

AWI-CMAS

Melbourne and governance - in a time of
water stress and climate change

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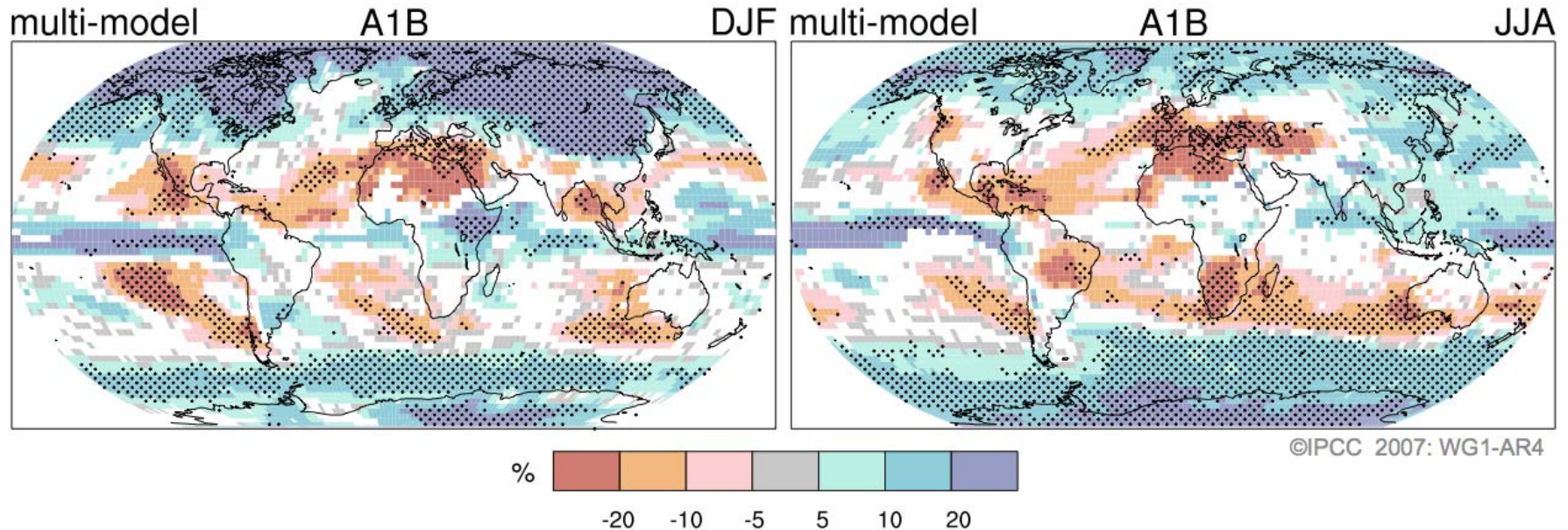
<http://www.caspi.unimelb.edu.au>



CASPI

Projections of Future Changes in Climate

Projected Patterns of Precipitation Changes



increases

Decreases

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Climate Change. CSIRO reports:

- Average temperature over Australia has increased by 0.9°C since 1950 with substantial rainfall declines across Victoria.
- Projections suggest continued warming with an approx. further increase of 1°C by 2030 relative to 1990
- By 2050 this is estimated to be around 1.8°C and precipitation is expected to decline further across this region



Related issues

Bush fires

Storm

Melbourne prime site for hydrometeorological disaster

Impacts on agriculture

Biodiversity



Governance

“the social, legal and political arrangements that humans create to seek shape to their future”



Framing Hypothesis

The governance and corresponding infrastructure are legacy arrangements that we have developed to organise water do not correspond well with understanding, monitoring, and working effectively with the natural water system under the stresses of climate change.



Incompatibility of governance system and water system

For example:

Water collected from rivers in dams

Piped to cities and agriculture

Water falling on cities treated as waste, piped to the sea

Used “waste water” flushed down sewers

Energy required treated as having no impact on the environment, or on future water flows

All under the control of conflicting jurisdictional authorities

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Designed without sustainability in mind

- large scale technological solutions to problems.
- institutional boundaries fracture understanding

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For example: in Australia

- Federal structure - major rivers flow across state boundaries
- individual authorities compete to deliver water
- local governments administer but do not have power to shape sustainable water responses

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For example: in Australia

- Governance arrangements do not integrate water with its *context* of energy use, carbon constraint, food impacts, industrial use, pollutants and demand

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For example: in Australia

- Governance arrangements do not bring together the elements of rising sea levels, depleting ground water, storm and extreme events, salinity of soils and declining rainfall and storage



QuickTime™ and a
decompressor
are needed to see this picture.

Melbourne , Governance and Climate Change

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decompressor
are needed to see this picture.



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Melbourne - second largest city with approx 3.8 million people situated on Port Philip Bay on the southeastern coast of Australia.

- experiencing a run of unusually warm years
- lowest rainfall years for 10 consecutive years
- water storage levels at record low levels
- water use restrictions in place in Melbourne
- some regional areas facing severe water restrictions and the inability to meet the needs of agriculture, dairy farming etc

Melbourne's Water Storage

Melbourne water storage at 5/3/2008 (www.melbournewater.com.au)

Reservoir	Capacity	Current Volume (ML)	% Full
Thomson	1,068,000	253,503	23.7
Upper Yarra	200,000	113,148	56.6
O'Shannassy	3,000	2,276	75.9
Maroondah	22,000	10,532	47.9
Sugarloaf	96,000	23,686	24.7
Yan Yean	30,000	4,863	16.2
Greenvale	27,000	22,732	84.2
Silvan	40,000	35,838	89.6
Cardinia	287,000	156,742	54.6
Total	1,773,000	623,320	35.2



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An Array of Agencies

Federal Govt

State Government

Local Government Authorities

Catchment Management Authorities

Melbourne Water

Retail distributors

etc

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A Legion of Legislation

Melbourne and Metropolitan Board of Works Act 1958

Water Act 1989. Water (Permanent Transfer of Water) Regulations 2001.

Environment Protection Act 1970 and Environmental Protection Amendment Act 2006. Environmental Protection (Scheduled Premises & Exemptions) Regulations 2006. State Environmental Protection Policy (Waters of Victoria) 2003.

Heritage Rivers Act 1992

Water Industry Act 1999

Catchment and Land Protection Act 1994

Environment Protection and Biodiversity Conservation Act 1999

Safe Drinking Water Act 2003 and Safe Drinking Water Regulations 2005

Essential Services Commission Act 2001.



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An Overkill of Organisations:

Minster for Water supported by the Department of Sustainability and Environment (DSE).

The Drinking Water Regulatory Unit of the Department of Health

Environmental Protection Agency Victoria (EPA).

Essential Services Commission (ESC).

The Energy and Water Ombudsman Victoria (EWOV)

Melbourne Water.

City West Water, South East Water, and Yarra Valley Water,

Port Phillip and Westernport CMA.



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A Plethora of Policy papers:

Victorian River Health Strategy 2002.

State Environmental Protection Policy (Waters of Victoria).

Victorian Government White Paper, *Securing our water future together*, 2004.

Water Recycling Action Plan (2002).

Water Supply-Demand Strategy for Melbourne (2006-2055).

Melbourne 2020

etc

A host of overlapping issues

How should governance of Melbourne's water system fit within Australia's federal system of government?

What mechanisms of accountability, transparency, and decision-making are required?

Who are the major policy actors in Melbourne's water system and what are their interests? Are there significant implications of climate change for these?

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What key climate change impacts need to be considered?

What other trends need to be taken into account?

In what ways might we expect climate change impacts and adaptation responses to influence or test existing institutional, governance, and legal arrangements currently governing water (including wastewaters, flood waters, and recycled water)?

How should governance boundaries be determined in relation to climate stressed natural systems?

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Key questions on ownership of water

- In whom and how should ownership of water be vested?
- What is the appropriate balance between State and private control?
- To what extent should there be, an open market in water?
- How should rights to use be 'defined'?



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What are the Barriers to change?

Barriers to /from:

- integrated water management (integrating different sources and uses of water at the local level).
- decentralisation
- social acceptance
- existing/legacy investments and infrastructure which inhibits change.



Desalination Plant

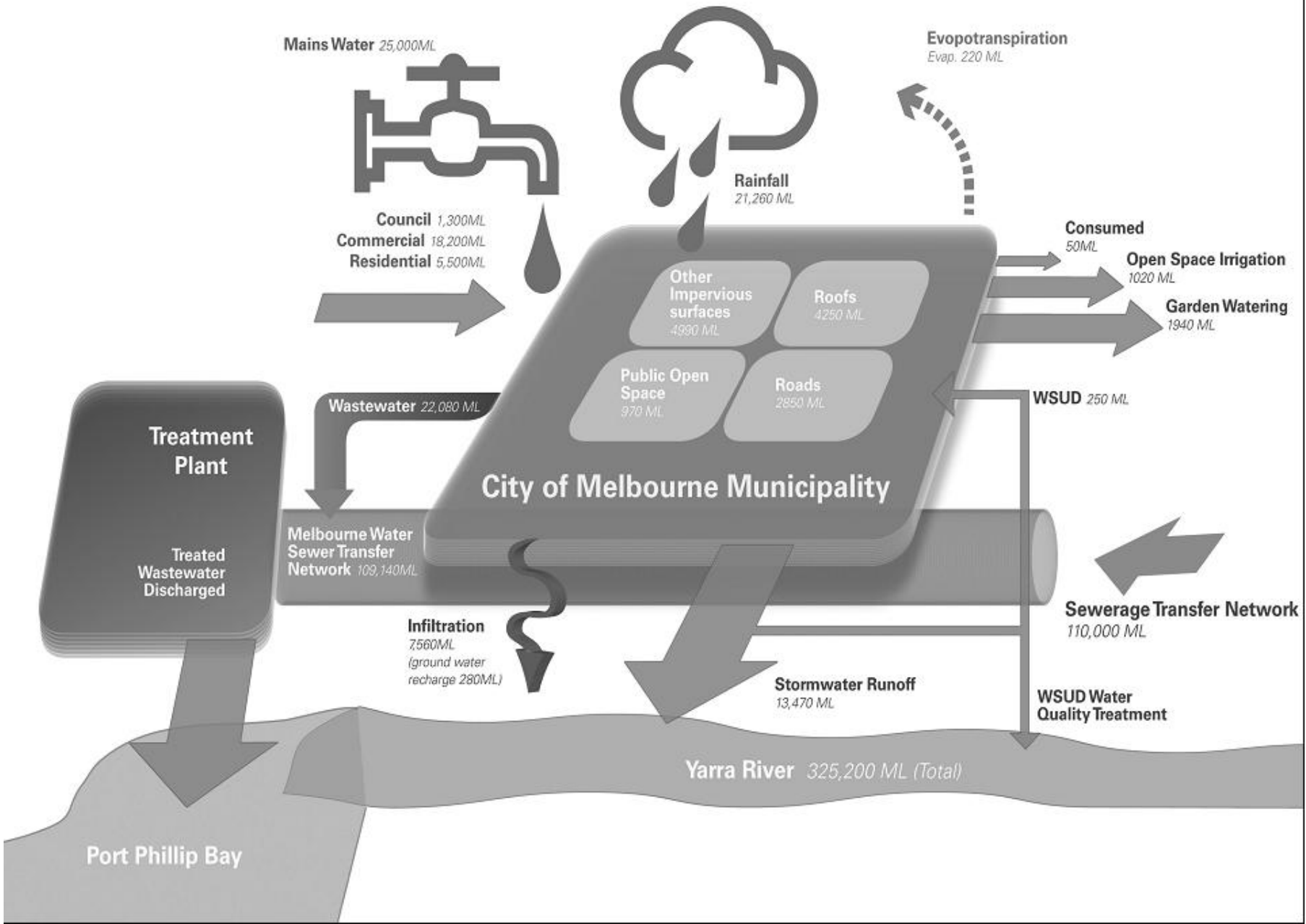
- \$3.1 billion desalination plant would be built in the Wonthaggi region(south-east of Melbourne) by the end of 2011.



Towards a new paradigm for Melbourne

**work done by Melbourne City Council
in conjunction with university
researchers at Monash and Melbourne
universities**

Following slides, courtesy Sheridan
Blunt, Sustainability Team, City of
Melbourne






Economy

City Ecosystem

Community

air quality
landscape

biodiversity
materials




Waterways
Port Phillip Bay
Yarra River, Maribyrnong River, Moonee Ponds Creek

WSUD Now: x kilolitres/x/x?? 80%????
Target: 40% by 2020 ??????



Groundwater


WSUD Now: 3%?????????
Target: 10% ??????????



Underground Drains

WSUD 06/07: x megalitres?
Target: x megalitres by 2020???


Now: 95% ????
Target: 50% by 2020???



Roads As A Catchment
Water In:
Stormwater up x%
Water Quality:
80:45:45
TSS:TP:TN
Water Out:
None, except in construction

06/07: x megalitres?
Target: x megalitres by 2020???

WSUD

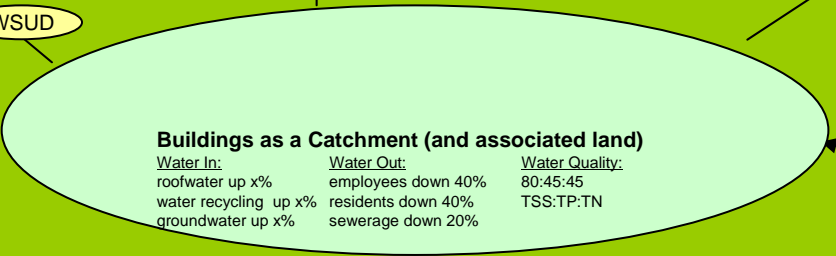


Public Open Space and Streetscapes as Catchments
Water In:
stormwater up x%
water recycling up x%
groundwater up x%
Water Out:
Council down 40%
Sewerage down 20%
Water Quality:
80:45:45
TSS:TP:TN

WSUD 06/07: x kilolitres/x/x or 10 tree pits???
Target: 400 tree pits by 2020???

WSUD Now: 95% ??
Target: 50% by 2020??

Now: megalitres/year
Target:



Buildings as a Catchment (and associated land)
Water In:
roofwater up x%
water recycling up x%
groundwater up x%
Water Out:
employees down 40%
residents down 40%
sewerage down 20%
Water Quality:
80:45:45
TSS:TP:TN

WSUD 05/06: 1 raingarden
Target: 30 raingardens p.a. by 2020?

99/00: x kilolitres/x/x
Target: 40% reduction by 2020.

WSUD 99/00: 296 litres/resident/day and 181 litres/employee/day
Target: 40% by 2020: 178 litres/person/day and 108 litres/person/day



Desalination



Mains Water

CLIMATE NEUTRAL WATER SAVING SCHEMES



Six Steps to Neutral...

Steps

1. Do baseline greenhouse gas audit



2. Reduce water use through efficiencies



3. Choose the water reuse technology

with consideration of:

- energy needs of technology;
- location of water reuse system;
- embodied energy in technology production



4. Consider the onsite generation of renewable energy



5. Consider the purchase of renewable energy (or 'Green Power').



6. Consider the use of emissions trading/carbon offsets.

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