

PRODUCTIVITY COMMISSION

SUBMISSION TO THE INQUIRY INTO THE REFORM OF AUSTRALIA'S WATER RESOURCES SECTOR 17 APRIL 2017

We thank the Productivity Commission for the opportunity to make a submission on the inquiry into the reform of Australia's water resources sector. This submission addresses the terms of reference, particularly progress in achieving the objectives and outcomes of the National Water Initiative (NWI) and the need for future reform. We identify a 10 point plan for a national water reform agenda that builds on our reflections on the outcomes of the NWI and related water reform efforts, the potential and realised benefits of NWI implementation and, particularly, the scope for improving the NWI.

The submission draws on our recent work on national water reform¹ and our collective and individual experience as academics and practitioners who research, teach or practice in the area of Water Law at the Australian National University, University of Idaho, University of Melbourne, University of Sydney, University of Western Australia, UNSW Sydney, the Environmental Defenders Office NSW and Environmental Justice Australia. The views expressed are however our own and do not reflect the position of our respective institutions.

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Submission Overview

At the outset, it is important to recognise that after two decades of cooperative governmental reforms on water, Australia has established a world-leading hybrid governance system involving top-down regulation, water markets and water planning with stakeholder cooperation. Yet, since the breaking of the millennium drought and the abolition of the National Water Commission (NWC) in 2015,² there has been a growing belief across many interests and sectors that Australia may have ‘dropped the ball on water’.³ As the Wentworth Group of Concerned Scientists affirmed in 2014, ‘it appears Australian governments are walking away from strategic water reform at the very time when we should be preparing for the next inevitable drought’.⁴

We accordingly welcome this Inquiry and the opportunity it offers to develop the next generation of national water reforms. The need for such a rethinking of national water law and governance could not be more urgent. Since the passing of the *Basin Plan 2012* (Cth) there has been little detailed intergovernmental direction about the next steps in Australia’s water law and governance journey.⁵ As John William’s noted early this year: ‘There has been a policy silence on water reform from Federal and state governments. Absolutely nothing has happened to take matters forward. In fact, there is mounting evidence of not just policy stagnation but rather policy retreat’.⁶ It is increasingly unclear how resilient the NWI blueprint will be in the face of shifting political agendas, growing complexity, reform fatigue, shrinking public resources at state levels and the absence of an independent oversight body like the NWC.⁷

It is paramount that Australia maintains ‘good’ water law and governance given that the next few decades will see major increases in Australia’s population and food production (both dependent on water), as well as likely water scarcity due to droughts and climate change.⁸ Further, even if support for the NWI were to continue, it is likely that major law and policy reforms will still be needed if the Coalition government’s 2015 White Paper vision of developing northern Australia’s water resources is to be fully realised.⁹

Although Australia has come a long way in water management under the NWI, the design and implementation of the NWI national reform does not appear sufficient to meet future water challenges. Further reforms and changes will be required and we believe the following ten priorities should be considered and addressed by governments, civil society and industries if we are to achieve a sustainable water future for Australia:

- 1. Regulate the water market to ensure equity, enhance efficiency and protect the environment**
- 2. Extend metering, monitoring and accounting**
- 3. Go beyond the limits of the market, especially for managing groundwater**
- 4. Reform water buy backs**
- 5. Develop new systems for dealing with cumulative impacts**
- 6. Protect environmental water**
- 7. Implement strategic planning**
- 8. Improve models and tools for participation in water governance**
- 9. Ensure full recognition of Indigenous interests**
- 10. Capitalise on successes and avoid past mistakes if northern development is pursued.**

We outline these ten points in more detail below.

Ten Points for National Water Reform

1. Regulate the water market to ensure equity, enhance efficiency and protect the environment

To date, most attention and resources have been focussed on water policy reforms at the national and state levels, in particular the establishment of cap and trade market systems based on sustainable yields. There has been insufficient attention and resources directed towards the implementation of this 'top down' policy approach on the ground. For example, there is a significant need for enhancing the education of water users so that they understand the importance of complying with extraction limits and enforcing laws where breaches occur. A recent survey of approximately 4000 non-urban water users in New South Wales (22% response rate) suggests compliance rates remain less than 50%, in part because water users' knowledge of water legislation, compliance policies, enforcement actions and penalties is very low (<15% reporting good or very good knowledge of these areas).¹⁰

Licence transfers should also be more closely regulated with a view to mitigating secondary impacts on other water users and on ecosystems, and so that increases in the consumptive portion of the former and new use are avoided.¹¹ This will in turn increase trust amongst users and help avoid unintended consequences. Attention will also need to be given to addressing the adverse impacts on vulnerable communities from water markets (and broader water policy), particularly the distributional and structural impact on rural communities. Furthermore, although national compliance frameworks have led to improved regulator action,¹² the federal funding for these reforms has largely come to an end and the gains will be squandered if further reform action and investment is not taken. These reforms will help to minimise risks of non-compliance (e.g. water users inadvertently failing to follow an 'unknown' requirement, despite a desire to comply with the law), provide a level playing field, build confidence in market systems and improve outcomes for the community and the environment alike.¹³

2. Extend metering, monitoring and accounting

There is substantial technology to improve telemetered metering, monitoring and data collection across multiple scales. While the Bureau of Meteorology and recent national and state metering policies have made significant strides,¹⁴ a renewed and extended policy and implementation effort in this area would greatly improve on-farm water management, facilitate assessment of equivalence between prior and new uses in transfers (above), enhance compliance and enforcement while reducing market transaction costs, and provide much more robust and reliable information to assist with better strategic decision making, water efficiency infrastructure reforms¹⁵ and water planning (see below).¹⁶ On-farm telemetry and greater transparency in real-time data of individual pumping activity (e.g. making data available to other water users, such as under the Audited Self-Management model discussed below, and/or making the data available to the wider public) are also required if we are to improve the compliance rates discussed above and enhance public confidence in Australia's water management systems.

3. Go beyond the limits of the market, especially for managing groundwater

While the use of a cap and trade market approach is a major achievement in the management of water in Australia, it is not without its challenges. These include limited trading in areas outside the Murray Darling Basin, minimal trading in groundwater, and unintended external impacts on social and environmental conditions.¹⁷ While continuing reforms to reduce transaction costs and unbundle land and water rights may be able to address some of these limits, it is timely to consider complementary policy and/or

governance approaches and how these can be accommodated within a 'cap and trade' system to produce good water outcomes.¹⁸ For instance, given the uncertainties associated with groundwater trading (e.g. impacts on quality, levels and groundwater dependant ecosystems),¹⁹ a national conversation will be needed to consider the feasibility of new proposals and to identify international innovations. One such innovation is Audited Self-Management (ASM)²⁰ which includes:

- participating water users being willing and able to form a legal entity or collective capable of managing the ASM program;
- this entity is allocated, and therefore has legal responsibility for, a collective water right (in effect, a 'bubble' licence) covering all the ASM participating members;
- within the collective licence, participants are able to determine individual annual extractions as they see fit (effectively trading within the bubble licence);
- all members must have in place accurate metering that uses telemetry to generate real-time water extraction data;
- the extraction data is made available to all participants (disaggregated to the individual level) and the government regulator (aggregated to the collective level); and
- the ASM program has in place appropriate integrity (e.g. an auditor) and enforcement mechanisms to ensure compliance, including, if necessary, the capacity to draw on the support of the external government regulator.²¹

This ASM approach can be used to manage groundwater use, but also has the capacity to manage groundwater connected to surface water, as well as water quality issues (see also 'new systems for dealing with cumulative impacts' below).²²

4. Reform water buy backs

Local concerns and political interference in the process of setting and implementing sustainable diversion limits under the Basin Plan have created a range of uncertainties, including the imposition of legislative caps on water buybacks.²³ This necessitates a reimagining of environmental water transactions within the Murray Darling Basin, which may include reconsidering the cap on buybacks, strengthening rules around environmental flows to ensure water for the environment (see below) and opening up collaboration between government and non-governmental actors in water transactions (e.g. water trusts and non-profit investment in environmental water transactions).²⁴ It will be critically important to design regulatory environments that allow for both collaboration between government and non-governmental actors, in order to bolster water recovery efforts, as well as institutional checks and balances to ensure sustainable water management (see also 'regulate the market' above and the need to address structural impacts on communities).²⁵

5. New systems for dealing with cumulative impacts

Future reform of the NWI needs to deal adequately with the cumulative impacts of water extraction on groundwater and groundwater-dependent ecosystems, particularly from mining including of unconventional gas (such as Coal Seam Gas (CSG) and shale gas). To date, state and national efforts have been evolving and are subject to ongoing reviews (see e.g. 'water trigger'²⁶ and state attempts to integrate CSG and mining activities into water accounting and planning frameworks). However, laws and policies in most jurisdictions do not adequately address this issue.²⁷

Bioregional assessment is being undertaken across a number of areas with a view to better understanding how the cumulative impacts associated with CSG and coal mining can be properly managed. However, it is crucial that the knowledge acquired through this process

translates into innovative and rigorous laws and policies (which incorporate strategic planning, see below). This should include an obligation to prohibit development where there is a risk of irreversible damage to water resources. It is also crucial that this sort of assessment be undertaken in other mining-intensive areas, such as in parts of Western Australia and South Australia.²⁸

6. Protect environmental water

The Australian Government has spent billions of dollars acquiring the rights to water licences in order to rectify over-allocation and improve environmental outcomes, particularly in the Murray-Darling Basin. However, rather than being protected as a public asset, environmental water is at times being legally extracted for consumptive use, thereby propping up the reliability of other licence holders (particularly during drier periods). Protecting the public's investment in sustainable water outcomes will require the imposition of rules to protect environmental water as it moves through the system, ensuring naturally occurring flows, or water released from a dam for the purposes of achieving specific environmental outcomes, can reach the desired destination (such as a wetland or floodplain). Rules protecting environmental water for groundwater-dependent ecosystems need further development and increased focus on implementation, taking advantage of scientific advances in this area.

Legitimacy also needs to be embedded as a core criteria for measuring success of environmental water management. Environmental water managers are increasingly aware of their need to have and maintain a 'licence to operate'.²⁹ Under-investment in legitimacy will ultimately lead to compromised efficiency and efficacy of environmental water management.³⁰ Further effort is needed to define the features of successful environmental water programs, and tools for guiding investment and evaluation of these programs. Various tools have been developed that emphasises the broad policy goals of environmental water programs (efficacy, efficiency and legitimacy), and reflect the essential implementation conditions (legal and administrative frameworks, organisational capacity and partnerships).³¹

7. Implement strategic planning

While significant progress has been made across Australia in water planning, the evolution has been slow and complicated, in part because the uncertainties we confront are high and the water management challenges complex.³² Acknowledging and addressing these challenges demands significantly improved strategic planning in future water reforms. Key issues will include:

- greater comprehension of surface/ground water connectivity;
- building in capacity for adaptive management at the outset;³³
- accommodating the impact of climate change as a driver of future policy reform and water infrastructure development. For example, the limits on water consumption set out in the Basin Plan do not take into account likely future climate scenarios.³⁴ This is a risky policy decision and one which could have disastrous consequences for farmers and the environment alike as rainfall becomes scarcer across parts of the Basin over the next few decades;³⁵ and
- the impacts of characterising water entitlements as property rights and whether there should be greater consistency across State/Territory legislation.³⁶

8. Improve models and tools for participation in water governance

National water reforms have emphasised a 'top down' policy approach. The focus of public participation in water governance has been either via water markets or through non-binding techniques of consultation undertaken by decision-makers. The extent of influence and

genuine engagement by the broad range of interests and stakeholders in the governance of water resources has been at best uneven. Community, farming, environmental and Indigenous actors can and do remain disenfranchised in decision-making, in particular where they have limited resources, organisation or legal rights. Yet, engagement and effective participation is central to justice in democratic societies. Broad-based participation is crucial to management of water resources given their character as a form of common, or public, good, also characterised by contested uses. It is critical to the inclusion of local and traditional knowledge that provide the locus for context specific solutions. It is also central to cooperative problem solving and innovation in water management, and to building trust and satisfaction with laws and plans.³⁷ The latter is particularly important to guard against further unwinding of water policy goals, ensure more successful implementation and enhance the legitimacy of the triple bottom line in water.³⁸

The needs of public participation in decision-making and governance will vary depending on the nature or difficulty of the issue, its scale, its impacts and its consequences. The suite of participatory models and tools will need to further mature and evolve, beyond mere opportunities to be 'consulted', including reform of third party rights to participate in or challenge decisions on public interest grounds (such as environmental sustainability or Aboriginal heritage protection),³⁹ the development of 'deliberative' democratic procedures⁴⁰ in appropriate circumstances, expanded use of public inquiries and hearings, establishment of 'co-management' arrangements in others,⁴¹ and continued evolution of 'water trusts'.⁴² These various models and tools also need to be backed up by both policy support and legal mechanisms. For example, improving access to water data (including information about water trades and compliance with extraction limits and other licence conditions) is vital for building community confidence in the system and facilitating genuine participation in water management processes, in turn improving accountability, efficiency and justice.⁴³

To date, considerable work and analysis has been undertaken on participatory approaches to water governance, most notably in relation to Indigenous participation. Formal requirements or provision for public engagement and involvement under the *Water Act 2007* (Cth) and *Basin Plan 2012* (Cth), for example, are few. The more elaborated concern Indigenous consultation, in particular under the *Basin Plan (2012)* (Cth) Ch 10 Part 14. Yet even these consultation obligations are relatively weak. In practice, actual delivery on consultation requirements in water resources planning and management has been problematic, given:

- arguably insufficient notice and time to Indigenous organisations and communities;
- limited capacity both internally and in terms of available independent expertise; and
- lack of developed and agreed procedural models for participation and engagement.

These shortcomings have been noticeable for instance in water resources plan preparation in the Murray Darling Basin.

These issues are typical, but not exhaustive, of dimensions of public involvement in water governance needing consideration and addressing in greater detail through future water reform. The use of law and policy to address participation in water management should additionally respond to power dynamics, resources and capacity among relevant interests and groups, with a view to better integrating distributive justice into planning and management.⁴⁴

9. Ensure full recognition of Indigenous interests

Despite progress in NSW and the Murray Darling Basin, engagement with Indigenous communities (discussed above), and the integration of their needs and concerns, including

the issues of commercial and native title water rights, has not been a priority of existing national water reforms.⁴⁵ This must improve. In particular, it must come to the fore in relation to the development of northern Australia where Indigenous land tenure (land rights or native title) is highly significant.⁴⁶

10. Capitalise on successes and avoid past mistakes if northern development is pursued

The challenge of developing northern Australia's water resources is to build on the strengths of water reforms in the Murray Darling Basin, whilst minimising the weaknesses. In addition, however, there are unique issues such as Indigenous interests, sensitive ecological resources such as free flowing rivers and vastly different tropical weather systems. Northern development will require all of the above priorities to be addressed in order to avoid repeating past mistakes.⁴⁷ As the former commission chair of the NWC has stated: 'We can avoid costly mistakes in the future by learning the lessons of the past. Future generations should never have to endure the social, economic and environmental costs of another Murray Darling Basin'.⁴⁸

We believe these 10 priorities are central to improving Australia's approach to managing water. We offer them with the aim of adding to this much-needed Inquiry into the future of National Water Reform in Australia.

¹ C Holley ed. "Rethinking Australian Water Law and Governance" *Special Issue of the Environmental and Planning Law Journal* (2016) Vol 33 Part 4; C Holley and Darren Sinclair, "Rethinking Australian water law and governance: Successes, challenges and future directions" (2016) 33(4) *Environmental and Planning Law Journal* 275; J Gray and L Lee, "National Water Initiative styled water entitlements as property: Legal and practical perspectives" (2016) 33(4) *Environmental and Planning Law Journal* 284; C Holley and D Sinclair, "Governing water markets: Achievements, limitations and the need for regulatory reform" (2016) 33(4) *Environmental and Planning Law Journal* 301; B Lindsay, "Public participation, litigation and adjudicative procedure in water resources management" (2016) 33(4) *Environmental and Planning Law Journal* 325; K Owens, "Reimagining water buybacks in Australia: Non-governmental organisations, complementary initiatives and private capital" (2016) 33(4) *Environmental and Planning Law Journal* 342; R Nelson, "Broadening regulatory concepts and responses to cumulative impacts: Considering the trajectory and future of groundwater law and policy" (2016) 33(4) *Environmental and Planning Law Journal* 356; B Cosens, "Water law reform in the face of climate change: Learning from drought in Australia and the western United States" (2016) 33(4) *Environmental and Planning Law Journal* 372; P Martin, "Creating the next generation of water governance" (2016) 33(4) *Environmental and Planning Law Journal* 388; Lily O'Neill, Lee Godden, Elizabeth Macpherson and Erin O'Donnell, "Australia, wet or dry, north or south: Addressing environmental impacts and the exclusion of Aboriginal peoples in northern water development" (2016) 33(4) *Environmental and Planning Law Journal* 402. Parts of this submission originally appeared in Emma Carmody, Barbara Cosens, Alex Gardner, Lee Godden, Janice Gray, Cameron Holley, Louise Lee, Bruce Lindsay, Liz Macpherson, Rebecca Nelson, Erin O'Donnell, Lily O'Neill, Kate Owens, Darren Sinclair, "The future of water reform in Australia — starting a conversation Australian Environment Review (2016) 31(4) 132-137.

² *National Water Commission (Abolition) Act 2015* (Cth). See also S Khan "Axing water overseer could leave regional Australia high and dry" (2014) *The Conversation* <https://theconversation.com/au>.

³ Australian Government, National Water Commission (NWC), *Australia's Water Blueprint: national reform assessment 2014*, 3–4; NWC "Don't drop the ball on water' urges National Water Commission", media release, 20 October 2014, (*NWC media release*) <http://www.nwc.gov.au/media-centre/media/>.

⁴ Wentworth Group of Concerned Scientists, B Tucker, *Statement on the future of Australia's water reform* (2014) 0.

⁵ See for example, Standing Council on Environment and Water, *Next Steps in National Water Reform: Preparation for the Future* (2013)

http://www.nwc.gov.au/data/assets/pdf_file/0006/37671/Appendix-E-accessible-PDF-for-web-NWC-Australias-water-blueprint-national-reform-assessment-2014.pdf.

⁶ J Williams “Turning the tide of water reform Time to reignite Australia’s stagnant policy debate” APPS Policy Forum, 8 February 2017. Available at: <https://www.policyforum.net/turning-tide-water-reform/>.

⁷ Australian Government, National Water Commission (NWC), *Australia’s Water Blueprint: national reform assessment 2014*, 3–4.

⁸ Climate Council of Australia, W Steffen, *Thirsty Country: climate change and drought in Australia* (2015) climatecouncil.org.au/droughtreport2015.

⁹ Australian Government, *Our North Our Future: White Paper on Developing Northern Australia* (2015) <http://industry.gov.au/ONA/whitePaper/Paper/index.html>.

¹⁰ C Holley and D Sinclair “Water extraction in NSW: Stakeholder views and experience of compliance and enforcement, a report of a survey of water users” (2015) *National Centre for Groundwater Research and Training and Connected Waters Initiative Research Centre UNSW Australia*, <http://www.connectedwaters.unsw.edu.au/sites/all/files/Water-extraction-in-NSW-stakeholder-views-of-compliance-and-enforcement-survey-report.pdf> pp. 32, 57.

¹¹ For example, the consideration of more detailed and rigorous environmental and public interest standards (e.g. ecosystem integrity) when assessing a licence transfer (see, e.g. R Nelson, *Groundwater, rivers and ecosystems: comparative insights into law and policy for making the links*’ (2013) 28(4) *Australian Environment Review* 559-560); the limitation of a transfer to the estimated amount of the water right actually consumed to avoid increased stream flow depletion; and a review of potential impacts on other water users and identification of mitigation measures – for example, to assure continued water delivery on shared infrastructure.

¹² Australian Government Department of Sustainability, Environment, Water, Population and Communities, *National Framework for Compliance and Enforcement Systems for Water Resource Management* (March 2012).

¹³ C Holley and D Sinclair, “Compliance and Enforcement of Water Licences in NSW: Limitations in Law, Policy and Institutions” (2012) 15(2) *Australasian Journal of Natural Resources Law and Policy* 149-189; C Holley and D Sinclair “Water extraction in NSW: Stakeholder views and experience of compliance and enforcement, a report of a survey of water users” (2015) *National Centre for Groundwater Research and Training and Connected Waters Initiative Research Centre UNSW Australia*, <http://www.connectedwaters.unsw.edu.au/sites/all/files/Water-extraction-in-NSW-stakeholder-views-of-compliance-and-enforcement-survey-report.pdf>.

¹⁴ See generally C Holley and D Sinclair, “Non-Urban Water Metering Policy: Water Users’ Views On Metering And Metering Upgrades In NSW’ (2013) 16(2) *Australasian Journal of Natural Resources Law and Policy* 101-131.

¹⁵ See for example the Commonwealth On-Farm Further Irrigation Efficiency program and Sustainable Rural Water Use and Infrastructure, <https://www.environment.gov.au/water/rural-water>. See also the National Water Infrastructure Development Fund, <http://www.agriculture.gov.au/ag-farm-food/natural-resources/national-water-infrastructure-development-fund>.

¹⁶ See generally, C McKay and A Gardner “Water accounting information and confidentiality in Australia” (2013) 41 *Federal Law Review* 127-162.

¹⁷ National Water Commission, *Australian water markets: trends and drivers 2007–08 to 2012–13*, Canberra; J Gray, “Dollars and Dreams: Legal Aspirations and Report Cards in the Murray-Darling Basin of Australia” in Westra L, Taylor P and Michelot A, (eds), *Confronting Ecological and Economic Collapse: Ecological Integrity for Law, Policy and Human Rights*, (Routledge Earthscan, Abingdon, Oxon, UK, 2013).

¹⁸ P Martin and N Gunningham, “Improving governance arrangements for sustainable agriculture: groundwater as an illustration” (2014) 1(1) *Australian Journal of Environmental Law* 5-23, 18; B Karkkainen “New governance in legal thought and in the world: some splitting as antidote to overzealous lumping” (2004) 89 *Minnesota Law Review* 471.

¹⁹ See, e.g., R Nelson, *Groundwater: Hidden promise, hidden perils*, Australian Water Project, Committee for Economic Development of Australia (2012) http://www.ceda.com.au/research-and-policy/research/2012/10/watervol1_additional.

²⁰ C Holley and D Sinclair, “A new water policy option for Australia? Collaborative water governance, compliance and enforcement and audited self- management” (2014) 17(2) *Australasian Journal of Natural Resources Law and Policy* 189-216.

²¹ C Holley and D Sinclair, “Governing water markets: Achievements, limitations and the need for regulatory reform” (2016) 33(4) *Environmental and Planning Law Journal* 301, 322.

²² Holley and Sinclair above n 20.

²³ E Carmody, "Managing water flows in the Murray-Darling Basin: a rebalance will benefit us all" http://www.edonsw.org.au/managing_water_flows_in_the_murray_darling_basin_a_rebalance_will_benefit_us_all.

²⁴ K Owens, "Reimagining water buybacks in Australia: Non-governmental organisations, complementary initiatives and private capital" (2016) 33(4) *Environmental and Planning Law Journal* 342.

²⁵ See K Owens, "Irrigation organisations and environmental water transactions: A comparative analysis of impediments and opportunities in relation to environmental water recovery" (2015) 18(1) *Australasian Journal of Natural Resources Law and Policy* 49-76; K Owens, *Environmental Water Markets and Regulation: A Comparative Legal Approach* (United Kingdom: Routledge/Earthscan 2017).

²⁶ *Environment Protection and Biodiversity Conservation Amendment Act 2013* (Cth) s 24E. See also Australian Government, Department of the Environment, *Independent Review of the 2013 EPBC Act amendment – Water trigger* (2015), <http://www.environment.gov.au/epbc/what-is-protected/water-resources/review>; E Carmody and K Ruddock "Coal seam gas and water resources: a case for Commonwealth oversight?" (2013) 28(3) *Australian Environment Review* 501-504.

²⁷ National Water Commission 2014, *Water for mining and unconventional gas under the National Water Initiative*, NWC, Canberra.

²⁸ R Nelson, "Broadening regulatory concepts and responses to cumulative impacts: Considering the trajectory and future of groundwater law and policy" (2016) 33(4) *Environmental and Planning Law Journal* 356.

²⁹ B Docker & H Johnson, "Operational issues". In: Horne, A., Webb, A., Stewardson, M., Acreman, M. & Richter, B. (eds.) *Water for the environment* (Australia: Elsevier, 2017).

³⁰ D Garrick & E O'Donnell, "Exploring Private Roles in Environmental Watering in Australia and the US". In: Bennett, J. (ed.) *Protecting the Environment, Privately*. (World Scientific Publishing 2016).

³¹ E O'Donnell & D Garrick (forthcoming), "Defining success: a multi-criteria approach to guide evaluation and investment". In: Horne, A., Webb, A., Stewardson, M., Richter, B. & Acreman, M. (eds.) *Water for the environment*. (Australia: Elsevier, 2017); B Cosens, R. Craig, S. Hirsch, C. A. (T.) Arnold, M. H. Benson, D. A. DeCaro, A. S. Garmestani, H. Gosnell, J. Ruhl, and E. Schlager, "The role of law in adaptive governance". (2017) 22(1) *Ecology and Society* 30.

³² PL Tan, KH Bowmer & C Baldwin, "Continued challenges in the policy and legal framework for collaborative water planning" (2012) 474(12) *Journal of Hydrology* 84-91; P Martin and N Gunningham, above n 18, 8-10.

³³ See, e.g., B Cosens, "Application of the Adaptive Water Governance Project to Management of the Lake Eyre Basin and its connections to the Great Artesian Basin" (2015) 30(6-7) *Australian Environment Review* 146-152; B Cosens, "Water law reform in the face of climate change: Learning from drought in Australia and the western United States" (2016) 33(4) *Environmental and Planning Law Journal* 372.

³⁴ Note however that the Basin Plan pursues an adaptive approach and provides 'a buffer' for ecological resilience and recovery – see <http://www.mdba.gov.au/basin-plan-roll-out/climate-change>; I Neave, A McLeod, G Raisin, J Swirepik, "Managing water in the Murray–Darling Basin under a variable and changing climate" 2015 42(2) *AWA Water Journal* 102–107.

³⁵ Climate Council of Australia, above n 8; L Godden, R Ison and P J Wallis "Water governance in a climate change world: Appraising systemic and adaptive effectiveness" (2011) 25 *Water Resources Management* 3971-3976, 3973.

³⁶ J Gray and L Lee, "National Water Initiative styled water entitlements as property: Legal and practical perspectives" (2016) 33(4) *Environmental and Planning Law Journal* 284.

³⁷ See, e.g., Environmental Justice Australia, *Water citizenship: Advancing community involvement in water governance in Victoria* (2015) <https://envirojustice.org.au/major-reports/water-citizenship-advancing-community-involvement-in-water-governance-in-victoria>; Mitchell, Bruce (2014). *Evolving Regional, Integrated and Engagement Approaches for Natural Resources Management in South Australia*, Report to the Goyder Institute and Flinders University, available at <<http://www.goyderinstitute.org/uploads/documents/publications/2014/Bruce%20Mitchell-WEB.pdf>>.

³⁸ B Cosens, "Application of the Adaptive Water Governance Project to the management of the Lake Eyre Basin and its connections to the Great Artesian Basin", 2015, ANZOG-Goyder Institute Visiting Professor Report, available at <http://www.goyderinstitute.org/uploads/FU%20LEB%20GAP%20Report-WEB.pdf>.

³⁹ A Kallies and L Godden, "What price democracy? Blue Wedges and the hurdles to public interest environmental litigation" (2008) 33(4) *Alternative Law Journal* 194-199.

⁴⁰ J Dryzek and S Niemeyer, "What is deliberative democracy?" on Australian National University, *Centre for Deliberative Democracy & Global Governance* (15 February 2012) <http://deldem.weblogs.anu.edu.au/2012/02/15/what-is-deliberative-democracy/>; Tan et al, above n 32; C Holley and D Sinclair, "Deliberative Participation, Environmental Law and Collaborative Governance: insights from Surface and Groundwater Studies" (2013) 30(1) *Environmental and Planning Law Journal* 32-55.

⁴¹ C Son, "Water reform and the right for Indigenous Australians to be engaged" (2012) *Journal of Indigenous Policy* 3-26.

⁴² M.A. Siebentritt (ed), *Water trusts: What role can they play in the future of environmental water management in Australia?* Proceedings of a workshop, The Water Trust Alliance and the Australian River Restoration Centre (2012) http://www.murraydarlingwetlands.com.au/our-partners/images/The_role_of_water_trusts_in_the_future_of_environmental_water_management_in_Australia.pdf.

⁴³ B Karkkainen, "Collaborative ecosystem governance: scale, complexity and dynamism" (2002) 21(2) *Virginia Environmental Law Journal*, 189-243; C Holley, N Gunningham and C Shearing, *The New Environmental Governance* (Earthscan, 2012); Cosens (2016), above n 33.

⁴⁴ B Lindsay, "Public participation, litigation and adjudicative procedure in water resources management" (2016) 33(4) *Environmental and Planning Law Journal* 325.

⁴⁵ L Macpherson, "The limitations of Indigenous water rights in the proposed Murray Darling Basin Plan" *Right Now*, 8 September 2012, <http://rightnow.org.au/topics/indigenous-people/>; V Marshall, "The progress of Aboriginal water rights & interests in the Murray Darling Basin in NSW: An essential element of culture" (2015) 30(6-7) *Australian Environmental Review* 158-163.

⁴⁶ L O'Neill, "The role of state governments in native title negotiations: A tale of two agreements" (2014) 18(2) *Australian Indigenous Law Review*, 29-42, 39.

⁴⁷ See P Martin, "Creating the next generation of water governance" (2016) 33(4) *Environmental and Planning Law Journal* 388; Lily O'Neill, Lee Godden, Elizabeth Macpherson and Erin O'Donnell, "Australia, wet or dry, north or south: Addressing environmental impacts and the exclusion of Aboriginal peoples in northern water development" (2016) 33(4) *Environmental and Planning Law Journal* 402.

⁴⁸ *NWC media release*, above n 3.