided rivers, rainfall and irrigation return flows. Although groundwater is abstracted from multiple depths below the city, most of the water supply wells penetrate the deeper aquifers due to concerns of potential groundwater contamination in shallow aquifers. One such concern is seawater intrusion, which has historically occurred at some locations within the city. The purity of the Christchurch untreated water supply is a source of pride to the city's residents and marketed to tourists as part of New Zealand's clean green image. This presentation will explore the hydrogeology of the Christchurch coastal aquifer system and consider the vulnerability and resilience of this critical water resource to seawater intrusion and to pressures associated with contamination, population growth, earthquakes and climate change. Is the pristine water image justified? And if so, for how long?

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