

## Profile: Professor Peter J Coombes

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Professor Coombes is a Systems Thinker, Scientist, Engineer, Economist, Problem Solver and Policy Analyst, a Provider of Alternative Perspective and a Designer of sustainable cities, projects and buildings.

Peter Coombes is a director of Urban Water Cycle Solutions that operates as an independent research, policy and consulting group, a Fellow of Engineers Australia, a member of the National Engineering Register (NER) and a Certified Practising Engineer (CPeng) at the highest level (EngExec). Peter has a PhD in Civil and Environmental Engineering, undergraduate degrees in Engineering (Civil and Environment) and Surveying, and an almost complete double degree in Law/Economics. He is an Honorary and Visiting Professor in the Crawford School of Public Policy at Australian National University and was most recently a Professor of Water Resources Engineering, Chair of Engineering and Associate Dean (Education) at Southern Cross University.

Peter is an editor the Urban Book of Australian Rainfall and Runoff published by Engineers Australia and was awarded the 2018 GN Medal for Hydrology and Water Resources and the 2019 Presidents Prize by Engineers Australia. Professor Coombes is a member of the steering committee at Imperial College London for the CAMELLIA research programme and a former Deputy President of Stormwater Australia. He has held senior academic positions University of Newcastle, University of Melbourne and Swinburne University. Peter Coombes was a Chief Water Scientist in the Victorian Government and recently contributed to inquiries into stormwater management and flooding by the Senate of the Australian Parliament and into water resources by the Productivity Commission.

Peter's experience includes managing director of Bonacci Water, a member of the water advisory group to the Prime Ministers Science, Engineering and Innovation Council, the advisory council on alternative water sources for the Victoria Government's Our Water Our Future policy, a member of the advisory panel on urban water resources to the National Water Commission, an advisor on alternative water policy to the United Nations and a national research leader of innovative WSUD strategies in the eWater CRC. Peter Coombes has generated over 250 scientific publications (see [Peter J Coombes Google Scholar](#) and [Peter J Coombes ORCID](#) for research impact) and designed more than 120 sustainable projects including settlements that generate all of their water resources and manage flooding. Professor Coombes was also a co-author of Australian Runoff Quality and a former chair of the Stormwater Industry Association.

He has experience in change processes in government, development of government policy and managing complex engineering business collaborations. His professional and research interests include systems thinking and analysis, hydrology, water resources, economics, molecular sciences, water quality and public policy (see [www.urbanwatercyclesolutions.com](http://www.urbanwatercyclesolutions.com), LinkedIn: Peter Coombes, Twitter: @PeterJCoombes).

## Qualifications

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Doctor of Philosophy, University of Newcastle, 2002

Bachelor of Engineering (Civil) (Hons), 1997

Bachelor of Surveying (Hons), 1998

Associate Diploma of Engineering (Hons), 1992

GreenStar Accredited Professional, 2008

B. Econ/B. Law (Undergraduate: 2015 - ), Awarded RS Neale Memorial Economics Prize.

## Membership of professional associations

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Fellow of Engineers Australia, Awarded the GN Alexander Medal in 2018

Member of Australian Water Association

Member of Stormwater Victoria

Member of the Econometrics Society

## Key strengths

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- Systems thinker, analyst and strategist
- Ability to understand and solve complex problems with associated leadership
- Investigation and design of stormwater management, flood mitigation, water supply and wastewater management strategies
- Capacity building and management of multiple disciplinary teams involved in change processes
- Strong experience of political processes at international, federal, state and local government levels. Indeed this experience includes initiating policy reform at Ministerial levels.
- Research leadership and management in challenging environments
- Data collection, forensic analysis, software development and simulation of systems
- The ability to design and deliver integrated systems, particularly water cycle, environmental and economic systems
- Technical investigation and academic research using first principles engineering analysis, investment economics and microbiological science
- Development of science and engineering curriculum, academic governance and teaching
- Extensive government, policy and regulatory understanding of water, urban development, planning and sustainability issues
- Creation of evidence based policies and regulation
- Excellent oratory skills - public speaking, seminars, technical lectures and media engagements
- Strong written communication style - technical publications, consultancy reports, public policy and public commentary such as opinion pieces

## Recent employment

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### [Honorary and Visiting Professor, Crawford School of Public Policy, Australian National University.](#)

Professor Peter Coombes joined the Crawford School of Public Policy at Australian National University to continue research into systems thinking with respect to government policy and regulation in the domain of water, energy, health, economic development, the environment and governance. It is expected that this activity will lead to publications focused on applied systems research into case studies to discover trade-offs from the perspective of whole of society and the biosphere. This work explores the potential of interventions to improve the sustainability of water, energy, health and environmental resources. These outputs will include sustainability research into the multiple scale behavioural responses to environmental and economic challenges. Professor Coombes will continue to develop research programs and supervise PhD students in understanding the contribution of distributed interventions to manage scarce resources that support society and environments.

### [Professor of Water Resources Engineering, Chair of Engineering and Associate Dean \(Education\) at Southern Cross University](#)

Professor Peter Coombes served as the Associate Dean (Education) in the Faculty of Science and Engineering, Professor of Water Resources Engineering and the Chair of Engineering at Southern Cross University (SCU). Following a competitive process, appointed as Associate Dean (Education) in the Faculty of Science and Engineering at Southern Cross University in February 2021. This role is builds on leadership of the change process to create the new Faculty of Science and Engineering that includes

Mathematics and Information Technology, and includes deputy leadership of the Faculty.

Appointed Chair of Engineering at Southern Cross University in September 2019 and assisted the Dean in leading the transition to a new faculty including Science, Engineering, Mathematics and Information Technology. This included leadership in the development of new Science and Engineering curriculums, and redefining the financial, research and academic performance of the school. Peter led the fundamental restructuring of the undergraduate and post graduate curricula within the school, as well as leadership in developing a team-based teaching approach and blended learning strategy. This included transforming the engineering academic cohort into an engaged, invigorated and collegial group. These innovative methods were also applied with success to restructure the science curriculum and development of the university wide mathematics curriculum, and adopted in the new University structure. In November 2020, He was promoted to level E on the basis of contributions to teaching and learning – in particular restructure of the Engineering curriculum, research and service contribution. Peter Coombes also led the restructure of the science curriculum with the Dean and a multiple disciplinary team from across the faculty and University.

### **Director of Urban Water Cycle Solutions**

January 1997 onwards. Urban Water Cycle Solutions is an independent applied science, engineering, economics and policy organisation dedicated to solving problems, finding alternative solutions and development of systems understanding of the urban, rural and natural water cycles with a view to finding optimum solutions for the sustainable use of ecosystem services, provision of infrastructure and urban planning. The company, led by Dr Peter Coombes, has been involved in a wide range of projects, advised many clients and governments, providing strategic design, policy and economic advice for over two decades. See [www.urbanwatercyclesolutions.com](http://www.urbanwatercyclesolutions.com) for details.

Urban Water Cycle Solutions is also dedicated to transfer of knowledge, science and guidance to international audiences via peer reviewed publications, multi-media forums and pro-bono contributions. We have significant experience in Science to Policy domain and demonstrated strong experience in analysing and creating government policies. The company has many significant clients and collaborators, including:

- Local, State and Commonwealth governments in Australia;
- The United Nations;
- International governments including Canada, New Zealand, Saudi Arabia and United Kingdom;
- economic and environmental regulators in many countries such as the Victorian ESC, The UK economic regulator Ofwat and UK environmental regulator EA;
- Water Utilities;
- Government Ministers; and
- The private sector.

Urban Water Cycle Solutions (UWCS) has provided a diverse range of outputs that included over 120 projects and more than 20 significant government policies or guidelines. My role includes management of these projects and contributed applied science investigations, strategic analysis, engineering design and economic assessments. In addition, these projects have required my leadership to manage collaboration with multiple contributors or partners and multiple stakeholders.

Recent examples of the diversity of our practice in 2018 are provided as follows. UWCS contributed, as part of a team of experts, to assessment of design innovations in the dairy Industry for the Victorian Environment Minister and Department of Environment, Land, Water and Planning (DELWP). This project is a confidential government assessment. Similarly, UWCS also provided, in partnership with TGM, a

strategic assessment of the impacts of climate change on the design and operation of building environments for Deakin University in Victoria. UWCS partnered with Kingspan Energy and Environment and other collaborators to publish an Alternative Water Plan for Greater Melbourne which involved over 20 government and private sector stakeholders. And UWCS also provided an assessment of Legionella risks resulting from the design and operation of infrastructure for a Latrobe Valley Hospital.

It has been a significant achievement to operate UWCS for over two decades and to provide many nationally and internationally significant projects with collaboration across multiple organisations. We have also provided pro-bono assistance or collaboration to organisations such as Ofwat, WaterAid, Engineers Australia, Rainwater Harvesting Association of Australia, Universities (eg; Imperial College London) and environmental NGOs. UWCS also provides reviews of infrastructure planning and designs, government policy and technical publications. Management of our website <http://urbanwatercyclesolutions.com> that provides scientific, technical, policy and practical knowledge to society is one example of our successful strategies with 93% increase in engagement, 11% increase in time spent reading articles and 7% decline in "bounces" from users of the website since 2014.

### **Member of Research Steering Committee, CAMELLIA Programme, Imperial College**

December 2018 onwards. Member of the research steering committee for the CAMELLIA project at Imperial College London. The CAMELLIA programme aims to enable water security for a liveable city by facilitating a real participatory process through a systems approach based on environmental science. This role on the steering committee followed a process of supporting and mentoring academics in the application process.

The aim of the five-year 'Community water management for a liveable London (CAMELLIA)' project is to bring together environmental, engineering, urban planning and socio-economic experts with governmental and planning authorities, industry, developers and citizens to co-develop solutions that will enable required housing growth in London whilst sustainably managing its water and environment. The steering committee provides overarching advice and guidance on strategic direction and communication of the NERC Community Water Management for a Liveable London (CAMELLIA) by:

1. contributing the expertise in the sector(s) they report;
2. providing strategic and scientific advice to maximise opportunities and value; and
3. overseeing performance to ensure that the programme meets its stated objectives (including meeting the needs of the funders (NERC)).

The Committee meets to hear reports on current plans, research activities and collaboration opportunities, as presented by representatives from the Management Steering Group (MSG) team.

### **Deputy Chair, Treasurer and Director of Stormwater Australia**

October 2018 to September 2020. Stormwater Australia links the diverse and multi-disciplinary interests of the Stormwater Industry and represents them at national forums. These activities include promotion of innovative and sustainable practice technologies, standards and policies to minimise adverse environmental, social and economic impacts. Stormwater Australia also facilitates an understanding of the roles and responsibilities of agencies and partners working to improve the management of our natural and built stormwater systems, provides an advisory and reference service for the industry and promotes the concept that stormwater is a resource. Better management of current problems and the implementing of improvements to existing systems is a major aim of the Association.

Appointed as a Director of Stormwater Australia in October 2018 and elected as Deputy Chair of the Association in December 2018. This role includes mentoring and guidance to younger board members as the association strives for a workable national framework of governance.

### **Committee Member: AWA Water Efficiency Specialist Network**

March 2018 onwards. Committee member of the water efficiency specialist network that aims to lead the national conversation on water efficiency. We believe that reduced water wastage is key to keeping water affordable for all users and providing resilient water systems for all communities. Our position is that water efficiency is not just a crisis response, but that maximising the utility of available water resources should be part of any approach to water planning or management that seeks to be prudent from an engineering, economic, environmental or governance perspective. Objectives:

- To collaboratively advance the conversation on the best-practice approaches to planning and implementation of water efficiency
- To demonstrate and represent the case for investment in water efficiency to the community, water utilities and policy makers
- To highlight how optimal outcomes for local communities can converge with good business outcomes for the water industry
- To advocate for water efficiency to be effectively embedded in all urban water planning, land use planning, building and development requirements

### **Adjunct Professor of Water Resources Swinburne University**

January 2016 to January 2017, Melbourne Australia. Dr Peter Coombes was an adjunct Professor of Water Resources in the Department of Civil and Construction Engineering in Faculty of Science, Engineering and Technology at the Swinburne University of Technology. He was lecturing in water and energy resources, and sustainability. This position involved preparation of lectures and tutorials for over 300 students from engineering and science backgrounds at under-graduate and post-graduate levels.

### **Revision of Australian Rainfall and Runoff Engineers Australia**

November 2014 onwards. Australian Rainfall and Runoff (ARR) is Australia's national guideline for managing stormwater runoff and flooding. The initial key task was to assist the Engineers Australia ARR Technical Committee with the first substantial revision of Australian Rainfall and Runoff since 1987, and to provide strategic direction for the project. This involved forming a stakeholder reference group and drafting a discussion paper on the need to integrate the stormwater component of Australian Rainfall and Runoff with the modern approaches to urban water management. The discussion paper was used as a facilitate discussion with industry about modern analysis and design methods for urban stormwater management.

Peter Coombes was then appointed as the lead editor the Urban Book of Australian Rainfall and Runoff. This task included co-authoring Chapter 3 Philosophy of Urban Stormwater Management and Chapter 6 Modelling Approaches, and coordination of science, practical and review inputs from the authors and the industry. This project required an international review of emerging science and practices that impact on design and management to avoid flooding of urban areas and degradation of waterways. Strong leadership skills were needed in this substantial behaviour change project to incorporate thirty years of emerging science and practice in the revised ARR Urban Book. The ARR Urban Book has been peer reviewed and was published on 4 December 2018.

### **Chief Water Scientist Victorian Government**

June 2013 to November 2014. Dr Peter Coombes from Urban Water Cycle Solutions was appointed as the Chief Water Scientist hosted by the Office of Living Victoria (OLV) with responsibility to provide science and policy advice to support the Living Victoria water reforms. The key task was to provide robust, independent scientific, engineering and economic analysis to inform the evidence based role of

the Department. A major element of this role was the use of the Systems Framework approaches developed over the last 20 years by Dr Coombes to provide insight into reform programs that deliver the optimum liveability and sustainability outcomes at a reasonable cost. This challenging role required independent analysis and review of proposals and policies originating from government departments, water monopolies and the private sector which was a strong departure from past practice of “insider review”. This position involved substantial interaction with senior bureaucrats, cabinet members and multiple stakeholders.

This role supported a number of key policy and strategy outcomes, including the Melbourne Water Future and Ballarat Water Future strategies that were ratified by the Victorian Cabinet in 2013 and 2014. The Chief Scientist was essentially required to foster an institutional behaviour change process to develop modern government water policies by challenging legacy assumptions and arrangements with evidence. Whilst the process was contested, significant lasting change was established in urban water cycle management which includes systems thinking, modern objectives and integration across society. Significant awards were also received for the applied science discoveries from this position, including runner up in the GN Alexander Medal in 2015 and winning the GN Alexander Medal in 2018.

### **Stormwater, flood management and IWCM strategy**

January 2009 to September 2013. Dr Peter Coombes from Urban Water Cycle Solutions was commissioned by the Metropolitan Planning Authority (MPA) to provide advice and designs for the draft East Werribee Precinct Structure Plan. This analysis was supported by Mark Colegate from TGM and finalised our previous innovative solutions to solve the historical flooding and water quality challenges at the site. This work built on previous work that commenced in 2009 where Dr Coombes and Bonacci Water developed a conceptual integrated water cycle management (IWCM) strategy that incorporated the objectives of a Multi-Agency Working Group and investigated options for use of regional stormwater and local rainwater harvesting, aquifer storage and recovery, wastewater reuse within the Precinct and water efficiency. The IWCM strategy was dependent on a stormwater management solution that mitigates the significant legacy of flooding and stormwater pollution at the site and incorporates the principles of water sensitive urban design (WSUD). The stormwater management elements of the proposed IWCM strategy were incorporated into a Development Services Scheme (DSS) developed by Dr Coombes in 2010 for Melbourne Water Corporation.

### **Advisor and Systems Analyst – integrated stormwater and flood management Australian Capital Territory Environment and Sustainable Development Directorate**

October 2012 – June 2013 (9 months) Canberra, Australia. Developed a systems framework for integrated catchment management for the ACT and surrounding region including downstream impacts on the Murray Darling Basin. This analysis supported the ACT government business case for integrated catchment management. The ACT government successfully submitted the business case to the Australian Federal government and the supporting analysis was positively reviewed as part of the process. The systems analysis highlighted the impacts of cumulative loads of pollutants and runoff volumes on regional waterways and catchments. A new policy regime was recommended. This analysis was accepted by the Commonwealth Treasury resulting in an award of \$85 million to the ACT government.

### **Systems analyst – flood investigations for the Western Highway VicRoads**

October 2010 – June 2014, Ballarat, Australia. Dr Peter Coombes from Bonacci Water and Urban Water Cycle solutions led the development of a systems framework for integrated catchment management for understand flood risks for the upgrade of 150 km of the Western Highway for VicRoads. This project required first principles analysis of hydrology and hydraulics across different topography, weather and catchment areas to define flood risks of gauged and ungauged catchments. An innovative combination

of two dimensional analysis using historical flooding records from multiple sources (including from interviews and photos) was utilised to resolve the actual flood dynamics of the regions.

### **Science and Policy Advisor Victorian Government**

July 2012 to June 2013. This position was based on an independent review of the Metropolitan Water Supply Demand Strategies proposed by Victorian water utilities by Dr Peter Coombes at Urban Water Cycle Solutions. This comprehensive review involved multiple stakeholder interviews and independent analysis of assumptions to provide the recommendations for reform of the Victorian water industry and business planning for the Victorian water bureaucracy. These recommendations were ultimately utilised by the Office of Living Victoria. A draft Melbourne Integrated Water Cycle Management Strategy was also provided to the Victorian Water Minister in December 2012 as a starting point for ultimate delivery of Melbourne's Water Future to Cabinet. The Secretary of the Department of Sustainability and Environment appointed Dr Coombes to the role of Chief Scientist but departmental legal processes delayed this appointment until June 2013. As an interim, this advisory position was extended to include contribution to the development of Melbourne's Water Future strategy and the ultimate submission to the Victorian Cabinet.

### **Systems analyst – flood management, stormwater and IWCM strategy for Ararat Prison Department of Justice**

October 2010 – June 2013, Ararat, Australia. Dr Peter Coombes from Bonacci Water and Urban Water Cycle solutions led the development of an integrated water cycle management strategy for the upgrade of the Ararat Prison. The project utilises rainwater harvesting and wastewater reuse for water supply, and to manage impacts on regional wastewater infrastructure and river catchments. This analysis also determined the flood risks on the upgrade of the Ararat Prison and designed a strategy to mitigate local and regional flooding impacts on the site. An innovative combination of two dimensional analysis using historical data from multiple sources (including from interviews, photos and gauged data) was utilised to resolve the actual flood dynamics of the upper Hopkins River catchments.

### **Managing Director Bonacci Water**

January 2008 – June 2012 (4 years 6 months) Melbourne, Australia. This position involved the establishment and management of a new division of the established engineering company Bonacci Group. This new multi-disciplinary business provided systems analysis, development of policy, strategy and designs for sustainable management of water resources, and optimum design of infrastructure and buildings. Bonacci Water achieved financial success from start-up and ultimately achieved an annual value of about \$2 million in a difficult business environment already dominated by existing consultancies with established relationships with bureaucracy.

Highlights from this position included initiation of and contribution to drafting of a new water cycle management policy and strategy for the State of Victoria (now called Living Victoria policy), development of a Systems Framework for the Greater Sydney region and a report on water cycle futures for Sydney Water Corporation, development of an alternative water cycle strategy for the city of Springfield in Queensland, advice to UNESCAP on development eco-efficient water policy, provision of regional analysis of flood risks for VicRoads and assistance with the design of many low impact buildings and projects

This role included coordination of up to 30 employees and collaboration with multiple agencies, government departments, utilities, developers, academics and other consultancies in Victoria, throughout Australia and internationally. This position often required leadership of professionals from Bonacci Water and a number of consulting companies to provide engineering and policy inputs to diverse groups of stakeholders. For example, Bonacci Water completed systems investigations of water

resources and town planning policies for the Victorian government's Living Victoria Ministerial Advisory Council which included over 200 stakeholder meetings and workshops. This process involved collaboration across the multiple organisations and agencies to produce highly influential policy advice. This position involved the establishment and management of a new division of an established engineering company. This multi-disciplinary business provided systems analysis, development of policy, strategy and designs for sustainable management of water resources, and optimum design of infrastructure. Bonacci Water achieved financial success from start-up and ultimately achieved an annual value of about \$2 million in a difficult business environment already dominated by existing consultancies with established relationships with bureaucracy. This role included coordination of up to 30 employees and collaboration with multiple agencies.

#### **Advisor: United Nations ESCAP**

January 2009 – December 2009 (1 year) Asia Pacific. Collaborate with the UN ESCAP to provide an advisory report on development of eco-efficient water infrastructure. This process involved research, participation in workshops and discussions, advocacy and ultimately delivery of a report to UN ESCAP.

#### **Research Leader for Innovative Water Sensitive Urban Design eWater Cooperative Research Centre**

January 2005 – June 2009 (4 years 6 months) Newcastle, Australia. Served as the National Research Leader in the eWater CRC for the E2 research program to investigate innovative water sensitive urban design strategies. This research programme included coordination across multiple research agencies, integration of hydrology, hydraulics, asset management, behavioural water demands, economics and ecosystems within biophysical systems approaches.

#### **Associate Professor University of Newcastle**

January 2004 – December 2007 (4 years) Newcastle, Australia. Associate Professor of Integrated Water Cycle Management. Initiated, led and contributed to a range of applied research projects in molecular sciences and systems analysis of biophysical systems including water resources and urban planning. Supervised 5 completed PhD research programs and generated more than 50 peer reviewed publications.

#### **Member of working group: Prime Minister's Science, Engineering and Innovation Council**

January 2006 – December 2006 (1 year) Canberra, Australia. Member of PMSEIC working group for water resources led by Australia's Chief Scientist and reporting to the Australian Commonwealth Government.

#### **Advisor: National Water Commission**

January 2005 – December 2006 (2 years) Canberra, Australia. Member of the advisory panel on urban water management reporting to the National Water Commission and the Australian Government.

#### **Postdoctoral Fellow: University of Newcastle**

May 2002 – May 2004 (2 years 1 month) Newcastle, Australia. Development of systems analysis for integrated water cycle management including shadow prices and optimum solutions. Contributed to research programs investigating integrated water cycle management. Published over 20 peer reviewed articles in scientific literature.

#### **Member of advisory panel for Our Water Our Future policy: Victorian Government**

January 2005 – December 2006 (1 year) Melbourne, Australia. The Victorian Government developed



the Our Water Our Future policy for management of water resources. Served on the advisory panel for alternative water resources as part of developing the Our Water Our Future policy.

## Summary of experience

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### Consulting and research

- Designed and developed over 120 sustainable developments in Australia and internationally
- Author of over 250 research publications, including book chapters, journal articles, keynote papers and conference publications, and supervision of 5 completed PhD research programs.
- Delivery of many research and consulting projects across science, engineering and economic issues relating to water resources including integrated water cycle management, source control, catchment management, ecological sustainability, water demand, water balance modelling, water resource economics and bio-chemistry.
- Awarded more than \$3 million in competitive and industry research funding
- Professor of Water Resources Engineering, Chair of Engineering and Associate Dean (Education) at Southern Cross University. Leadership in modernising the Science and Engineering curriculum, and development of new Faculty of Science and Engineering. Systems analysis of University economics and impact to develop strategy.
- Founding and Managing Director of Bonacci Water (2008 - 2012)
- Founding and Managing Director of Urban Water Cycle Solutions (1998 -)
- National research leader for innovative Water Sensitive Urban Design strategies in eWater CRC (2005 – 2010)
- Chairman of the Stormwater Industry Association and Deputy President of Stormwater Australia.
- Initiator and advisor on the creation of the Bluescope Water by Bluescope Steel

### Government advisory

- Chief Water Scientist in the Victorian Government (2012 - 2013)
- Member of water advisory panel of the Prime Minister's Science, Engineering and Innovation Council (2006-07)
- Member of the Urban Water Advisory Panel of the National Water Commission (2006 - 2008)
- Advisor, United Nations Water Security Section, Environment and Development Division
- Advisor to international Governments including Canada, Saudi Arabia, India, Republic of Korea and New Zealand
- Assisted New South Wales, Victoria, Western Australian and Queensland Governments in the development of water, planning and regulatory policy (1999 - )
- Author of policy reviews and design guides for Water Sensitive Urban Design and Integrated Water Cycle Management across all levels of Government
- Member of Victorian Government's Our Water Our Future panel on alternative water sources (2007)
- Advisor on regional stormwater management projects for the Victoria Department of Sustainability and Environment (2006).

- Author of and expert adviser to the Victorian Government *Living Melbourne, Living Victoria* water policy for Greater Melbourne (2010 - 2014)
- Author of the integrated systems analysis, alternative water and business strategy for the Greater Sydney region for the Board of Sydney Water Corporation.
- Leader and co-developer of the original capacity building program for integrated water cycle management and water sensitive urban design in the Hunter region of New South Wales that involved 16 local government areas, water authorities, government agencies and the community (1998 – 2002).
- Special project officer, Infrastructure and Planning Manager, Newcastle and Maitland City Councils
- Director of the program to develop the Melbourne Integrated Water Cycle strategy for the Office of Living Victoria
- Leader of water reform process for restoring the Al Asfar Lake system in the historical city of Al Hasa in Saudi Arabia

### Conferences and publications

- Chair, 13th International Rainwater Catchment Systems Conference, Sydney, 2007
- Chair, 5th International Water Sensitive Urban Design Conference, Sydney, 2007
- Co-author of "Australian Runoff Quality"
- Editor and co-author of "Australian Rainfall and Runoff" Urban Book
- Editor of the Water Journal
- Chair of the Scientific Committee for Stormwater2020
- Over 170 academic publications (book, book chapters, journal articles, conference papers and reports). The impact of these research publications is indicated by Google Scholar: [Peter J Coombes Google Scholar](#); and by recent Research Gate statistics: [Peter J Coombes ResearchGate](#) since 2014.

### Teaching and supervision

Peter Coombes supervised or mentored five completed PhD, multiple masters and honours level students at University of Newcastle, Swinburne University, Australian National University and Southern Cross University. In addition, he provided supervision or mentoring to business leaders, academic staff (for example at Imperial College, University of Newcastle and Australian National University), within government science policy groups and to engineering staff.

Peter also provided research projects and mentoring for the Environmental Policy subject in Fenner School of Environment and Society at Australian National University, lectured in Engineering Project Management at University of Newcastle and Sustainability at Swinburne University.

At Southern Cross University, he developed and delivered learning units in Hydrology, Humanitarian Projects, Engineering Project Management and Professional Ethics, Engineering Capstone, Engineering for Resilient Catchments and Floodplains, and Coastal and Fluvial Hydrodynamics. This contribution also included leading restructure of the Engineering curriculum from three degrees into one degree program with specialisations in Civil, Mechanical and Coastal Systems Engineering with an Associate Degree in Civil Construction.

Professor Coombes also applied these methods with success to restructure the science curriculum from five degrees into a single Bachelor of Science with four specialisations and four majors. Leading the thinking thought each unit of study, he also met the challenge of effectively turning our academic team

to on-line delivery to address COVID-19 while co-developing material for our 2022 delivery in the 6x6 format, using a blended learning approach that we are now replicating across the School.

### Career highlights

- Promoted to full Professor at Southern Cross University whilst fulfilling the role of Chair of Engineering and assisting the Dean in the creation of a new faculty. This included leadership in the development of new Science and Engineering curriculums, and redefining the financial, research and academic performance of the school.
- Awarded the Presidents Prize by Engineers Australia for contributions to the revision of Australian Rainfall and Runoff.
- Systems Framework research and development acknowledged by Engineers Australia as one of the most significant contributions to water resources and hydrology in 2014-15 and awarded the G.N. Alexander Medal in 2018
- Lead editor of Australian Rainfall and Runoff Urban Book for Engineers Australia and the Commonwealth Government. Awarded the Presidents Prize by Engineers Australia.
- Appointment as a Chief Water Scientist in the Victorian Government and contribution to the successful submission of Melbourne's Water Future strategy to the Victorian Government Cabinet.
- Strong experience in leading high level teams in complex and challenging political environments
- Development of non-linear economic methods that account for the actual depreciation of water assets that allow more realistic planning for infrastructure management
- Establishment of the one of the first stormwater management divisions within a local government authority.
- Development of integrated systems analysis approaches that allow understanding of the decentralised, multiple scaled and regional impacts of water and energy solutions throughout cities, regions and countries. This process provides understanding of the performance of solutions at multiple scales in response to multiple objectives.
- Developed and refined first principles methods for combining hydrology, hydraulics, topography, weather and demographics in analysis of flooding, stormwater runoff, wastewater discharges, water use and environmental impacts in a systems framework.
- Development of dynamic systems economic methods to allow understanding of the value of solutions at multiple scales across society.
- Delivery of systems analysis and policy research, and applied policy processes to led to government policies to allow and encourage urban rainwater harvesting and decentralised water management. In particular, research and policy advice that ultimately led to creation of the state environmental policy BASIX in New South Wales. This project included interaction with the NSW Cabinet.
- Completion of PhD research that developed a systems approach to water cycle management and economics. Followed by the award of an Australian Research Council Post-Doctoral Fellowship and ultimately an Associate Professor at University of Newcastle and Melbourne University. Awarded over \$3 million in competitive and industry research funding, and completion of a large number of influential publications in less than a decade.
- Leader and strategist in the original capacity building program for water cycle management and Water Sensitive Urban Design in the Hunter Region of New South Wales. This was essentially a change program to move the water and planning industries from traditional approaches to a more diverse range of solutions and to augment the capacity of those professions. Importantly, this

original program has been replicated throughout Australian in a range of similar strategies such as Clearwater in Melbourne and WSUD in Sydney.

- A contribution over a period of more than twenty years as a forensic and systems analyst to find solutions to significant problems throughout the Australian and international water industry. This has involved the resolution of a wide range of challenges from country towns, regional flooding and metropolitan water resources. This contribution has also included key roles in many major projects.
- Founding and Managing Director of Urban Water Cycle Solutions and Bonacci Water. Both companies have been dedicated to development of systems and forensic analysis leading to transparent policy and project advice to industry and government. Both companies have achieved financial success from start-up (Bonacci Water ultimately achieved an annual value of about \$2 million) in a difficult business environment already dominated by existing consultancies with established relationships with bureaucracy.
- Contribution to and leadership in many policy processes including The Living Victoria Living Melbourne water policy reform process, the Sydney Water Alternative Water Strategy, The Water Advisory Group of the Prime Minister's Science Engineering and Innovation Council and Urban Water Advisory Group of the National Water Commission.