ONE BASIN CRC PhD program

Are you looking at developing world-leading skills in helping communities tackle climate change, capitalise on the digital transformation and accelerate rural innovation? Are you interested in receiving training from internationally renowned experts, whilst working with industry partners in the iconic Murray-Darling Basin on real-world problems?

The One Basin Cooperative Research Centre (One Basin CRC) offers attractive PhD packages in a broad range of disciplinary fields and across multiple universities in Australia (Australian National University, Charles Sturt University, Flinders University, The University of Adelaide, The University of Melbourne, The University of Sydney). Our PhD graduates will be the future leaders in basin research and application. Our One Basin PhD program provides unprecedented leadership development opportunities, extensive industry networking, and the chance to establish a deep understanding of your chosen field. Key features of the One Basin CRC PhD Program are:

- A 3.5 year scholarship with the option of a 6 month-funded internship with an industry partner or equivalent part-time employment.
- A flexible funding package including a stipend as much as $56,000 pa* and generous travel and operational costs, with potential additional income from working part-time with industry partners and further scholarship funding.
- The PhD program seeks to achieve gender balance and attract candidates from all walks of life, with Australians of Indigenous and Torres Strait Islander heritage particularly encouraged to apply.
- Opportunities for travel (including the possibility of international conferences), development and engagement with a strong research network that is being developed through the 10-year CRC.
- Each candidate will spend the majority of their time in one of the following research hubs: Loxton (South Australia), Mildura (Victoria), Griffith (NSW) and Goondiwindi (Queensland) with associated node in Narrabri (NSW).

Our PhD program will give you the professional skills and networks to accelerate your career in research or practice across the water, agriculture or environmental sectors.

** This is dependent on the host university policies, other available co-funding, and candidature experience and background. Candidates will receive a minimum stipend of $35,000 pa and a further minimum $20,500 (total) in operational funding (2024-25 rate). The exact allocation of the funding package between the stipend and support activities (such as conferences, travel to and from regional hubs) will be agreed to by the host university, PhD student and the 1BCRC. Applicants must be intending to apply for, and be highly competitive for, a Research Training Program (RTP) Stipend (or an equivalent scholarship). The student will enter the PhD program in 2025 and enrol on a full-time basis.*

Are you a student looking for an outstanding PhD opportunity with strong industry links and career opportunities at an equivalent graduate level salary? Are you an industry professional who is open to undertaking a PhD project while retaining employment and salary benefits?

PhD project ID: 1BPhD22-03 **Date advertised:** 5 September 2024

PhD project title: **Hydrogeological opportunities and constraints of the groundwater resource across the Murray-Darling Basin**

Description of the topic of PhD project:

This project will contribute to a basin-wide understanding of the groundwater resource and its suitability to support current industry, agriculture and local communities as well as their potential future expansion within the Basin. In the 1990s regional-scale hydrogeological mapping generated basic data on key hydrogeological indicators of the groundwater resources. This 'Basin in a box' data should be extended by new data on hydraulic parameters, groundwater systems delineation, and water quality; acidity, redox conditions, major ions, including nitrate, as well as minor ions, such as iron and manganese, providing a 'fit-for-purpose' evaluation of the resource. Other identified gaps in the understanding are the level of groundwater use and its risk due to connectivity to surface waters. The research challenge is to conceptually model a wide variety of data into hydrogeological relevant information, requiring integration through GIS, geostatistics, and derivation of groundwater indicator maps, allowing better-informed decision-making, leading to improved economic, environmental and social outcomes. This PhD will develop hydrogeological evaluation methods and test these in multiple case study areas across the Basin:

- to delineate areas where groundwater quantity and quality permit sustainable use of groundwater as a viable water resource through direct use.
- to delineate areas where opportunities for alternative water supplies exist:
  i) areas suitable for managed aquifer recharge;
  ii) areas suitable for decentralised on-farm desalination;
  iii) areas suitable for bankfiltration.
- to contribute to a web-based decision support system allowing industry and governments to better visualise, evaluate and communicate opportunities and limitations of groundwater use in the Basin.

Primary university supervisor(s):
Prof Okke Batelaan (Flinders University)

Co-supervisors:
To be confirmed depending on student interests: Ilka Wallis, Howard Fallowfield (Flinders University), Michael Leonard/Holger Maier (University of Adelaide), Juliette Woods (DEW), Steve Barnett (DEW)

Requisite qualifications and experience:
Candidates must have a qualification equivalent to an Australian H1 Honours degree (a prior research thesis that was at least six months of full-time credit and received an excellent mark, or a first author publication in a peer-reviewed international journal). Candidates with Masters or honours degrees in the following disciplines, or with equivalent research or work experience will be favourably considered: *Earth/Environmental Science, Civil/Environmental Engineering.* Quantitative groundwater hydrology research experience would be particularly welcomed.

To determine your eligibility for studying at Flinders University see:
https://www.flinders.edu.au/study/postgrad

1BCRC industry partner(s) potentially involved:
DEW (South Australia), MDBA, CSIRO, and likely DEECA (Victoria), DCCEEW (NSW)