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## Geographic Information System (GIS) as a basis for the next generation of hydrogeological models to manage the geothermal area Waiwera (New Zealand)

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The geothermal hot water reservoir below the small town of Waiwera in New Zealand has been known to the indigenous people, the Maori, for many centuries. Its use by European immigrants began in the 19<sup>th</sup> century. Until the end of the 1960s, all production wells drilled for the warm water were artesian. But, triggered by overproduction, the water which has a temperature of up to 50 °C, has to be pumped up since then. In the 1970s, the warm water springs on Waiwera beach also dried up. Therefore, the Auckland Council implemented a water management plan for a future sustainable use of the area in the 1980s (Kühn and Altmannsberger 2016). Just recently, there have been reports about recovered, temporary artesian flow from several wells. Further, there is indication for a renewed activity of the hot springs at the beach (Präg et al. 2020). For a comprehensive understanding and an environmentally friendly and balanced long-term usage of the aquifer, a fairly complex hydrogeological model is required.

Various approaches for a quantified hydrogeological description of the Waiwera reservoir have been implemented since the 1980s. Some are data driven (Kühn and Schöne 2017, Kühn and Grabow 2021) and others process based (Kühn and Altmannsberger 2016, Somogyvári et al. 2019) to finally understand and assess the constraints and impacts on the system (Kühn and Schöne 2018). However, none of the models directly delivers all the results needed for an all-encompassing water management. Disadvantage of all previous work is the independent model set-up and usage of only some of the acquired monitoring and simulation results. We present now a Geographic Information System (GIS) as a data base which integrates all geoscientific information known about the geothermal area of Waiwera combined with software tools for management. This will be the basis of the next generation of hydrogeological models for the geothermal area.

### Literature

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