ASERSA Conference
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Water reuse in Australia:
An Australian Water Association Perspective

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Presentation Outline

- About the AWA
- Climate change and water scarcity in Australia
- Water security through diversity
- The role of water reuse
- Water reuse & the AWA

Who we are and what we do

- AWA is the peak body serving water professionals & organisations
- Independent and not-for-profit
- > 5,000 Individual members
- > 600 Corporate members
- On average, one event every three days, somewhere in Australia

Our Mission

- **To foster the sustainable management of water (science, practice & policy) through:**
  - **Advocacy,**
  - **Collaboration**
  - **Professional Development**
- **Embrace and engage whole water cycle**
- **An umbrella for all water professionals in Australia to meet, grow and contribute**
- **Close and supportive relationships with other national and international organisations**

Our Core Deliverables

- Ozwater
- Water Journal
- E – News
- Specialist networks & meetings
- Technical sessions & speakers
- Bookshop
- Jobs and Tenders
- Outstanding branch activities
- Global representation & exchange

National Water Skills Initiatives

- **Water Industry Skills Taskforce**
- **Water Industry Capacity Development Program**
- **H2OZ**
- **Water AUSTRALIA**
- **IDA World Congress on Desalination and Reuse 2011**

Water Awards Program

Innovation & Excellence Awards

- Water Professional of the Year
- Water Industry Woman of the Year
- Young Water Professional of the Year
- Infrastructure Project Innovation Award
- Program Innovation Award

Other Awards

- Prime Minister's Award for Water Efficiency
- Member Service Awards
- Student Awards
- Awards for Papers & Presentations

Young Water Professionals

Challenges for the AWA

- Responding to changing industry structure and needs
- Competition or collaboration – commercial and associations
- New tastes, needs and ways of engaging or doing business
- Finding a common voice

Climate change and water scarcity in Australia

Australia - facts

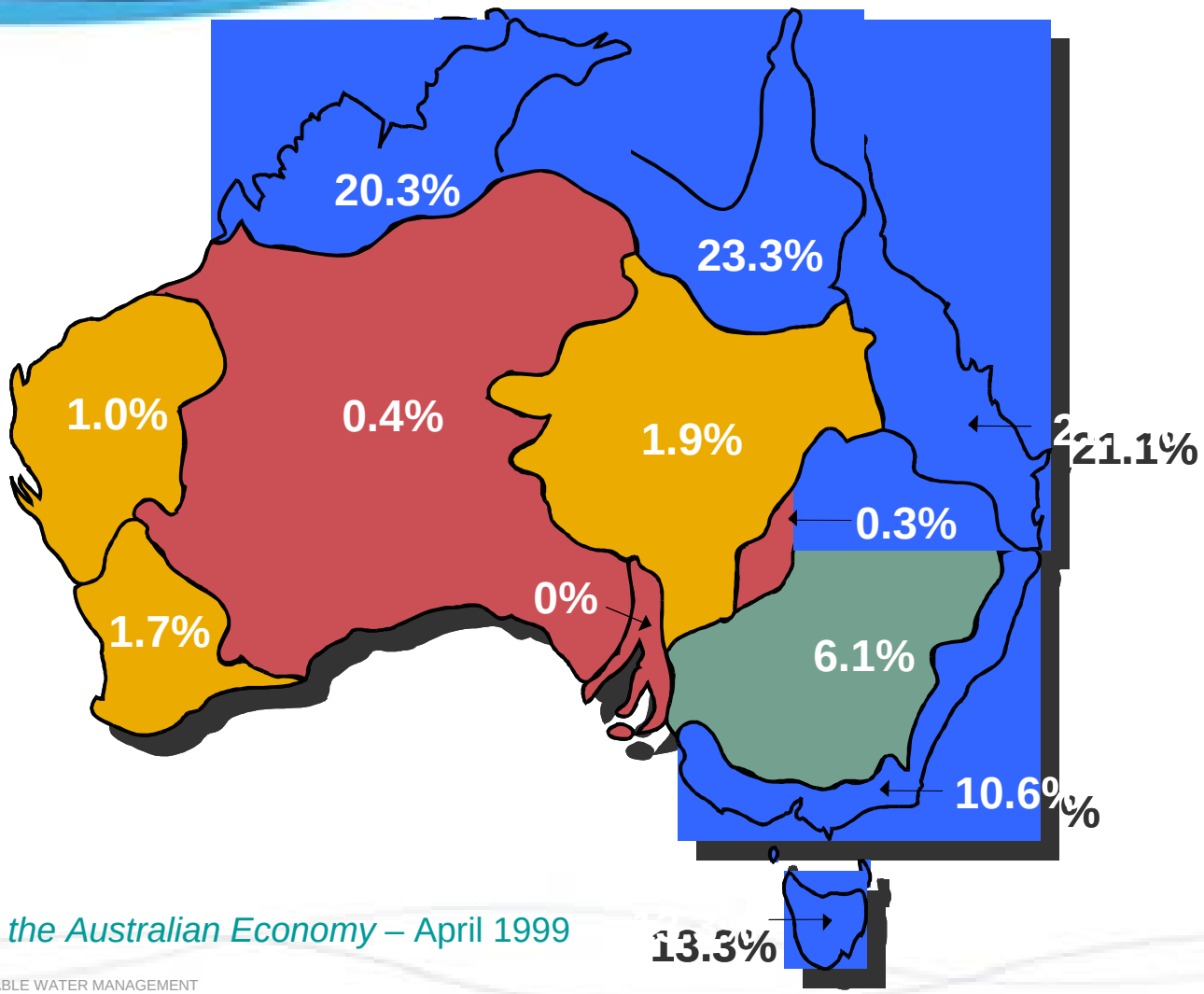
- Federation of 6 States and 2 Continental Territories
- European Settlement 1778
- 7.7 million sq. kms
- 21 million inhabitants
- 90% of population within 100kms of the coast
- Occupied private dwellings 7.64 m
- Average household 2.7 people

A country of extremes

Extreme wildlife…

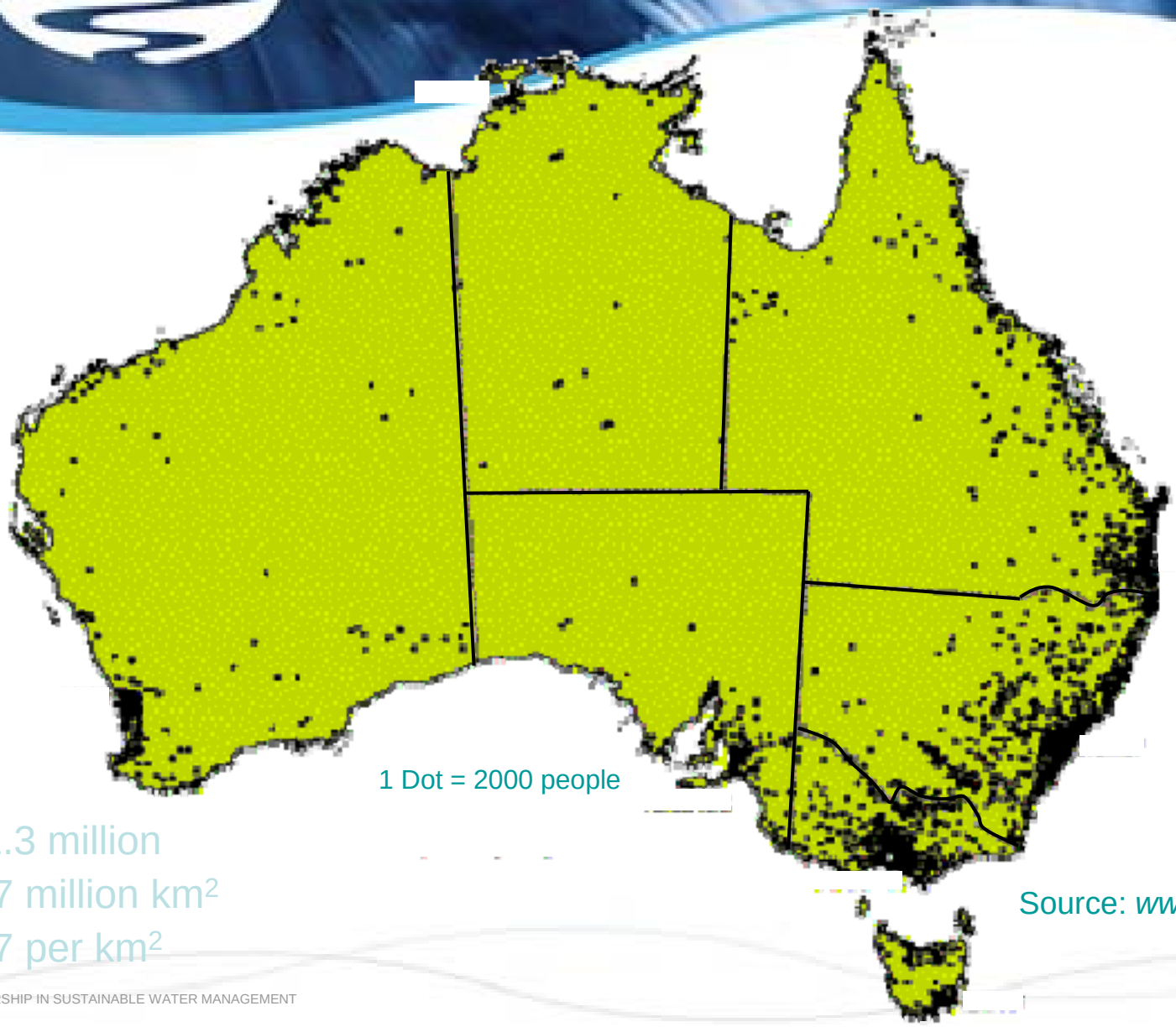
… and extreme weather

Uneven rainfall & runoff



Source: *Water and the Australian Economy* – April 1999

South-east highly urbanised



1 Dot = 2000 people

21.3 million

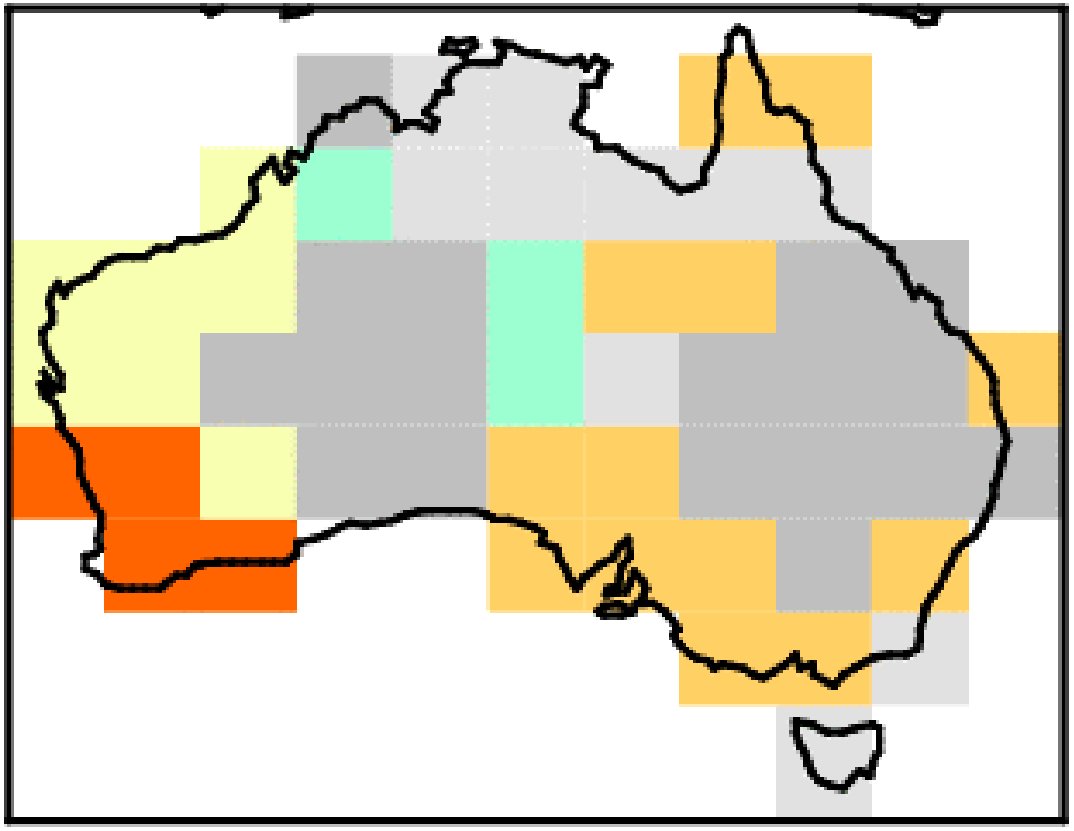
7.7 million km^2

2.7 per km^2

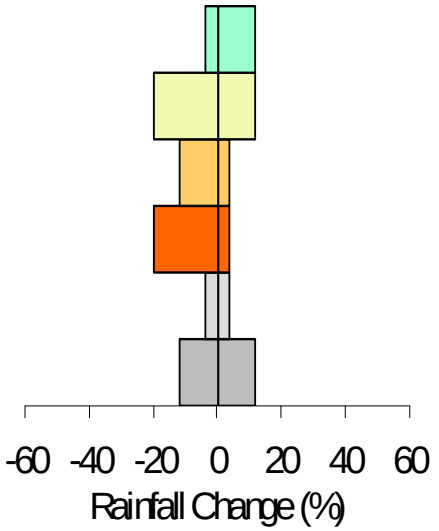
Source: *www.abs.gov.au*

…and changing

Climate Change Projections (2030) – across Australia



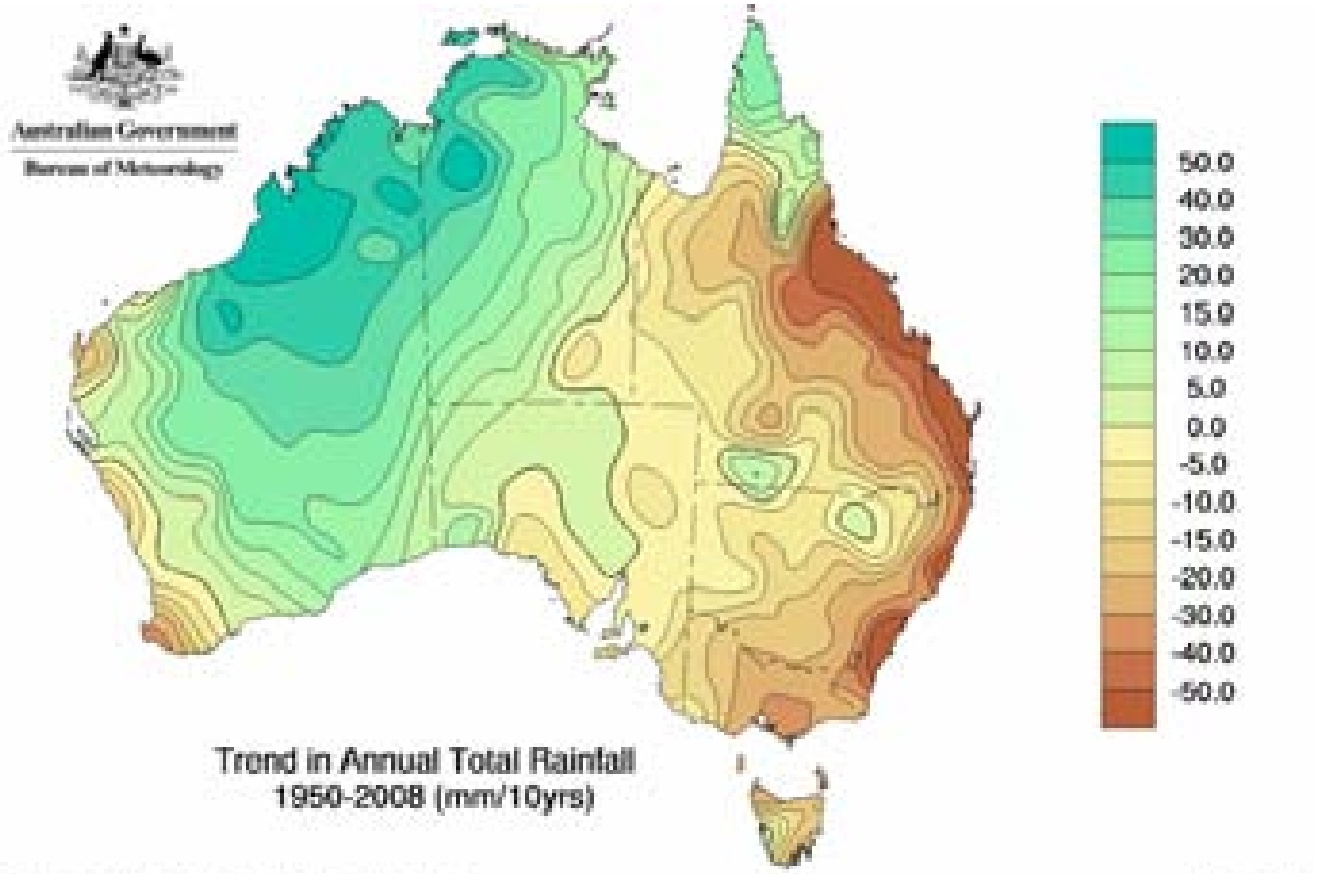
Warming will change general climatic patterns and there will be greater climatic variability



Source: CSIRO

Changing rainfall

Declining Rainfall in Key Areas



…and demographics

Projected Population Increases for Australia's Major Urban Areas up to 2050

City	Current Population June 2006 (000s)	Project population 2030 (000s)	Project population 2050 (000s)	% increase from June 2006 to 2050
Melbourne	3,682.6	4,869.9	5,846.5	58.8
Sydney	4,307.7	5,386.7	6,267.8	45.5
Brisbane	1,864.0	3,071.3	4,147.1	122.5
Perth	1,512.2	2,299.4	2,965.9	96.1
Darwin	114.7	199.8	290.4	153.2
Canberra	330.3	446.7	542.3	64.2
Hobart	206.3	253.5	285.4	38.3
Adelaide	1,133.2	1,259.9	1,324.5	16.9
Total	**13,151.0**	**17,787.2**	**21,669.9**	**64.8**

Source: ABS Population Projections Australia 2006

The new face of water scarcity

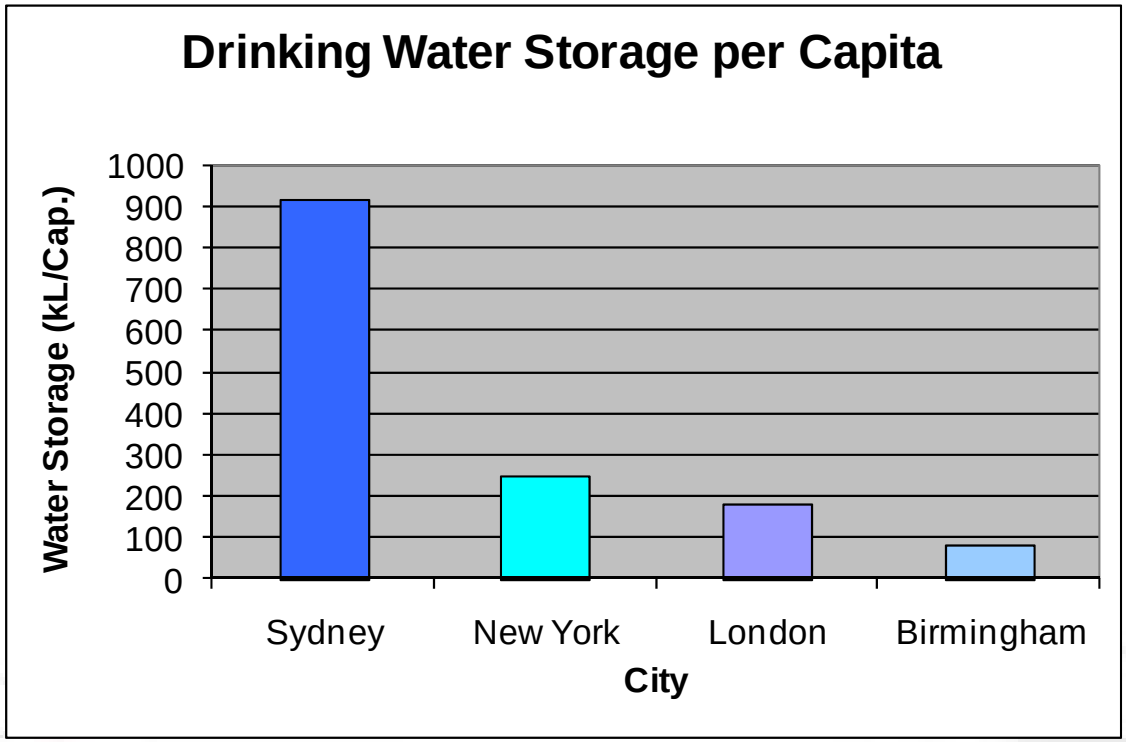
- Declining Yields as a consequence of drying (and warming) climate
- Population Growth
- Need for increased environmental flows for stressed rivers
- Water scarcity came to the city

Australia's response:

Water security through diversity

Rethinking water

Per capita we store six times the water compared to the average European city

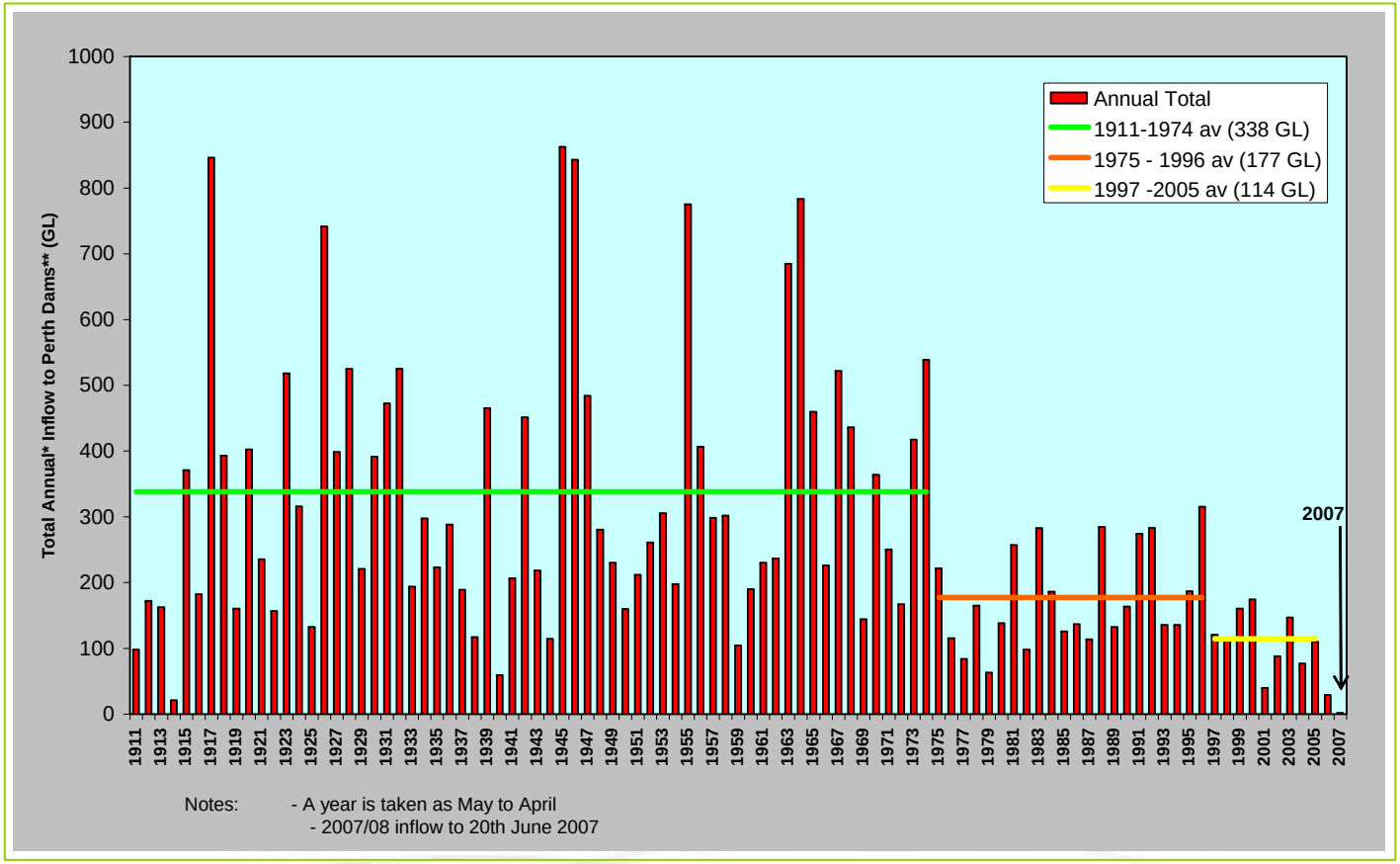


But, surface runoff is a diminishing resource

Only 10% of rain in Australia ends up in rivers compared to:

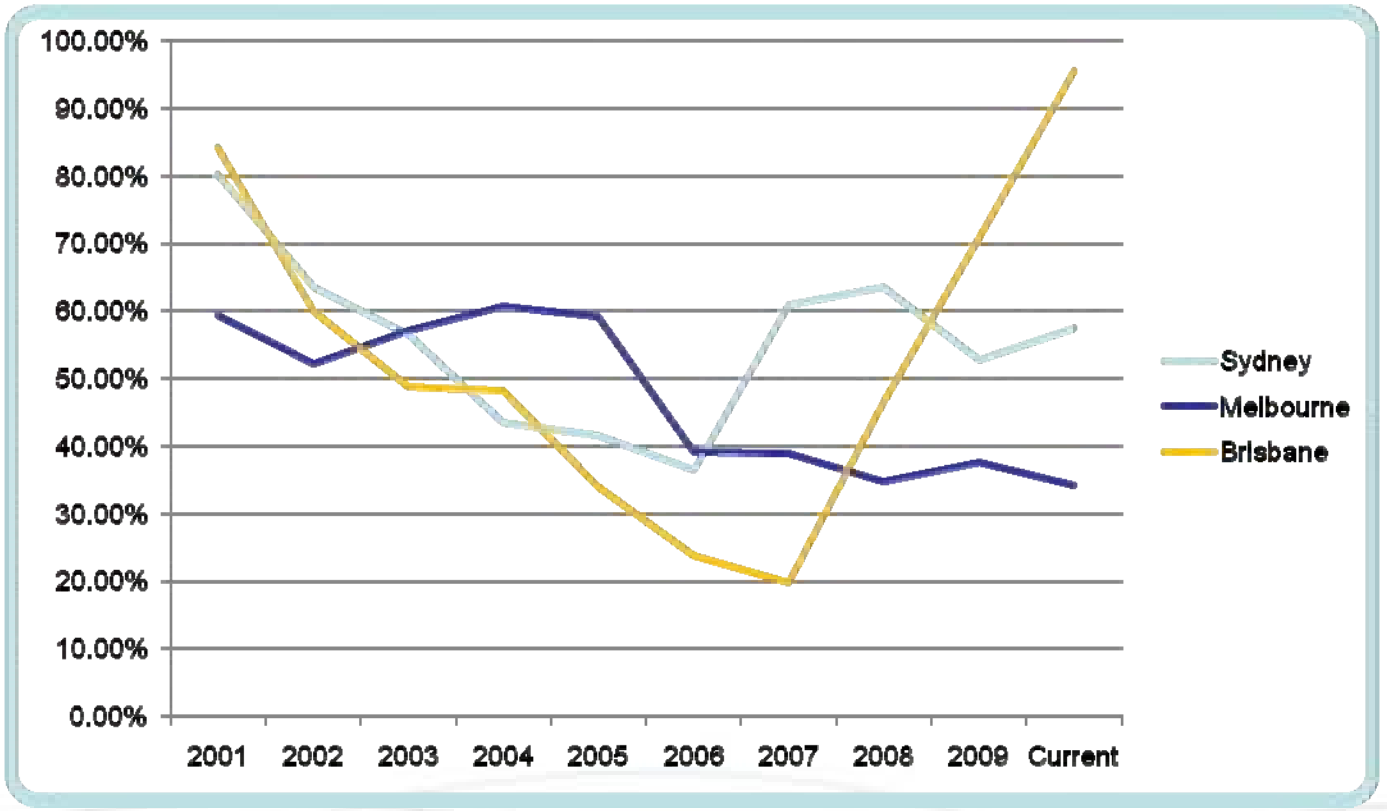
- 52% in North America
- 48% in Asia
- 38% in Europe

Perth inflows to dams



Source: Water Corporation, W.A.

East Coast Urban Water Storage Levels



A portfolio approach

Water Corporation of Western Australia

"Security Through Diversity"

Smarter use of Water

Desalination

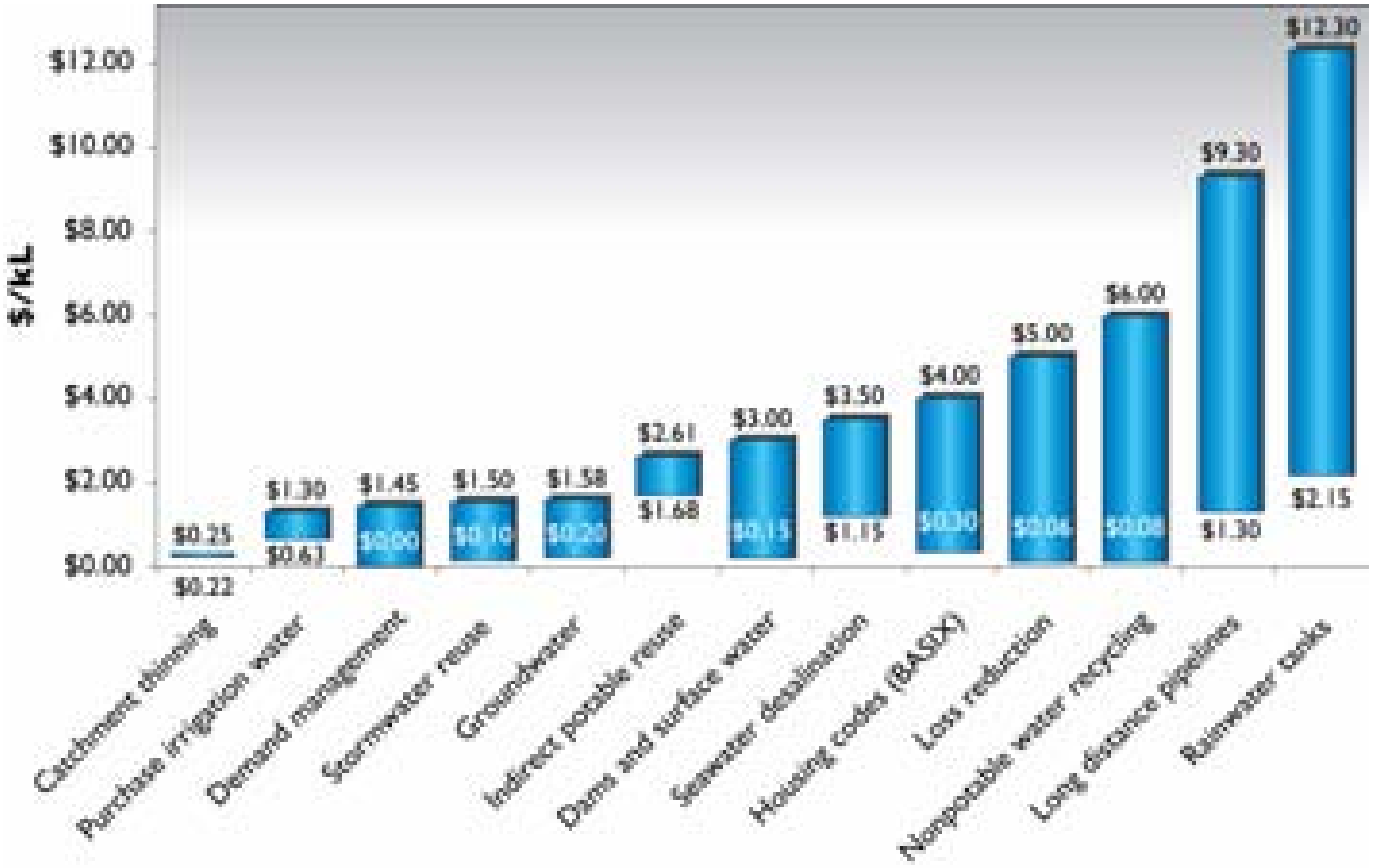
Catchment Management

Water Trading

Surface Water

Groundwater

Assessing direct costs of all water supply/demand options



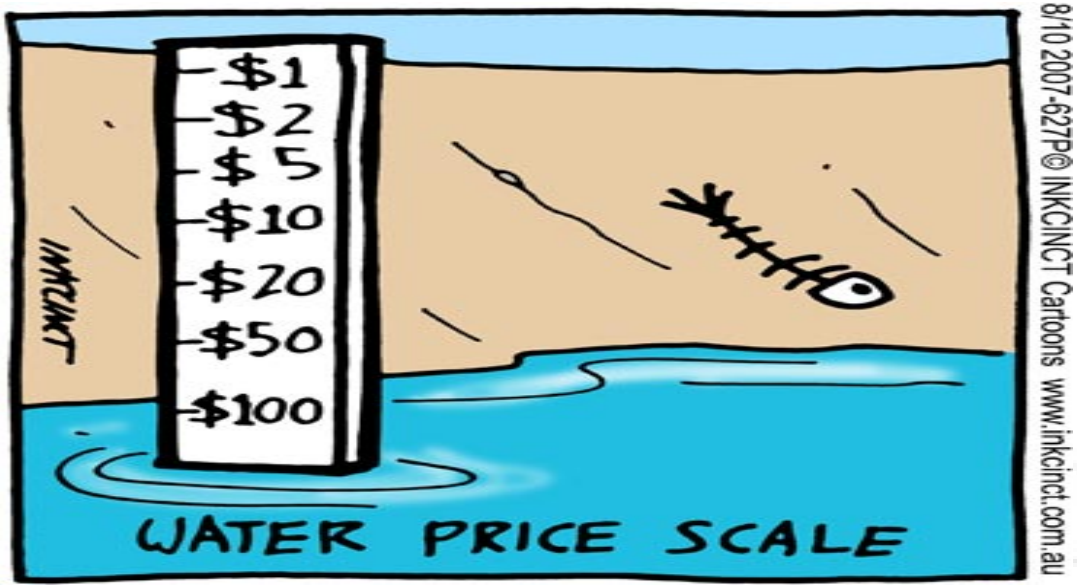
Direct costs $/kL: Sydney, Adelaide, Perth, Newcastle
Source: Marsden Jacobs Assoc, 2006

Water Conservation

- Rebates for water efficient appliances
- Free water efficient showerheads
- Waterwise household, garden, irrigation and industry programs
- Extensive community education
- Voluntary labeling of water saving products
- Mandatory Water Efficiency Labeling

Valuing and pricing water

- Urban (and increasingly irrigation) supplies accurately metered
- Increasingly consumption charges, not fixed or “tax” based
- Water prices increasingly based on full cost recovery
- Extensive reform of utilities to reduce hidden subsidies and improve commerciality



- Water trading in irrigation areas
- Ongoing removal of policies that limit trade within and between areas and sectors

Water Sensitive Urban Design

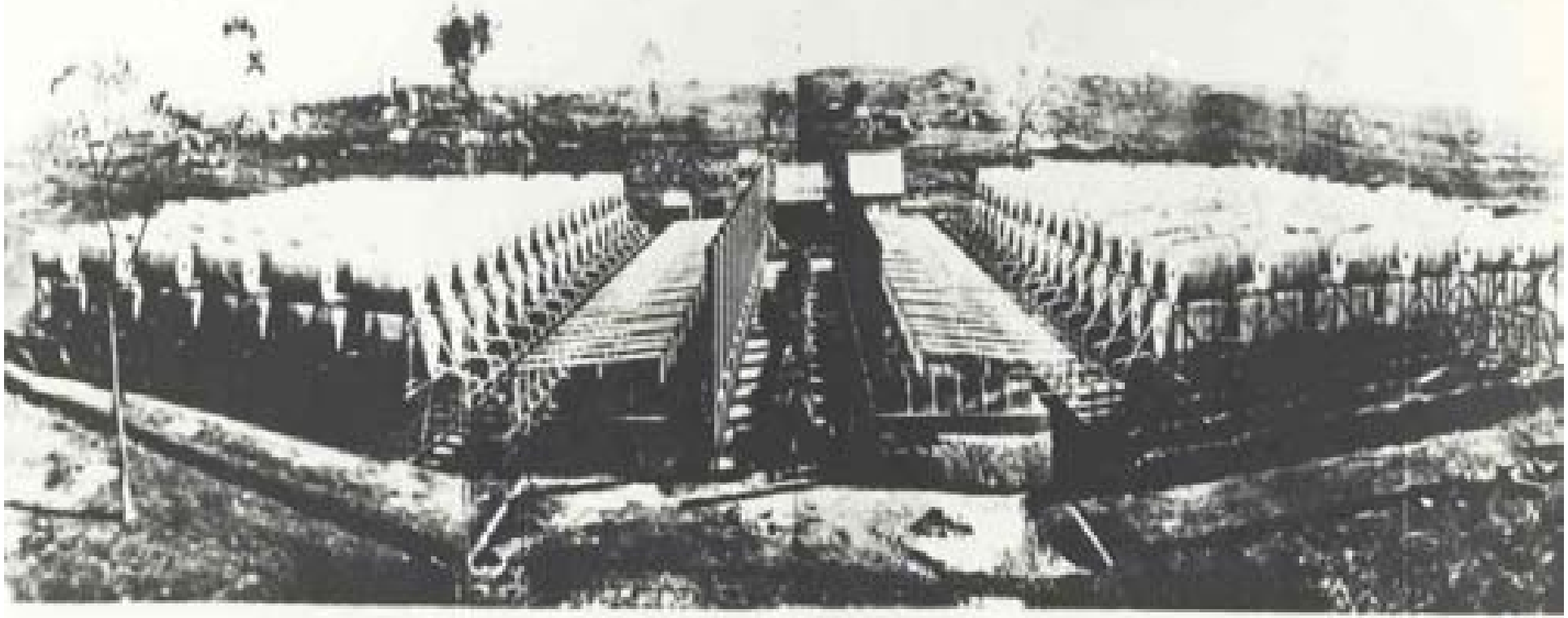
....water from the North a “pipe dream”?

- 3 700km long and cost $2 billion (Tenix 2004)
- 3 x Energy and 4.5 x GHG Emission of desalination (GHD 2004)
- $6.10/kL and significant ecological impacts (GHD 2004)

Desalination is not a new solution

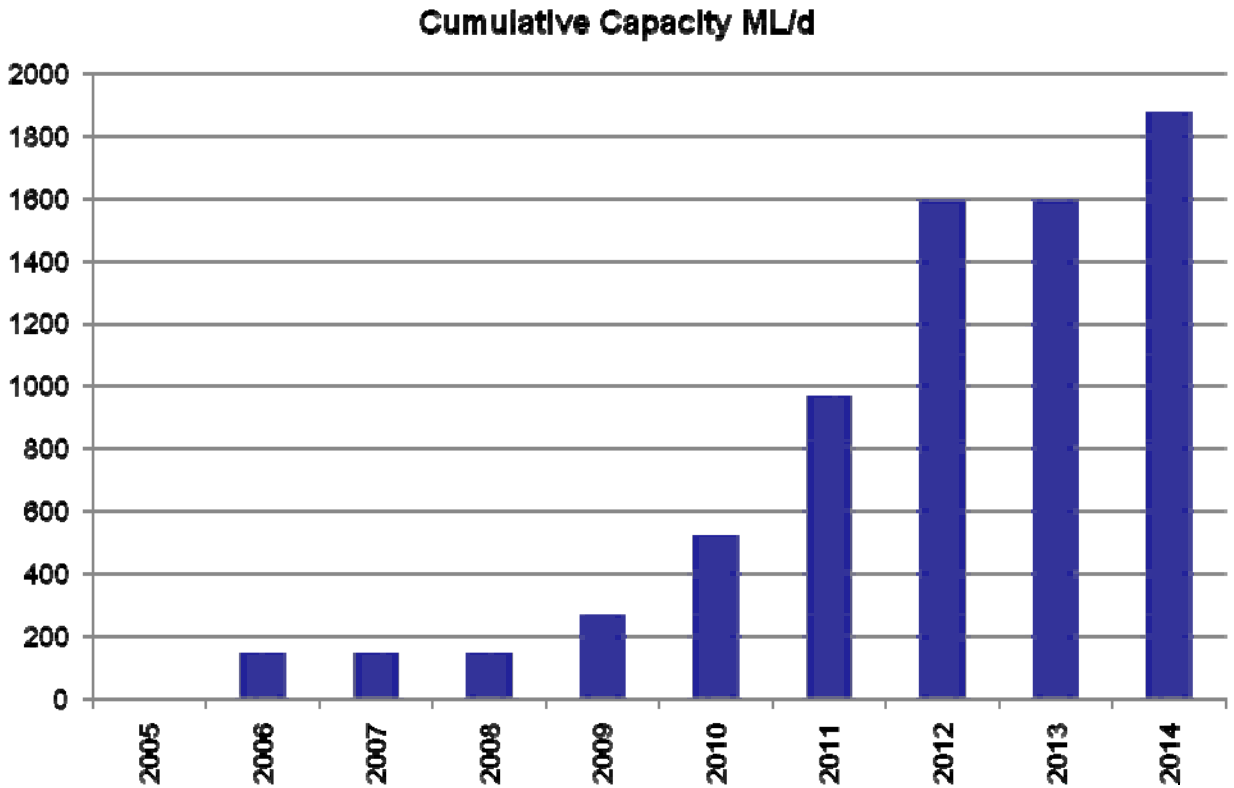
Coolgardie, 1896

In 1896 the worlds largest desalination plant was built in WA at Coolgardie



Mammoth Water Condenser.

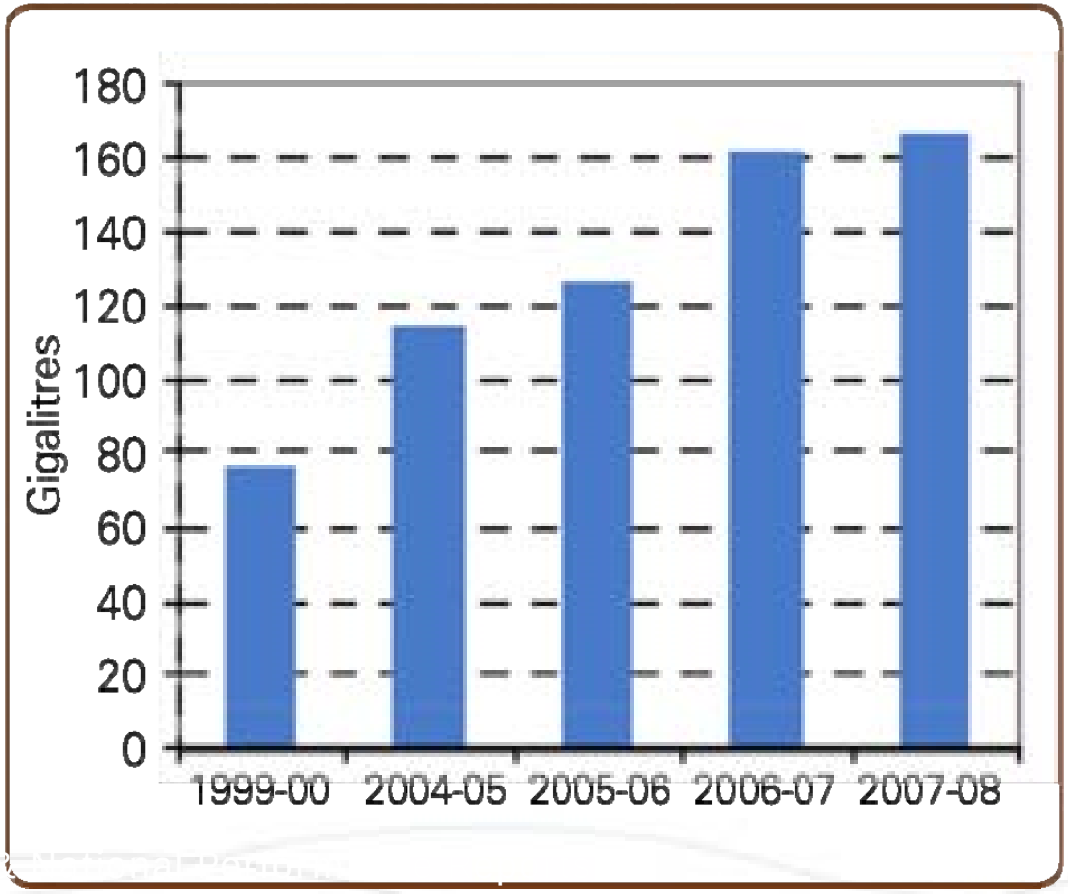
Desalination capacity by 2014



The role of water reuse in Australia

Water recycling

Graph 1 - Growth in the use of recycled water in major urban water utilities



Agricultural, Horticultural and Viticultural

Industrial

Third Pipe or Dual Supply Systems

Environmental Flows

Potable Water Augmentation

Current water reuse

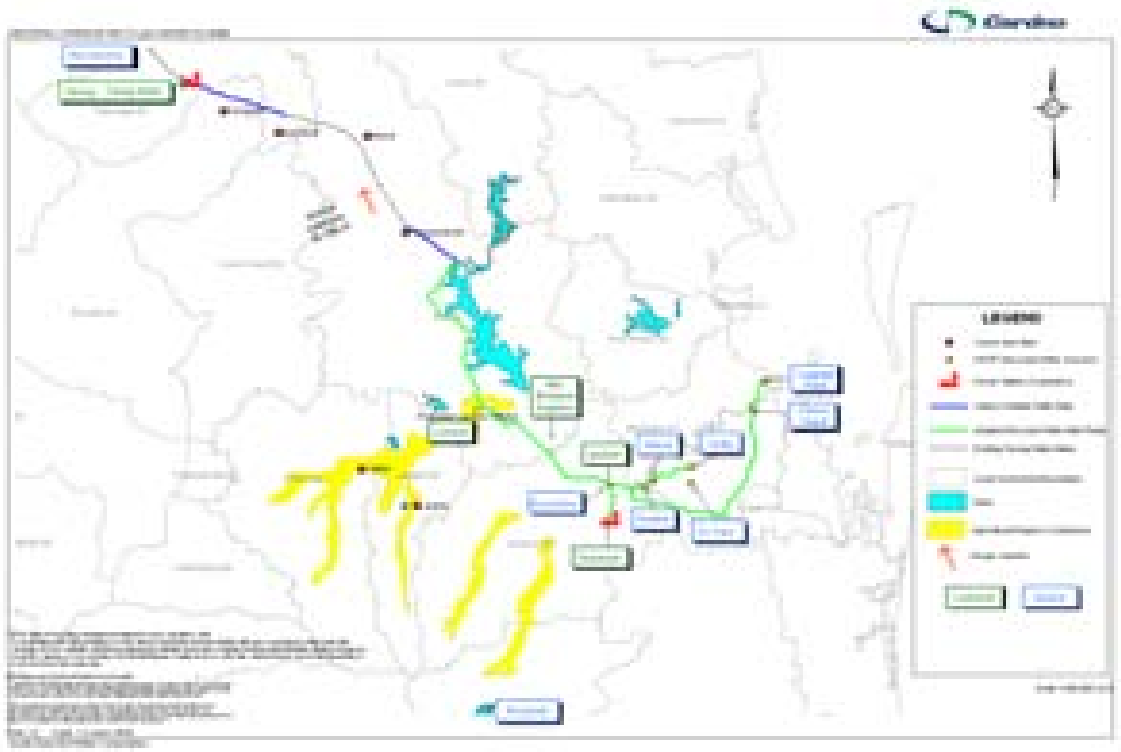
- Historically single use of water
- 2005/2006, 9% water recycled in major utilities, 23% in non major urban utilities
- Some well established schemes eg Virginia Pipeline Scheme build in 1999 – 100 ML per day
- Significant changes in drought/climate change, government policy, costs
- Reuse predicted to reach 30% by 2015

Expected growth in water recycling

Figure 1: Growth in Water Recycling in Australia
- percent of total demand in all Capital Cities

Western Corridor Recycling Scheme (Brisbane)

- Construction of:
  - >200 km of large-diameter underground pipeline
  - 3 advanced water treatment plants
  - 9 storage tanks
  - 12 pumping stations.
- High quality treated wastewater to industry (e.g. oil refinery) and for power station cooling
- Initially intended to provide drinking water Wivenhoe Dam



Regulation

Guidelines and Legislation

- Australian Drinking Water Guidelines - 2004
- National Guidelines for Recycled Water – 2005
- Augmentation of Water Supplies - 2008
- Queensland Water Recycling Guidelines (example)
- Amendments to the Water Act (QLD) 2008
  - Recycled Water Management Plan
  - Expert Panels

Water recycling research

Urban Water Security Research Alliance

Queensland Government

CSIRO

Griffith UNIVERSITY

The University Of Queensland

WQRA water quality research australia

Australian Water Recycling Centre of Excellence

New national focus on recycling & reuse

Australian Water Recycling Centre of Excellence

Centre goals

1. The social, economic & environmental value of water recycling is demonstrated and enhanced
2. A national validation framework for water recycling is established
3. Reclaimed water is seen as an acceptable ‘alternative water’ for augmenting drinking water supplies; and
4. A national knowledge, training and education program for water recycling is established

Australian Water Recycling Centre of Excellence

Research Themes

Theme 1 Technology, efficiency and integration

Theme 2 Water quality & scheme validation

Theme 3 Social, economic and institutional changes

Theme 4 Sustainability in water recycling

Water reuse and the Australian Water Association

AWA Water Reuse Specialist Network

"to maximise water recycling within Australia in a method that is efficient, socially acceptable and economically and environmentally sustainable, without causing adverse health impacts"

- Specialist network workshop at Ozwater
- AWA Water Recycling Conference 2011
- Prepare submissions to Government inquiries, plans, legislation
- Link with National Centre for Excellence in Water Recycling
- Technical meetings

AWA Water Reuse Objectives

- Promote water recycling as a source of water for development
- Facilitate adoption of standard legislation, regulation, policy & guidelines
- Ensure that research is adequate & efficient
- Build relationships with other stakeholder organisations
- Track the adequacy of monitoring programs and technical data
- Support the development and implementation of technology
- Increase industry and community awareness and understanding through education and demonstration

Conclusions on water reuse

- A mix of drivers are increasing focus on water reuse
- Shift away from rainfall dependent raw water focus
- Increasing focus on enabling regulation and policy
- Significant government funding to drive change
- There has been rapid grown in water reuse
- Reuse WILL be an increasingly important contribution to meeting Australia's water security

We are making progress!

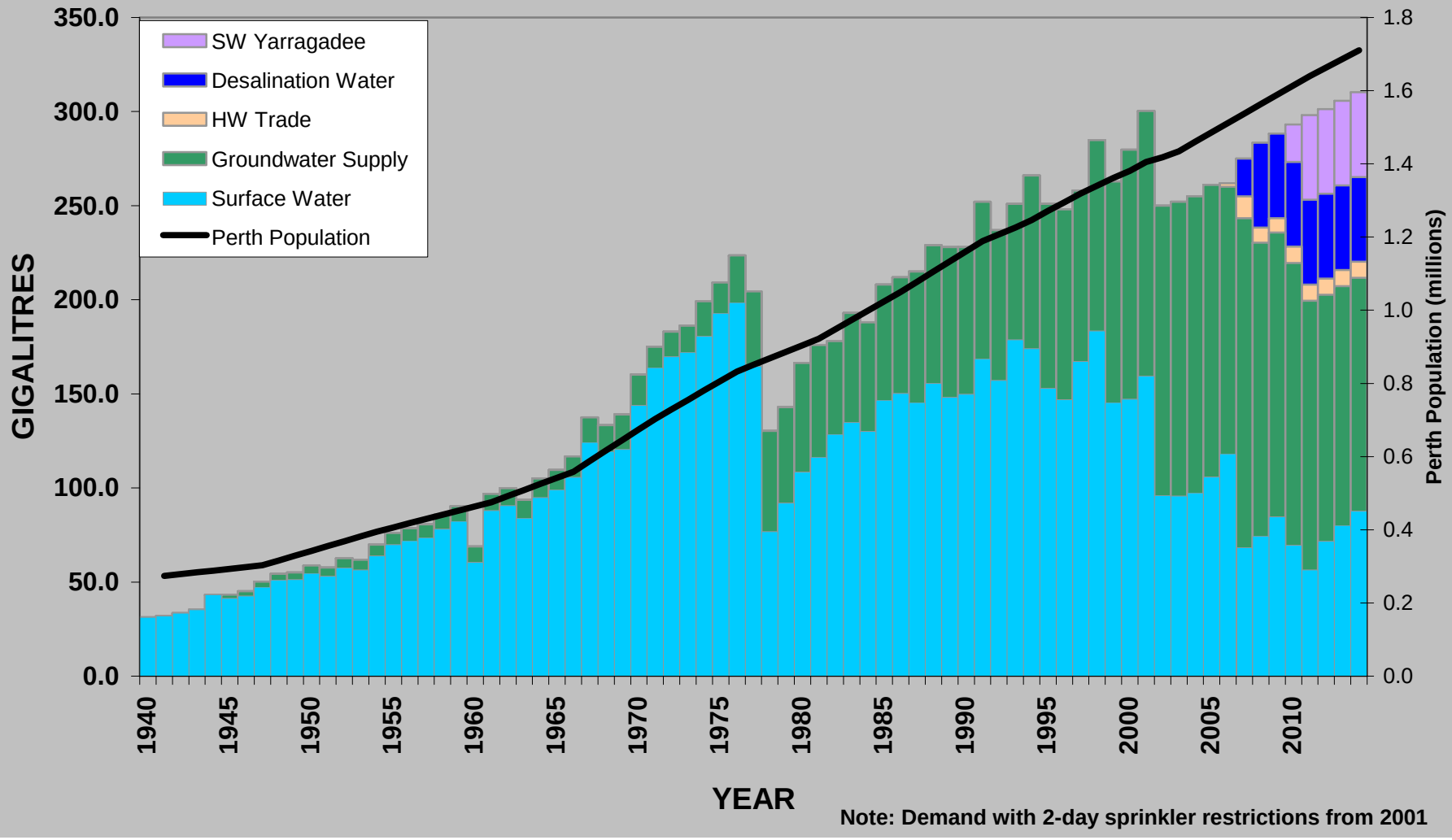
Per capita/per annum capital city residential consumption

	2000-01 kL	2007-08 kL	2008-09 kL	% reduction
Canberra	106.7	68.6	71.0	33%
Brisbane	109.6	50.7	52.5	52%
Melbourne	87.9	60.4	57.4	35%
Darwin	153.7	177.7	180.2	+17%
Adelaide	114.0	84.4	83.1	27%
Sydney	93.1	67.7	73.9	21%
Perth	128.4	103.9	105.9	18%

Diversification of supply

SUPPLY AND DEMAND FOR THE INTEGRATED SCHEME

with SWY in 09/10

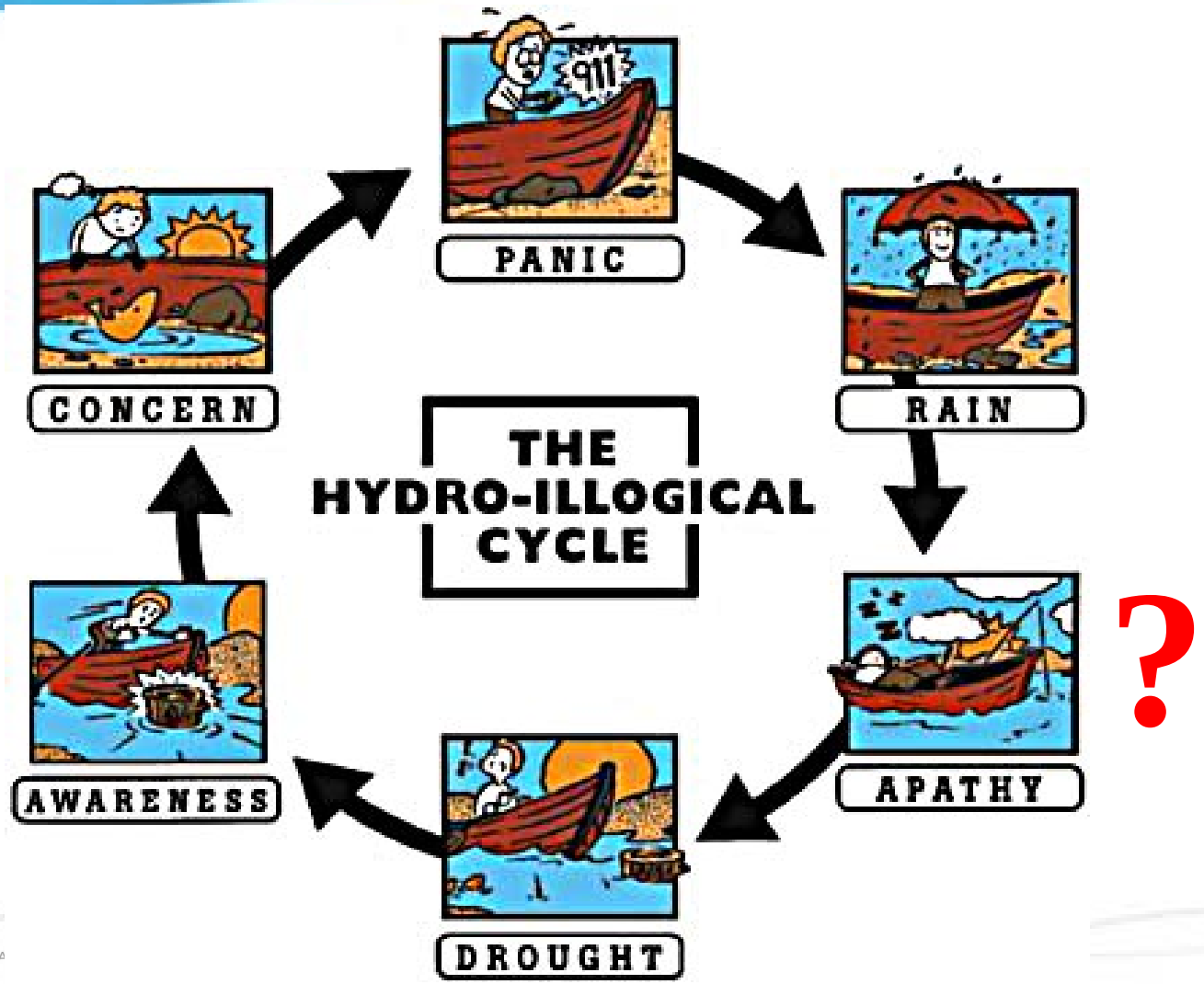


Note: Demand with 2-day sprinkler restrictions from 2001

Some final observations

- Australia's water solutions over the coming decades will be diverse...including "manufactured" water, demand management and local, regional and on-site solutions
- Progress has been good, but more is needed if we are to achieve sustainable solutions
- Our adaptation will need to include not just a changing physical environment, but a dynamic social, political and economic setting
- We need more capacity to meet the challenges ahead!

Drought: A Behavioural problem?



Working together

- Australia has confronted its challenges and made good headway
- We are keen to share what we have learnt and to learn from you
- Spain shares many common issues and concerns
- Opportunities include:
  - Explore links between our associations
  - Arrange for exchanges of people and visits
  - Work on joint projects
  - Share research outcomes and industry intelligence
  - Present at each others conferences

IDA

International Desalination Association

perth

IDA World Congress on Desalination and Water Reuse

Desalination: Sustainable Solutions for a Thirsty Planet

September 4-9, 2011

Perth Convention and Exhibition Centre, Western Australia

strategic partner

AWA

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Muchas gracias / thank you

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Australian Water Association
The hub for Australian water professionals
Providing a knowledge network
Leading the conversation on water issues