

Top 5 New and Innovative Water-Efficient Products - 2010

by

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Disclaimers

- ✓ The authors (Gauley & Koeller) have no special interest, financial or otherwise, in the products, technologies, companies, or organizations manufacturing, promoting, or selling the products described in this presentation.
- ✓ This presentation identifies those products that, **in the authors' opinion**, are innovative, and likely to result in substantial water savings.



Criteria for selection...

- ✓ Indoor water use reduction (irrigation is another matter)
- ✓ Residential and non-residential applications
- ✓ Generally available in the marketplace
 - A product, technology, or program
 - Can be a new approach to an old application
 - *But*, no “ideas” or undeveloped products
- ✓ Water use can be determined
 - Field *or* laboratory - “real world” preferred
- ✓ Potential for significant, long-term impact
 - Regional *or* all of North America
 - Potable *or* non-potable water



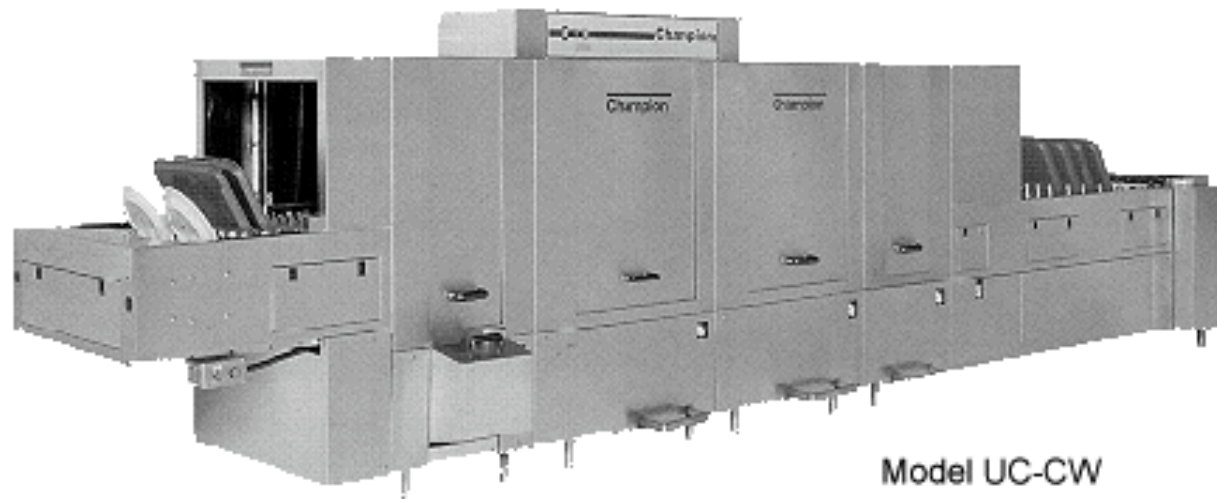
How did we select?

- ✓ Work with manufacturers & industry leaders
- ✓ Feedback from water utilities & water efficiency practitioners
- ✓ Laboratory and field testing by Veritec, Koeller, & others
- ✓ Interviews with other stakeholders...
 - Green building advocates
 - WaterSense[®] implementation team members
 - Facilities managers and property owners

So, let's get started!!!!

#5 High-Efficiency Commercial Dishwashers

- ✓ 150,000 high-capacity DWs in N.A.
 - Conveyor & Flight-type
 - Many over 15 years old
 - Energy costs driving machine efficiencies

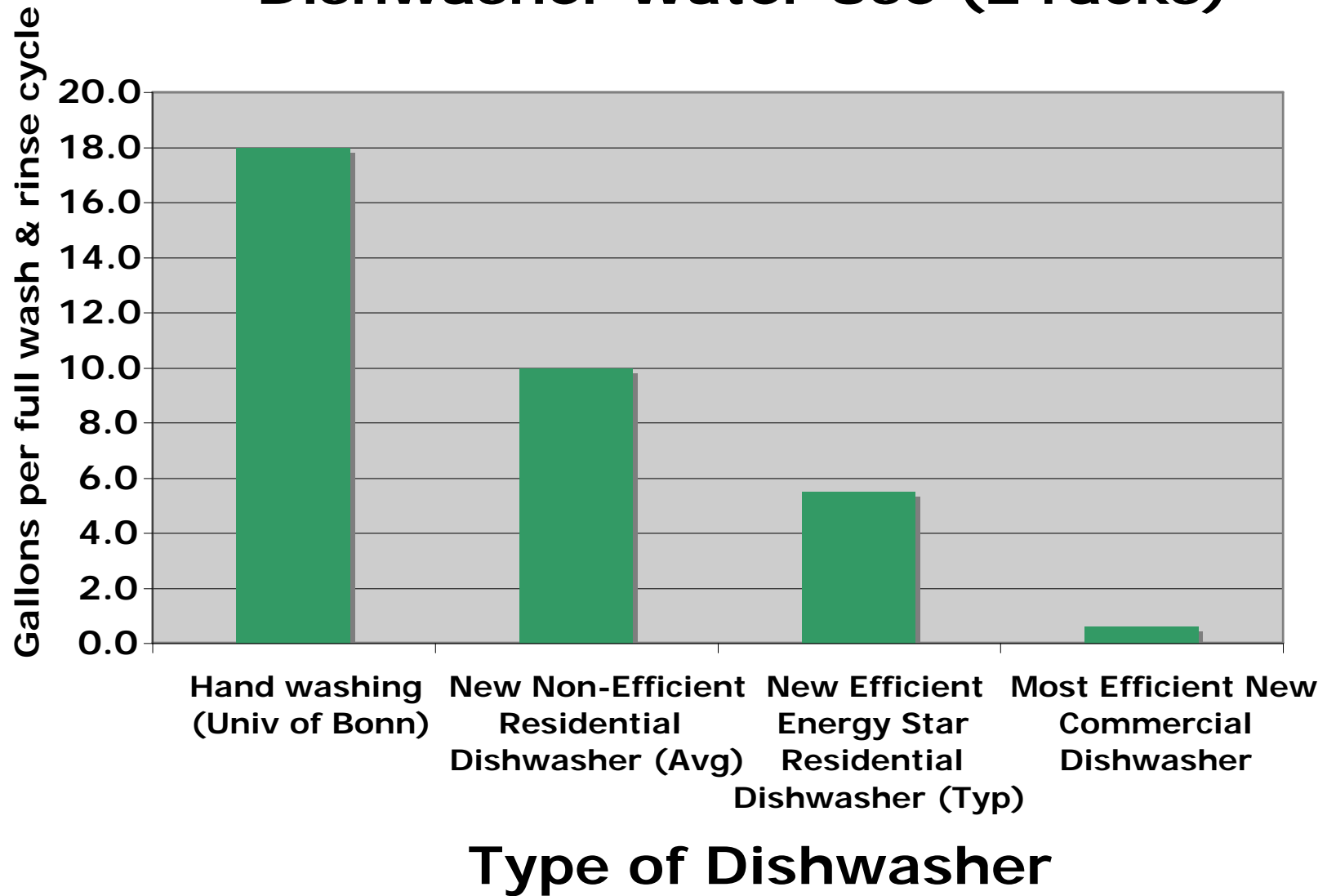




#5 High-Efficiency Commercial Dishwashers

- ✓ Evolution of hot water use efficiency to wash, rinse, sanitize
 - 1990s - 2.5 gallons per rack (9.5 Litres)
 - 2000 - 1.2 gallons per rack (4.5 Litres)
 - **2010 - 0.3 gallons per rack (1.1 Litres)**
- ✓ Standard DW 'rack' - 20" x 20" (500 mm x 500 mm)
 - Capacity equivalent = ~30 plates

Dishwasher Water Use (2 racks)





#5 - High-Efficiency Commercial Dishwashers

...for U.S.-Canada

✓ Total potential annual potable water savings - estimated -

21 billion gallons or 80 bil. litres

TOP PRODUCT #4

Waterless Wok

The “typical” kitchen!





#4 - Waterless Wok

- ✓ Originally conceived & developed in Australia - Sydney Water & others
- ✓ U.S. development: Wok Water Saver
 - Double-burner wok table
 - Burner efficiency same as conventional
 - Water recirculation loop to external chiller
 - ✓ Removes excess heat from wok table
 - ✓ Only 2.3% additional energy
 - Savings = ~120 gallons per hour





#4 - Waterless Wok

...for U.S.-Canada

✓ Total potential annual potable water savings -

**37 billion gallons or
140 billion litres**

✓ BUT, a “difficult sell”



#3 Hot water demand system (after-market)

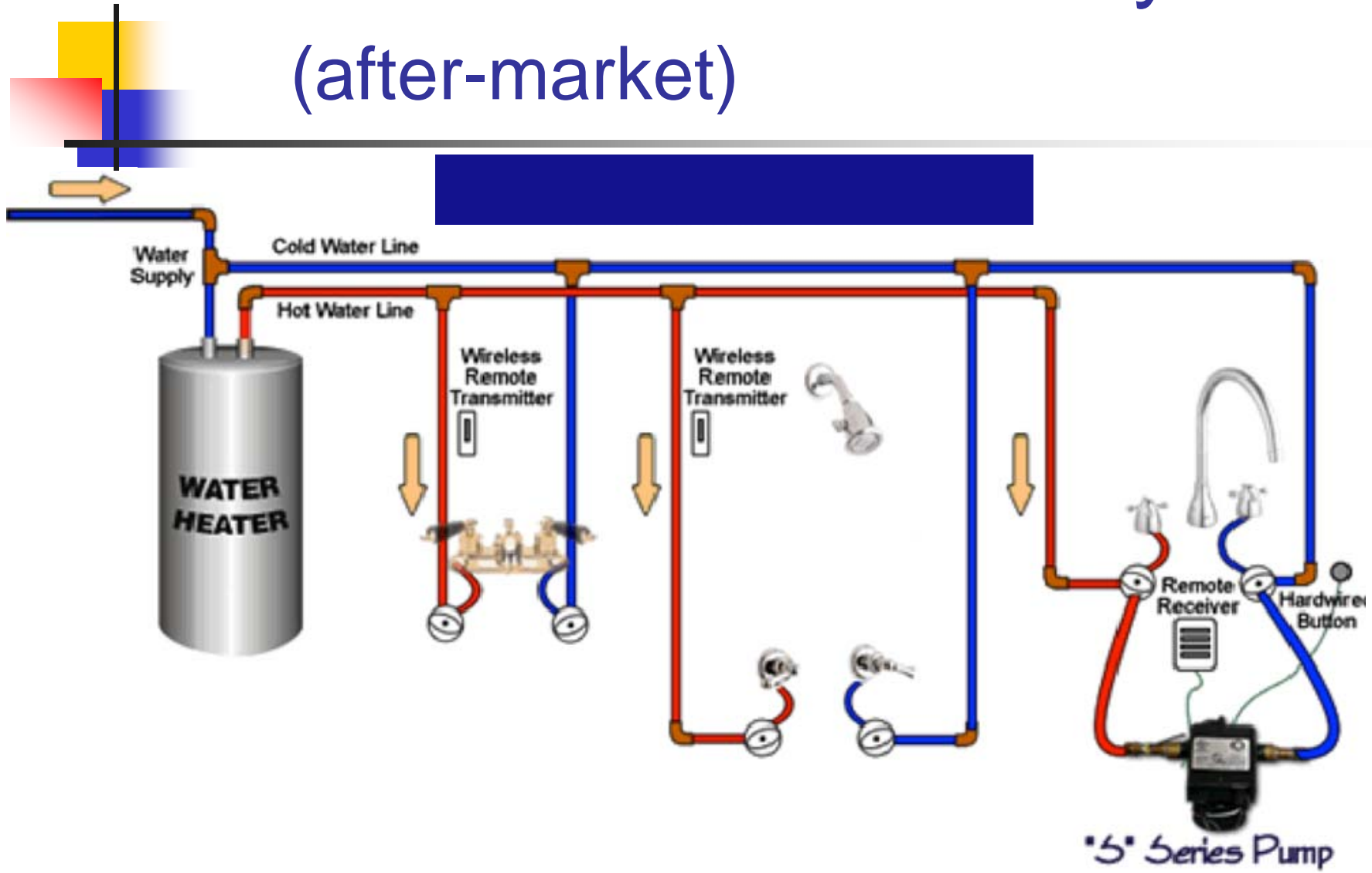
- Not “new”available for years
- Used to reduce “wait time” for hot water
 - Primary user benefit
 - Water use reduction a secondary benefit
- Not a “tankless water heater” nor
“point-of-use water heater”



#3 Hot water demand system (after-market)

- Uses dedicated 'return line' OR existing cold water supply line
- Timer, temperature-controlled, or "on-demand"
- Barrier to installation: requires electrical outlet under lav sink furthest from water heater
(cost of unit PLUS cost of electrician)
- User/homeowners install for convenience and just happen to save water

#3 Hot water demand system (after-market)





#3 Hot water demand system (after-market)

...for U.S.-Canada

✓ Total potential annual potable water savings -

**250+ billion gallons or
950+ billion litres**



#2 - After-market dual-flush retrofit conversion device

- ⑩ Design Concept: Convert single-flush toilets to dual-flush toilets
- ⑩ BUT - Many mfrs (>12) with products of questionable performance & safety
- ⑩ Result: 2009 - Koeller and Veritec issued serious CAUTION STATEMENT!!!
- ⑩ Retrofit devices...
 - May increase full flush volume
 - May negatively affect toilet performance
 - May reduce trap seal



#2 - After-market dual-flush retrofit conversion device

PROBLEM: No accepted performance “standard” for such after-market devices

- ⑩ Koeller and Veritec offer manufacturers participation in 3rd-party testing to address issues (manufacturers pay for testing)
- ⑩ Manufacturers informed that all test results would be published – good or poor
 - ✓ Maximum flush volumes
 - ✓ Independently adjustable full and reduced flush volumes
 - ✓ Ease of installation (need to remove tank?)
 - ✓ Ease of adjustment
 - ✓ Quality of kit, expected water savings

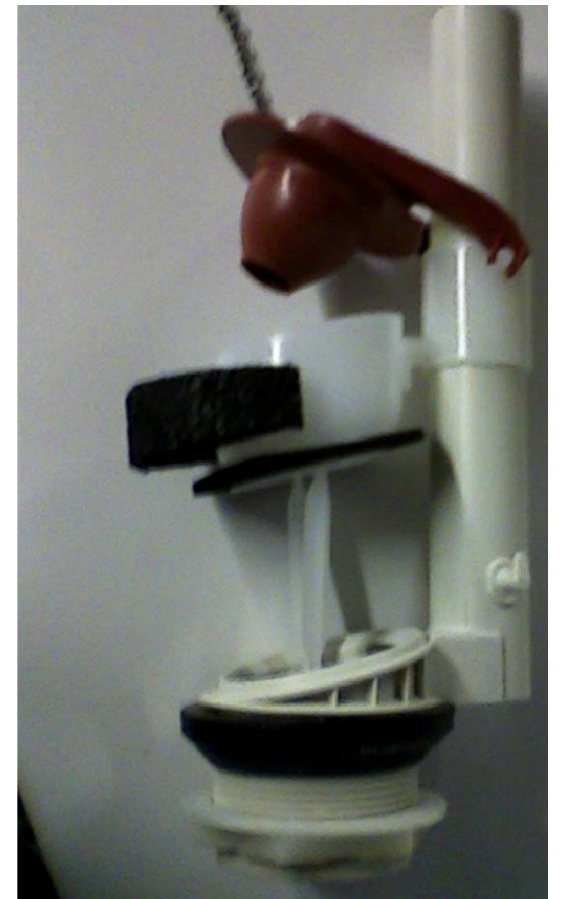


#2 - After-market dual-flush retrofit conversion device

- Manufacturer response to 3rd-party testing-
 - Many initially show initial interest
 - Only 2 submit products for testing
 - Only 1 (so far) meets minimum requirements
- ⑩ Large potential savings –
 - Remaining devices at risk (water use, perf., safety)
- ⑩ **CAUTION STATEMENT** remains!

All such products must be 3rd-party tested to a recognized protocol!!!

flush retrofit conversion device



#2 - After-market dual-flush retrofit conversion device





#2 - After-market dual-flush retrofit conversion device

...for U.S.-Canada

✓ Total potential annual potable water savings -

**300+ billion gallons or
1+ trillion litres**



TOP PRODUCT #1

0.8gal/3.0L Residential Toilet

- ✓ Canadian development...2009
 - “Proficiency” in Canada *and*
 - “Stealth” in U.S.
- ✓ Field testing
 - Successfully completed in Ontario
 - Underway in Southern California
- ✓ Drainline transport addressed in 2005
- ✓ Single flush - NO “behavioral” element!!



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TOP PRODUCT #1

0.8gal/3.0L Residential Toilet

...for U.S.-Canada

✓ Total potential annual potable water savings -

**1 trillion gallons *or*
4 trillion litres**



Wrapping up...

	Total Potential Annual Water Savings		Capturable Annual Water Savings			Relative Degree of Difficulty & Cost to Implement	Behavioral Change Required?
	(billions of gals)	(Billions of litres)	% Likely Capture*	(billions of gals)	(Billions of litres)		
#1 - 3L Toilets for Residential	1,038	3,929	20%	208	786	Low	None
#2 - Dual-Flush Conversion Device	309	1,168	20%	62	234	Low	Slight
#3 - Hot Water Demand System	258	976	10%	26	98	Medium	Slight
#4 - Waterless Woks	37	141	10%	4	14	High	Maybe
#5 - High-Efficiency Comm'l Dishwashers	21	81	5%	1	4	High	None

***-without financial incentives**

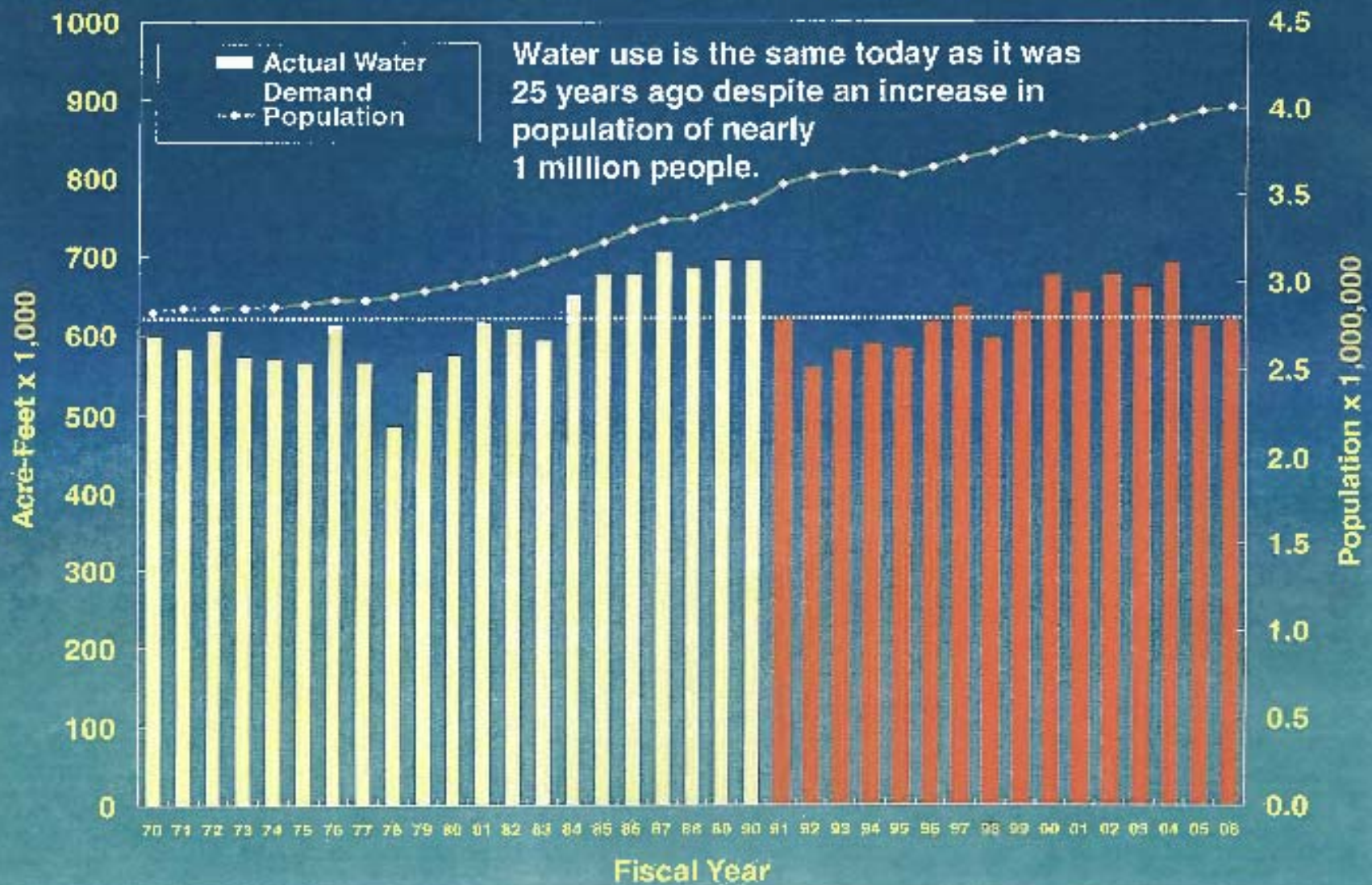


And finally...

- ✓ Can these products (and others) reduce North American potable water consumption, accommodate growth, and defer major infrastructure capital expenditures?

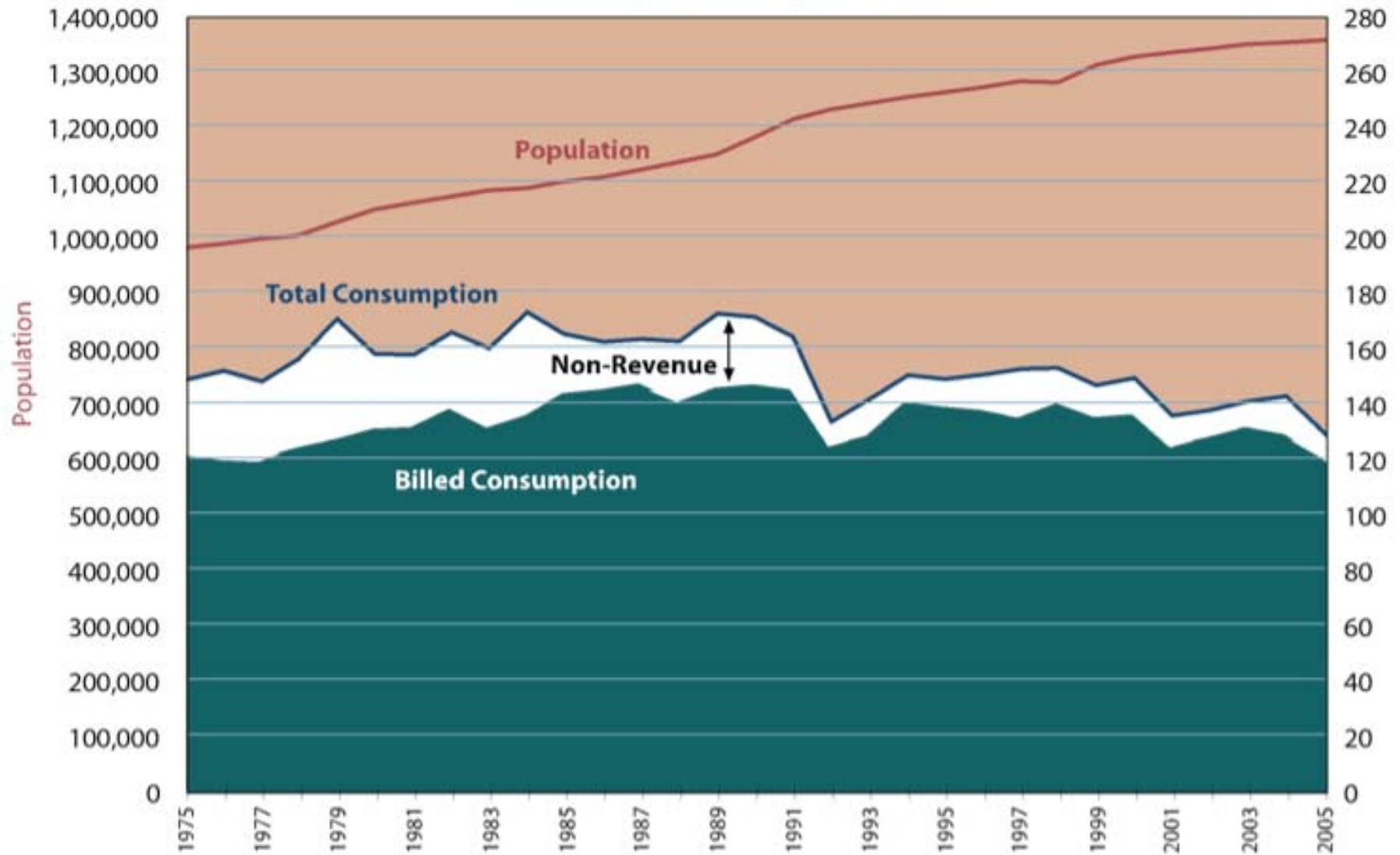
Absolutely!!!

CONSERVATION'S IMPACT ON CITY OF LOS ANGELES WATER USE

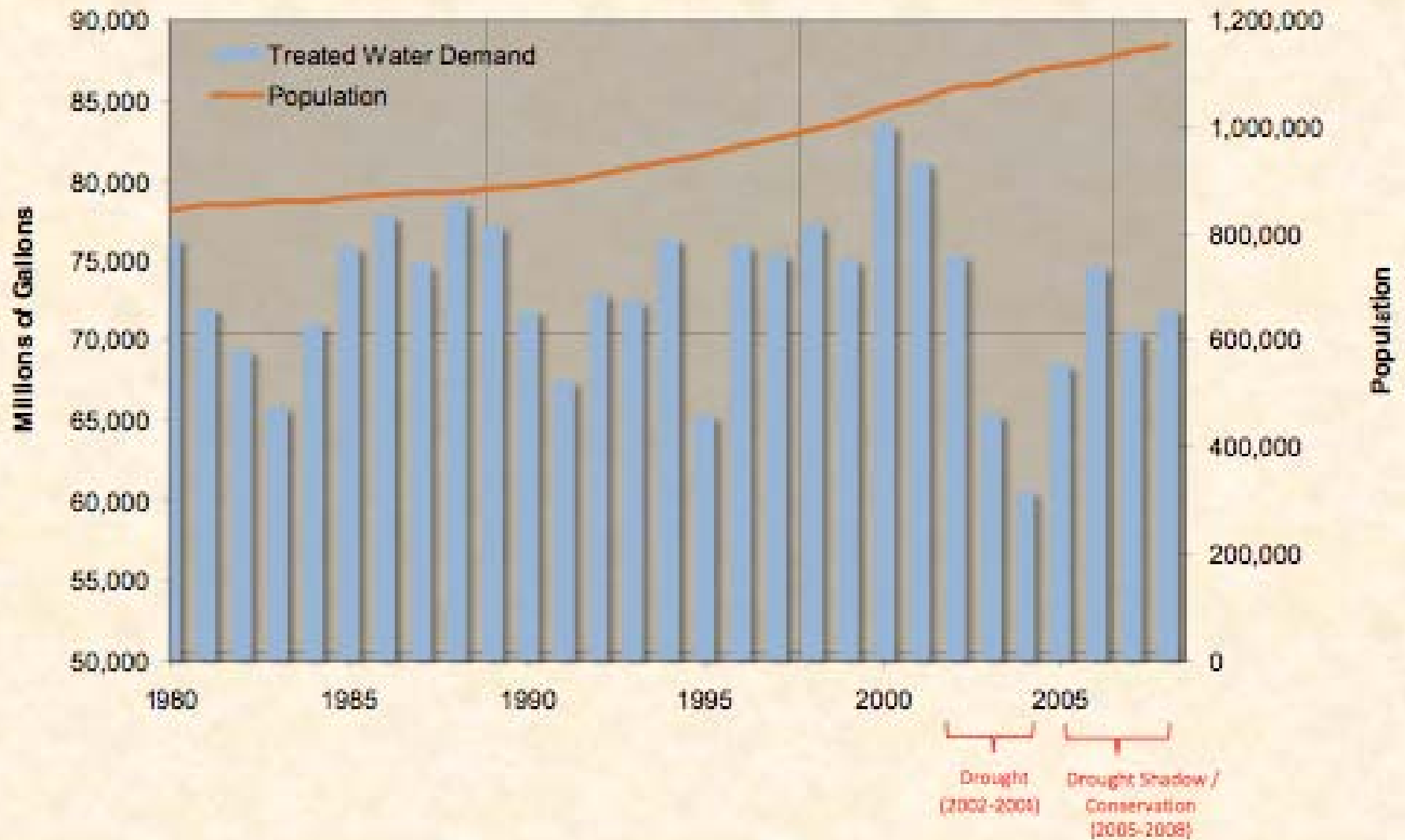


Growth in Population and Water Consumption

Seattle Regional Water System: 1975-2005



DENVER'S TREATED WATER DEMAND AND POPULATION





Thank you...

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