

ASSOCIATE PROFESSOR BRYCE KELLY

*Cotton Seed Distributors
Researcher of the Year*



Associate Professor Bryce Kelly has been undertaking research for the cotton industry since 2004. Working for the Connected Waters Initiative Research Centre, UNSW Australia, his research focuses on water use efficiency, sustainable aquifer management and assessing the impacts of the expansion of mining and coal seam gas (CSG) developments adjacent to agricultural lands.

Bryce's research has seen him test 60 groundwater wells across the Condamine and Namoi Catchments for methane levels. Working with a team of researchers from UNSW Australia, the Australian Nuclear Science and Technology Organisation (ANSTO) and Royal Holloway, University of London, Bryce has been baselining existing atmospheric and groundwater conditions and has established where there is connectivity between coal measures and the overlying freshwater aquifers.

The team has pioneered as a world's first, the combined use of atmospheric and groundwater methane surveys. Their car-mounted equipment accurately measures concentrations of methane allowing them to map the location of abandoned exploration boreholes and natural seeps via geological faults, as well as gas leaks from CSG production facilities and coal mines.

Because it takes decades for groundwater impacts to actually play out Bryce is particularly focused on assessing the long term impacts of today's management decisions. As Australia has the best groundwater records in the world in terms of levels, he has been able to quantify the impacts of past management decisions, using this to guide better future groundwater management decisions.

Unfortunately, monitoring of Australia's groundwater quality has been done as rare snapshots. For this reason much of the teams' recent work is on mapping the quality and age of the groundwater, in an effort to help determine how recharge zones

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FINALIST

Associate Professor Bryce Kelly

should be managed. Whilst some of the water has been shown to be less than 100 years old, some of it is up to 30,000 years old.

Bryce believes aquifers are nature's perfect dams, as the evaporation rate in the aquifers is zero! The team is now researching how flood waters could be better managed for aquifer recharge, to replenish stressed aquifers.

Bryce is passionate about personal engagement with groundwater users. The analysis of groundwater levels, chemistry, quality and age has enabled the





team to provide extensive, personalised feedback to cotton growers and irrigators about the origin and sustainability of the groundwater that they use.

The work Bryce has done has greatly improved the cotton industry's understanding of groundwater resources. This has not only informed industry itself, but also the CSG industry, government policy and legislation and the broader community on the potential impacts of the CSG production, mining and irrigated agriculture. He has helped inform this important public debate with robust science.

He is now evaluating the impacts of the recently implemented water sharing plans in NSW to determine if the plans achieved the desired goals, and if not how can they be modified.

Bryce is an inspiration to younger researchers. He has mentored over 40 Honours, Masters and PhD

students through their projects and start in earth science careers. One of his PhD students recently published an article that is ranked in the top 2% of scientific articles in the world.

With his ability to easily convey highly complicated concepts Bryce has reached international, peer reviewed acclaim, as well as garnering great respect from across the cotton industry. He hopes that his research will result in the improved management of our groundwater resources - benefiting both the wider environment and rural communities for many generations to come.

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