PhD opportunity: Using environmental tracers in contaminant hydrogeology for protection of high value springs and water supplies

Supervision team: Prof. Matthew Currell (Griffith University); Dr Dylan Irvine (Charles Darwin University), Dr Mark de Bruyn (Griffith University);

Background:

Groundwater is a vitally important source of water for communities and the environment, yet its quality is threatened by a range of pollution sources and anthropogenic impacts. The aim of this project is to use a novel combination of environmental tracers present in groundwater from a high-value aquifer system in northern Australia – the Cambrian Limestone Aquifer, to better understand:

a) The processes that control the occurrence, movement and behavior of key emerging contaminants (including PFAS, pesticides and other micropollutants)
b) The impacts and interactions between contaminants and the groundwater ecosystem, through monitoring and analysis of environmental DNA data

The research will improve our knowledge of the major controls on contaminant sources and behaviour in groundwater within complex karst geology and improve our understanding of the interactions between chemical pollutants and the groundwater eco-environment. This is vital for ensuring clean water for all, and protecting the intrinsic value of the ecosystems within and connected to aquifers.

Proposed methodologies

The project will involve multiple fieldwork campaigns to sample groundwater bores and springs, and analyse environmental isotopes, major and minor ions, contaminants of emerging concern and environmental DNA in the water. The PhD candidate will be expected to conduct sample preparation and analysis work, supported by various laboratories where analysis will take place. The data obtained will be analysed in conjunction with existing hydrochemical, hydrogeological and contextual data and information, to develop better conceptual and analytical models of the system and inform impact assessment, contaminant management and remediation strategies.

Timeframe: The project will be conducted over a three-year period (full time), commencing in the first half of 2026.

Scholarship/funding support: Base stipend allowance of $35,000 per annum, tax-free.

Up to $35k per annum to fund student travel, field equipment and sample analysis.

Contact: m.currell@griffith.edu.au **/ +61407741120**