

Urban Water Security Research Alliance

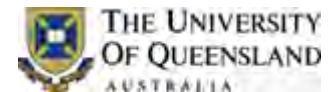


A Preliminary Analysis of Potable Water Savings from Mandated Rainwater Tanks in New Residential Properties in SEQ

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PERFORMANCE
CRITERIA

ACCEPTABLE SOLUTIONS

Water savings targets

- P1** *Class 1* buildings supplied directly with water from the *reticulated town water supply system*, by a water service provider registered under the *Water Act 2000* must achieve targets listed in Appendix B. To achieve the targets in Appendix B, water must be sourced by means other than the use of the *reticulated town water supply system*.
- A1** *Class 1* buildings connected to a *reticulated town water supply system* provided by a water service provider registered under the *Water Act 2000* use –

- (a) a *rainwater tank*; or
- (b) a *greywater treatment plant*; or
- (c) *alternative water substitution measure*; or
- (d) a combination of (a) and/or (b) and/or (c) as specified in a local planning instrument, State Code or State Planning Policy.

Rainwater tank installation,
capacity and water quality
protection measures

- P2** A *rainwater tank* must have sufficient storage capacity to provide an acceptable contribution to meet water savings targets listed in Appendix B having regard to –
- (a) local rainfall pattern;
 - (b) roof catchment area; and
 - (c) area available to site the *rainwater tank*.
- A2** A *rainwater tank* –
- (a) has a minimum storage capacity –
 - (i) of at least 5,000 litres for a detached *Class 1* building
 - (ii) at least 3,000 litres for a *Class 1* building other than a detached *Class 1* building; or
 - (iii) greater than (a) (i) or (a) (ii) as specified by the local government in a local planning instrument; and
 - (b) is installed to receive rainfall from –
 - (i) a minimum roof catchment area that is at least one half of the total roof area or 100m², whichever is the lesser; or
 - (ii) a minimum roof catchment area that is greater than (b) (i), as specified by the local government in a local planning instrument; and
 - (c) is connected to –
 - (i) toilet cisterns and washing machine cold water taps (other than those connected to a *greywater treatment plant* or *alternative water substitution measure*); and
 - (ii) an *external use*; and

- Queensland Development Code
- MP4.2 Water savings targets
- January 1 2007
- Savings from mains water of 70kL/household/year
- 70kL..???

Aim & Methods

- Is the 70 kL/hh/year mains water savings target achievable?
- Are there demographic and residential features that influence potable water consumption?
- Obtain household water consumption (billing) data from SEQ councils – Moreton Bay Regional Council, Gold Coast City Council, Redland Shire Council, Ipswich City Council, Sunshine Coast Regional Council
- Data pairs:

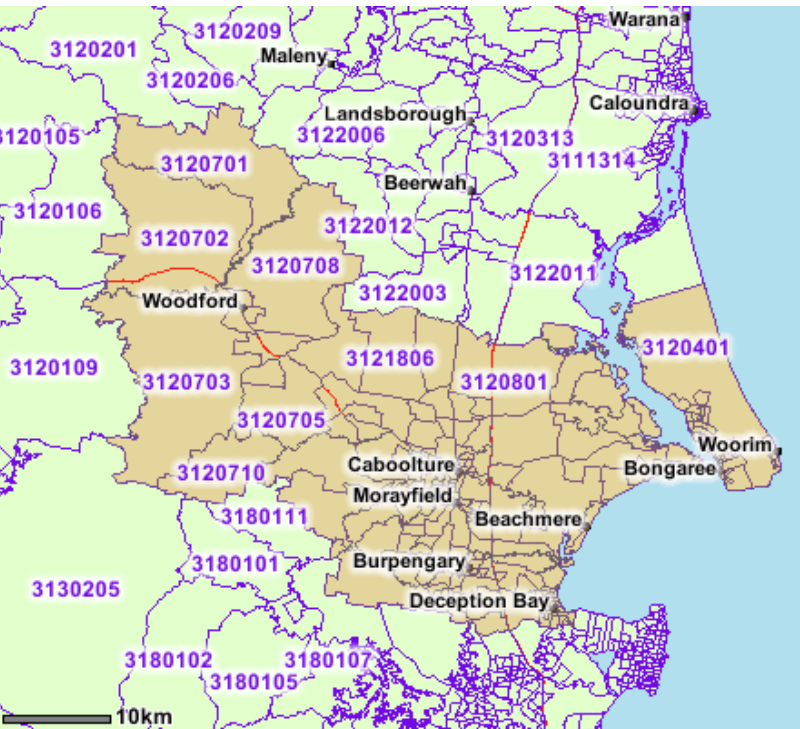


Criteria	Indicator from database
Houses without mandated rainwater tank	Houses constructed before 2007 (ex. rebates)
Houses with mandated rainwater tanks	Houses constructed after 2007
Similar geographical location	Suburb / ABS census district
Similar urban footprint	Lot size < or > 700 m ²
Similar demographics	Suburb / ABS census district (family composition)

- Comparison of the means & two tailed, paired t-test

Caboolture Region MBRC

WATER RESTRICTIONS



WATER USE	MBRC	GCCC*	RSC
QWC Notification if $\geq 800\text{L}/\text{hh}/\text{d}$	✓	✗	✗
Established gardens/ lawns – irrigation systems and unattended &/or sprinkler systems	✗	✓	✗
Hand held hose	✗	✓	✓
Hand held bucket &/or watering can	✓	✓	✓
Newly established gardens/lawns – Irrigation systems, sprinkler systems etc.	✗	✓	✗
Hand held hose	✗	✓	✓
Hand held bucket &/or watering can	✓	✓	✓
Filling up new pools/spas	✓ Once daily	✓	✓ twice daily
Topping up pools/spas & ponds/ aquariums	✗	✓	✓
Car/boat/caravan	✗	✓	✓
General outdoor cleaning	✓ Extremely limited	✓	✓

* Note GCCC off QWC restrictions between Feb and Nov 08. Jan & Dec as per MBRC restrictions.

Caboolture Region

Snapshot so far....

n = 6,040 pairs

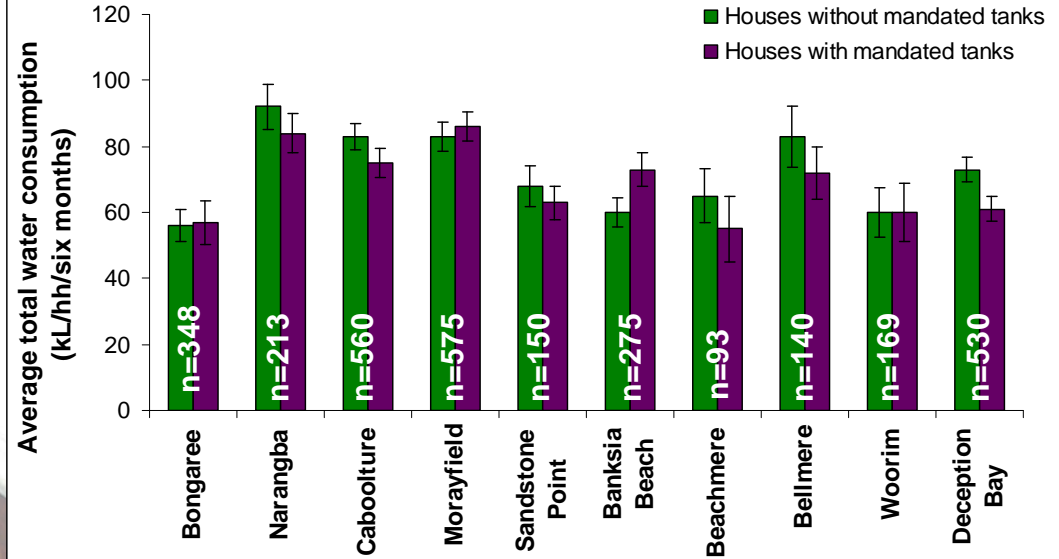
Av. mains use for houses without mandated tanks = 146 kL/hh/year

Av. mains use for houses with mandated tanks = 133 kL/hh/year

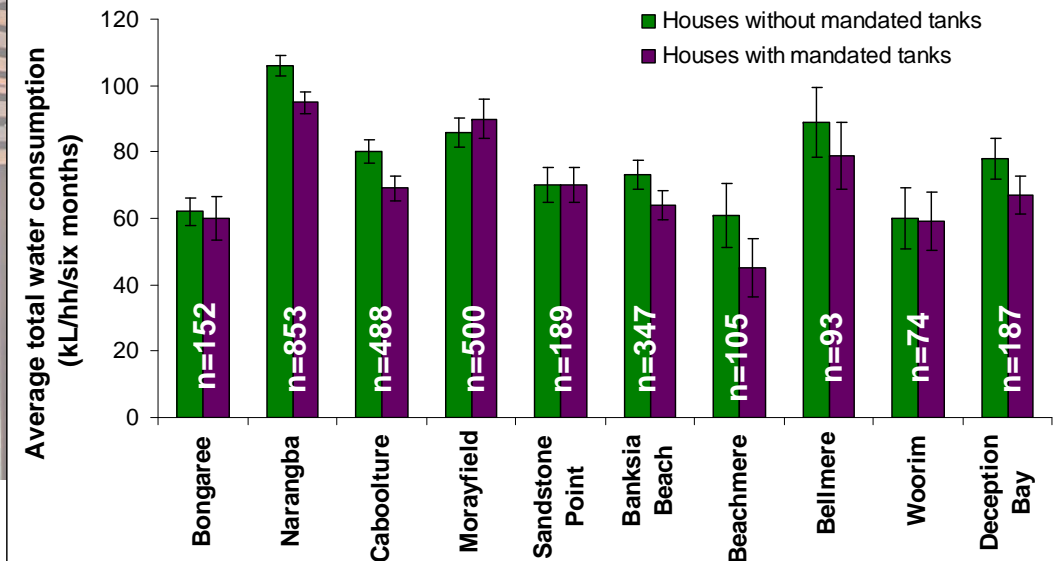
Only 1 suburb showed statistically lower water use in post 2007 homes for both lot size categories

Estimated savings for post 2007 homes = 26 kL/hh/year (not statistically significant)

Water use for Caboolture region properties (< 700m²) for period Jan to Dec 2008



Water use for Caboolture region properties (> 700m²) for period Jan to Dec 2008



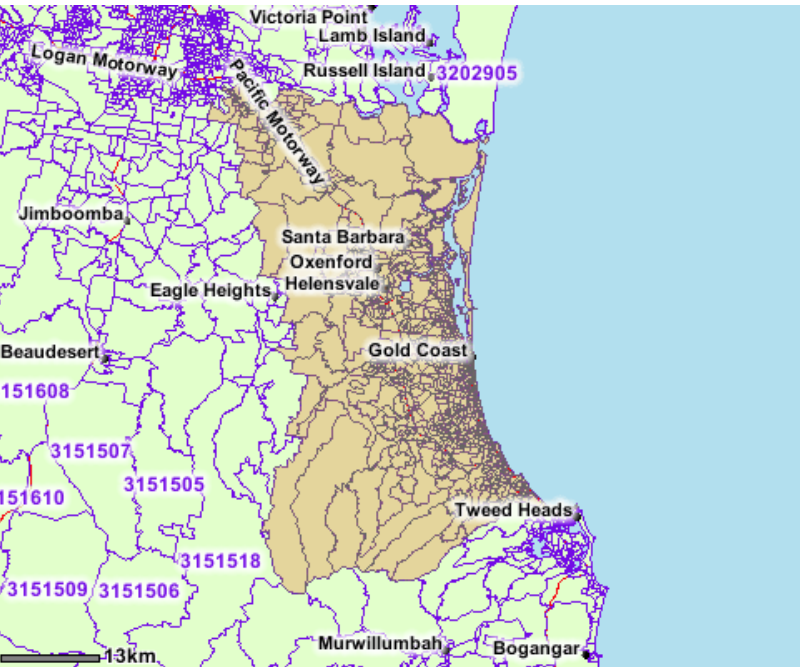
Estimated savings for Caboolture region

Average annual savings (kL) Jan to Dec 2008 for all properties from selected suburbs in Caboolture area (Moreton Bay Regional Council)



Gold Coast City Council

WATER RESTRICTIONS



WATER USE	MBRC	GCCC*	RSC
QWC Notification if $\geq 800\text{L}/\text{hh}/\text{d}$	✓	✗	✗
Established gardens/ lawns – irrigation systems and unattended &/or sprinkler systems	✗	✓	✗
Hand held hose	✗	✓	✓
Hand held bucket &/or watering can	✓	✓	✓
Newly established gardens/lawns – Irrigation systems, sprinkler systems etc.	✗	✓	✗
Hand held hose	✗	✓	✓
Hand held bucket &/or watering can	✓	✓	✓
Filling up new pools/spas	✓ Once daily	✓	✓ twice daily
Topping up pools/spas & ponds/ aquariums	✗	✓	✓
Car/boat/caravan	✗	✓	✓
General outdoor cleaning	✓ Extremely limited	✓	✓

* Note GCCC off QWC restrictions between Feb and Nov 08.
Jan & Dec as per MBRC restrictions.

Gold Coast City Council

Snapshot so far...



n = 1,944 pairs



Av. mains use for houses without mandated tanks = 188 kL/hh/year



Av. mains use for houses with mandated tanks = 167 kL/hh/year



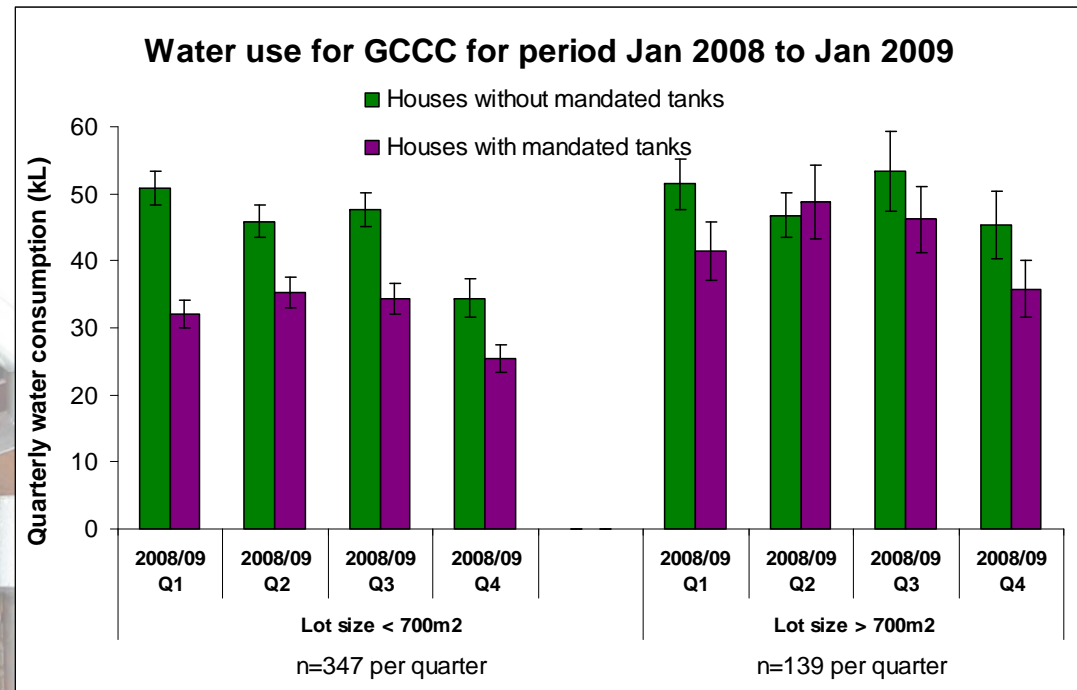
All post 2007 homes had significantly lower water use for <700 m²



Estimated savings for post 2007 homes = 38 kL/hh/year

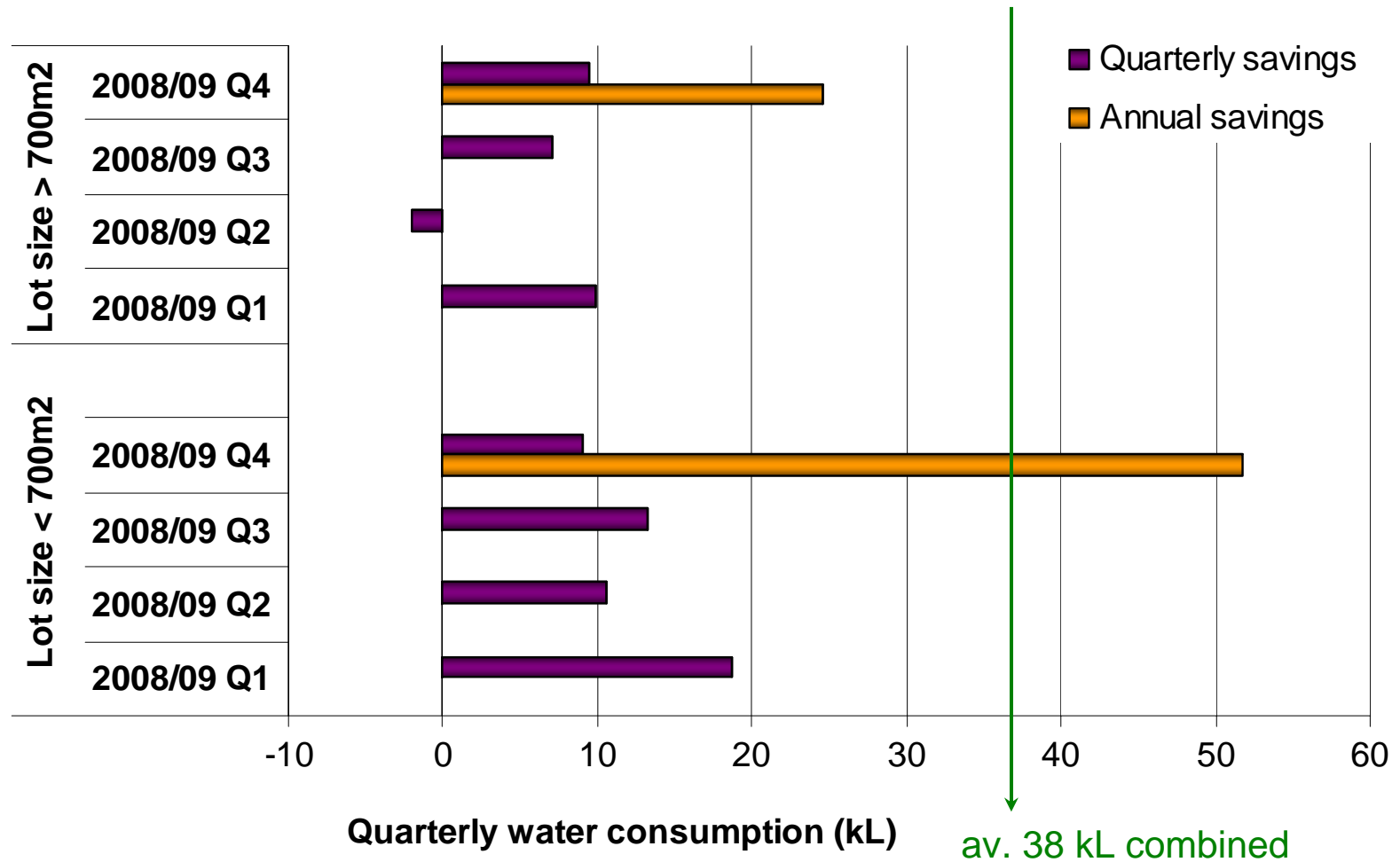


Outdoor water use less restricted in GCCC – greater expression of differences between mandated & non mandated houses



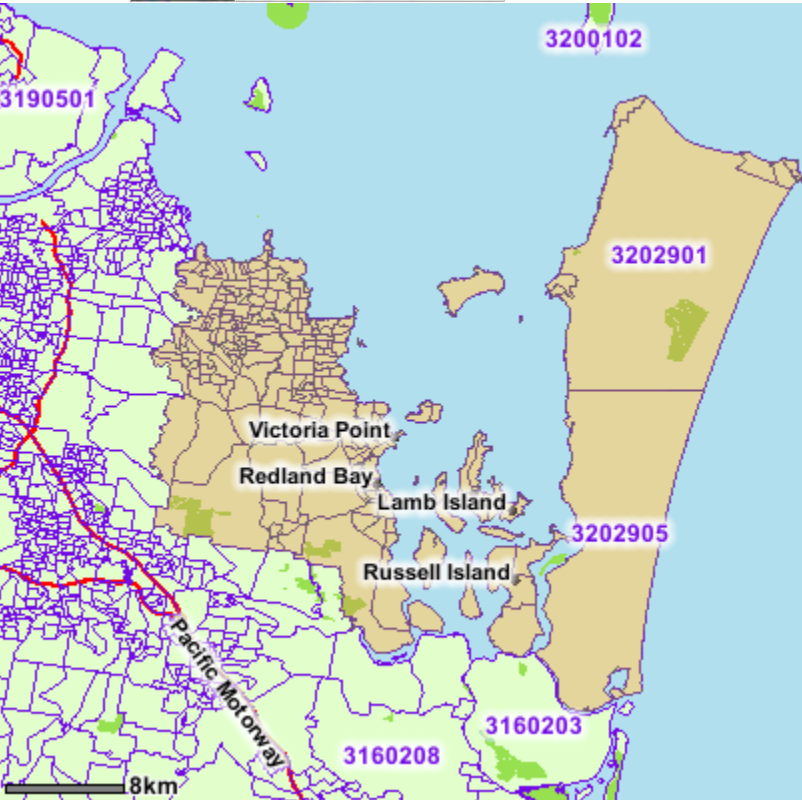
Estimated savings for Gold Coast

Estimated average savings from mains water in GCCC over the period
Jan 2008 to Jan 2009



Redland Shire Council

WATER RESTRICTIONS



WATER USE	MBRC	GCCC*	RSC
QWC Notification if ≥800L/hh/d	✓	✗	✗
Established gardens/lawns – irrigation systems and unattended &/or sprinkler systems	✗	✓	✗
Hand held hose	✗	✓	✓
Hand held bucket &/or watering can	✓	✓	✓
Newly established gardens/lawns – Irrigation systems, sprinkler systems etc.	✗	✓	✗
Hand held hose	✗	✓	✓
Hand held bucket &/or watering can	✓	✓	✓
Filling up new pools/spas	✓ Once daily	✓	✓ twice daily
Topping up pools/spas & ponds/ aquariums	✗	✓	✓
Car/boat/caravan	✗	✓	✓
General outdoor cleaning	✓ Extremely limited	✓	✓

* Note GCCC off QWC restrictions between Feb and Nov 08. Jan & Dec as per MBRC restrictions.

Redland Shire Council

Snapshot so far...



n = 3,920 pairs



Av. mains use for houses without mandated tanks = 212 kL/hh/year



Av. mains use for houses with mandated tanks = 112 kL/hh/year



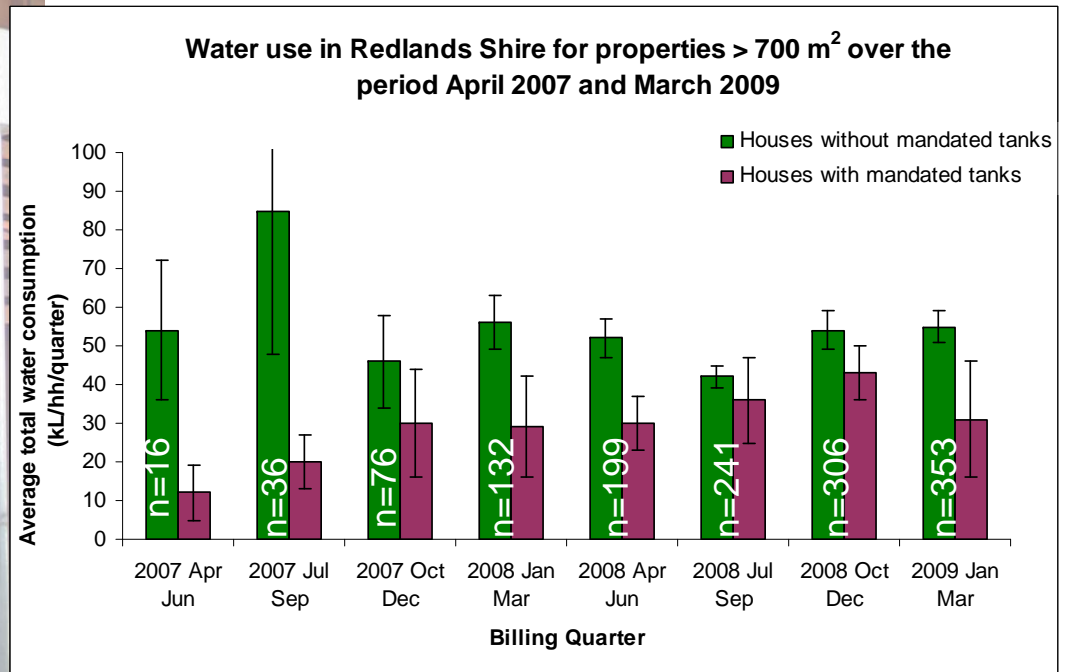
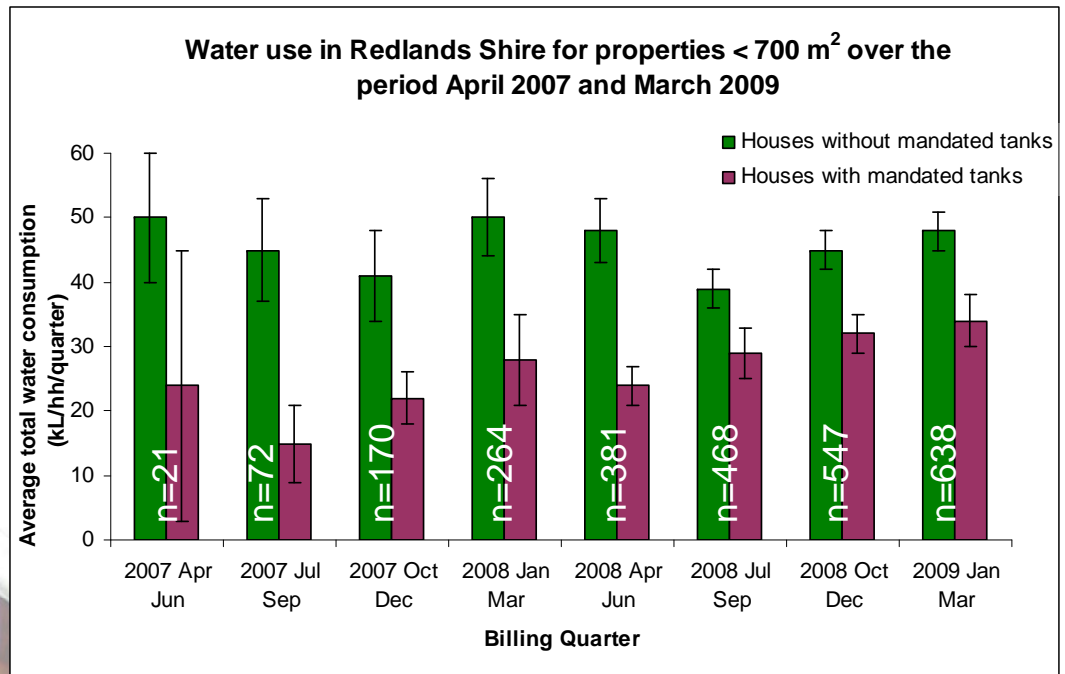
All post 2007 homes had significantly lower water use for <700 m²



Estimated savings for post 2007 homes = 80 kL/hh/year

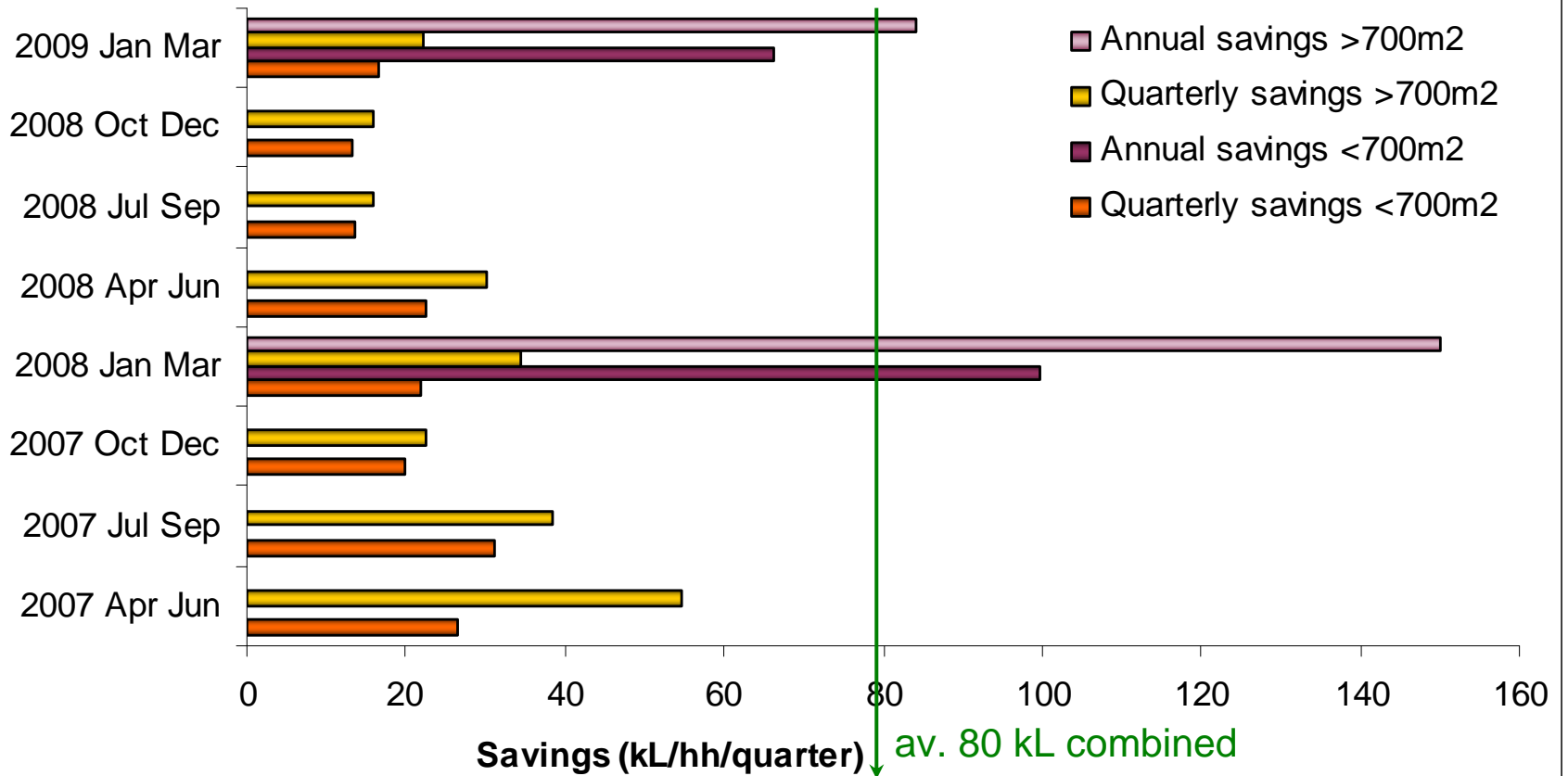


Outdoor water use less restricted in RSC – greater expression of differences between mandated & non mandated houses



Estimated savings for Redland

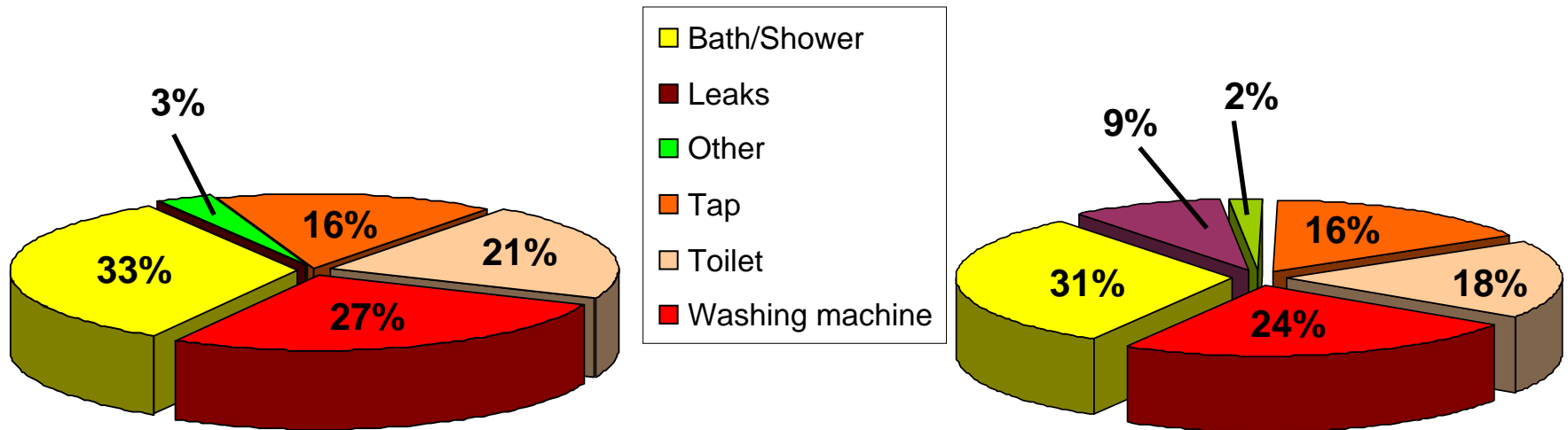
Estimated average savings from mains water in Redlands Shire over the period April 2007 and March 2009



Internal water use & estimated savings

Perth - 155 L/pp/day

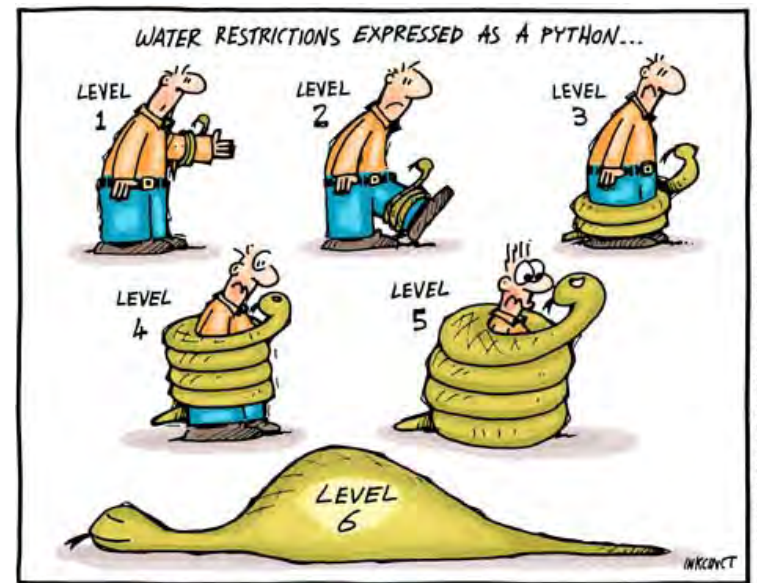
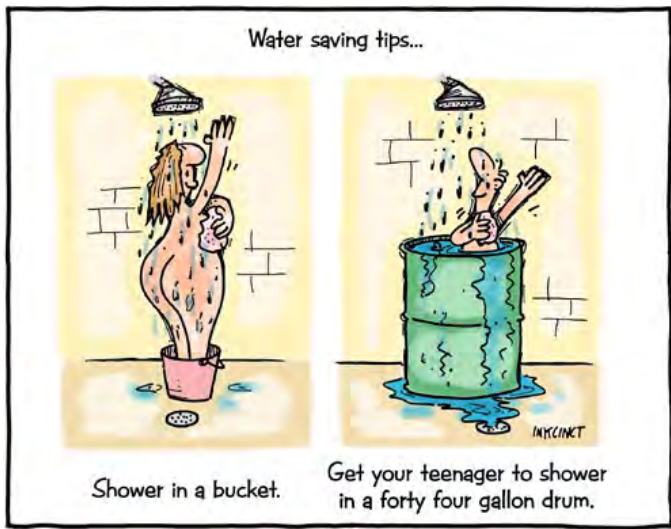
Yarra Valley – 169 L/pp/day



- Toilet + laundry = average 45% of internal water use (73 L/p/d)
= 71 kL/hh/year savings from mains water (assuming full tank)
- Caboolture – 26 kL/hh/year
- Redlands – 80 kL/hh/year
- Need modelling to identify tank capacities and savings under range of scenarios

Further considerations / work...

- Rebate tanks to be excluded from dataset
- ABS Census district data – allows for greater resolution in pairing homes and teasing out demographic influences on domestic water use
- Teasing out effects of restrictions, rebates and Waterwise features v effects from internally plumbed rainwater tanks (e.g. some council regions have enforced rainwater tank installation prior to 2007 (e.g. Pine Rivers))
- Roof and tank size will affect rainfall & volume
- Garden size / lawn area more relevant parameters than lot size in gauging outdoor water use, although data much harder to obtain



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Thank you

www.urbanwateralliance.org.au

