

Markets, Groundwater & Law

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Never Stand Still Connected Waters Initiative Research Centre




UNSW AUSTRALIA

OVERVIEW

// WHAT WILL WE TALK ABOUT



HISTORY

- Evolution of law and policy



ACHIEVEMENTS

- Flexibility
- Efficiency and Economic Benefits
- Functionality



CHALLENGES

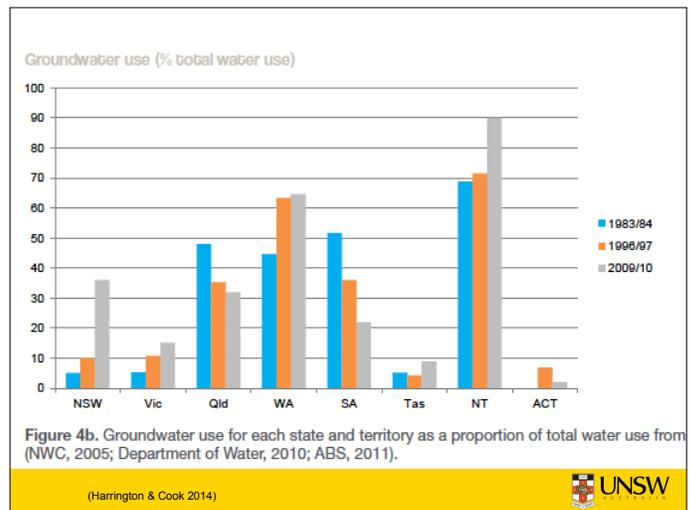
- Enforcement
- Accuracy
- Universality
- Environment
- Social
- Subsidies
- Coverage

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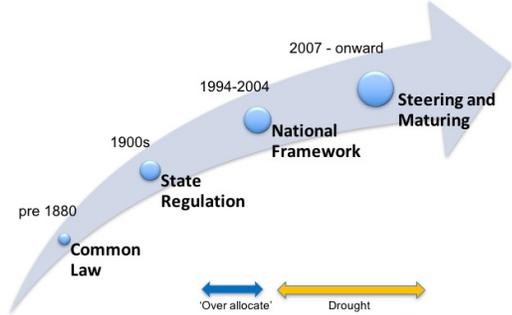
Groundwater

- 15,000 GL per annum (12160716 acre-feet) – around one third sourced from groundwater (~4M acre-foot), with the remainder derived mostly from surface- water sources (Harrington & Cook 2014)
- 60% used by agriculture
- \$AU4.1 billion use value per annum & flow on effects to other industries ~\$AU6.8 billion per annum (NCGRT 2013)

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History of Water Governance



Timeline of Water Governance:

- pre 1880: Common Law
- 1900s: State Regulation
- 1994-2004: National Framework
- 2007 - onward: Steering and Maturing

Key factors: Over allocate, Drought

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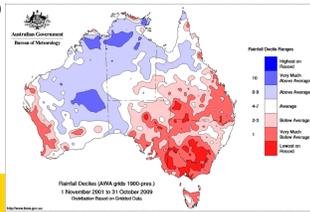
Our Project

- Evidence of mixed success in trading and markets (e.g Chile, South Africa, Western USA) (Grafton et al 2011; Lago et al 2015)
- quantitative survey of approximately ~4000 NSW water licence holders conducted between September 2012 and January 2013
- qualitative interviews with 48 water licence holders between February and July 2013
- 17 targeted interviews with key government agencies, peak bodies, farmers, NGOs, and other water holders from Queensland and Victoria, 2015
- Data presented is a snapshot in time (institutions and reforms are evolving)

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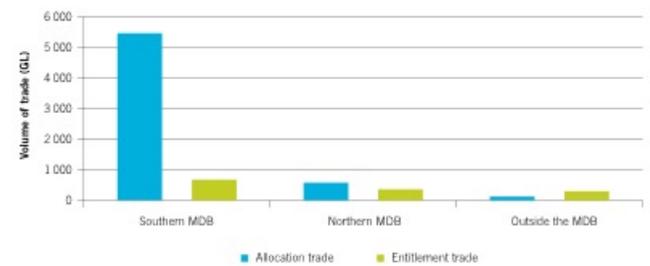
Success – Healthy Market

- when we started the drought, the irrigator didn't have a lot of say in how they could affect their own security...as the markets developed, it expanded the tools you can use. I think we are better placed now than we've ever been to face 2002 again
- water tradability...what it allows people to do is find the highest value for their water. Instead of wasting water running cows or something, its all heading to the highest value. So each Megalitre is producing the most earning (\$AU1.4 billion; NWC 2014)
- having a property right...that's been a huge thing, especially for security purposes and banks.



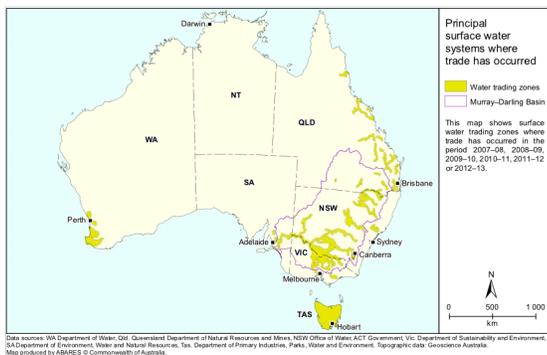
<http://www.bom.gov.au/climate/updates/articles/a010-southern-rainfall-decline.shtml>

Figure 1.6: Water traded in major market segments, 2012-13 (GL)



Main Water Trading Systems since 07/08

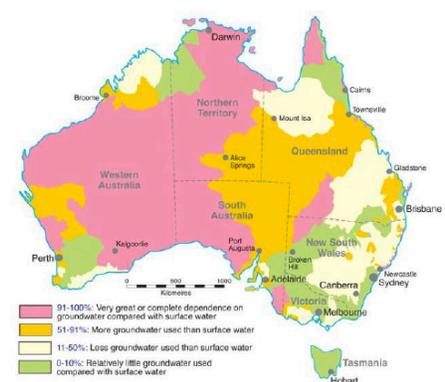
Figure 1.5: Principal surface water systems where trading has occurred



Data sources: WA Department of Water, QLD Queensland Department of Natural Resources and Mines, NSW Office of Water, ACT Government, Vic. Department of Sustainability and Environment, SA Department of Environment, Water and Natural Resources, Tas. Department of Primary Industries, Parks, Water and Environment, Geographic data: Geoscience Australia. Map produced by AGRRES © Commonwealth of Australia.



Figure 1.2: Australia's reliance on groundwater



Source: National Centre for Groundwater Research and Training, 2013



Trading and Groundwater

- GW makes up around 21% of entitlements by volume and 49% by number
- trading of groundwater entitlements is relatively limited
 - all entitlement trades around 4% by volume of the total entitlements on issue (2012-2013),
 - GW 12% of total entitlement trading
 - all allocation trades = five times the volume of entitlements traded (~5M acre-feet) (NWC 2014)
 - GW 1% of total allocation trading (in NSW and Vic) (NWC 2012/14).
- incomplete un-bundling of groundwater from land
- sleeper licences & transition to cutbacks
- hard to trade between discrete groundwater aquifers
 - difficult to achieve universality (hydrogeological connectivity)
 - limited physical infrastructure linking groundwater areas



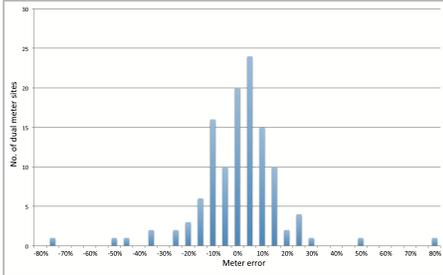
Groundwater Accounting



- surface water use has often been metered, but the monitoring of groundwater extraction remains weak (or completely absent) (Holley & Sinclair 2013).
- approximately 7,000 bores which extract groundwater in the Murray-Darling Basin for commercial purposes. Of these, meters are mostly installed on the larger sites and up to 5,000 new meters will be installed (mostly to replace existing meters) (NSW 2010)
- '[groundwater] meters were never read' or 'not functioning'
- 'my meter is not working at the moment, but it does when you hit it with a hammer, so I just keep using it. The meter guy says nothing. They are not doing their job in regards to policing water, they are not uncovering the problems'.



Distribution of metering error (NSW Water)



- Audits of existing meters have shown that the bulk of meters are not operating to an acceptable standard (Holley & Sinclair 2013)
- Many many more unmetred stock and domestic

NSW Water 2015)



Compliance

C&E - 'where the rubber hits the road'

- if caps are exceeded due to illegal water extraction (in collaborative water sharing plans);
- if the various licences, approvals and tradable water rights (essential to efficient markets) are not adhered to; and
- if stakeholders lack confidence there is an equitable sharing of water resources (particularly in periods of drought);
- then the entire edifice of non urban water management is undermined

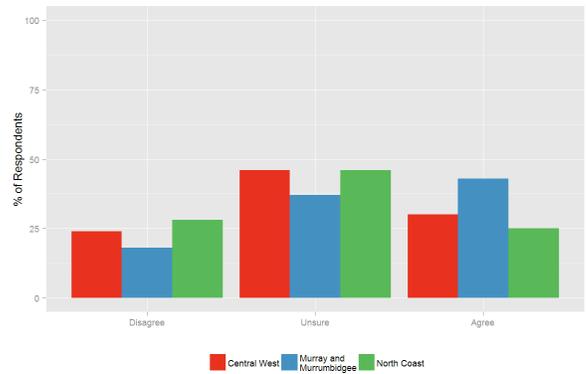
Challenges – compliance with entitlements

- Between ~400 and ~600 alleged breach reports a year, and less than 10 per cent of reports relate to groundwater (2010/2011)

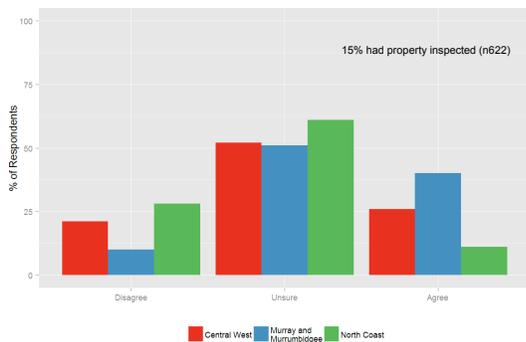
Topic: Levels of compliance	n	Strongly disagree	Disagree	Unsure	Agree	Strongly agree
I am confident water users in my region comply with their licence conditions	604	3%	3%	45%	39%	10%
Illegal water extraction is a big problem in my region	583	10%	24%	60%	4%	2%
Illegal water extraction has increased over the past ten years	587	9%	18%	67%	4%	2%



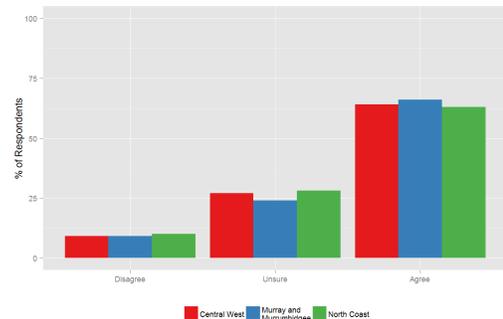
Detect illegal extraction (n618)



Compliance officers work in the region (n533)



Take stronger enforcement action against water users who break the rules (n616)



Summary

- Early days - benefits for efficiency, dealing with drought and delivering economic outcomes
- A number of challenges, theoretically 'fixable': regulatory underpinning, improving accuracy of metering/hydrogeological information, unbundling of rights...but would likely require increased investment and reform (Wheeler 2014; Grafton et al 2016)
- Many are more challenging: universality of impact/source for groundwater
- Alternative?
 - extensive sunk costs already invested in establishing Australia's cap and trade schemes, as well as the likely political, revenue and public 'compensation' impacts of such a decision
 - 'Crowding out' - constraints on market or pricing that other regulatory policies might induce have the potential to undermine the efficiency of the market
 - Complementary alternatives

Audited Self Management – Bubble Licence



Audited Self Management – Bubble licence

- enabling water users to form a legal entity or collective capable of managing the ASM program;
- allocating the entity a collective water right (in effect, a bubble licence) covering all the ASM participating members;
- enabling participants to determine individual annual extractions as they see fit (effectively trading within the bubble licence);
- ensuring members 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);
- the ASM program has in place appropriate integrity (e.g. auditor) and enforcement mechanisms to ensure compliance, including, if necessary, the capacity to draw on the support of the external government regulator.



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