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Drought Management and Melbourne's Water Supply

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Outline:

- Melbourne's water supply system
- Hydrology
- Drought Response Planning framework
- 1997-2008 Chronology
- Key initiatives and actions
- Conclusions

Acknowledgements:

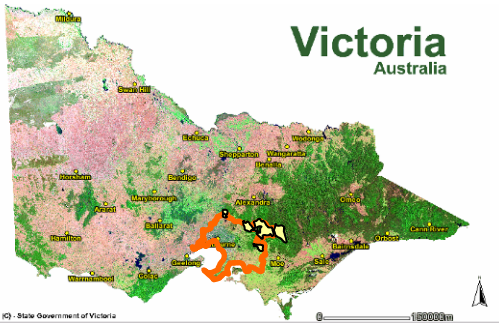
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C Fitzgerald (CWW)
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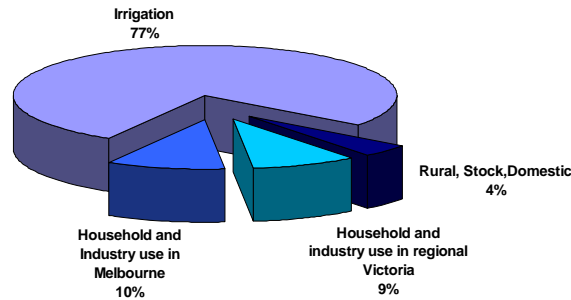
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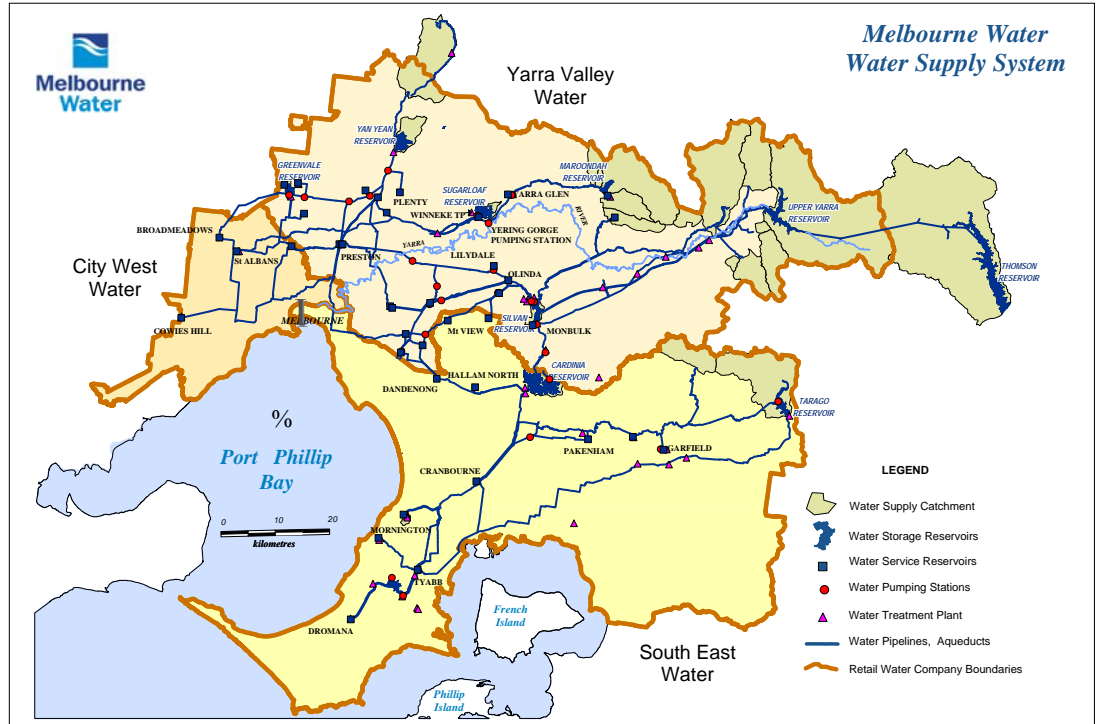
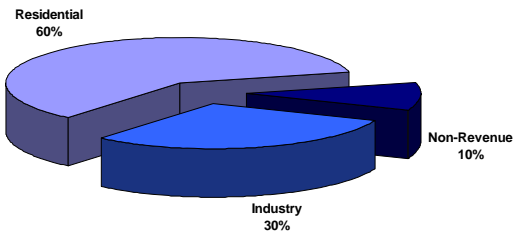
Melbourne Water Supply System



Victorian Use



Melbourne Use



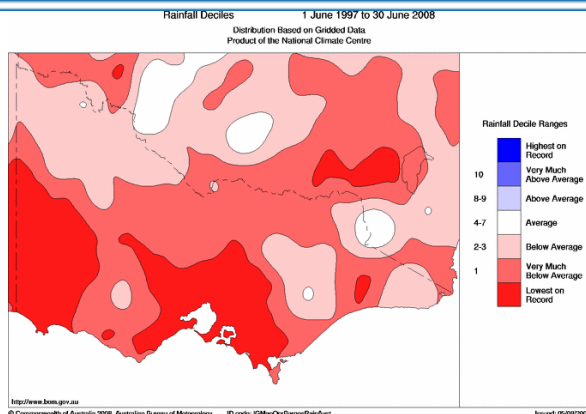
Australia's second largest city - population – 3.7 Million

Surface supplies - catchment area 1560km² (602 sq miles)

Large storage capacity relative to demand and inflow

Average annual demand prior to drought around 480,000ML/a (126,720 Mg/a)

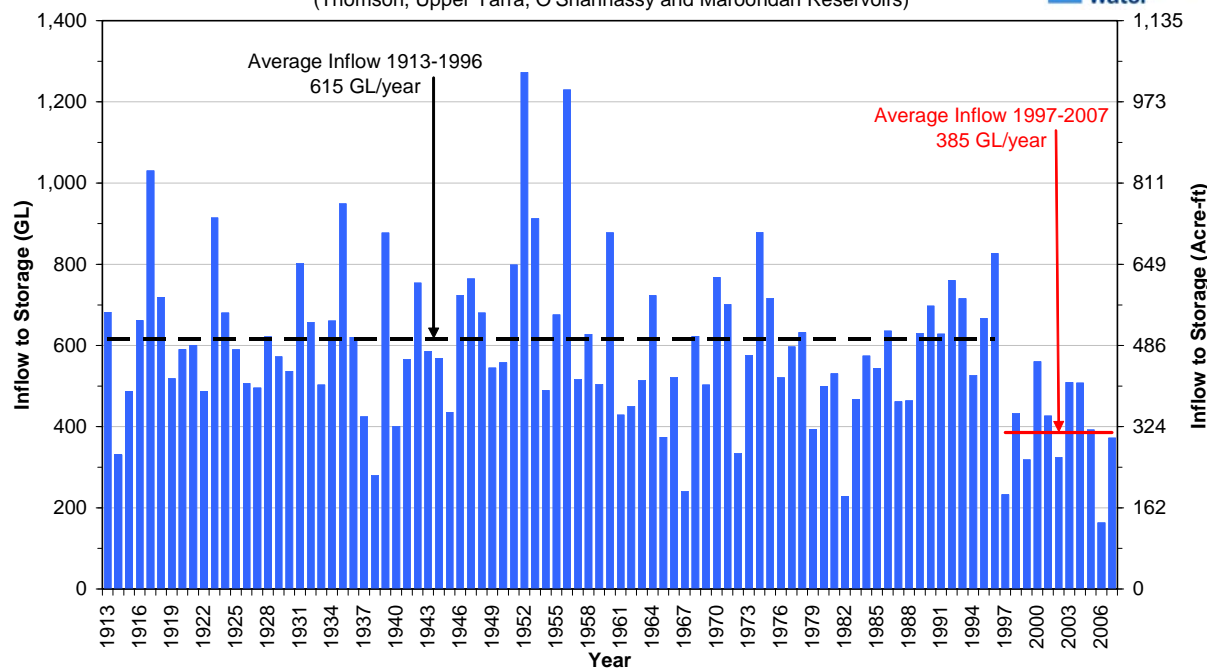
Data Source: Our Water Our Future. The next stage of the Government's Water Plan 2007



- Lowest 11 year recorded streamflow
- 3 significant El-Nino events (1997/98, 2002/03, 2006/07)
- 2006 streamflow 30% lower than previous lowest
- 11 year streamflow 37% lower than long term average

Source: Bureau of Meteorology

Annual Streamflow at Melbourne's Major Harvesting Reservoir Sites
(Thomson, Upper Yarra, O'Shannassy and Maroondah Reservoirs)





Managing Melbourne's water resources systems for climate variability and change in a sustainable manner requires:

Data Collection and Analysis

Decision support systems

Long term planning

- Supply - Demand strategies (includes climate change)
- Design principles and standards
- Integrated resource management

Short term response

Drought Response Plans

- Pre Drought, Drought, Post Drought Phases
- Ministerial Guidelines for Victoria

Emergency Response Plans

Communications and awareness

Research and development

- Climate variability and change studies
- Benchmarking

On-going review and development

Developed in accordance with State Guidelines Defines roles and accountabilities

- Retail Company restriction implementation
- Ongoing Resource and Climate Assessment
- Protocol for water companies
- Drought Coordination Committee

Provides for Staged Response

- Early Warning
- Drought
- Post Drought Review

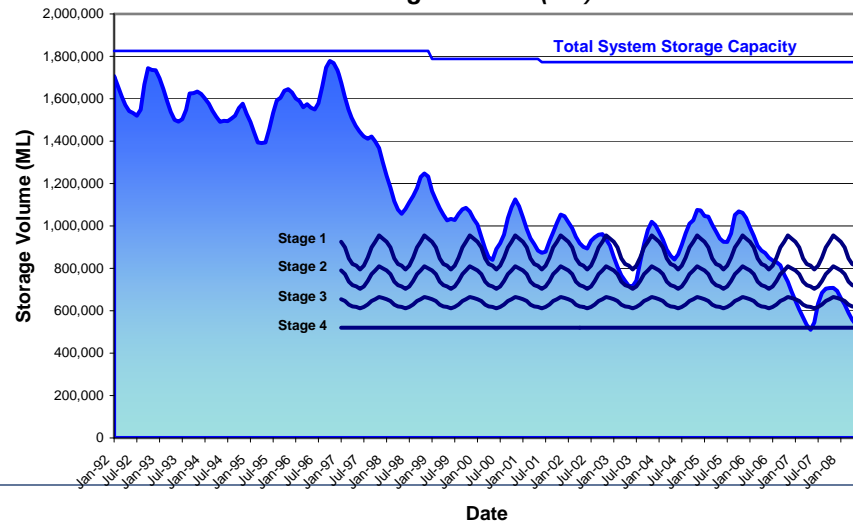
Four Stage Restriction Policy

- Linked to Permanent Water Conservation Measures
- Flexible options for savings included
- Est. 17.5% reduction annual reduction
- Est. 36% peak month reduction


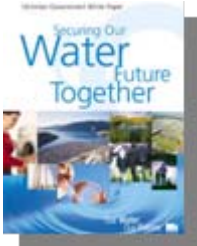

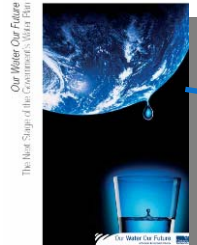
Trigger Methodology

- Operating Levels
- Drought demands
- Drought inflows
- Levels of service

**Melbourne Water Storage
Total Storage Volume (ML) Since 1992**



Chronology – Strategic Plans and Drought Actions

	Year	Key Strategies, Plans, Studies	Drought and Response Actions	Restriction Stage
	1997		1997/98 El-Nino	
	1998		Yarra R. Diversions Drought Plan	
	1999		Ministerial Guidelines for Drought Planning	
	2000		Commencement streamflow management plans	
	2001			
	2002	Water Resources Strategy for Melbourne	Revised Drought Response Plan (DRP) Guidelines Legal update of DRP	
	2003	Victorian Government Green Paper - Securing Our Water Future Joint Water Conservation Plan	Implementation of DRP	Nov 02 - Stage 1 Aug 03- Stage 2
	2004	Victorian Government White Paper - Securing Our Water Future Together MW/CSIRO Climate Change study Joint Water Conservation Plan - Revised		
	2005	Discussion Paper - Central Region Sustainable Water Strategy	Restrictions lifted	
	2006	Central Region Sustainable Water Strategy Water Supply Demand Strategy for Melbourne Environmental flow entitlements allocated (Oct)	Permanent Water Conservation Measures (PWCM) introduced Revised 4 stage policy for PWCMs 2006/07 El-Nino - Lowest inflow on record Development Uniform Statewide 4 stage policy	Mar 05 PWCMs
	2007	Our Water Our Future: The Next Stages Joint Water Conservation Plan Revision	Introduction of restrictions Supply improvement initiatives Qualification of environmental flows (Jan & Nov) Catchment Bushfire response	Sep 06 - Stage 1 Nov 06 - Stage 2 Jan 07 - Stage 3
	2008	Our Water Our Future: The Next Stages 12 Month Progress Report	Update Stage 3 to Stage 3a Lowest total recorded autumn streamflow	Apr 07 - Stage 3a

Demand Management/Restrictions

- Demand management programs derived from strategic targets
 - Industry programs
 - Showerhead exchange
 - Individualised social marketing (CWW)
 - Government rebates
- Flexibility of restriction stages
- Permanent Water Savings Rules
- Stage 3a restrictions

Supply:

- Operational efficiencies
- Leak and pressure reduction
- Reinstatement diversion weirs
- Environmental flow management
- Water quality management
- Access to low reservoir levels

Other:

- Research
- Water Efficiency Labelling (WELS)
- Pricing
- Communications



EVERYONE IN MELBOURNE IS STILL AT 3a

Stage 3a water restrictions are still in place for every house, apartment and business in Melbourne. Cut out the section below and keep it as a reminder of what the restrictions are. Visit ourwater.vic.gov.au or call your water business for further details of the restrictions and great ideas to help you save water.

STAGE 3a WATER RESTRICTIONS ARE NOW IN PLACE ACROSS MELBOURNE. RESTRICTIONS APPLY TO MELBOURNE'S DRINKING WATER.

 <p>MANUAL WATERING & DRIPPER SYSTEM 6AM - 8AM*</p> <p><small>*Garden hoses and drip irrigation can be used in Saturday and Sunday, and on treated on water on Sunday and Wednesday (with specified limits).</small></p> <p><small>*Manual drip systems, a hand-held hose fitted with a trigger nozzle, watering cans and tubs can be used to water plants as required.</small></p>	 <p>AUTOMATIC DRIPPER SYSTEM MIDNIGHT TILL 2AM*</p> <p><small>*Automatic drip systems can be used to water plants on specified watering days between midnight and 2am.</small></p> <p><small>*Incompatible with irrigation systems larger than 10 litres or use water to fill manually on specified watering days between 6am-8am or 6am-10am.</small></p>	 <p>EFFICIENT COMMERCIAL CAR WASH ONLY*</p> <p><small>*High-pressure car wash systems can be used to wash private cars on specified watering days between midnight and 2am.</small></p> <p><small>*Incompatible with car wash systems larger than 10 litres or use water to fill manually on specified watering days between 6am-8am or 6am-10am.</small></p>	 <p>1 IN 4 SPORTSGROUNDS CAN BE WATERED</p> <p><small>*The efficient commercial car wash (not larger than 10 litres) or hose pipe which can be used. Car washes not be washed at home with drinking water. A bucket that from a tap can be used to clean windows, mirrors and lights, and wet surfaces on the additional.</small></p> <p><small>*Watercourse safety 10 magnitude of water or more per year must comply a water conservation action plan (see WAP program).</small></p>	 <p>INDUSTRY WATER CONSERVATION PLAN*</p> <p><small>*The efficient commercial car wash (not larger than 10 litres) or hose pipe which can be used. Car washes not be washed at home with drinking water. A bucket that from a tap can be used to clean windows, mirrors and lights, and wet surfaces on the additional.</small></p> <p><small>*Watercourse safety 10 magnitude of water or more per year must comply a water conservation action plan (see WAP program).</small></p>	 <p>SOLUTIONS: RAINWATER & GREYWATER ANYTIME</p> <p><small>*The efficient commercial car wash (not larger than 10 litres) or hose pipe which can be used. Car washes not be washed at home with drinking water. A bucket that from a tap can be used to clean windows, mirrors and lights, and wet surfaces on the additional.</small></p> <p><small>*Watercourse safety 10 magnitude of water or more per year must comply a water conservation action plan (see WAP program).</small></p>
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*Paradees apply for non-compliance and water patrols are out in force. You can report any breaches by calling 18WATER.
CITY WEST WATER: 611 691 SOUTH EAST WATER: 131 867 YARRA VALLEY WATER: 131 721

Our Water Our Future

2008 Print advertisement

Website

- Rainfall and river levels, storage volumes
- Weekly water update
- Drought
- Water conservation
- Drought Response Plan and restrictions information

Daily storage information

Eg Media, Taxis

Water Bill Information

Advertising Campaigns

- Print adds and direct
- TV and Radio

Media Advice

Weekly TV Weather

Education

Brochures and Booklets

Partnerships

Savewater

Research

- Smart Water Fund
- Climate research

Stakeholder Engagement

- Peak bodies
- Water agencies



MELBOURNE'S GUIDE TO WATER RESTRICTIONS

STAGE 2

- NO WATERING LAWNS AT ANY TIME**
- GARDEN MANUAL WATERING SYSTEMS**
6 AM ▶ 8 AM
8 PM ▶ 10 PM*
- GARDEN AUTOMATIC WATERING SYSTEMS**
MIDNIGHT TILL 4 AM*
- TRIGGER NOZZLE FOR GARDENS AT ANY TIME**
- NO HAND HELD HOSES ON VEHICLES†**

*Odd numbered houses water on odd dates and even numbered houses water on even dates.
†A bucket, high-pressure cleaning device or commercial car wash can be used.

STAGE 3

- NO WATERING LAWNS AT ANY TIME**
- GARDEN MANUAL DRIPPER SYSTEM**
6 AM ▶ 8 AM
8 PM ▶ 10 PM*
- GARDEN AUTOMATIC DRIPPER SYSTEM**
MIDNIGHT TILL 4 AM*
- TRIGGER NOZZLE FOR GARDENS AT ANY TIME**
- NO HAND HELD HOSES ON VEHICLES†**

*Even numbered houses can water on Sunday and Tuesday; odd numbered can water on Sunday and Wednesday.
†A bucket filled from a tap can be used to clean windows, mirrors and lights, and spot-correct concrete surfaces. A commercial car wash can be used.

For a full set of water restrictions, visit www.ourwater.vic.gov.au or contact your local water business.
To report a breach call 13WATER.
USE LESS WATER.

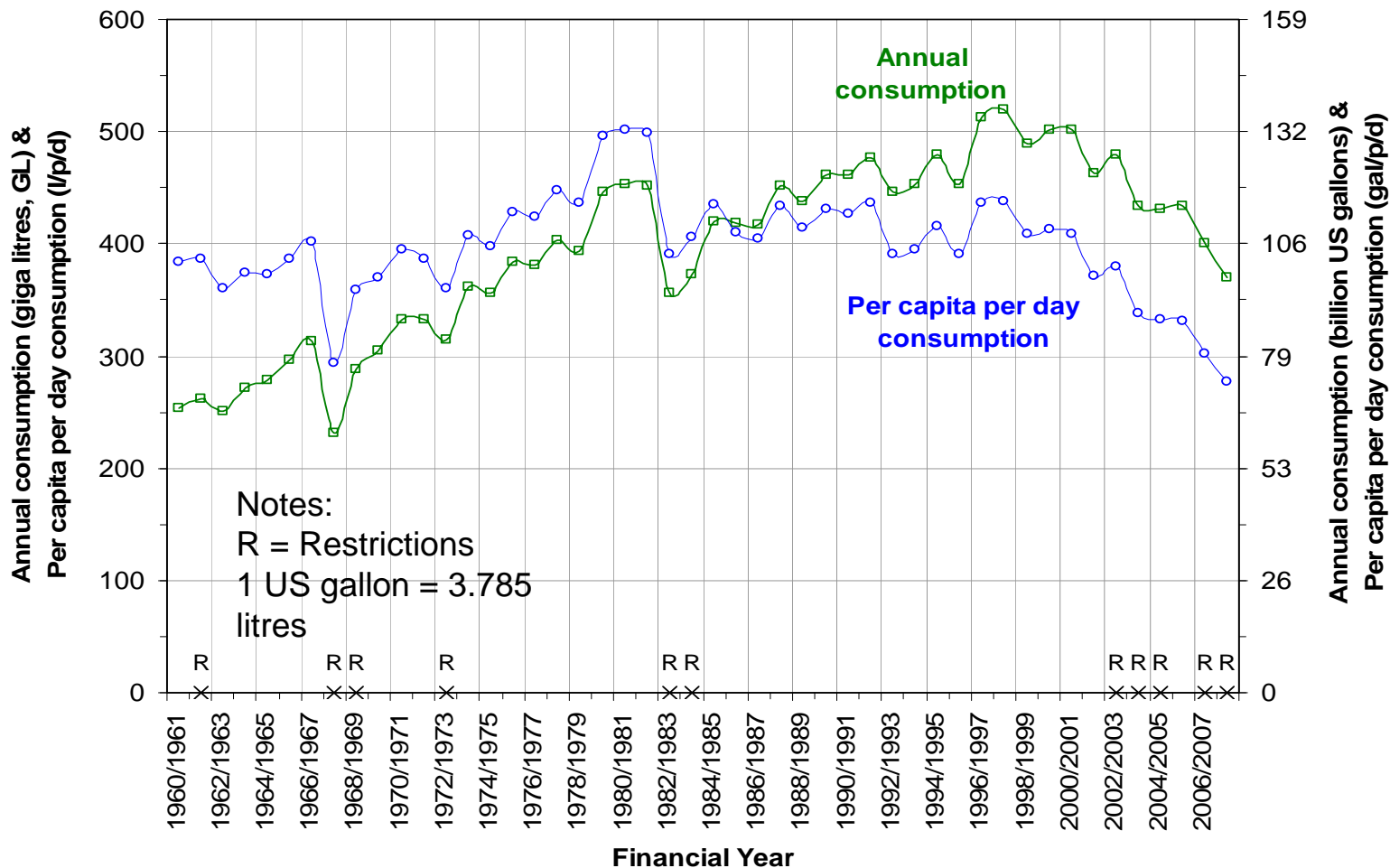
City West Water 131 691 • South East Water 131 667 • Yarra Valley Water 131 721

Our Water Our Future

Authorized by the Victorian Government Melbourne. A Victorian Government initiative. Melbourne The Place To Be.



Melbourne's Water Consumption 1960-2008



Total volumes saved in storage 2002 – Jun 2008 = 362GL



- Lowest 11 year recorded inflows
 - Climate variability or change?
- Strong framework for managing climate variability and change
- Drought response framework
 - Predefined,
 - flexible,
 - collaborative
- Major strategic reviews and initiatives 2002, 2006, 2007
- Communication/education strategies
- Market research to support response activities
- Strong and sustainable response to reducing demand
- Many challenges exist



Victorian and Melbourne web links:

Melbourne Water:

www.melbournewater.com.au

Metropolitan Water Businesses:

City West Water: www.citywestwater.com.au

South East Water: www.sewl.com.au

Yarra Valley Water: www.yvw.com.au

Victorian Government water information:

Our Water Our Future www.ourwater.vic.gov.au

Drought Response Plan:

see www.yvw.com.au/yvw/Home/WaterRestrictions

Smart Water Fund Research:

www.smartwater.com.au

Water Conservation:

conservewater.melbournewater.com.au

www.savewater.com.au