

Groundwater threat to rivers worse than suspected

November 2 2010, By Mary Mulcahy



Groundwater and surface water interact in complex ways to determine the health of ecosystems. Credit: Ian Overton, CSIRO

Excessive groundwater development represents a greater threat to nearby rivers and streams during dry periods (low flows) than previously thought, according to research released today by CSIRO.

In an address to the [Groundwater](#) 2010 Conference in Canberra, CSIRO Water for a Healthy Country Flagship scientist, Dr. David Rassam, said land-use practices that reduce groundwater recharge into [rivers](#) and streams could significantly reduce low flows in nearby rivers and streams.

“Many rivers are highly dependent on ‘base-flow’ from groundwater to keep running through dry times and traditional ways of managing groundwater pumping follow a ‘safe yield’ approach which balances the

amount of water extracted with the amount known to be ‘recharging’ the aquifer,” Dr. Rassam said.

However, the study, conducted at Tarcutta in NSW, showed that application of this ‘safe yield’ approach in times of low-flow can reduce recharge much more severe than previously thought.

“The yield of an aquifer must be considerably less than recharge to ensure sufficient water to maintain the quantity and quality of low flows in streams, springs, wetlands and other groundwater-dependent ecosystems,” Dr. Rassam said.

“Many people don’t realise that groundwater discharge from shallow aquifers to surface water systems represents an environmentally critical component of the flow in most rivers.

“It’s the groundwater discharging into the channel through the bed and banks of the stream that keeps it flowing during the dry period. Most rivers are basically sustained by groundwater during the dry season.

“What we found was that the impact on base-flow of reducing recharge might be small at first, but that each subsequent reduction of recharge has a disproportionately large impact on base-flow in the stream.

“In this stream in Tarcutta we found that increasing groundwater pumping by 40 per cent caused a 93 per cent reduction in base-flow in the river – it’s not a linear relationship at all.

“This demonstrates that preventing water entering aquifers, or pumping too much groundwater out, may lead to complete drying of nearby streams during the dry period.

“This can happen much more easily than we previously thought. The

impacts on local water ecosystems could be dire.”

More information: The Groundwater 2010 conference runs from 31 October to 4 November at the National Convention Centre, Canberra.

Provided by CSIRO

Citation: Groundwater threat to rivers worse than suspected (2010, November 2) retrieved 20 April 2024 from <https://phys.org/news/2010-11-groundwater-threat-rivers-worse.html>

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