



ARC Training Centre for

Climate-Resilient
Water

Resilient water, secure future



climateresilientwater.org

Join the ARC Training Centre for Climate-Resilient Water:

Shape the future of Australia's water security

The ARC Training Centre for Climate-Resilient Water is a nationally funded, five-year research and training initiative developing the next generation of researchers and industry leaders to deliver reliable, affordable, low-emissions water systems.

By 2070, water demand in some Australian cities could double — just as climate change reduces supply reliability and increases system volatility. Energy costs are rising, emissions targets are tightening, and the need for affordable, secure water has never been greater. Yet Australia currently lacks the workforce capability required to navigate this transformation. Our centre aims to address this challenge.



Australian Government
Australian Research Council



About us

Our PhD projects span three interconnected research themes:



A. Collaborative Governance

How do we transform our social and regulatory systems to enable adaptive climate-resilient water options to become mainstream?

Projects: 1, 2, 3



B. Reliable Water

How do we transform large supply systems to be more reliable given far greater climatic extremes, at less energy cost?

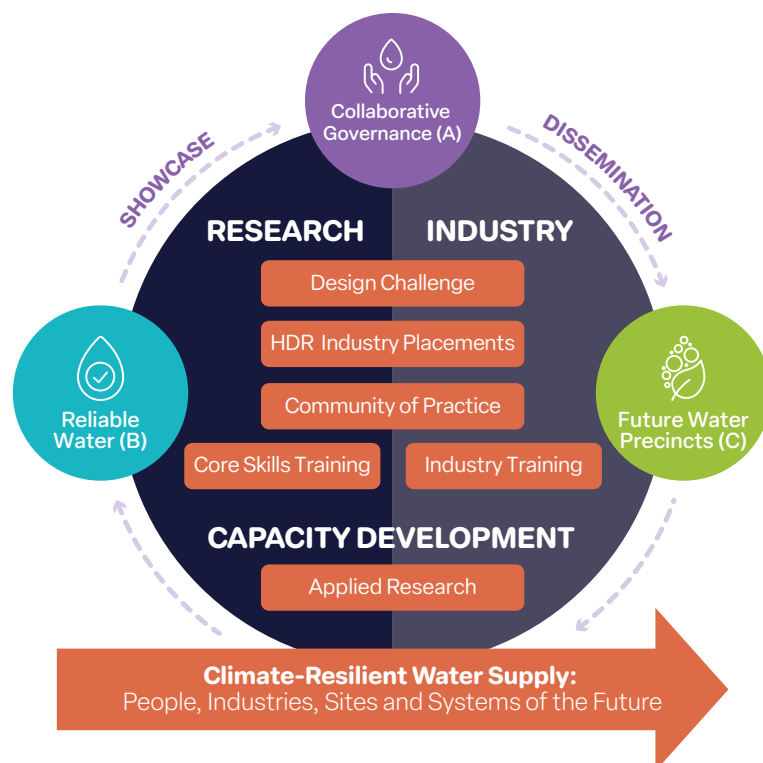
Projects: 4 and 5



C. Future Water Precincts

How do we transform planning to create new localised resilient water supply, energy-positive precincts and systems at least cost and with greatest benefits?

Projects 6 and 7



Why complete a PhD with us?

- ✓ Learn in a dynamic and multidisciplinary research environment supported by leading academics and industry experts
- ✓ Gain professional development, mentoring and networking that supports both academic and career opportunities
- ✓ Work directly with industry partners on real-world challenges; collaboratively develop solutions and expand the breadth of your knowledge through 'hands-on' work experience
- ✓ Access to cutting edge technologies and multidisciplinary supervision

What we can offer

- ✓ Scholarships at The University of Queensland, Griffith University and University of Technology Sydney
- ✓ Fully funded university-based stipend PLUS a top-up scholarship (tax-free)
- ✓ 12-month industry placement with co-supervision and project collaboration

Who should apply

We welcome expressions of interest from candidates working in areas relevant to climate-resilience and related social and physical sciences. Candidates must meet Australian university entry requirements (please see [UQ](#), [GU](#) and [UTS](#) criteria). Candidates currently working or with a degree in the following fields are strongly encouraged to apply:

- Environmental Engineering
- Hydrology and Water Resources
- Environmental Science
- Urban Planning
- Economics
- Public Policy and Governance
- Data Science
- Sustainability Transitions
- Environmental Management
- Geography
- Urban and Regional Planning
- Architecture and Design
- Environmental Law and Arts
- Civil and Chemical Engineering
- Hydrology
- Sustainable Energy and Climate Sciences.

Apply now

It's more than a PhD – it is industry-connected, impact driven research.

Submit your expression of interest (EOI) via our website:

climateresilientwater.org/phd-scholarships

To be considered, applications must include all documentation requested on our webpage.

EOI's close **10 August 2026** for a 2027 commencement



More information

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Project 1



Adaptive Planning and Management

Focuses on how to shift the water-sector from deterministic planning and decision making to a process where uncertainty is planned for using scenarios and pathways for incremental decisions and investments collaboratively. It addresses the question of how to build a collaborative inter-agency approach where data is shared, understood and applied through scenarios, real option analysis and investment pathways. Wider understanding of future scenarios is needed to help co-ordinate and plan for droughts and flood, and harmonised data will support planning for climate-resilience integrated water-energy performance and related adaptive management.

PhD topics

A1: A multi-criteria adaptive planning approach for wastewater treatment plants under multi-dimensional uncertainty

Location:

University of Technology Sydney

Industry Partner: Unitywater

Description:

Develop innovative approaches to help water utilities make smarter long-term investment and planning decisions in an uncertain future. This project will explore how climate change, population growth and other emerging challenges can be incorporated into adaptive, multi-objective planning that balances water security, environmental outcomes, liveability and economic priorities. Using interagency data and future scenarios, the research will support more resilient and informed regional water planning.

A2: Data harmonisation, inter-agency sharing and decision-making for water resilience

Location:

The University of Queensland

Description:

Develop innovative data solutions to improve integrated water planning and decision-making. This project will investigate how harmonised, high-quality data across climate, infrastructure, land use, social and economic systems can support collaboration between agencies. Using emerging sensing technologies and advanced data integration, the research will create tools that improve predictions, strengthen water security, and inform policy and planning for resilient, sustainable communities.

A3: How can climate forecasting for water planning be strengthened? Forecasting tools and scenarios for water security management.

Location:

The University of Queensland

Industry Partner: Queensland Government Department of the Environment, Tourism, Science and Innovation (DETSI)

Description:

Help shape the future of climate-informed water management. This project will develop advanced forecasting tools and future climate scenarios to improve predictions of floods, droughts and other hydroclimate extremes. Working with industry partners, the research will support better long- and short-term planning, strengthen water security, and help communities and utilities adapt to climate uncertainty and increasing environmental, social and infrastructure challenges.

Project 1



A4: How to improve inter-departmental and inter-agency collaboration, and systemic planning to achieve climate-resilient water supplies?

Location:

The University of Queensland

Industry Partner: DETSI

Description:

Explore how stronger collaboration can deliver more climate-resilient water systems. This project will investigate new approaches to integrated planning across government agencies and sectors, balancing water, energy, environmental and community outcomes. Using real-world case studies, such as Olympic precinct planning, the research will develop strategies and policies that improve cross-agency decision-making and support sustainable, resilient infrastructure.

A5: How to operationalise scenarios in decision making? Bridging the gap between scenario development and planning integration.

Location:

University of Technology Sydney

Description:

Help turn climate scenarios into practical decision-making tools for the water sector. This project will investigate how strategic foresight and future scenarios can be effectively integrated into water utility planning and operations. Working closely with industry stakeholders, the research will develop and test approaches that support adaptive planning, climate resilience, and informed investment decisions under an uncertain future.

A6: How to communicate uncertainty and risk in a complex system? Framing and defining uncertainty and risk in a complex system for effective responses.

Location:

University of Technology Sydney

Description:

Investigate how uncertainty and risk can be effectively communicated in complex water systems to support better decision-making. This project will design and test communication and visualisation approaches that clearly convey forecast uncertainty while maintaining trust and clarity. It will also explore how risk framing influences stakeholder understanding, acceptance of restrictions, and support for investment and policy decisions in water planning.

A7: How to improve prioritisation of climate risks?

Location:

University of Technology Sydney

Industry Partner: Department of Climate Change, Energy, the Environment and Water

Description:

Develop improved approaches for prioritising climate risks in water utility planning under constrained resources. This project will create an applied risk assessment framework that integrates multiple dimensions of risk to support clearer decision-making. Focusing on governance and operational needs, the research will help utilities identify and respond to the most critical climate risks, improving resilience and investment prioritisation in complex systems.

A16: Climate-resilient planning for coastal water and wastewater assets

Location:

University of Technology Sydney

Industry Partner: Unitywater

Description:

Develop approaches for planning and managing coastal water and wastewater infrastructure under climate change impacts such as sea-level rise, flooding, and saltwater intrusion. The project will focus on improving resilience, asset reliability, and long-term service delivery in vulnerable coastal environments.

Project 2



Promoting Social Licence

Develops knowledge and approaches to build a social licence for climate-resilient water. Community opposition has been a critical barrier to the implementation of alternative water sources internationally. This is front of mind for politicians and water organisations when considering alternative water sources. Although, a large body of research about community perceptions exists, we know little about how to communicate climate-resilient water concepts. There is a gap relating to how water industries use existing and emerging social research in planning. Scant research focuses on the value of engaging First Nations peoples, despite reserves of water being held in First Nations Country. This project will develop innovative communication and participatory approaches that can effectively engage diverse communities with resilient circular water concepts.

PhD topics

A8: Gamification for Collaborative Governance

Location:

The University of Queensland

Industry Partner: Seqwater

Description:

Develop innovative gamified approaches to improve collaboration and understanding in water governance. This project will design interactive scenarios that help government and non-technical stakeholders explore water security challenges, trade-offs, and demand management strategies. By simulating real-world decisions, the research aims to strengthen communication, support better policy outcomes, and enhance engagement in water efficiency and conservation initiatives.

A9: Digital interactive engagement for water-energy-climate literacy

Location:

The University of Queensland

Description:

Develop innovative digital engagement tools to improve public and industry understanding of water-energy-climate systems. This project will create interactive visualisations and experiences that build systems thinking and literacy around climate-resilient water solutions. It will explore how digital tools influence awareness, acceptance of new water sources, and support for sustainable behaviours, policies, and investments in a changing climate.

A10: First Peoples' water perspectives

Location:

Griffith University (Brisbane)

Description:

This project will work in partnership with First Nations peoples in South East Queensland to embed Indigenous perspectives, cultural values, and aspirations into water planning. It will explore how water resources on Country can support meaningful economic, employment, and cultural outcomes under climate change. The research will also help shape policy and governance settings that enable long-term, place-based benefits and strengthen collaborative, culturally informed water management.

A11: Social tolerance for restrictions under deep drought

Location: The University of Queensland

Description: Investigate how communities perceive and value water security under severe drought conditions. This project will explore public willingness to accept water restrictions and invest in measures that avoid extreme scarcity outcomes such as “day zero.” It will quantify the social and economic value of preventing water shortages, helping utilities and policymakers design fair, effective drought response strategies and long-term water security investments.

Project 3



Innovative Policy and Regulation

Addresses the issue that industry and academics point to a lack of fit-for-purpose regulation and policy as a major barrier to introducing new circular and climate-resilient approaches to water management. Given that appropriate policy and regulation are such critical ingredients for the success of new water management options, it is vital to identify the type of regulatory and policy settings that can facilitate the shift to climate-resilient water.

PhD topics

A12: Policy and collaboration for climate-resilient water economy

Location:

The University of Queensland

Description:

Examine how policy and regulation can better support a climate-resilient, circular water economy. This project will analyse best-practice approaches to water recycling, stormwater use, and integrated planning across regional and city scales. It will identify opportunities to improve inter-organisational coordination and evidence-based policy settings that enable innovation, strengthen resilience, and support more sustainable water systems under climate change.

A13: Regulatory model innovation for climate-resilient water

Location:

Griffith University (Brisbane)

Industry Partner: ARI Water

Description:

Assess how regulatory systems can better enable safe and effective water recycling and stormwater harvesting. This project will review global best practices and evaluate current national and state guidelines to identify barriers and opportunities for reform. Through case studies and stakeholder engagement, it will explore how regulation can balance safety, innovation, and performance to support more widespread adoption of climate-resilient water solutions.

A14: Regulatory and social enablers for potable stormwater harvesting

Location:

University of Technology Sydney

Description:

Explore the regulatory and social foundations needed to support potable stormwater harvesting as a climate-resilient water source. This project will examine international case studies, analyse policy frameworks, and investigate public perceptions to understand what builds trust and acceptance. The research will identify governance and regulatory reforms required to enable safe, socially supported adoption of stormwater reuse for drinking water supply.

A15: Bridging the climate adaptation gap in water planning

Location: University of Technology Sydney

Description: Investigate why climate information is not fully integrated into water planning decisions and how this gap can be closed. This project will examine governance structures, decision-support tools, and incentive mechanisms that influence the uptake of climate data. The research aims to identify practical ways to strengthen the use of climate science in planning, improving adaptation and long-term resilience in water systems.

Project 4



Responsive Management of Water Supply

Will develop decision-support tools to facilitate dynamic use of alternative water sources which requires good quality, real-time data, adequate models and the consideration of economic and environmental factors. One of the critical challenges for strategic management of multi-source systems is the acquisition of reliable, real-time data, including chemical and biological water quality parameters. In recent years, there have been substantial advances in the development of online sensors for chemical parameters, as well as the use of rapid sequencing tools for biological characterisation of aquatic samples.

PhD topics

B1: Drought-flood risk: Systems modelling and decision support

Location:

The University of Queensland

Description:

Develop advanced systems modelling and decision-support tools to manage the combined risks of drought and flooding in climate-impacted catchments. This project will use systems dynamics and scenario analysis to explore long-term water supply strategies, including desalination, recycling, and dam operations. The research will support integrated decision-making that balances water security, flood risk, energy use, and emissions under uncertain future conditions.

B2: Advanced monitoring for treatment plant reliability in face of climate impact

Location:

The University of Queensland

Description:

Investigate how extreme weather affects the reliability of water treatment plants under changing climate conditions. This project will use real-time water quality, temperature, and operational data to model treatment performance across different stages. The research will identify system limits and vulnerabilities, helping define how existing and emerging treatment processes perform under stress and informing more resilient infrastructure design and operations.

B3: Optimising spatial-temporal water monitoring in face of climate change

Location:

The University of Queensland

Description:

Develop a collaborative framework for evaluating and managing town water risks under climate uncertainty. This project will move beyond traditional likelihood-consequence approaches by incorporating multi-dimensional criteria to better prioritise resilience risks. Working with government and industry partners, it will support more consistent, transparent, and adaptive decision-making to strengthen local water security planning.

Project 4



B4: Climate-sensitive waterborne disease surveillance: Developing rapid on-site molecular detection of *Cryptosporidium* to strengthen public health resilience

Location:

Griffith University (Brisbane)

Industry Partner: Seqwater

Description:

Develop rapid, field-deployable detection tools to improve surveillance of climate-sensitive waterborne diseases. This project will focus on *Cryptosporidium*, integrating advanced molecular techniques with simplified on-site sampling and testing methods. By improving speed, sensitivity, and usability under real environmental conditions, the research aims to support early warning systems and strengthen public health responses to climate-driven risks in drinking and recreational water.

B7: Barriers and opportunities for regional town water security risk reduction - drawing on past experiences

Location:

University of Technology Sydney

Industry Partner: NSW Water Directorate

Description:

Investigate the key barriers and enabling factors influencing regional town water security, drawing on lessons from past droughts, floods, and system failures. The project will identify practical strategies to reduce future risks and strengthen resilience in regional water supply systems.

Project 5



Flexible Augmentation of Reliable Supply

Addresses the issue that current surface water treatment processes are pressed to maintain water quality and quantity through droughts and floods. Existing, constructed stormwater systems have relatively minor use as supply, and innovative surface water require optimisation for improved resilience, affordability and sustainability.

PhD topics

B5: Stormwater as supply – advanced monitoring and control

Location:

Griffith University (Brisbane)

Industry Partner: ARI Water

Description:

Explore how stormwater can be safely and reliably transformed into a climate-resilient water supply. This project will assess and trial treatment, storage, and monitoring systems for capturing and delivering fit-for-purpose stormwater. Through case studies and field validation, it will improve understanding of system performance, supporting safer use of underutilised stormwater resources during both floods and droughts.

B6: Impact of climate change on drinking water distribution systems

Location:

The University of Queensland

Description:

Assess how climate change affects drinking water distribution systems and the delivery of safe, reliable water supplies. This project will investigate how rising temperatures and changing water quality influence disinfectant decay, pathogen risks, and disinfection by-products. It will develop models to support improved maintenance and residual management strategies, ensuring water quality and public health are protected under future climate conditions.

Project 6



Planning and Design of Circular Resilient Precincts

Focuses on developing resilient circular water economy precinct designs. It addresses land use, built assets and infrastructure, with an emphasis on wastewater, stormwater, energy, carbon, heat, and nutrients within a socio-economic and business-oriented framework.

PhD topics

C1: Planning and design of resilient circular water precincts

Location:

The University of Queensland

Industry Partner: ARI Water

Description:

Explore how circular water precincts can be designed, planned, and regulated to support resilient, low-carbon urban development. This project will analyse leading national and international examples to identify best-practice approaches across land use, infrastructure, and water-energy systems. It will develop design and implementation strategies for integrated precincts that reuse wastewater and stormwater for diverse end uses, supporting sustainable growth and investment.

C2: Value engineering design for resilient circular water precincts

Location:

Griffith University (Brisbane)

Description:

Examine how circular water precincts can be made financially and commercially attractive to industry, government, and residents. This project will analyse global exemplar precincts to design value propositions, incentives, and regulatory frameworks that support investment in climate-resilient water systems. It will also explore certification, performance metrics, and business models that demonstrate economic, environmental, and risk-reduction benefits for precinct-based industries.

C3: Renewable energy integration in future-water precinct design

Location:

The University of Queensland

Description:

Investigate how renewable energy can be integrated into the planning and design of future water precincts and water-intensive developments. This project will assess current planning and regulatory frameworks to understand how they enable or constrain water-energy system integration, including emerging demands such as data centres. It will identify opportunities to improve policy, design, and governance to support more resilient, low-carbon, and resource-efficient precincts.

Project 6



C4: How can circularity be re-thought to broaden productive uses of recycled/reused water?

Location:

The University of Queensland

Industry Partner: Queensland Government Department of the Environment, Tourism, Science and Innovation (DETSI)

Description:

Reimagine circularity in water systems to expand productive uses of recycled and reused water across agriculture, industry, and regional development. This project will develop new methods for assessing the economic, environmental, and resource efficiency benefits of circular water use. Through real-world case studies, it will explore how water and energy integration can improve productivity, reduce intensity, and support policy objectives for resilient, sustainable regional economies.

C5: How to manage novel changes in water demand at a precinct level using data and AI

Location:

University of Technology Sydney

Description:

Explore how data analytics and artificial intelligence can be used to understand and manage emerging changes in water demand at the precinct scale. The project will develop decision-support approaches to improve forecasting, optimise system operations, and support adaptive planning in response to evolving urban and industrial water use patterns.

Project 7



Maximising Efficiency and Savings in Water, Energy and GHG Emissions

Seeks to improve both water supply options and usage efficiency, while lowering the environmental impact of water services including GHG emissions. This project develops a framework for climate-resilient water supply, addressing the economic, social, and cultural factors under future urbanisation and climate change uncertainties. The project addresses a current dearth in comprehensive value circular economy precinct evaluation frameworks.

PhD topics

C6: Water efficiency and energy benefits

Location:

The University of Queensland

Description:

Investigate how water efficiency can deliver both water security and energy savings across residential, commercial, and industrial sectors. This project will analyse water end-use patterns and their links to energy consumption to identify least-cost pathways for emissions reduction. It will support integrated water-energy planning by evaluating efficiency options that reduce both upstream supply impacts and downstream use emissions across the urban water cycle.

C7: Energy and emissions management in water

Location:

The University of Queensland

Industry Partner: Unitywater

Description:

Develop a comprehensive framework for understanding and reducing Scope 3 emissions in the water industry. This project will quantify upstream and downstream greenhouse gas emissions linked to water services, including procurement, chemicals, and end-use energy impacts. It will establish improved emissions baselines and reporting methods to support sustainable procurement, targeted emissions reduction strategies, and more accurate, locally relevant carbon accounting across the water sector.

C8: Non-residential water demand forecasting under climate and economic change

Location:

Griffith University (Brisbane)

Description:

Develop improved forecasting models for non-residential water demand under changing climate and economic conditions. This project will integrate emerging data sources, including smart metering, benchmarking, and industry projections, to better capture demand patterns across commercial and industrial users. It will enhance understanding of how climate and economic shifts influence water use, supporting more accurate long-term planning and resource management.

Project 7



C9: Collaborative investment for viable climate-resilient water solutions

Location:

Griffith University (Brisbane)

Description:

Investigate collaborative investment and financing models that support climate-resilient water solutions across the full water cycle. This project will analyse how costs, risks, and benefits can be shared between public and private stakeholders to enable co-investment. Using economic modelling, literature review, and stakeholder engagement, it will identify effective funding strategies that support circular economy approaches and long-term water infrastructure resilience.

C10: Urban resilience design for water and energy

Location:

The University of Queensland

Description:

Develop integrated urban design approaches that enhance resilience across water and energy systems. This project will explore planning and infrastructure strategies that reduce vulnerability to climate impacts while improving resource efficiency, reliability, and sustainability in cities.

C11: Strategy and policy training needs for climate-resilient water

Location:

The University of Queensland

Description:

Identify and address the capability and training needs required to deliver climate-resilient water strategies and policies. This project will assess current workforce skills, organisational gaps, and emerging competency requirements across the water sector. It will inform the design of targeted training and capacity-building approaches to support effective strategy, governance, and decision-making under climate uncertainty.

C12: Non-residential water demand forecasting under climate change

Location:

University of Technology Sydney

Description:

Develop improved forecasting approaches for non-residential water demand under future climate change conditions. This project will integrate climate projections with commercial and industrial water use data to better understand how demand patterns may shift over time. The research will support more accurate planning, enabling water utilities to anticipate changes and improve long-term system reliability and efficiency.

C13: Determining the water efficiency potential for water security in small regional towns

Location:

University of Technology Sydney

Industry Partner: NSW Water Directorate

Description:

Assess the potential of water efficiency measures to strengthen water security in small regional towns under climate variability and growth pressures. This project will evaluate demand management options, identify barriers to adoption, and quantify potential savings.

The research will support practical strategies to improve local resilience and reduce reliance on new supply infrastructure.