



focus on **NRM** research

New and rare species of stygofauna in our aquifers

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What are you researching?

The project investigates the groundwater ecology of the Condamine, Gwydir, Namoi, and Macquarie catchments. Specifically, we are interested in the ecological roles of two broad groups of organisms: groundwater microbes, and stygofauna (highly specialised invertebrate that live in aquifers).

Together, these groups of organisms effectively maintain water quality and potentially maintain flow in aquifers, so that it remains suitable for drinking and agricultural purposes.

What have you found?

Research focused on the biological components of groundwater is a relatively recent endeavour in eastern Australia; consequently, the majority of the stygofauna we've found belong to species, or even genera, that are entirely new to science.

Stygofauna and microbial species inventories are currently being compiled, and their distributions mapped within the target catchments. In terms of results, previous research in the Gwydir and Namoi catchment has identified biological differences in ecosystems under irrigated and non-irrigated land. Preliminary evidence in these catchments indicates increased diversity and abundance of both stygofauna and microbes at sites adjacent to irrigated farms. The implications of these findings in terms of groundwater health and quality are unclear at this stage.

A framework to measure groundwater health has been created and is currently being refined and tested. This framework is the first framework anywhere in the world that attempts to measure the health of groundwater using a combination of ecological, environmental and water chemistry measurements.

Why is it important?

Initially this project will establish a baseline inventory of stygofauna and microbes within the target catchments, and subsequently data will demonstrate how diversity within these communities responds to environmental conditions and land-use practices.

The work will use DNA sequencing and other methods to indicate differences in microbial and stygofaunal community structure and function under alternative land-uses, such as pasture or irrigated agricultural land. This research will contribute to refining the Groundwater Health Index, a practical tool by which groundwater health can be evaluated and monitored in a quick, cheap and robust way.

How can I apply the research/what should I do about it?

In these early stages of the project, the Groundwater Health Index is still being refined, and alternative techniques trialled, to produce practical and affordable tools for use by industry.

Where do I go for more information?

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