Australian water, reform and policies

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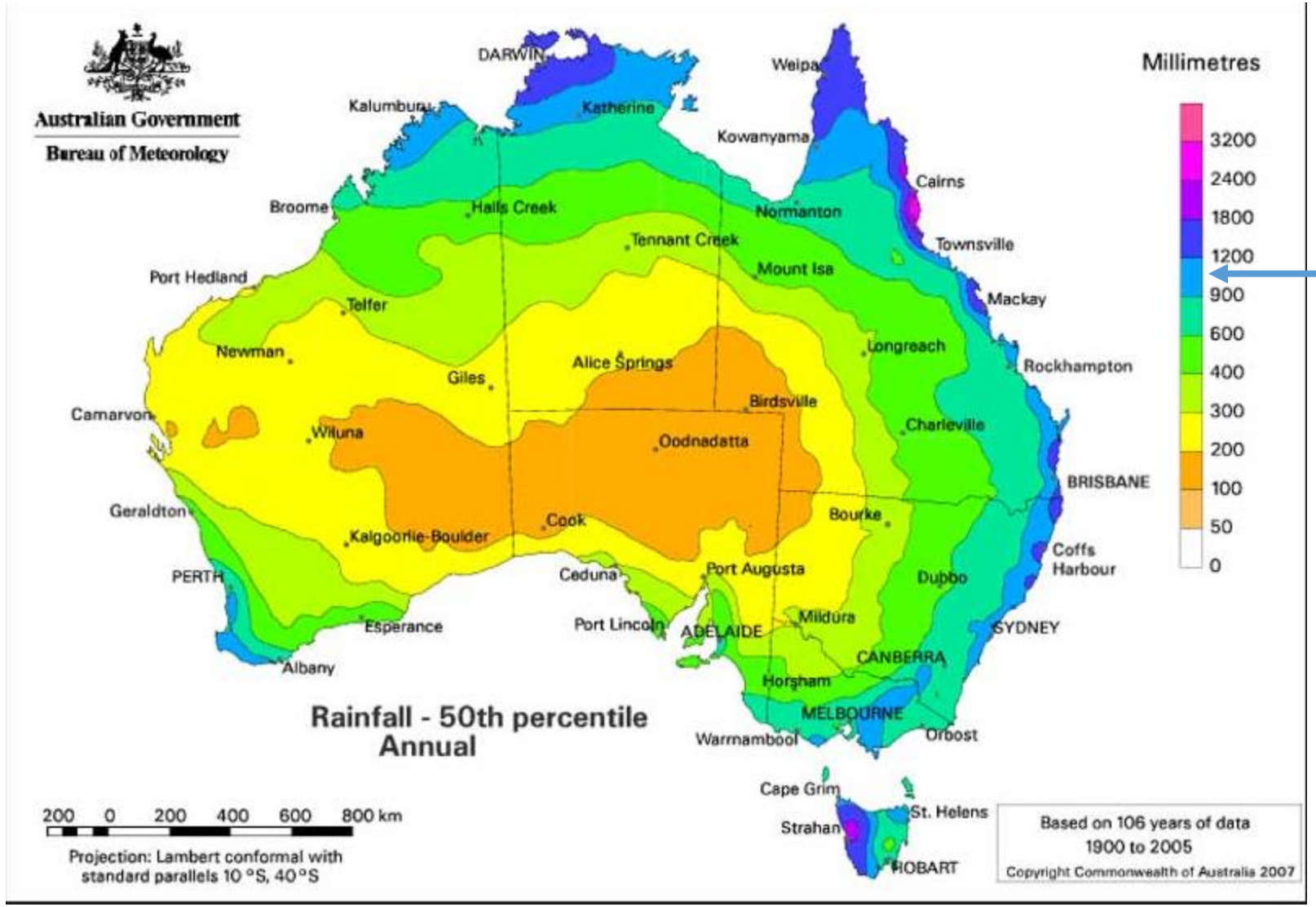
1. Australia and its water management

Australia is a Federation of 6 States and 2 Territories

'Water supply is a State and Territory responsibility'

Australia's annual rainfall



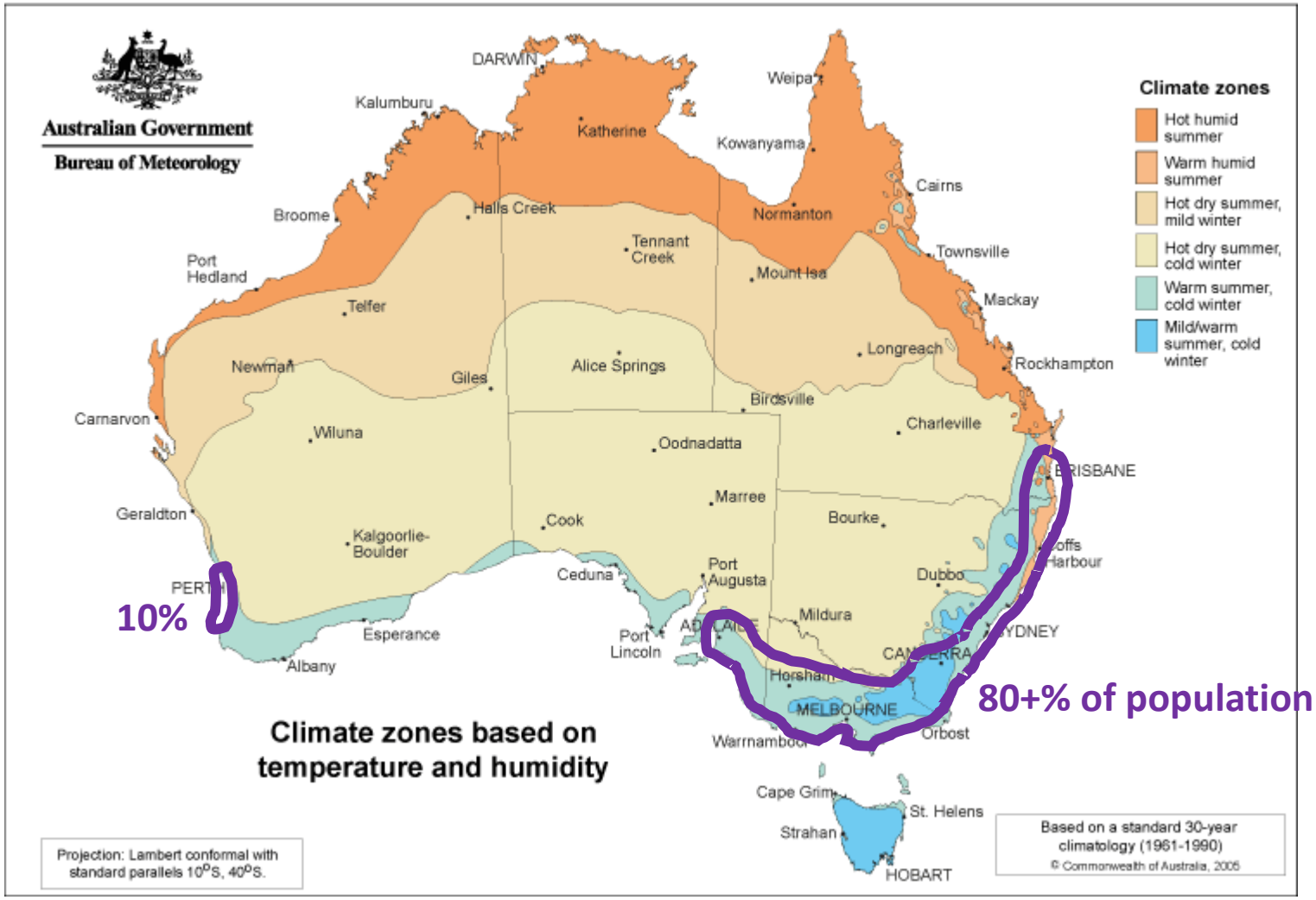
Noumea = 1060mm

"Coastal rainfall in north and east is good"

"Inland is dry"

“New Caledonia rainfall is similar to the same latitude on the east coast of Australia”

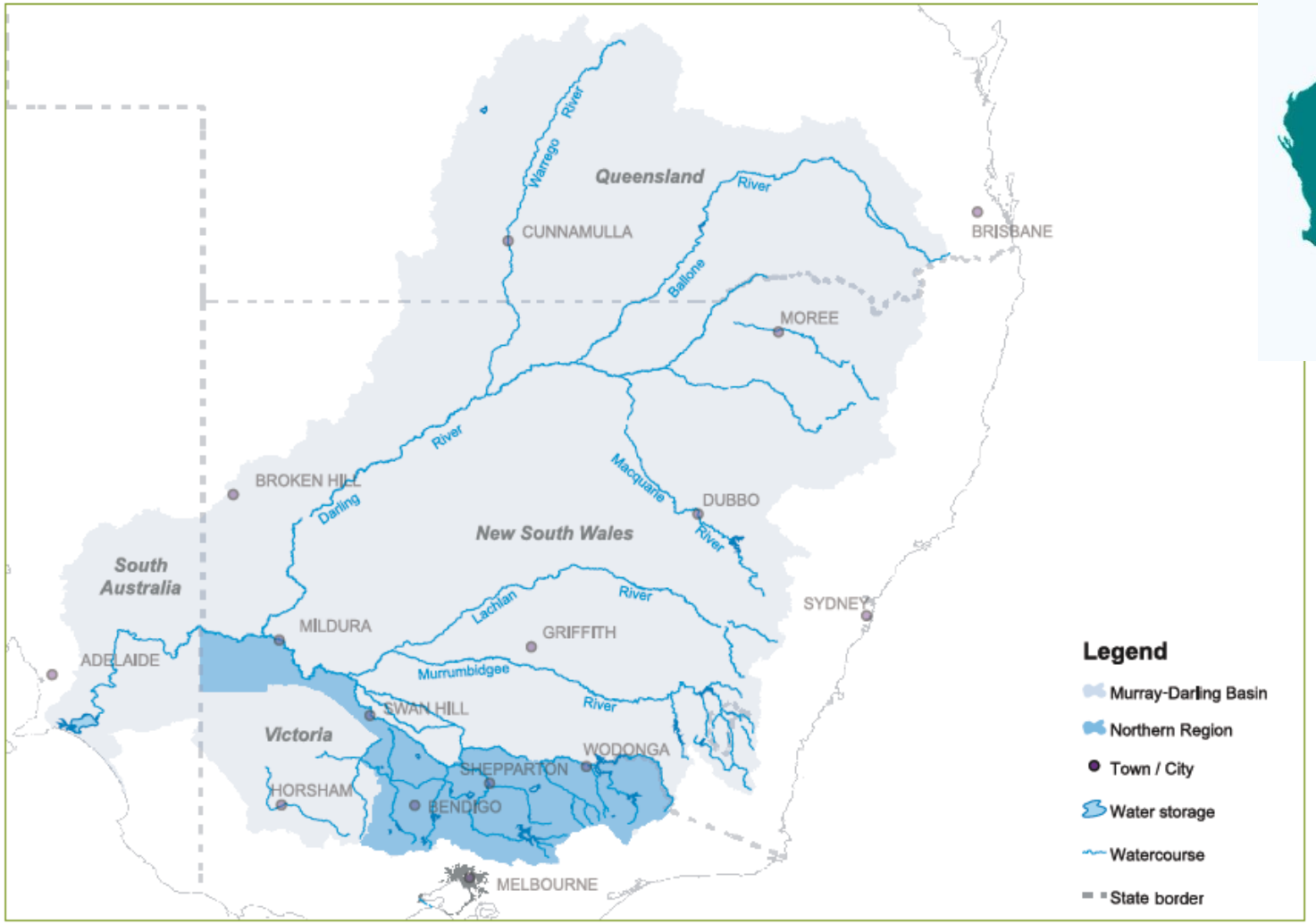
Most Australians live in big cities around the south east coast in cooler climate zones



10%

80+% of population of 24 million

50% of water extraction is inland in the Murray-Darling river basin



"Most of this water is used in irrigated agriculture"

"

Australians have three tiers of government to elect

1. Federal (Australian) government

2. 6 State plus 2 Territory governments

3. Many ‘Local’ governments within each State

plus

Council of Australian Governments (COAG)

- comprises heads of Federal and State/Territory governments and representative from Local Government
- meets several times each year to deal with major issues referred to it

Federal Government is involved in interstate, national and international water issues

2015
- One of four governments in Murray River agreement
  - Funds for building dams and water infrastructure

1989
- Coordinating 'Guidelines for water quality management'
  - Drinking water quality
  - Many other guidelines

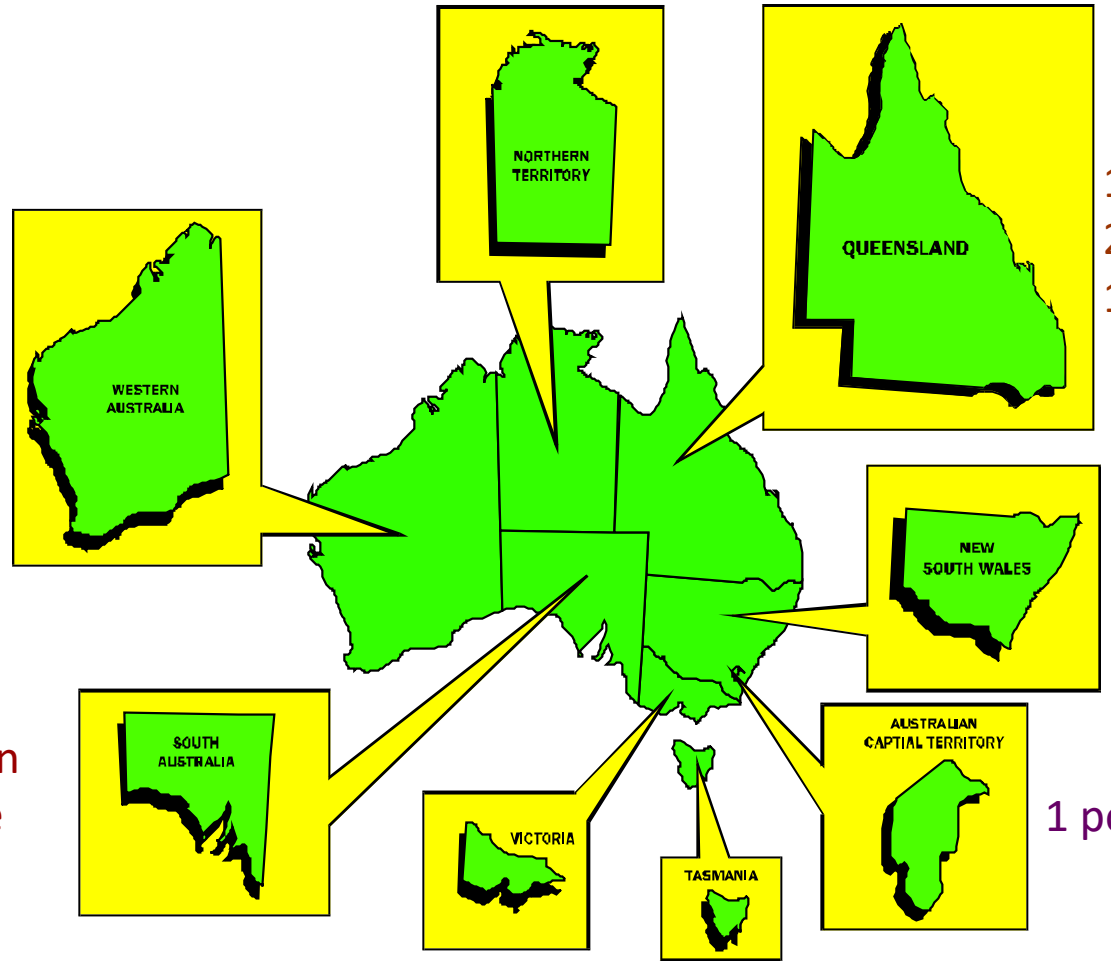
1995
- Leading and incentives for national water reform

2007
- National 'Water Act'
- $13 billion in funding in Murray Darling basin for
  - irrigation systems being modernized
  - environmental water purchases
- Economic regulator of water institutions in Murray Darling basin
- National water data
- Owner of environmental water

"More direct involvement over time with bigger problems and funds needed to fix problems created by past"

Different states, different institutional models

1 power and water corporation



1 treated bulk water corporation
2 large urban water corporations
1 statewide rural bulk water corporation
local government water suppliers

1 statewide water corporation
2 smaller water corporations
Mining water supplies

2 State owned water corporations
92 local government water suppliers

One statewide water corporation
Local government for sewerage outside Adelaide

1 power and water corporation

19 water corporations

1 statewide urban water corporation
1 statewide irrigation water corporation

Local government roles

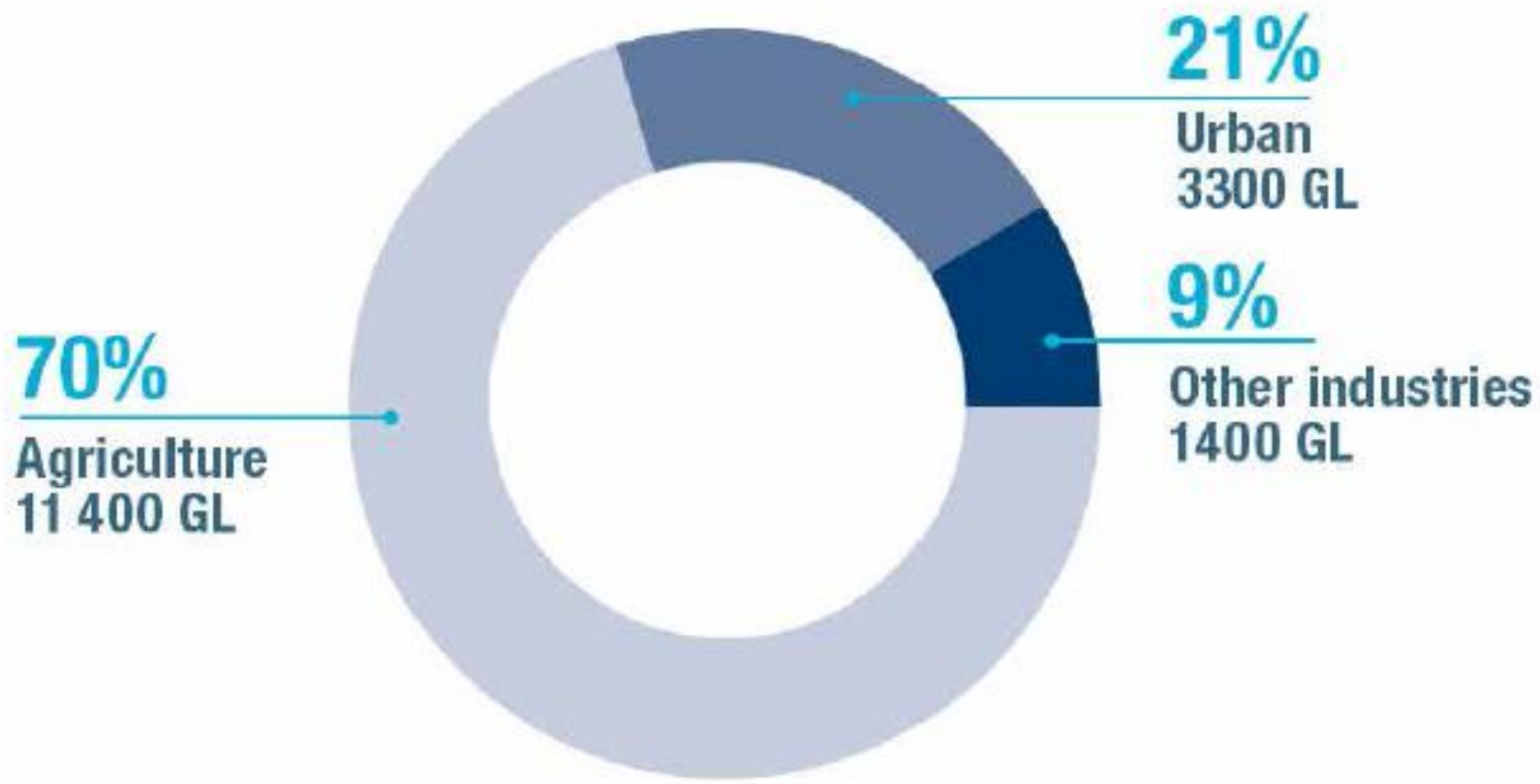
- Stormwater and drainage – all states
- Urban water supply outside capital cities – NSW and Queensland
- Urban sanitary sewerage – NSW, Queensland and South Australia

Private sector roles

- Construction
- Consulting and professional services
  - Engineering
  - law, accountants, recruitment, strategic and management support
- Build-own-operate contracts for treatment plants for 20 years
- Operating contracts for urban networks and treatment plants
- Equipment
- Technology

2. Current water performance data

Australian water extractions for different uses



Australian water performance statistics "30 years of development"

- Benchmarking data started for urban water utilities in 1987
- Standardized over 30 years to create meaningful performance measures
- Data presented from National Performance Report 2016/17: Urban Water Utilities
- Sizes and types of urban utilities in Report

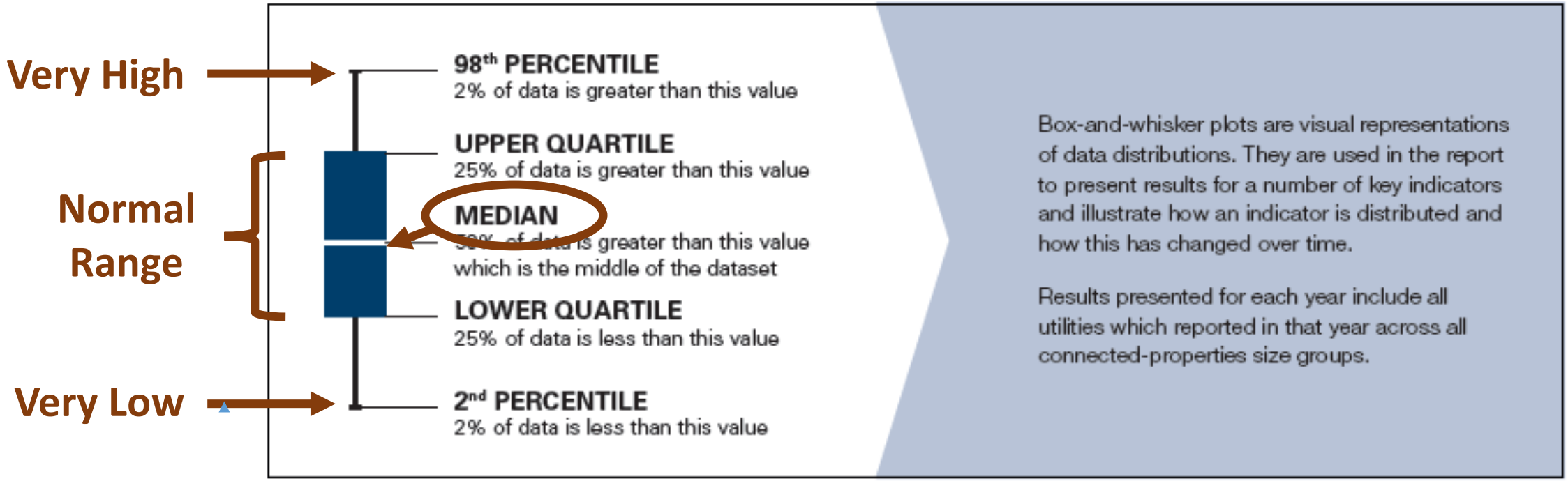
Group	Connected properties	Number
Bulk		5
Small	10,000 - 20,000	29
Medium	20,000 - 50,000	24
Large	50,000 - 100,000	11
Major	100,000 +	15
Total		84

Water use and charges – urban utilities

- Note:
  - 1 kL = 1 cubic metre
  - Water charge = Fixed connection charge ($) + volumetric price ($/kL)

- Volumetric water price varies from about $1/kL to $3/kL
- Sewerage charge = Fixed charge (normally)
- Focus of performance is around affordability of customer water and sewerage bill
- Typical water and sewerage charge for residence is calculated for each utility based on 200kL/annum water usage
- Industry charged same water price for drinking water quality water with higher connection charge

Performance measures presented in ‘Box-and-Whisker’ plots



Example Figure 2 How to interpret a box-and-whisker plot

Annual urban water use per residence

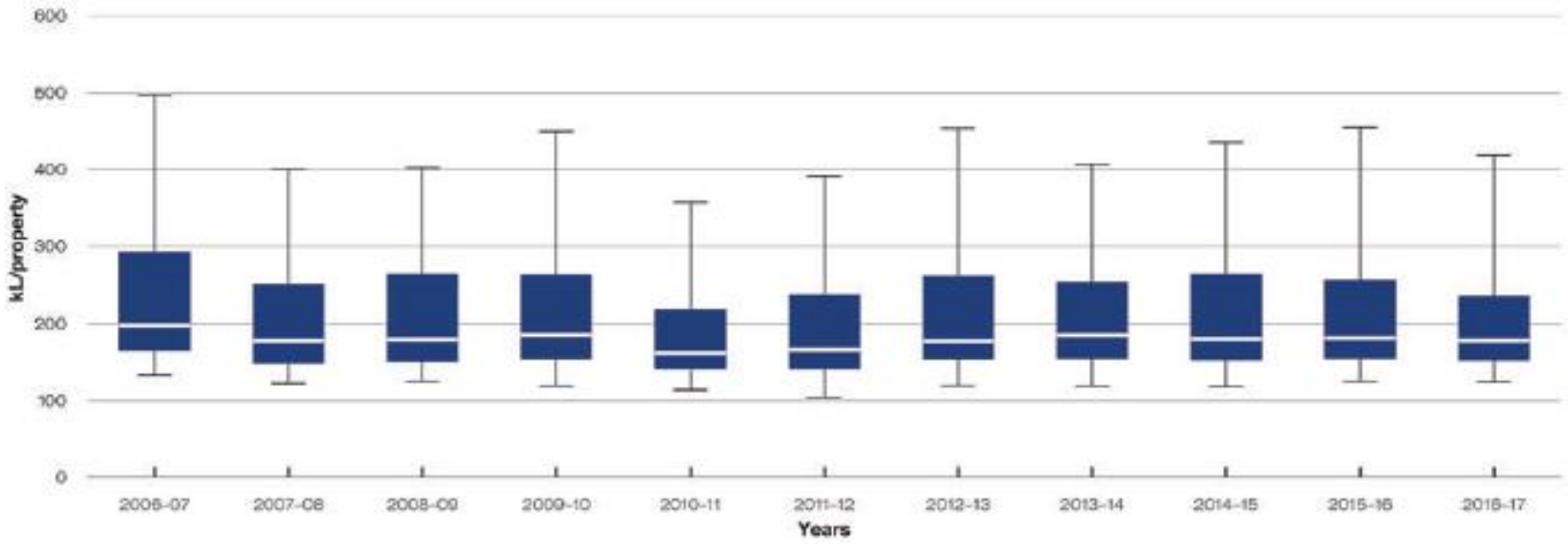
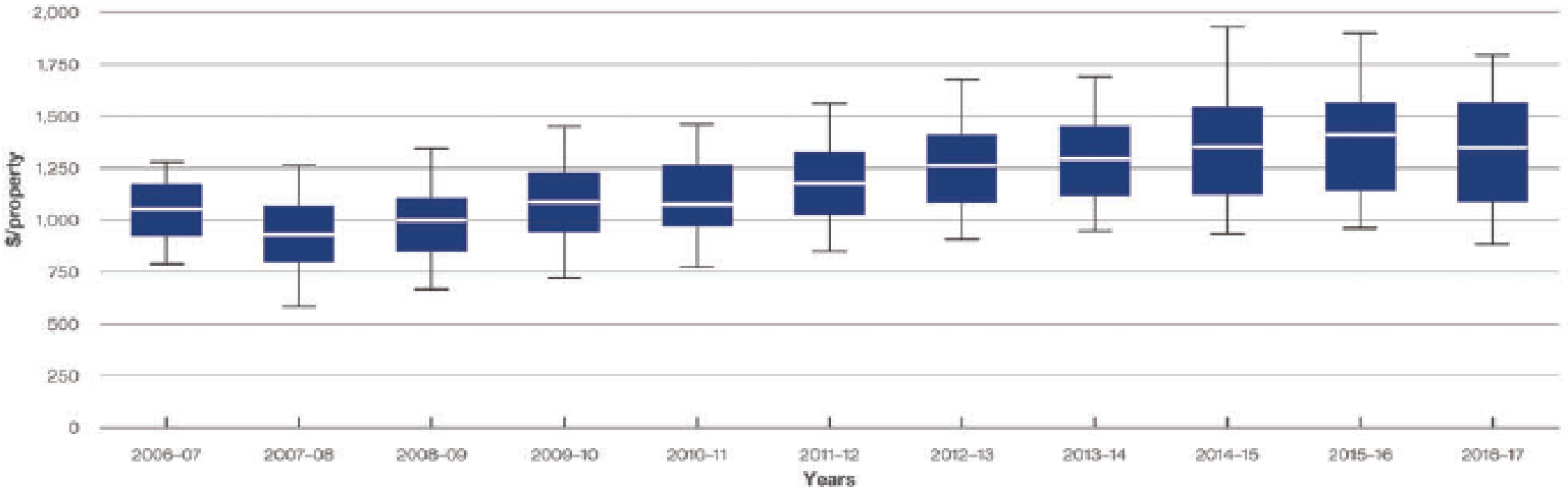


Figure 3.1 Average annual residential water supplied (kL/property)

Answer: approximately 190kL which varies each year with weather.
Note that a few utilities have water usage of over 400kL per residence

Residential water and sewerage bills



Answer: $1332 with the increasing trend in bills flattening in recent years due to efficiency gains and lower interest rates on borrowings

Water losses per connection per day

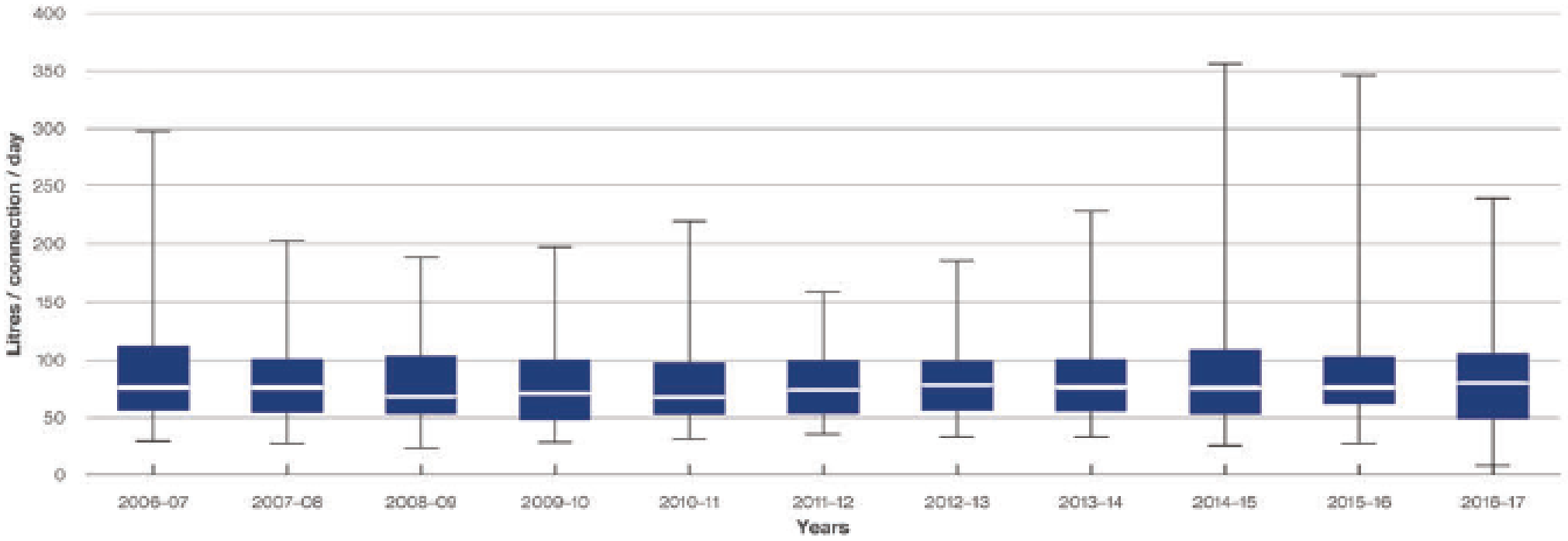


Figure 7.5 Real losses (L/service connection/day)

Answer: Losses of 82 l/day/residence are about 16% of water use

National urban performance reports

- Published annually online
- Trends become evident over time
- Create peer pressure to improve performance amongst utilities

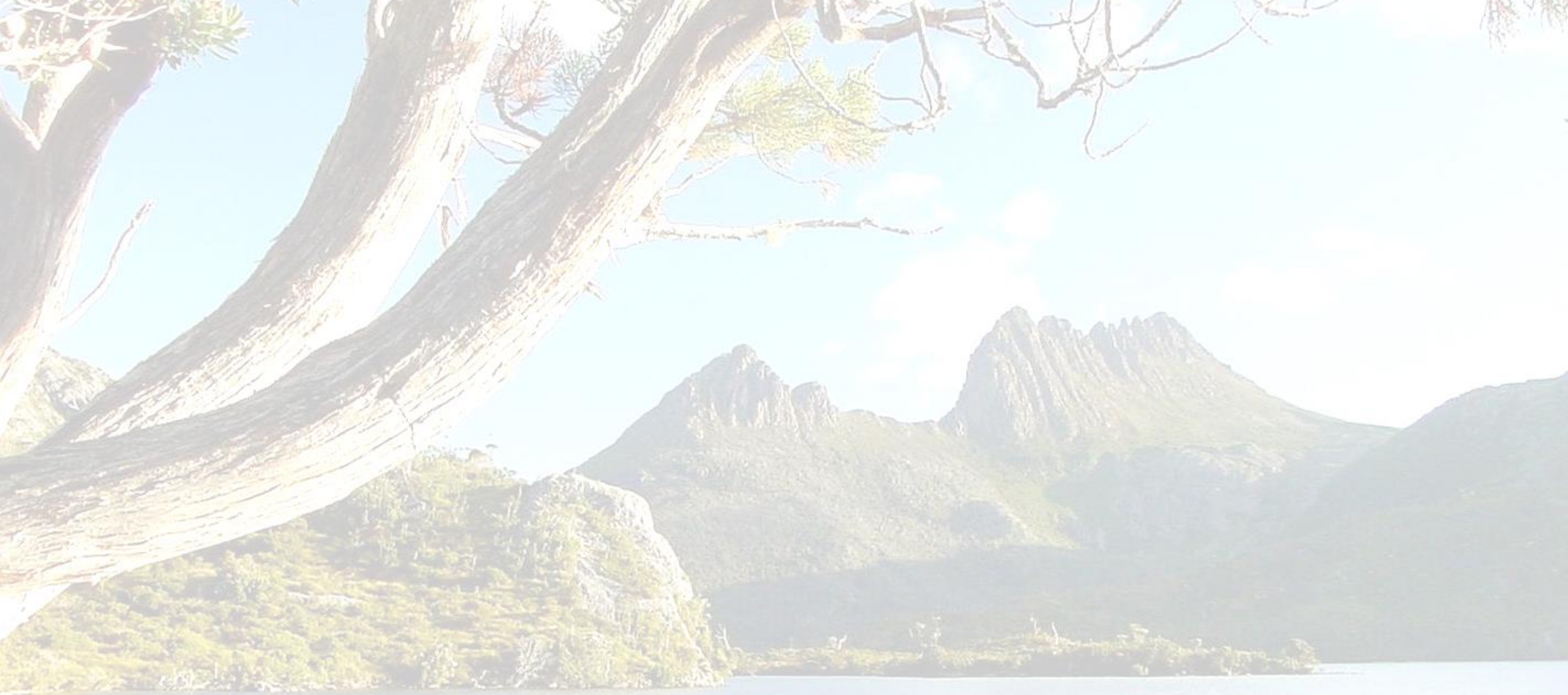
Urban data for comparison ‘best estimates’

- Average Household connection rate to drinkable water supply system
  - 96%
- Average Household connection rate to sewage water system
  - 90%
- Average Price for water per cubic meter for drinkable water supply
  - $1 to $3
- Average Price for water per cubic meter for wastewater
  - Normally fixed charge as considerable outside water use
- % of wastewater recycled in Australia
  - 13%

Bulk raw water and irrigation water delivery charges

- Water charges depend on source and regulated based on costs
  - Regulated and based on costs
  - Many (20 +) types of fees
    - River
    - Groundwater
    - Delivery through channel system eg $300 plus $0.02 per cubic meter
    - Drainage
    - High and low security water
    - ……

- Market prices for each ‘source or system’ and weather (online)
  - Temporary trade $0.1 to $0.5 per cubic meter
  - Permanent trade $2 to $4 per cubic meters
  - Forward market trade



3. Water policy reform over past 40 years

The Problems in 1980

- Water expenditure large and growing for State Governments
  - New dams and water infrastructure
  - Subsidies in many forms
- Major environmental problems and water conflicts between user groups
- Inefficient large and numerous small public water authorities
- Corruption in many forms
- Poor quality drinking water in regional cities and towns
- Lack of sewerage especially in regional towns
- Major conflicts over irrigation water prices and availability

Victoria started water reform early (1983)

1. New Water Department to undertake reform
2. Inventories of water resources and environmental values
3. Water pricing introduced to urban users
4. Subsidies reduced and prices increased for irrigators
5. Commercial accounts for water authorities
6. Vision of next 100 years
7. All water rights specified again, separated from land and made tradable
8. Environmental water rights
9. 385 water authorities reduced to 25 over 10 years
10. New enabling water law
11. 30 years of continual reform adding extra layers of detail and efficiency

National water reform (1994)

- water pricing reform
  - based on the principles of consumption-based pricing and full cost recovery
- elimination of cross subsidies and making other subsidies transparent
- clarifying water ‘property’ rights
- allocating sufficient water for environmental purposes
- facilitating and promoting water rights trading
- rigorous assessment of new rural water projects
- reforming water industry institutions

Reform initiatives and events since then

- Refresh of National water initiative (2004)
- Millenium drought: 1990-2011 (worst on record)
- Federal Water Act and $10 billion in funds
  - Funds to purchase water rights for environment for Murray Darling
  - Modernization of irrigation channels to save water

Fixing conflicts of use

- **Proper pricing of water**
- **Well specified water rights and markets for trading rights**
- **Environmental and indigenous uses and values identified and satisfied in various ways**
- **Efficient water delivery agencies and contracts**
- **Customer focus and protections**
- **Improving performance measures over time**
- **Online information**

4. Water markets

Ways of developing water-intensive industries

1. New dams, wells and delivery infrastructure
2. Greater water delivery and water use efficiency
3. Water markets
   - Moves available water to higher valued and new uses over time
   - Quick way for a new venture to obtain water
   - Successful and trusted in Australia

Australia pioneered large water markets

- Started 30 years ago
- Mainly for agriculture but industry and urban use also involved
- Now very advanced, online and operated by private water brokers
- Markets have moved agricultural water to higher valued use without Government involvement
- Markets allowed the available water to move between users in the recent ‘100 year’ drought and avoided social and political turmoil

Requirements for water markets

- ✓Well specified water rights
  - separated from land on which water is used
- ✓Online register of water rights
- ✓Proper pricing of water delivery and other costs
- ✓Good metering and enforcement
- ✓Water brokers
- ✓Trading information online with latest price and volume information

Australian water market activity 2016-17

- *Over 24,000 transactions*
- *Market turnover = $131 million*

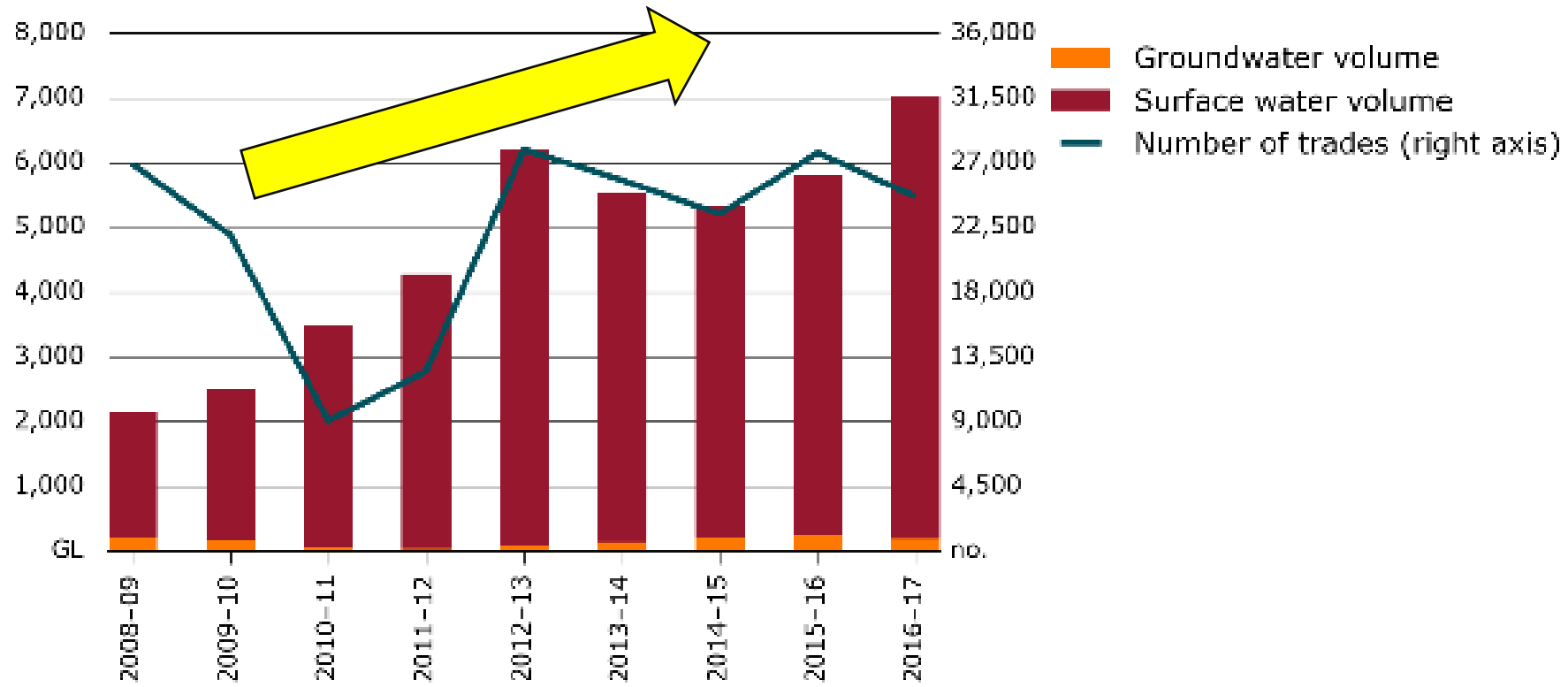
Table 1: Allocation trade summary, 2016–17

Region	Resource type	Transactions	$0 transactions (%)	Volumes (GL)	Turnover ($m)
Southern MDB	Regulated surface water	20,813	48	5,922	111
	Unregulated surface water	0	0	0	0
	Groundwater	257	40	116	2
Northern MDB	Regulated surface water	1,435	47	541	14
	Unregulated surface water	62	100	175	0
	Groundwater	330	49	64	3
Rest of Australia	Regulated surface water	1,482	82	200	1
	Unregulated surface water	20	100	2	0
	Groundwater	239	100	17	–

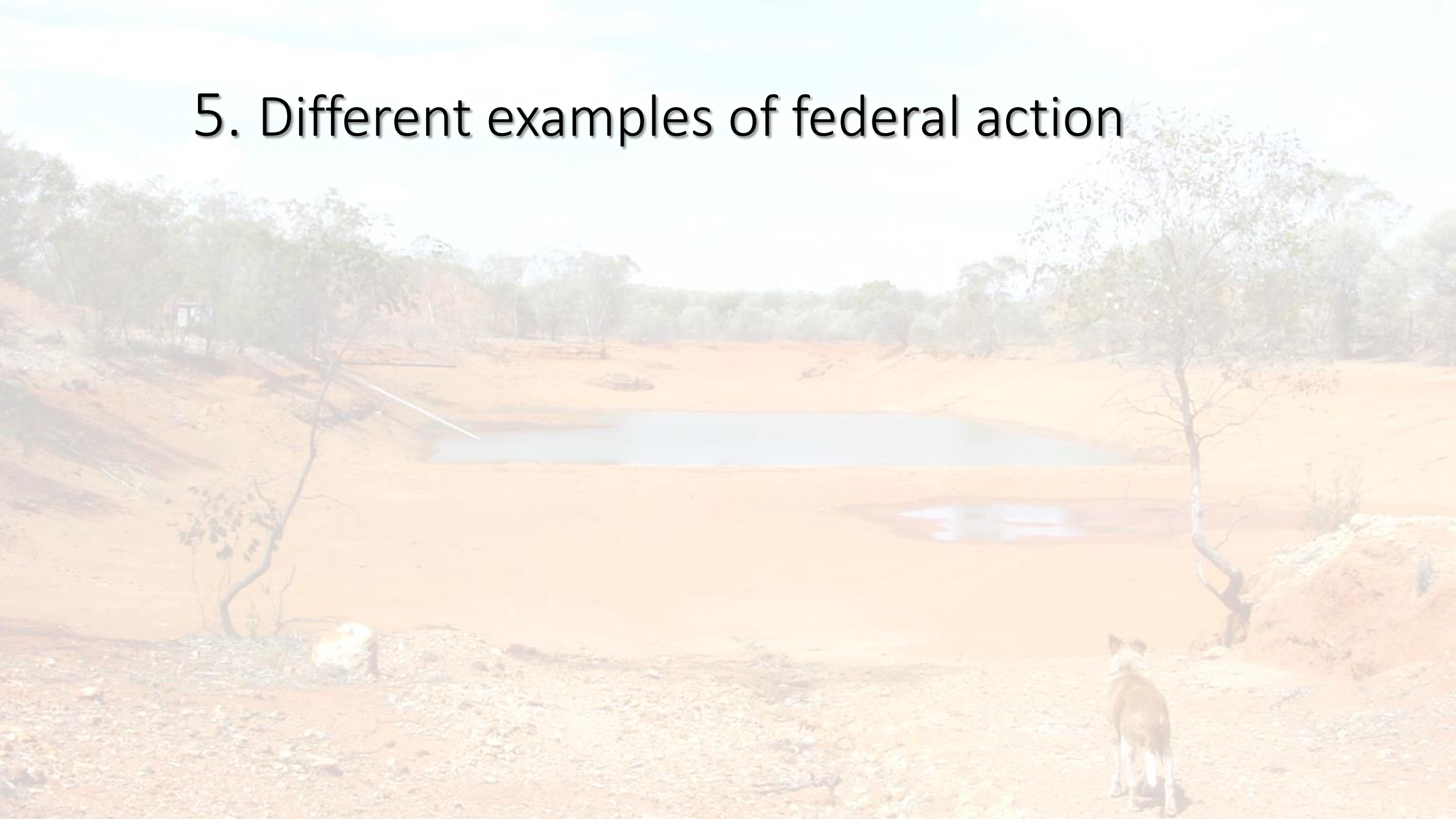
Note: Price data is only available for New South Wales, Victoria and South Australia. Transactions outside these states are classified as $0 transactions.

Water market trade is increasing each year "regular and trusted part of irrigation management"

Figure 12: Volume and number of water allocation trades, 2008–09 to 2016–17



5. Different examples of federal action



Federal cooperation in developing water policy

Australian Water Resources Council
National Water Quality Management Strategy (1988-92)

- Produced 21 guideline documents for States and their water utilities to implement
- Guidelines developed in a cooperative way by nominated experts from States with help from consultants

Strengths

- Good for broad policy, principles and technical subjects

Weaknesses

- States may or may not implement

National funds for policy reform if pass annual audit

Council of Australian Governments
National Water Reform Initiative (1995-2002)

- Agenda for major water reform including institutional, performance and major improvements in water rights and law
- Funding given annually if States passed audit on progress or otherwise get reduced payment

Strengths

- Good for achieving progress on tough water policy issues across all States and Territories

Weaknesses

- States did the easier changes first and some States never implemented tough policy reforms fully

Major Federal Government funding and take-over of State roles

Federal Government initiative

New Federal Water Act and $10 billion in funding (2007-12)

- Focused on Murray Darling Basin, restoring environmental flows and values, irrigation modernization
- States had to allow Federal Government to regulate their water management activities in the Murray Darling basin in return for funding irrigation system modernization and other reforms

Strengths

- Good for achieving significant progress on major environmental issues

Weaknesses

- Expensive and ongoing long term costs for Federal Government in managing its environmental water rights
- Environmental water benefits take 20 years whereas social adjustment problems with major reductions in consumptive water use are short to medium term

Conclusions

- Australia is a ‘laboratory’ of water policy reform and ideas
- One of few countries in world where really tough water governance and policy modernization have been
- Many success stories and some failures
- Federation requires special considerations
- Many good examples of water policy reform to learn from