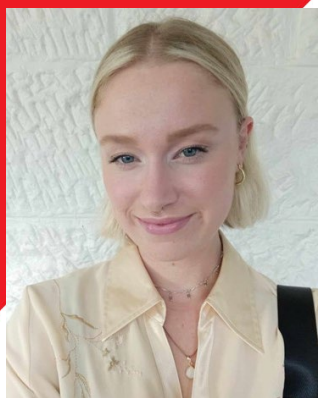

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Summary

Natural springs have long been revered for their important role transferring water, nutrients and energy from below the ground to our surficial environments. As such, springs are commonly associated with ecological significance and cultural values. Spring discharge, particularly when perennial, can also be influential in supporting and sustaining surface water flows and their associated ecosystems far from the relatively limited spatial extent of the spring. However, due to the nature of groundwater being difficult to access and visualise, sources and dynamics of spring discharge and length and duration of the groundwater flow paths transporting water to springs is often poorly characterised. This in turn limits our understanding of the role this water plays when discharged into surface environments, and ultimately, reduces our capacity to assess vulnerability of water resources and dependent ecosystems to changes in water availability or system dynamics, caused by external factors such as climate change and water use by industry.

This research aims to develop conceptual understandings of springs in Queensland that are associated with the Great Artesian Basin, Australia's and one of the world's largest groundwater resources. The study area includes springs in the Carnarvon National Park that are associated with significant cultural value to the First Peoples of the region, and known to support rare and threatened ecological communities.

This project employs a multi-tracer approach that combines hydrological tracers, including isotopes and water chemistry, with eDNA as an ecological indicator. This novel combination of chemical and biological indicators, applied as hydrological tracers, will serve as a case study for the value of integrating abiotic and biotic parameters for tracing water through the environment and uncovering new insights about its ecological role and influence.

Research Expertise

- Hydrological conceptual modelling
- Field campaign planning and water sampling