



Groundwater Case Study: Irrigation

Annual Monitoring Summary 2007/08

Key points

- The number of applications for irrigation resource consents has steadily increased since 2002 with groundwater supplying over 80% of irrigation resource consents.
- The amount of groundwater allocated for pasture irrigation is currently higher than the conservative demand scenario projected in the Water Demand Strategy (2003).
- Irrigation development is being restricted in some parts of Southland as aquifers approach their sustainable limit.
- Although the supply of water use data has been poor, available data shows irrigators used on average 54% of their allocated volumes during the dry 2007/08 season – up on previous seasons.

Why we monitor groundwater abstractions

Under natural conditions the volume of water in an aquifer reflects a balance between recharge from rainfall and river flow, and discharge to other water bodies including rivers, streams and lakes.

Groundwater abstraction can affect the natural balance

through lowering groundwater levels. A single abstraction can cause drawdown over a small, localised area but over a longer time scale, or if the rate and number of abstractions increase, then localised drawdowns can accumulate into an aquifer-scale groundwater level reduction.

If not appropriately managed, the cumulative drawdown effect may impact existing groundwater users, affect flows in rivers and streams and may ultimately exceed the sustainability of the resource.



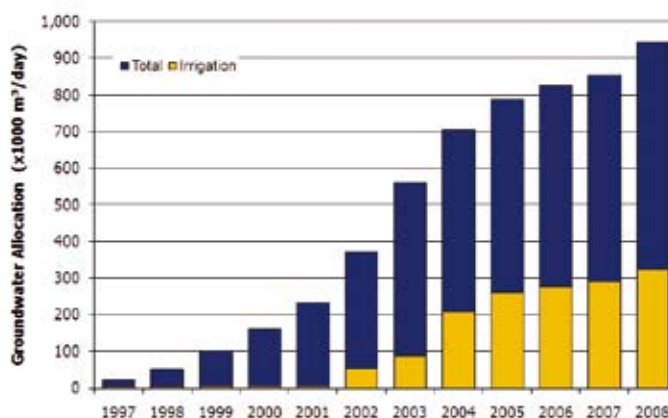
Growth of irrigation in Southland

Demand for groundwater has risen rapidly in recent years, primarily driven by pasture irrigation. The “water rush” started in 2002 and since then the number of resource consent applications for irrigation received by Environment Southland has steadily increased. In 1998 there were 3 resource consents for pasture irrigation - today there are over 60. Over 85% of irrigation consents source their supply from groundwater.

equivalent to about 10% of groundwater allocated in Canterbury. But with most of Southland’s pasture irrigation

concentrated within a relatively small area, the effects on sustainability and water resources are significant.

Consented groundwater takes



In progress

Telemetry of water use data:

In order to make it easier for consent holders to supply water use data, Environment Southland has set up a system designed to automatically process this data daily. Please contact Environment Southland if you would like to find out more on how to provide your water use data electronically.

New guidelines for managing confined aquifers and stream depletion effects:

Environment Southland's Regional Water Plan recognised that there was limited understanding of Southland's groundwater resources when the Plan was reviewed in 2004. Since then understanding of the region's aquifers has grown, leading to a review of how to manage some of the aquifers, particularly those facing the greatest demand.

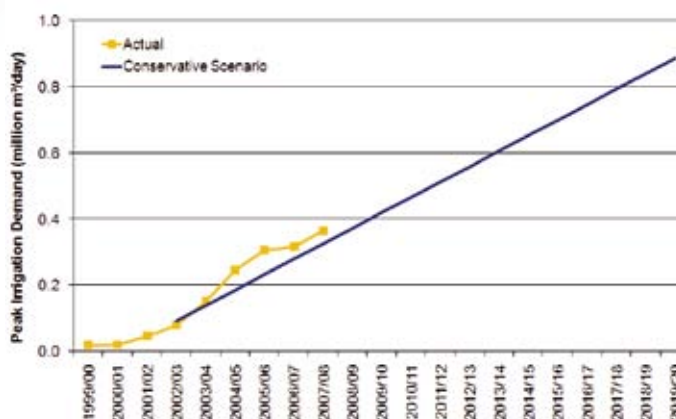
References

Lincoln Environmental and MWH (2003). *Water Resources Study – Stages 1 to 3*. Lincoln Environmental report no 4597/1 prepared for Venture Southland.

Groundwater allocation

As part of the Southland Water Resources Study (Lincoln Environmental and MWH, 2003), the likely future demand for water in Southland was investigated. The study suggested pasture irrigation would be the main driver for a significant increase in future water use in Southland and that groundwater would be predominantly used to meet this demand. So far the demand for water for irrigation surpasses the conservative scenario proposed in the study. Under this scenario, it is projected that by 2020 parts of Northern Southland will be unable to meet the water demand and that moderate levels of storage would be required to address the shortfall. In areas where there may be shortfalls, there may not be enough groundwater to meet all the irrigation demand, but there is likely to be enough to meet demand for all other purposes.

Water demand for irrigation



Restriction to irrigation development can occur naturally when an aquifer is unable to provide sufficient yield or can be imposed through consent conditions which are designed to ensure the abstraction is sustainable and does not result in adverse environmental effects. Currently there are several aquifers in the Waiau, Oreti and Mataura catchments either at or close to their preliminary allocation threshold. Granting of further resource consents for abstraction from these aquifers is likely to be limited until further work is done to more accurately determine the sustainable limit.

Water use

While pasture irrigation is a major consumptive use of groundwater in Southland, the amount used each season is strongly influenced by climate – particularly rainfall, air temperature and wind. Due to below average rainfall which started in November 2007 and continued throughout summer to late autumn, many areas experienced dry conditions during the past irrigation season. This was particularly evident in the Waimea Plains which suffered a severe rainfall drought. Despite the dry conditions, consent holders on average used only 54% of their consented volumes however less than half of consent holders have supplied Environment Southland with their water use data as required by their resource consent. Environment Southland is currently reviewing how it deals with ongoing non-compliance of water use data.



Further information

More detail on the groundwater monitoring programmes is available on our website at www.es.govt.nz.



Contact at Environment Southland:

Karen Wilson (Groundwater Scientist)

Phone: 03 211 5115

Email: karen.wilson@es.govt.nz