

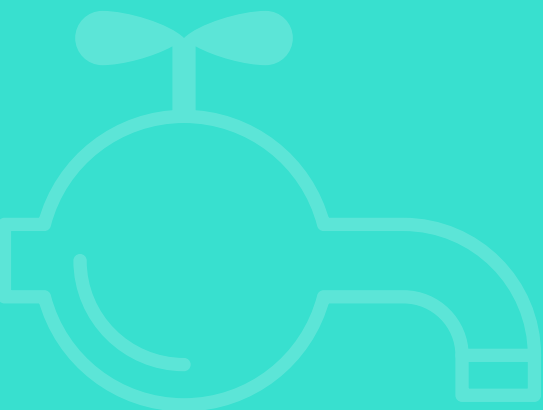


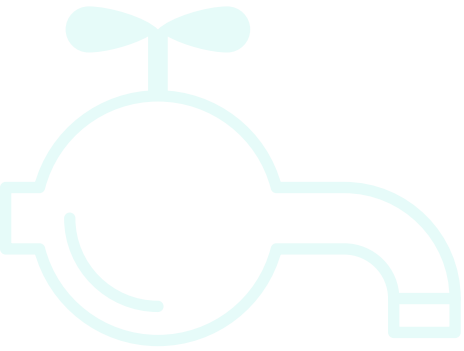
Water  
Research  
AUSTRALIA



# Water Wisdom to Future Flow

Event Program





## Welcome to Next Water!

Research has long formed the backbone of the water industry — providing the scientific evidence-base to inform policy, provide best practice applications and ensure public and environmental health.

Now more than ever, in a time where the water sector is expected to offer cost-effective solutions to complex problems with greater urgency and foresight as the effects of climate change and financial and budgetary pressure are felt by organisations and their customers alike, scientific research that drives impact and innovation is needed to meet these ever-growing customer expectations.

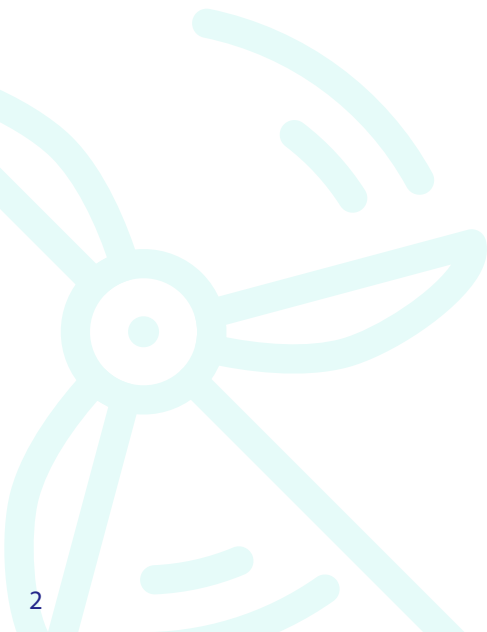
Next Water will revisit the water wisdom of the industry's past and use this as a platform to determine what impact and innovation needs to occur to ensure future flow.



## You're on Wangal Country

Water Research Australia respectfully acknowledges the Wangal People, the Traditional Owners, Custodians and Carers of the lands and waters on which Next Water is held.

We recognise the importance of all Traditional Owners' water wisdom and knowledge in the advancement of water science and pay our respects to their elders past and present. We extend that respect to all Aboriginal and Torres Strait Islander peoples.



## Keynote Speakers



**Professor Alan Duffy**  
Astronomer, science communicator & Director of the Space Technology and Industry Institute

Alan Duffy is Director of the Space Technology and Industry Institute at Melbourne's Swinburne University. A professional astrophysicist, he creates baby universes on supercomputers to understand how galaxies form and to probe the nature of dark matter.

Before this, he was a postdoctoral researcher at the University of Melbourne and a postdoctoral research associate with ICRAR at the University of Western Australia. Alan obtained his PhD from the Jodrell Bank Centre for Astrophysics and spent two years as a postgraduate at the Sterrewacht, Leiden Observatory in The Netherlands. Alan is a member of SABRE, the world's first dark matter detector in the Southern Hemisphere, based at the bottom of an active gold mine in the Stawell Underground Physics Laboratory in Victoria, Australia.



**Dr Fiona Kerr**  
Founder and Director, The NeuroTech Institute

Dr Fiona Kerr is the founder of The NeuroTech Institute, and FOCUS consulting.

Combining engineering, neuroscience, psychology and anthropology with over 35 years in industry, she is globally recognised for her work on the cognitive science of both human-human and human-technology interaction and the dynamics of complex systems and consults on how these findings inform practice.

Fiona advises a broad national and international list of clients, including government, defence, corporate and creative and sits on a number of global advisory panels.



**Professor John Thwaites AM**  
Chair, Ministerial Advisory Group on the Circular Economy

John Thwaites is a Professorial Fellow, Monash University, and Chair of the Monash Sustainable Development Institute, ClimateWorks Australia, Melbourne Water and a Director of Fairtrade Australia New Zealand.

He is a Co-Chair of the Leadership Council of the UN Sustainable Development Solutions Network ("SDSN") launched by the Secretary General of the United Nations to provide expert advice and support to the development and implementation of the Sustainable Development Goals.

John was appointed Member of the Order of Australia for "significant service to the environment and to the people and Parliament of Victoria" in the 2021 Australia Day Honours. John was Deputy Premier of Victoria from 1999 until his retirement in 2007. During this period, he held various Ministerial portfolios including Minister of Health, Minister of Environment and was Victoria's first Minister for Climate Change.

8.30am Delegate Registration

9.00am Welcome to Country and Official Open

Welcome to Sydney | Chris Gould, General Manager Business Development, Sydney Water

9.30am **KEYNOTES**

Professor Alan Duffy  
Professional astronomer and science communicator  
Director, Space Technology and Industry Institute, Swinburne University of Technology

Professor John Thwaites AM  
Chair, Ministerial Advisory Group on the Circular Economy

10.30am **MORNING TEA**

Stream 1 | Lake Room

Stream 2 | Park Room

11.00am **SESSION 1 | Diversification of Water Sources**

Each day, water managers are presented with challenges arising from climate variability, population growth, and evolving customer expectations. Purified recycled water is core to achieving diversification of water sources. Hear from water leaders on the future of water recycling.

**SESSION 1 | Addressing Current & Emerging Challenges**

Analysis, testing, and treatment are essential to addressing the challenges of contaminants and pathogens of concern, including PFAS, microplastics, bromide, and biological organisms. Listen to some of the ways in which the water industry is addressing these.

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Jourdain: Paving the way towards planned indirect purified recycled water in France  
Dr Kathy Northcott | VEOLIA ANZ

The role of Sydney Water's Purified Recycled Water Demonstration Plant in technical engagement with NSW Health  
Dr Kaye Power | SYDNEY WATER

Demonstrating how high pressure membranes can receive greater pathogen log reduction value credits in potable reuse applications  
Dr Stacey Hamilton | WATER CORPORATION & Jason Assouline | CAROLLO (International guest)

Technical assessment of alternative treatment technologies – 2023 Churchill Fellowship Study Tour  
Dr Stacey Hamilton | WATER CORPORATION

#### PANEL SESSION

The importance of treatment validation in assessment of alternative treatment technologies:

- » Development of a WaterVal Granular Filter Validation Protocol  
Dr Alex Keegan | SA WATER
- » Assigning and maintaining appropriate pathogen LRVs in MBRs  
Dr Faisal Hai | UNIVERSITY OF WOOLLONGONG
- » The importance of treatment validation in putting all options on the table  
Dr Marty Hancock | WATER RESEARCH AUSTRALIA
- » NSW regulation and approval of PRW — a technical perspective  
Nanda Altavilla | NSW DEPARTMENT OF PLANNING, INDUSTRY & ENVIRONMENT

#### PANEL DISCUSSION

Chair: Dr Stacey Hamilton  
Panellists: Dr Marty Hancock, Nanda Altavilla, Dr Faisal Hai, Dr Alex Keegan, Jason Assouline

Development of PFAS testing methodology for the water industry  
Danny Snee & Luke Baker | NATIONAL MEASUREMENT INSTITUTE

How to perform the analysis of microplastics in a commercial environmental laboratory?  
Dr Julia Jaeger | EUROFINS ENVIRONMENT TESTING AUS & NZ

Efficiency of sewage treatment processes in microplastics control: A case study  
Dr Li Gao | SOUTH EAST WATER with A/Prof Linhua Fan | RMIT

Co-hydrothermal treatment of sewage sludge on PFAS and microplastics removal  
Kamrun Nahar | RMIT

Investigating backwash return management practices in drinking water treatment systems  
A/Prof Pierre Le Clech | UNSW

Bromide criteria for seawater desalination plants  
Prof Cynthia Joll | CURTIN UNIVERSITY with Anthony Bodycoat | WATER CORPORATION

Extended water stagnation in buildings during the COVID-19 pandemic increases the risks by opportunistic pathogens  
Casey Huang | UNIVERSITY OF QUEENSLAND

12.30pm

LUNCH

1.30pm

**SESSION 2 | Innovating with Technology and Ingenuity**

Showcasing enablers for transitioning utilities of today to those of the future, including remote monitoring of wastewater and environmental waters, machine learning-incorporated digital twins, and removal of antibiotics from polluted waters.

Developing novel end-use pathways for Water treatment sludge: Turning waste into a resource  
Minh Duc Nguyen | DEAKIN UNIVERSITY

Effect-based methods (EBM) in a water safety plan (WSP) context: Why, How-to and case studies  
Prof Frederic Leusch | GRIFFITH UNIVERSITY with Stephanie Rinck-Pfeiffer | GWRC

Remote monitoring of *Enterococcus faecalis* in wastewater and environmental waters  
Alka Rani Batra | RMIT

Finger Point Basin, clean, safe, innovative and collaborative  
Charndee Chahal | SA WATER

Evaluation of reactivity and stability of surface modified bimetallic iron nanoparticles for remediation application  
Abhisek Mondal, Dr Meenakshi Arora, Dr Brajesh Kumar Dubey & Dr Kathryn Mumford | UNIVERSITY OF MELBOURNE

Machine learning-incorporated digital twins to drive the smart operation of water desalination systems  
Yunyi Zhu | UNSW

Removal of antibiotics from polluted water by an enzymatic membrane bioreactor  
Prof Faisal Hai | UNIVERSITY OF WOLLONGONG

Membrane Capacitive Deionization (MCDI) for treated domestic wastewater reuse  
Clare Bales | UNSW

**SESSION 2 | Wastewater in the Circular Economy**

Wastewater presents the water sector with a ubiquitous potential resource. Channelling the reuse/recycle culture to maximise our resources, how can we harness the value of wastewater to underpin economic growth, reduce environmental impacts and generate healthy liveable communities?

Making the case for biochar production from the ACT's biosolids: Higher value products for local circular economy  
Benjamin Bryant | ICON WATER with Dr Wolfram Buss | ANU

Improving the grade and quality of biosolids and their derived biochar via mild acid pre-treatment  
Ibrahim Hakeem | RMIT

Regional sewage treatment transformation  
Dr Andrew Ward | AUSTRALIAN CENTRE FOR WATER AND ENVIRONMENT, UNIVERSITY OF QUEENSLAND with Jason Dwyer | URBAN UTILITIES

Biosolids-derived biochar enhances the bioremediation of diesel-contaminated soil  
Charles Chinyere Dike | RMIT

Fate of nutrients in the circular economy — nice and valuable outputs!  
A/Prof Stefano Freguia | UNIVERSITY OF MELBOURNE

Potential of resource recovery from wastewater treatment plants: A case study  
Prof Felicity Roddick, Arash Mohseni & A/Prof Linhua Fan | RMIT UNIVERSITY with Dr Li Gao | SOUTH EAST WATER

Restoring the nitrogen cycle in wastewater treatment using a flow electrode system  
Jingyi (Christine) Sun | UNSW

**AFTERNOON TEA**

3.00pm

**Demonstration of an MCDI Groundwater Desalination unit in a remote central Australian community using an Augmented Reality-based Digital Twin**  
Conference attendees can experience how Membrane Capacitive Deionisation (MCDI) of brackish groundwaters works through this demonstration of an operating MCDI pilot plant based in remote outback Australia using an AR-based Digital Twin of the real on-ground unit.

Prof David Waite | UNSW SYDNEY

3.30pm

**SESSION 3 | Monitoring for Human Health**

The COVID-19 pandemic saw the water industry rapidly increase its capacity and capability in monitoring wastewater for the most optimum public health outcomes. Hear about the health burden of water-based pathogens, the tracking of variants through genetic sequencing, and continuous innovation to monitor for public health threats. Participate in a Q&A session on wastewater surveillance, and panel session on microbial health-based targets.

Water-based pathogens: Which & what is the health burden?  
Prof Nicholas Ashbolt | SOUTHERN CROSS UNIVERSITY

Continuous innovation in wastewater surveillance for COVID-19 and other public health threats  
Dr Monica Nolan | DEPARTMENT OF HEALTH VICTORIA

Tracking SARS-CoV-2 variants in Victorian wastewater  
A/Prof Aaron Jex | WEHI

Wastewater surveillance in Queensland for COVID-19, drugs and other public health issues  
Dr Phil Choi | QUEENSLAND HEALTH

**Q&A WITH PRESENTERS****PANEL SESSION**

Challenges in applying the annualised microbial health-based targets approach to short-term events when designing for the reliability of barriers and responding to events and barrier failures  
Dr Daniel Deere | WATER FUTURES with Kim Mosse | MELBOURNE WATER

**SESSION 3 | Net Zero: The Research Behind the Race**

Emissions, greenhouse gases, and green hydrogen present both challenges and opportunities to the water sector. Listen to the research behind the race to net-zero and understand where some of the opportunities lie. Participate in a panel session on the water sector's net-zero landscape and become a champion of net-zero transition.

Net-zero emission programme for Australia urban water industry  
Dr Arash Zamyadi | MONASH UNIVERSITY

In-situ measurement of greenhouse gas emissions from WWTPs as we move towards net-zero emissions  
Kaili Li | UNIVERSITY OF QUEENSLAND with Clare Idriss | ICON WATER

Transition to a new era: Is green hydrogen possible from tertiary water effluents?  
Prof Kondo-Francois Aguey-Zinsou | UNIVERSITY OF SYDNEY with Heri Bustamante | SYDNEY WATER

Greenhouse gas emissions from wastewater sludge lagoons  
Sarah Aucote | UNIVERSITY OF QUEENSLAND with Ben van den Akker | SA WATER

**PANEL SESSION**

The research behind the race to net zero  
Chair: Karen Rouse | WATER RESEARCH AUSTRALIA  
Panellists: Prof Xiwang Zhang | DOW CENTRE, Stephanie Rinck-Pfeiffer | GWRC, Joel Segal | SOUTH EAST WATER

5.00pm

Day 1 Concludes

6.00pm

Conference Dinner

8.00am Delegate Registration

9.00am Welcome

9.10am **KEYNOTE**

Dr Fiona Kerr  
 Founder and Director, The NeuroTech Institute

9.45am **MORNING TEA**

Stream 1 | Lake Room

Stream 2 | Park Room

10.15am **SESSION 1 | Recognising First Nations Water Wisdom and Research**

How can the water industry help build a just, equitable, and reconciled Australia? First Nations wisdom must underpin all we do in the water sector. Listen to and walk with those from the indigenous community to understand how we can work together to achieve more sustainable land and water management.

**SPECIAL GUEST**



**Dr Leslie 'Phil' Duncan**  
 Dr Leslie 'Phil' Duncan, a member of the Gomeri Nation, has for over 40 years worked to improve the lives of Aboriginal people by increasing recognition of the rich cultural history, the return of lands, the improvement of living conditions and education of the next generation of Aboriginal Australians through both employment and active engagement with community. His career has been based on a principle of sharing knowledge, bringing disparate stakeholders together to develop and strengthen opportunities for Aboriginal people.

EPIC outcomes from seeing with 2-eyes

Dr Phil Duncan | EPIC (ECONOMIC PARTICIPATION OF INDIGENOUS COMMUNITIES) CRC BID

A community-led approach to identification of drinking water issues using the Household Water InSecurity Experiences (HWISE) Scale  
 Christine Corby | WALGETT ABORIGINAL MEDICAL SERVICE

Best ways to respect cultural and intellectual property  
 Dr Terri Janke | TERRI JANKE & CO PL

**SPECIAL GUEST**



**Dr Terri Janke**  
 Dr Terri Janke is of Meriam and Wuthathi heritage, and is the owner and Managing Director of Terri Janke and Company, an award winning legal and consulting firm founded in 2000. The team at Terri Janke and Company strive to empower Indigenous people to manage their culture and attain their business goals — the key to Indigenous self-determination is being able to control and manage their own future. Terri is an international expert on Indigenous cultural and intellectual property. Her book True Tracks: Working with Indigenous Knowledge and Culture was published in 2021. Terri is also the Co-Chief author of the State of Environment Report 2021. Photo credit: Jamie James jamesphoto.com.au

**PANEL SESSION**

Building common language and trust using "You can't ask that!" approach with questions from audience

Chair: Jacqueline Frizenschaf | WATER RESEARCH AUSTRALIA

Panellists: Karen Rouse | WATER RESEARCH AUSTRALIA, Dr Leslie 'Phil' Duncan | EPIC CRC, Dr Terri Janke | TERRI JANKE & CO PL, Walgett Community members

**SESSION 1 | The Human Factor**

Our cities, towns, and communities rely on ongoing water research and development enhance community outcomes now and into the future. How can the water sector better engage with its customers and strengthen the social licence to operate? How can the water sector ensure that it attracts and retains a dynamic, high performing, and skilled workforce?

**SPECIAL GUEST**



**A/Prof Sera Young**  
 Sera Young is an Associate Professor of Anthropology and Global Health at Northwestern University in Chicago. Professor Young's work focuses on quantifying human experiences with water insecurity, using the Water Insecurity Experiences (WISE) Scales which generate high-resolution, globally comparable data that bring the human perspective to conventional water indicators. Professor Young will give a brief overview of the WISE, and discuss how they shape our understanding of health, well-being, and policy development.

Household Water Insecurity Experiences (HWISE)

A/Prof Sera Young | NORTHWESTERN UNIVERSITY, ILLINOIS USA

Goals, feedback and rewards: The South East Water 'Water Saver' application trial

Joel Segal | SOUTH EAST WATER with David Byrne | UNIVERSITY OF MELBOURNE

Investigating community attitudes to alternative water sources: Barwon region, Australia

Christina Semasingha | DEAKIN UNIVERSITY

Reflexiving: The game-changing (leadership) skill that just might be within everyone's reach

Prof Cynthia Mitchell | UTS & The Good Ancestor

**PANEL SESSION**

Learning from the experience of frontline operators: Critical skills and knowledge in a crisis

Dr Kathy Northcott | VEOLIA ANZ

Sallyanne Bartlett | COLIBAN WATER

Brendan Guiney | NSW WATER DIRECTORATE

Dr Ali Gharaibeh | VEOLIA ANZ



12.00pm

LUNCH



**INVITATION ONLY**

**WATER LEADERS LUNCH | D-RISK Develop Research to Inform Strategy with Knowledge**

Water Research Australia CEO Karen Rouse will be joined by strategy and research leaders from the water sector for the Next Water Leaders' Lunch, exploring the key role research can play in informing water sector strategy.



**PRE-REGISTRATION REQUIRED**

**WALKING TOUR | Discover Australia's largest smart blue-green infrastructure R&D project**

Join our exclusive lunch hour walking tour where SIMPaCT – Smart Irrigation Management for Cool Parks and Towns – project partners will demonstrate how science and industry are working together to deliver innovative and effective urban cooling solutions.

Stream 1 | Lake Room

Stream 2 | Park Room

1.30pm

**SESSION 2 | Planning for Resilience**

Australia's catchments are feeling the effects of climate change impacts. More than ever smart management of water bodies is required, and the use of data, decision-support tools, and models is crucial. Hear how leading researchers and water utilities are developing the tools needed to secure future supplies that meet community and environment needs and preferences.

**SESSION 2 | Managing Our Blue-Green Future**

A look into cyanobacteria management, water quality monitoring, and the potential algal-related challenges of discharging recycled water into reservoirs and lagoons.

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**SPECIAL GUEST**



**Dr Alex Held**  
Alex is one of Australia's leading Earth Observation experts. Under his stewardship as Director of the CSIRO Centre for Earth Observation, Alex has overseen the establishment of the new radar satellite NovaSAR-1 as one of Australia's newest national research facility; leads the development of innovative science in remote sensing and drives

the development of spatial technology and data analytics to support sustained Earth observation and measurement of our planets eco-systems.

Smart management of water bodies to enhance resilience  
Dr Alex Held | AQUAWATCH AUSTRALIA MISSION, CSIRO

Investigating the relationships between riparian restoration data, catchment land-use, and ecological data in Victoria  
Mariah Sampson | DEAKIN UNIVERSITY

Anticipating and managing water quality risks from extreme weather events  
Prof Stuart Khan | UNSW SYDNEY (after Mariah)

Freshwater Biodiversity: you can't protect what you can't detect  
Edward Tsyrin | UNIVERSITY OF MELBOURNE

Understanding and incorporating run-off non-recovery in source water models: better accounting for observations and climate change impacts for water security  
Owen Gould | ICON WATER with Sreelakshmi Cherampatta Mana | ANU

A semi-quantitative assessment tool to determine groundwater pathogen risks  
Jamie Burgess | WATER CORPORATION

Hydrologic model loss parameters for Northern Territory River basins  
Trang Thi Thuy Nguyen | CHARLES DARWIN UNIVERSITY

Algal Innovation: Future is algae friendly!  
Dr Arash Zamyadi | MONASH UNIVERSITY

Towards a tiered water quality monitoring system  
Dr Tarun Sanders & Asma Akther | CSIRO

WaterNSW Cyanobacteria Research Roadmap  
Dr Heather Lacey | WATERNNSW

Integrated cyanobacterial management at basin/catchment scale – addressing a significant global and Australian problem  
John Verhoeven, Stuart J Khan & Megan Evans | UNSW

Will treated recycling wastewater cause algal blooms? A study of the effect of nutrient inputs to a drinking water reservoir  
Prof Michele Burford | AUSTRALIAN RIVERS INSTITUTE AND GRIFFITH UNIVERSITY

Algae-related challenges to recycled water supply from wastewater lagoons  
Dr Nick Crosbie | MELBOURNE WATER with Dr Bojan Tamburic | UNSW

Cyanobacterial persistence in waste stabilisation ponds; insights from metagenomics  
Caitlin Romanis | UNIVERSITY OF NEWCASTLE

3.00pm

Networking Session

3.30pm

Conference Concludes



# next water '23

22-23 February 2023 | Sydney

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