New Zealand

Capital city: Wellington
Inhabitants: 4.9 Million

INSTITUTIONAL SETTING AND PURPOSE

The Ministry for the Environment is responsible for setting national level legislation and regulation on water quality and activities that can impact it. Operational management of groundwater resources is undertaken by local government. Regional councils, of which there are 11 in New Zealand, are responsible for managing water quality and quantity, including activities which can affect aquifers. City councils are responsible for providing clean drinking water, and there are 6 unitary authorities which provide both functions of the regional and city councils.

The Ministry for the Environment periodically reports on the national state of different aspects of the environment, including freshwater and groundwater quality. Nationally, groundwater quality is assessed using the indicators ammoniacal nitrogen, chloride, dissolved reactive phosphorus, chloride, conductivity and Escherichia coli. The latest national report on freshwater was published in 2020.

Central government also provides funding for regional or national scale research to get a better understanding of groundwater resources in New Zealand. For example, a study published in 2019 was undertaken to classify different geological units at a national level in terms of their importance for groundwater flow and storage, as shown in figure 1. Other national level research includes funding for the National Groundwater Monitoring Programme, a long-term research and monitoring programme run in collaboration with all of New Zealand's regional authorities. The "Our Land and Water" National Science Challenge, is another funding avenue. This is a contestably funded research initiative, which funds research on New Zealand's freshwater resources with a particular focus on enhancing the productivity of New Zealand's primary sector.

CHARACTERISTICS OF THE NETWORK

National institutional arrangements require that each Regional Council or Unitary Authority have their own groundwater monitoring programme. The extent of the different monitoring networks varies across regional councils, depending on their size and available resources, as well as the requirements set forth in their Regional plans. However, all regions will have some monitoring of water quality, groundwater resource allocation and groundwater levels. The example of the Tasman District Council is described below.

The district council of Tasman monitors groundwater levels in all major aquifers in the district. The levels are registered at each site every fifteen minutes with data loggers. Currently, Tasman District has 50 automated groundwater level monitoring sites, and the data of these sites are available in real time via telemetry network, Figure 2.

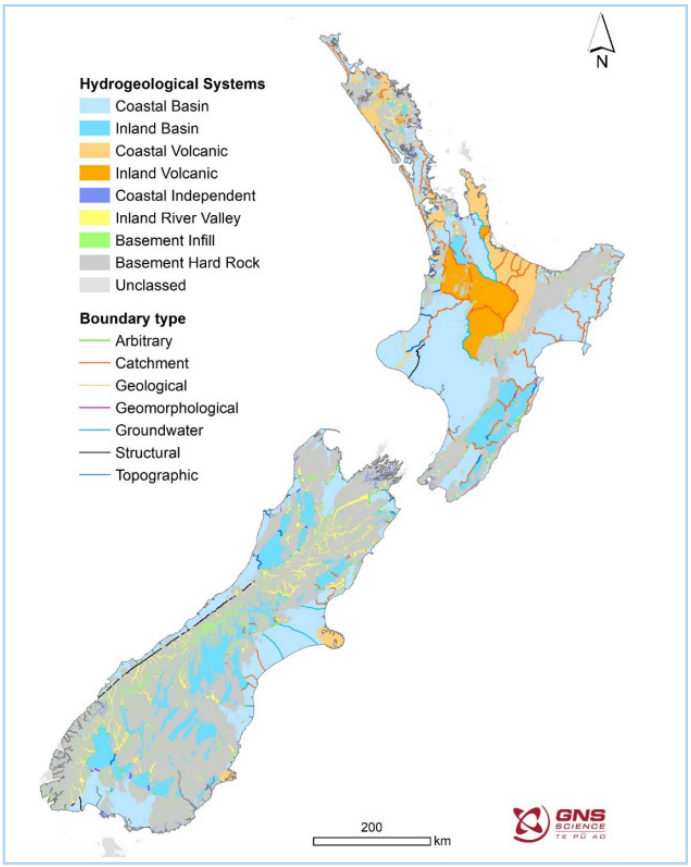

Figure 1 – National map of hydrogeological systems (from Moreau et al, 2019, and provided by the Ministry for the Environment)

PROCESSING AND DISSEMINATION

The Council publishes two groundwater level graphs: for 7 and 30 days, Figure 3. The groundwater levels are analysed as minimum, maximum and average levels and presented in a table format on the website of the Tasman District Council, Figure 4.

Groundwater History

Aquifer: Arthur Marble Aquifer

Catchment: Takaka

Zone: Takaka

Period of analysis: 25 August 1999 to 31 December 2016

Comment: This well is located in the recharge part of the Arthur Marble Aquifer (unconfined) in the central Takaka valley. This well provided long term information on the recharge to the Arthur Marble Aquifer and consequently flows in Te Waikoropupū Springs.

	Month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Min level (m)	19.19	22.55	20.62	19.50	20.52	26.63	34.26	31.98	33.98	33.71	21.63	19.39
Year it occurred	2016	2015	2006	2010	2001	2008	2013	2013	2011	2015	2005	2016
Max level (m)	44.98	44.60	46.03	47.26	48.43	47.71	46.51	46.13	44.71	45.38	47.05	48.68
Year it occurred	2012	2004	2016	2014	2011	2003	2003	2010	2012	2011	1999	2011
Average	36.08	35.17	34.46	35.80	37.94	40.49	40.52	40.25	40.05	40.19	38.16	36.58

This table shows the minimum and maximum water levels recorded each month and the year the extreme value was reached during the stated analysis period.

Figure 2 – Groundwater level analysis of the Tasman District Council

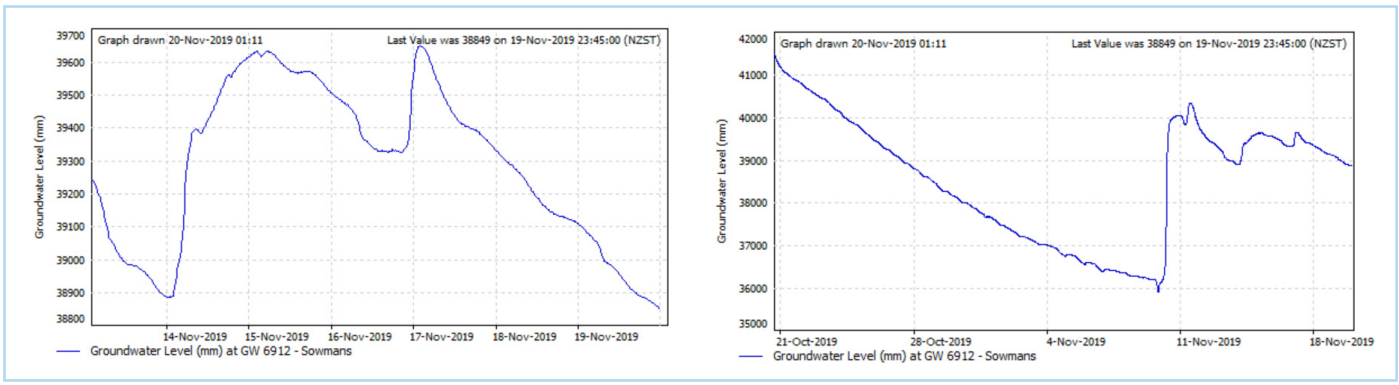

Figure 3 – Groundwater Level for last 7 and 30 days at Arthur Marble Aquifer at Sowmans

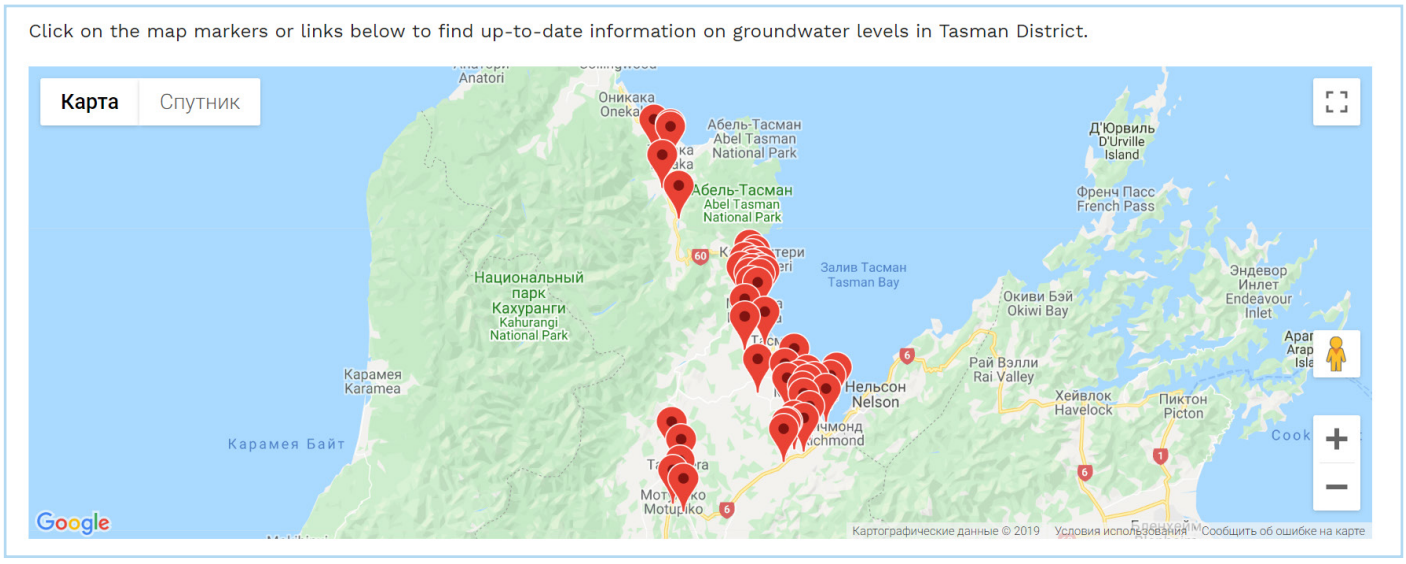

Figure 4 – Groundwater level analysis of the Tasman District Council

Sources

- **Feedback from the Ministry for the Environment** - received on 01-10-2020;
- **Ministry for the Environment, Our freshwater 2020 Report** - https://www.mfe.govt.nz/publications/environmental-reporting/our-freshwater-2020;
- **Ministry for the Environment, New Zealand groundwater atlas** - hydrogeological-unit map of New Zealand: https://www.mfe.govt.nz/publications/fresh-water/new-zealand-groundwater-atlas-hydrogeological-unit-map-of-new-zealand; and
- **Tasman District Council, Groundwater levels** - https://www.tasman.govt.nz/my-region/environment/environmental-data/groundwater-levels.