

State of the Environment Report Card 2017

Measuring our groundwater levels

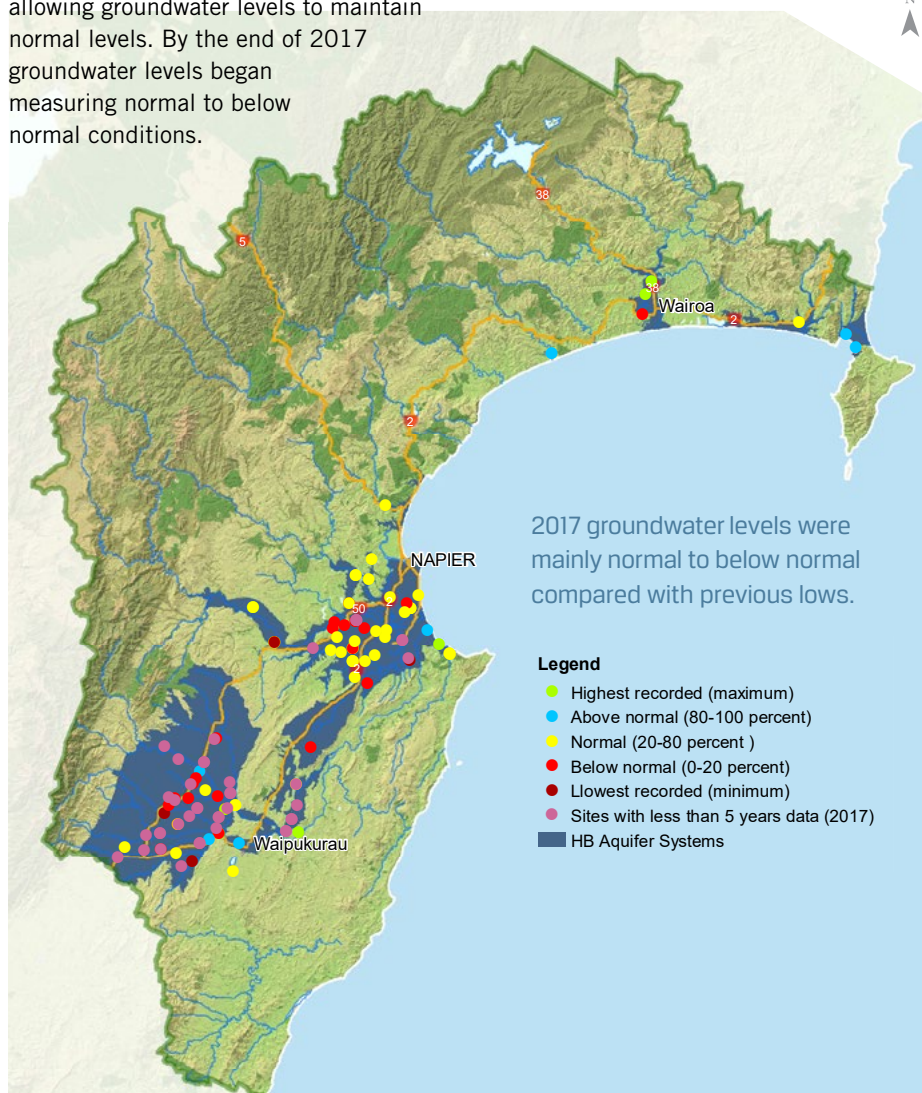
Hawke's Bay Regional Council has been measuring groundwater levels since 1968.

Groundwater levels are monitored to evaluate changes in the groundwater resource over time, develop groundwater models and forecast trends, and to design, implement and monitor the effectiveness of Resource Management Plans. In Hawke's Bay, groundwater levels fluctuate seasonally between winter highs and summer lows.

What happened in 2017 on the Heretaunga and Ruataniwha Plains?

Groundwater levels on the Ruataniwha and Heretaunga Plains for 2017 measured mainly normal except during January and February. Drier than normal conditions between December 2016 and February 2017 resulted in many record lows. By early autumn, rainfall had lowered the demand for groundwater abstraction, and levels at most sites rose to normal conditions.

A wetter than normal winter meant groundwater levels maintained their normal conditions throughout May to August with some sites on the Ruataniwha Plains measuring above normal and highest-ever levels, particularly during May and June. Rainfall in late spring probably delayed irrigation until later in November, allowing groundwater levels to maintain normal levels. By the end of 2017 groundwater levels began measuring normal to below normal conditions.



Bore 5335 in Central Hawke's Bay equipped with a float encoder and cell phone telemetry.

How we monitor groundwater levels

Groundwater levels are generally measured monthly by manually dipping monitor bores across the region. However, HBRC has a small network of bores with equipment capable of automatically measuring groundwater. These instruments record groundwater levels every 15 minutes, but can be set to measure at higher or lower frequencies.

Groundwater levels measured at high frequency allow HBRC to monitor short-term responses in the aquifer system, such as tidal effects, drawdown from neighbouring pumping and flood propagation waves during high river flows.

This information not only informs us about the specific pressures acting on the aquifer but can also be used to estimate aquifer properties, which are needed for modelling.

When telemetry is coupled with recorders, groundwater levels can be monitored in real time, so any changes can be instantly observed at the HBRC office. Telemetry also helps us identify when instruments fail - allowing us to remedy any problems immediately.



GNS Scientist placing fibre optic cable in the Ngaruroro river

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State of the Environment Case Study

Drilling below the subsurface

The Hawke's Bay Regional Council monitors groundwater at over 100 bores across the region. This network consists of both privately owned and Council-owned monitor bores. These monitor bores provide direct access to the subsurface and make it possible to measure groundwater levels, obtain water samples, conduct aquifer tests and identify physical and geochemical properties of the earth's material.

Drilling a new monitor bore is expensive. To avoid costs involved in drilling new monitoring bores, the network was initially developed mainly from privately-owned bores. Access to take groundwater samples and measurements was provided free of charge by Hawke's Bay landowners. Today, many of our most valuable monitor bores are still privately owned.

QUICK FACTS

Hawke's Bay has the second largest groundwater resource in New Zealand

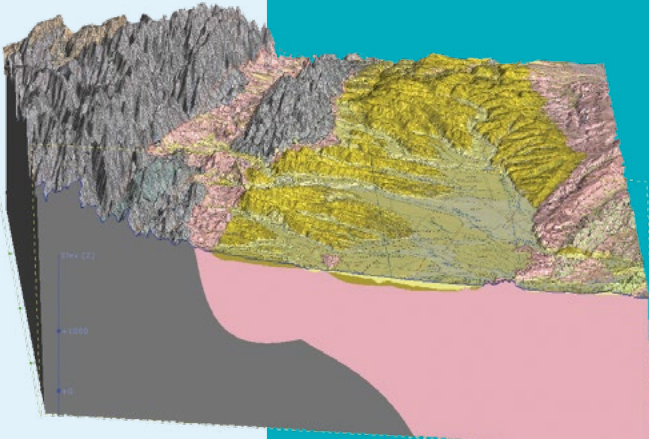
Approximately **70%** of all water consented for abstraction in Hawke's Bay is from groundwater

Groundwater is mainly used for irrigation - about **75%** of the weekly allocated volume

The Ruataniwha geological model

The main groundwater resource underlying the Ruataniwha Plains is located within a complex sequence of Quaternary deposits. These deposits infill a shallow depression, which was once occupied by a seaway that extended from Hawke's Bay to the Wairarapa. Over time, uplift and erosion of the Ruahine Range provided sediment that has infilled the basin and created a multi-layered aquifer system.

Data collected from bores suggests the alluvial aquifer system is up to 200 metres thick and overlies a sequence of marine deposits. Information about these layers helps to construct numerical models to predict the impacts of pumping and land use on the groundwater system.



Find out more

Hawke's Bay Regional Council monitors our land, water and air.

We use this data to inform our work with communities to improve and protect the environment.

Each year we develop a series of report cards to provide you with a snapshot of how our environment is tracking.

For more details including the full technical reports visit www.hbrc.govt.nz (search: report search)

For up to the minute monitoring results from Hawke's Bay and other parts of the country visit www.lawa.org.nz

