

This presentation premiered at WaterSmart Innovations

watersmartinnovations.com



A WILD WEST TALE: DEBUNKING THE MYTH THAT CONSERVATION INCREASES RATES

CANDICE RUPPRECHT

WATER CONSERVATION
MANAGER

TUCSON WATER



PETER MAYER, P.E.

PRINCIPAL

WaterDM

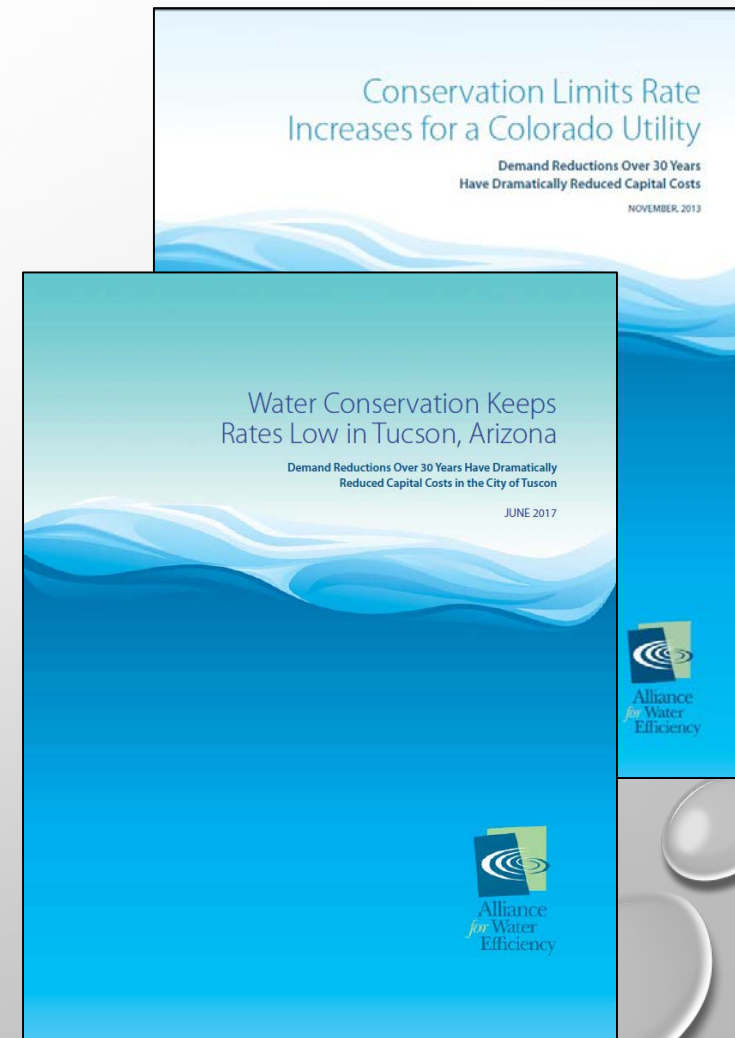


EVER WONDER WHY
your water rates are going up,
even though
YOU'RE USING LESS?

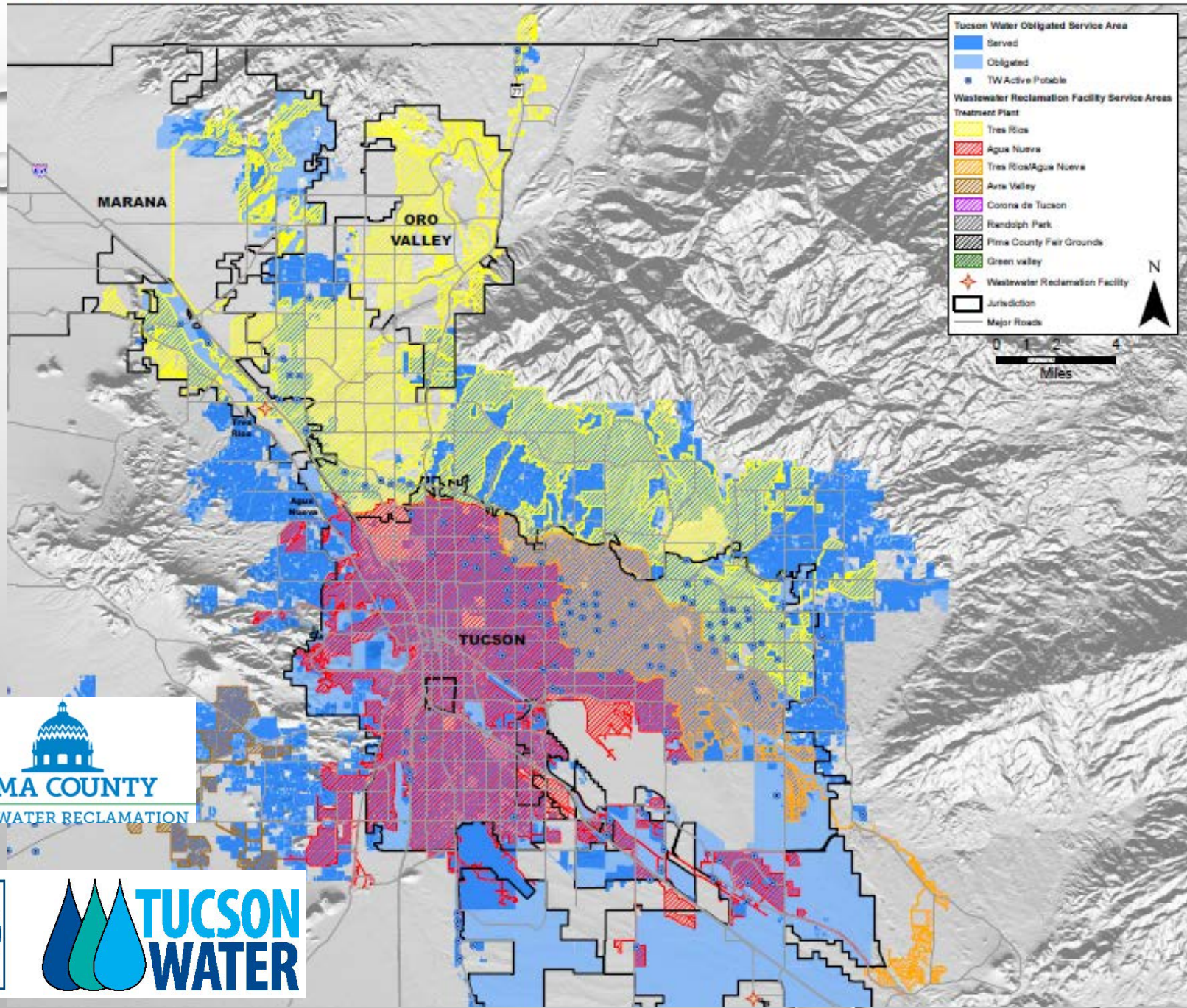


AWE AVOIDED COST STUDY

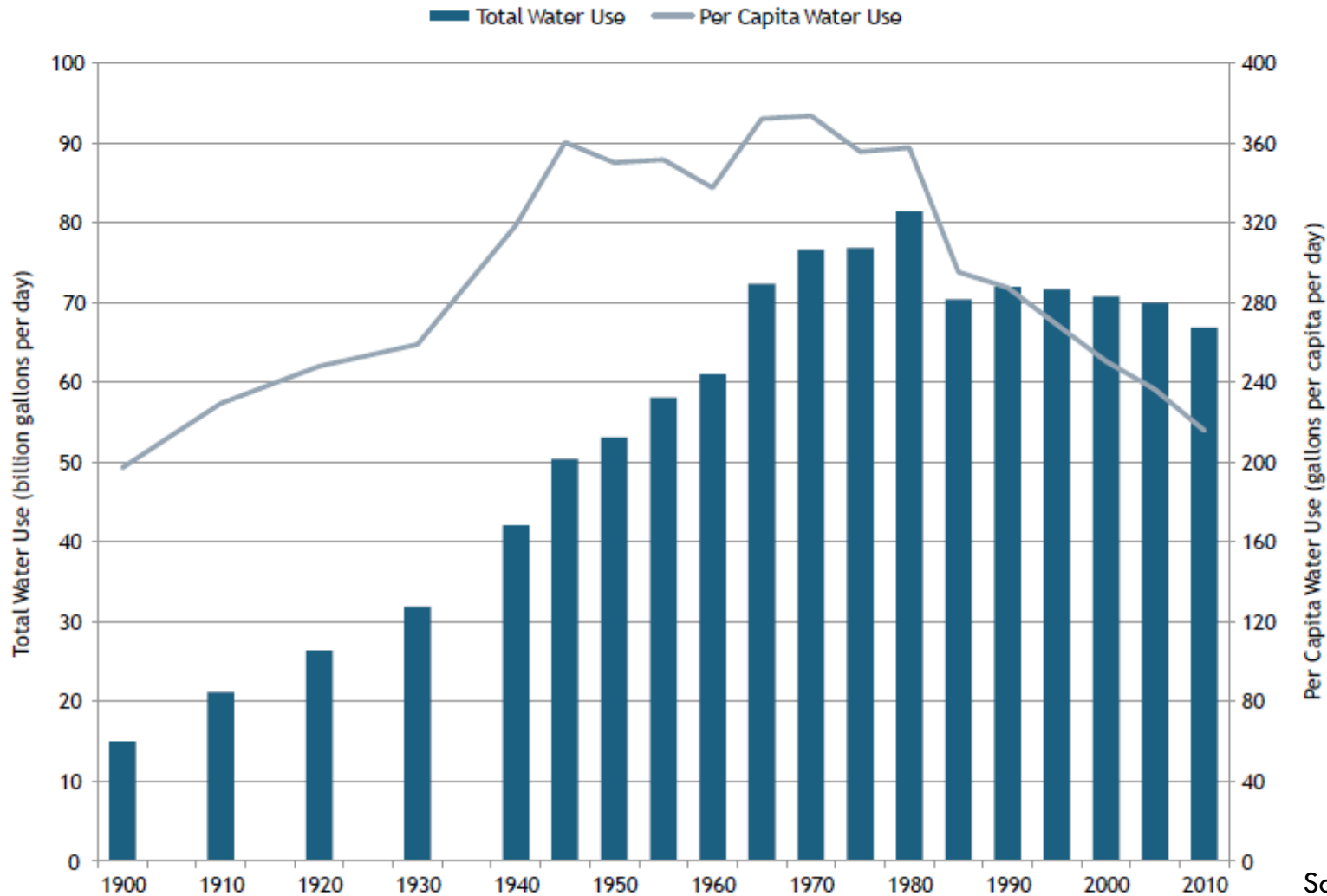
- Alliance for Water Efficiency grant funds from Walton Family Foundation focused on Colorado River Basin
- Building on previous work by WaterDM and City of Westminster Study in 2013
- Tucson, AZ and Gilbert, AZ selected to participate
- **Goal: Examine the impact of increased water use efficiency on customer rates**



Regional Wastewater Reclamation Department Service Areas

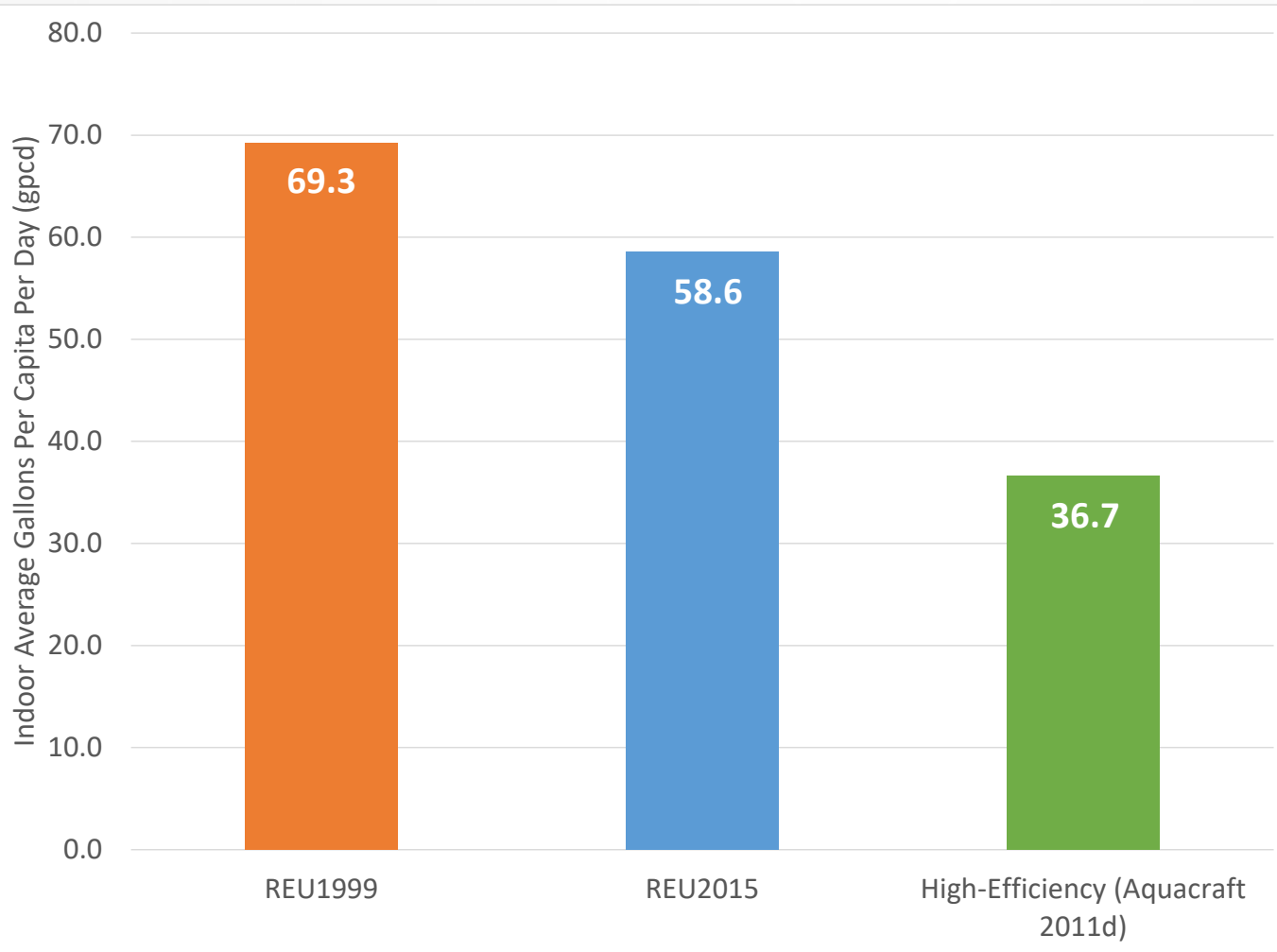


M&I WATER USE IN THE US, 1900 - 2010



Source USGS and
Pacific Institute 2015

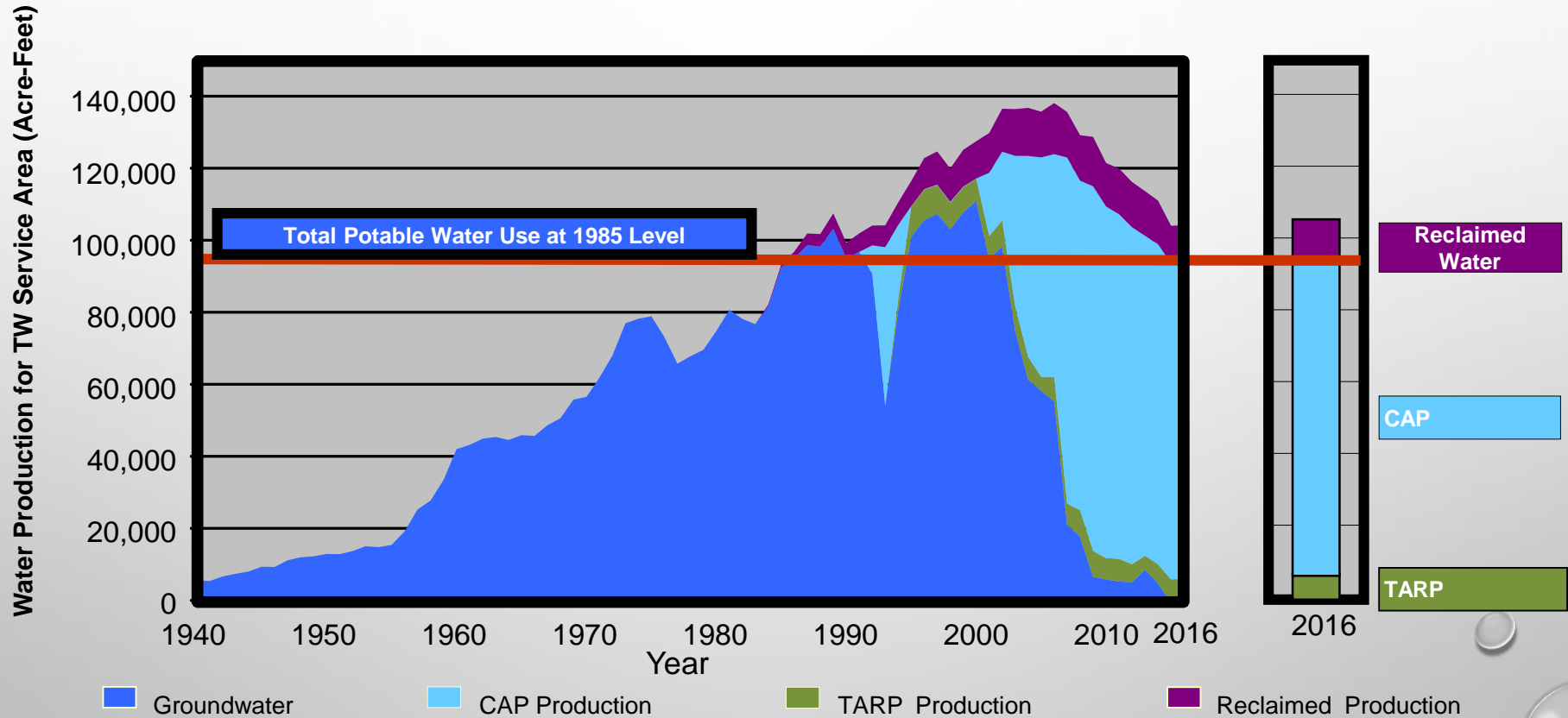
RESIDENTIAL INDOOR GPCD



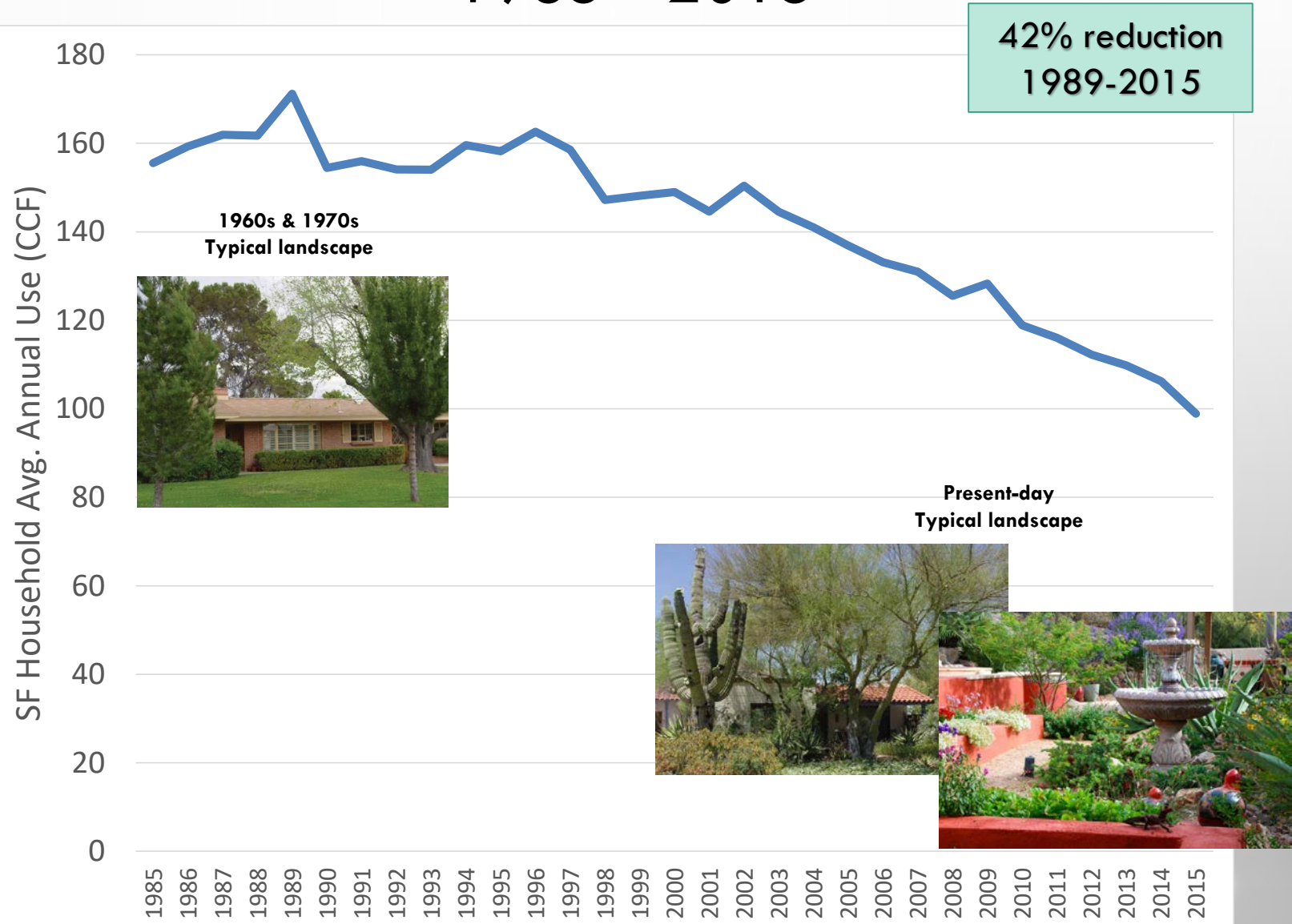
1999 vs. 2016 =
15.4% reduction

2016 vs. HE =
37.4% reduction

TUCSON WATER ANNUAL PRODUCTION (1940-2016)

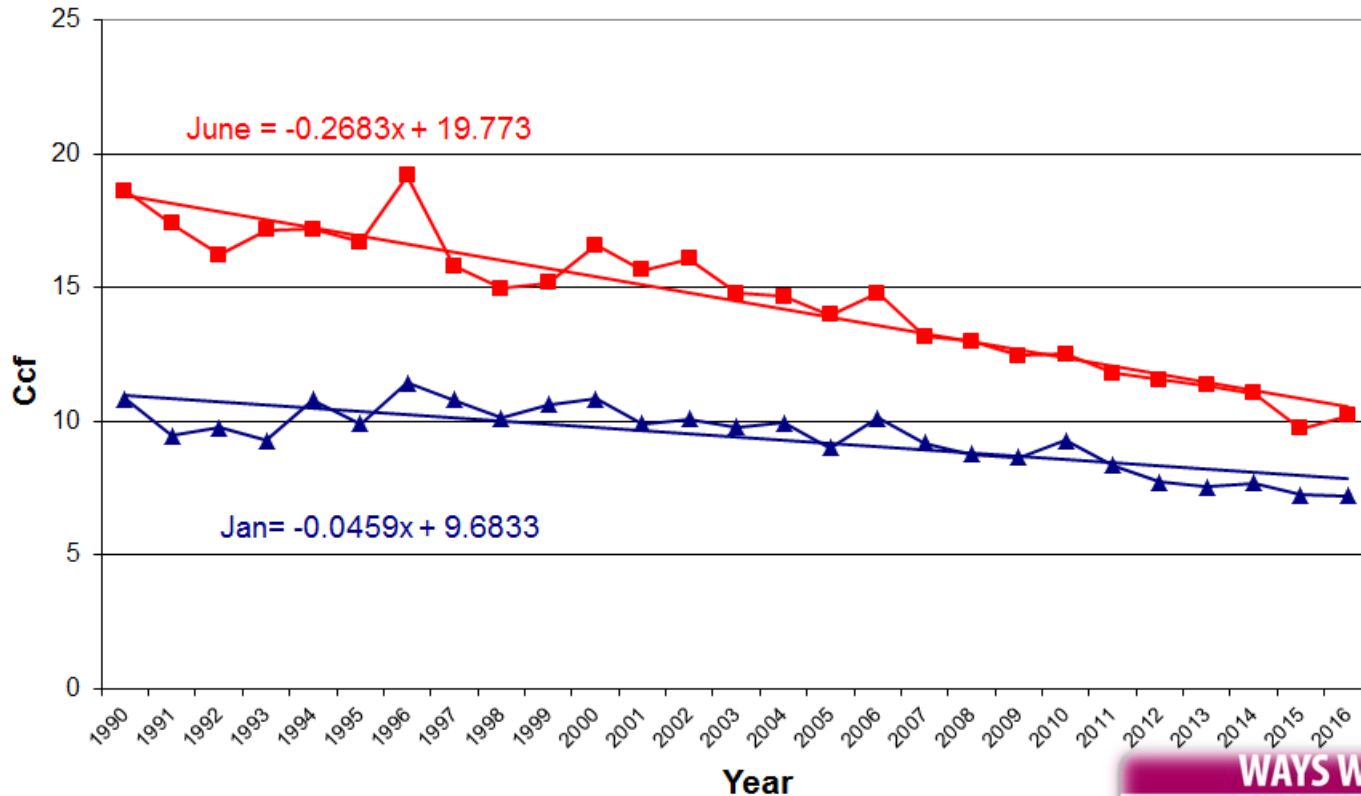


SINGLE FAMILY AVG. ANNUAL WATER USE 1985 - 2015



INDOOR V. OUTDOOR USE

Single Family Usage Per Service in Ccf:
January vs June
1990 to 2016



Exterior use has decreased 53%

Interior use has decreased 23%

Historically, outdoor water use was 45% of single-family use

WAYS WE USE WATER AT HOME



27%

Outdoor



20%

Toilet



12%

Faucet



16%

Laundry



13%

Leaks/Other



12%

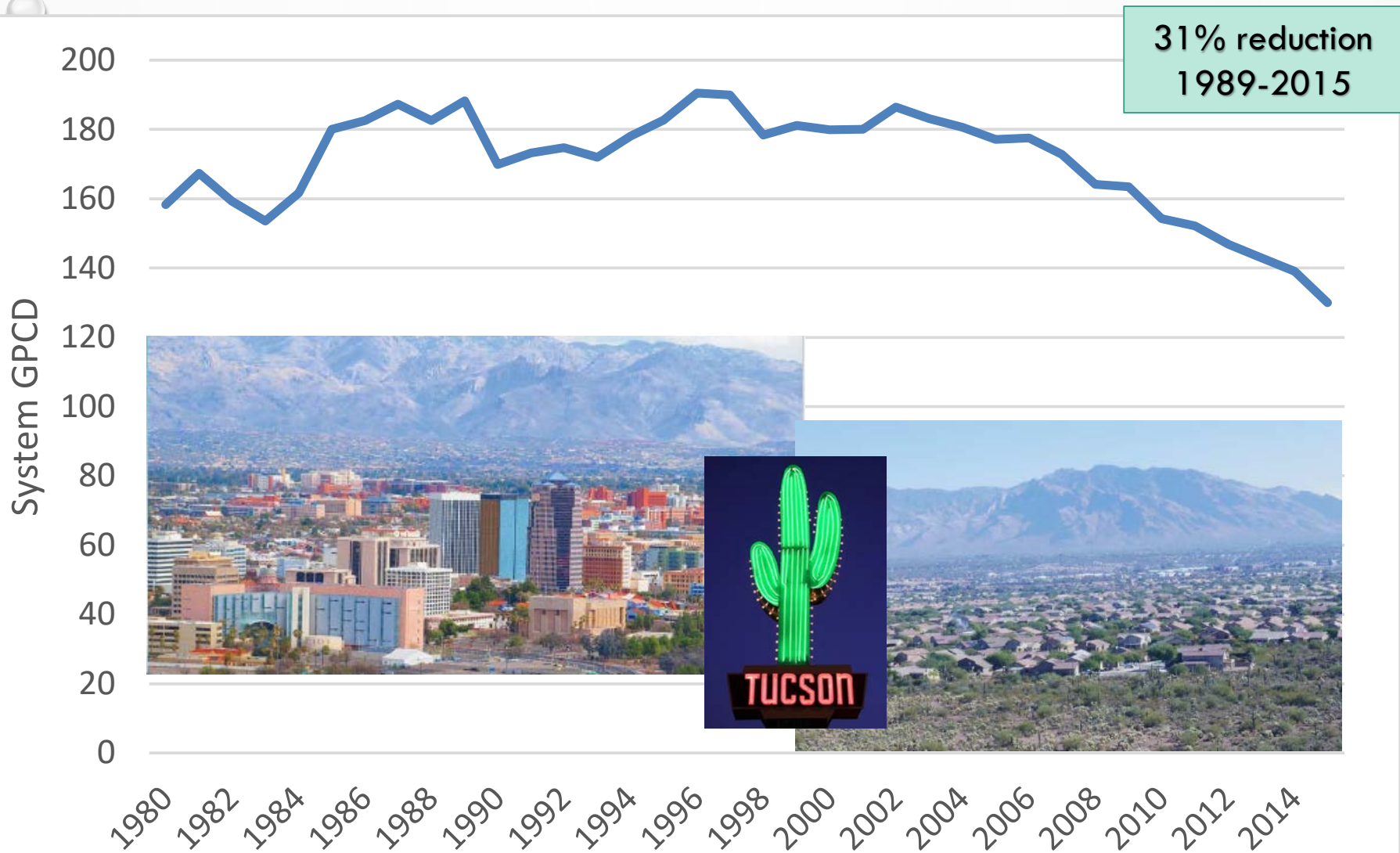
Shower

WATER EFFICIENCY IS NOT ONE, BUT MANY APPROACHES

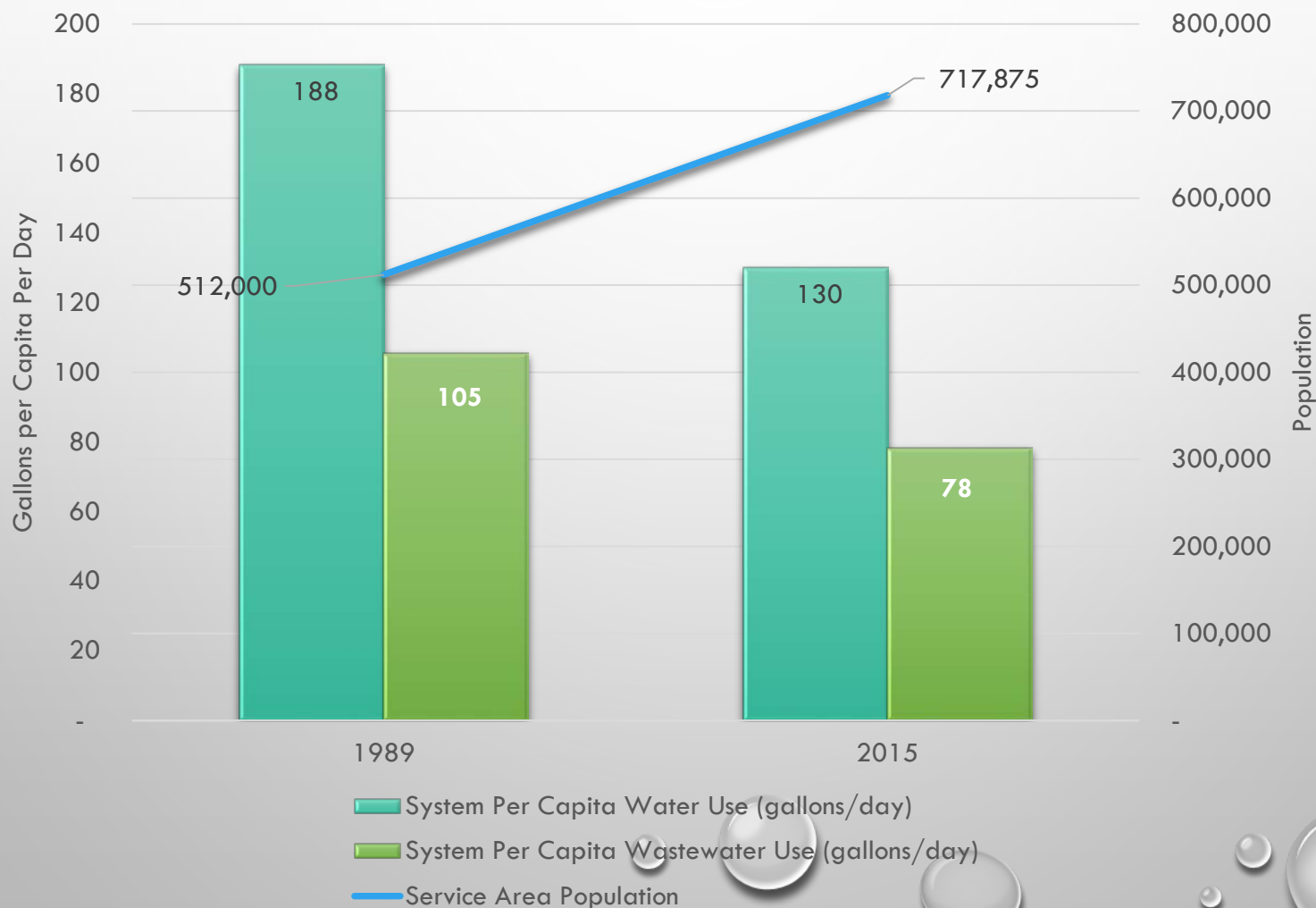
- Utility-sponsored conservation & education programs
 - Rebates, Youth & Professional Education
- Community outreach campaigns: Pete the Beak; Water Reliability
- Increasing block rate structures
 - 4-Tier structure: \$1.55, 1-7 ccf; \$3.00, 8-15 ccf; \$7.48, 16-30 ccf; \$11.75 > 30 ccf
- Local ordinances: Xeriscape Landscaping (1991), Water Waste (1984) & Comm. Rainwater Harvesting (2008)
- International Plumbing Code → Tucson Plumbing Code
- National Policy that drives Innovation & technology improvements
 - Energy Star (2002) & WaterSense (2006)



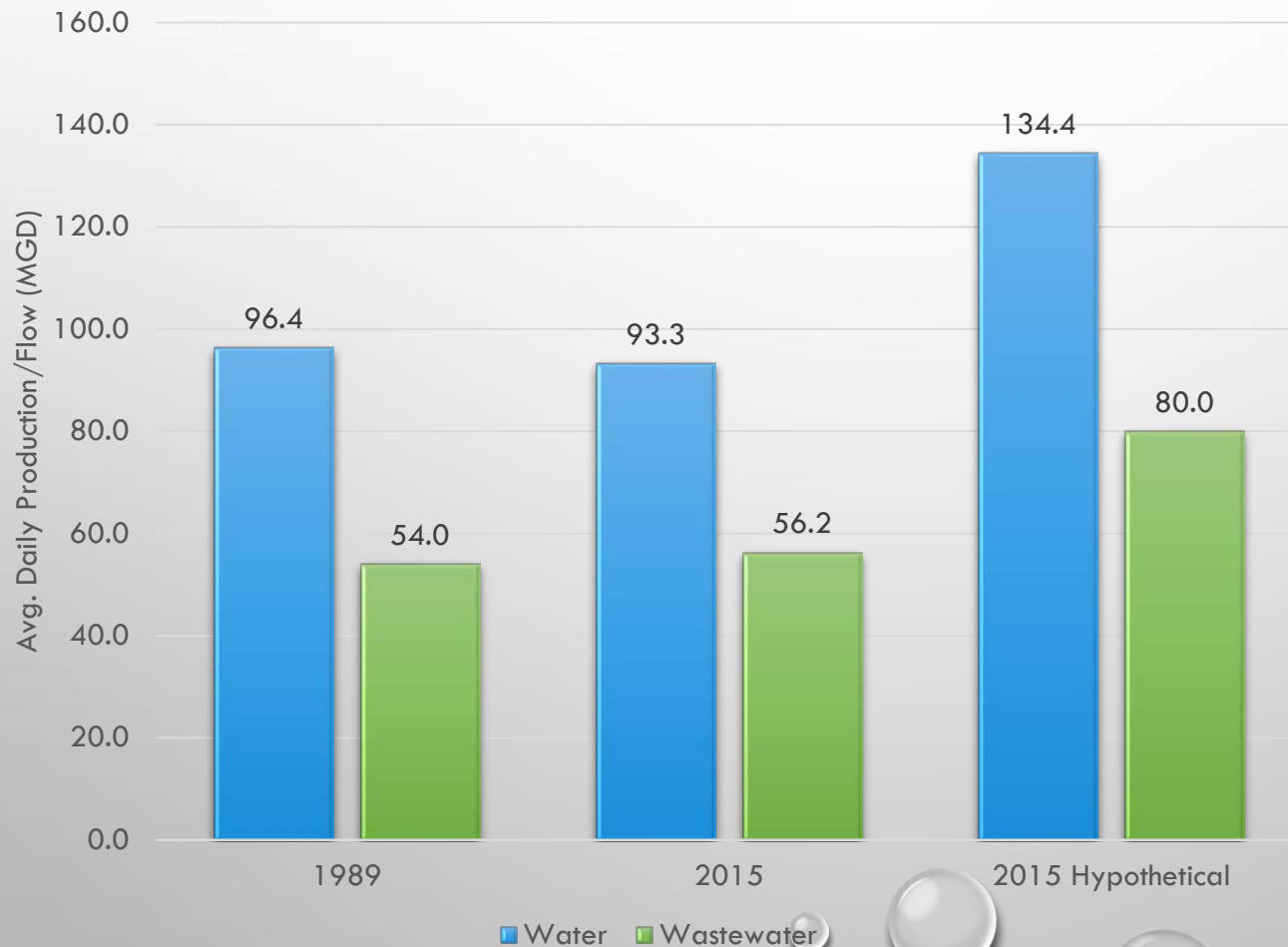
TOTAL WATER SYSTEM GPCD 1980 - 2015



POPULATION AND PER CAPITA WATER AND WASTEWATER USE



HYPOTHETICAL, NON-CONSERVING WATER & WASTEWATER DEMANDS



Daily Water
Production &
Wastewater Flows:
- 1989 actual
- 2015 actual
- 2015 hypothetical

1989: 188 / 105 gpcd
Pop. 512,000

2015: 130 / 78 gpcd
Pop. 717,875

“WHY ARE MY RATES GOING UP AGAIN WHEN I KEEP CONSERVING WATER?!”

- Due to conservation, per capita water use in Tucson has dropped 45% and wastewater by 35% since 1989.
- Yet.... costs to customers continue to increase.
- Some customers are confused and frustrated.
- What is the impact on water and wastewater rates due to conservation?



WATER SYSTEM AVOIDED COSTS

How much additional cost to meet the non-conserving, hypothetical demand of 134 mgd? Or an extra 41.1 mgd?

- Water Treatment Infrastructure
 - \$140,000,000 for new Avra Valley Transmission Main CIP
 - \$15,400,000 for new 7 MGD recycled water facility
- Operating Costs
 - Additional \$22 million per year for water system O&M
- Water Resources
 - None because of CAP supply



WASTEWATER SYSTEM AVOIDED COSTS

What additional wastewater system infrastructure and costs to meet 80 mgd avg. daily flow?

- Wastewater Treatment Infrastructure
 - Current System Max. Treatment Ability ~ 95 MGD
 - Capacity increased to 107 MGD to meet Hypothetical Non-Conserving Daily Flow
 - \$195,000,000 for additional 12 MGD of wastewater capacity, financed over time
- Operating Costs
 - Additional \$6,400,000 per year for wastewater treatment O&M

\$4,066 single-family connection fee or
\$16.02 million/MGD

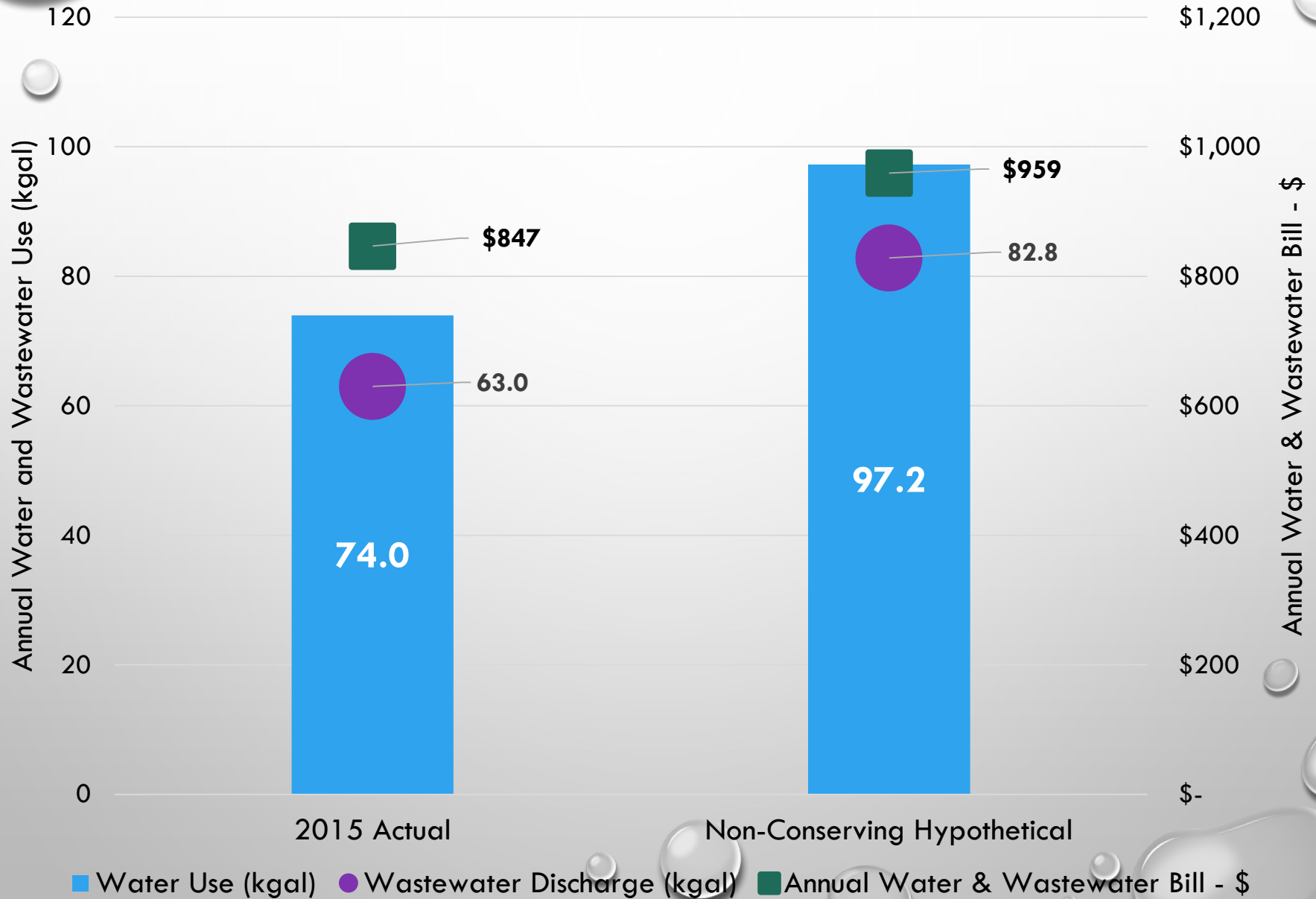


HOW ARE CUSTOMER RATES AFFECTED?

- Current avg. single-family, water customer uses **74,000 gal/year**, and pays for **63,000 gal/year** of wastewater treatment.
- At current rates, the avg. single-family customer pays **\$847** per year for water and wastewater service.
- Under the non-conserving scenario (assuming 188 gpcd/105 gpcd) the average single-family customer would pay **\$959** per year for water and wastewater.

Due to water efficiency, rates today are at least 11.7% LOWER than otherwise necessary.

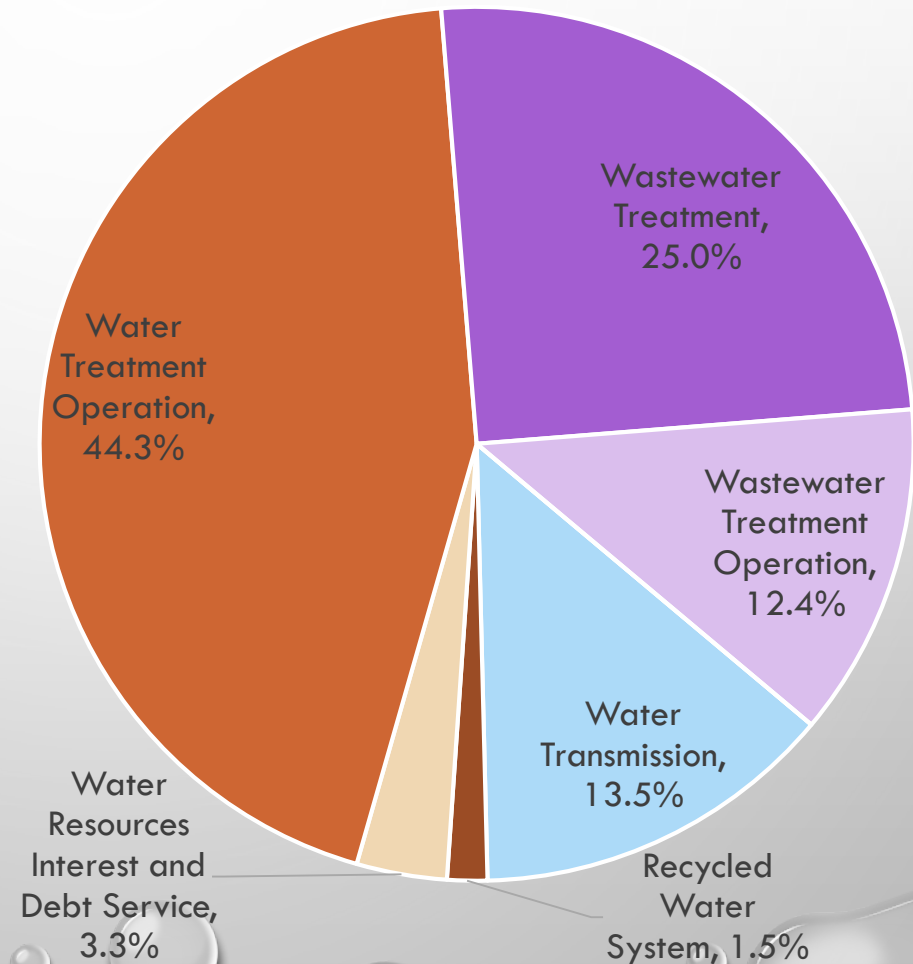
Impact to an Average Single-Family Customer - Tucson, AZ



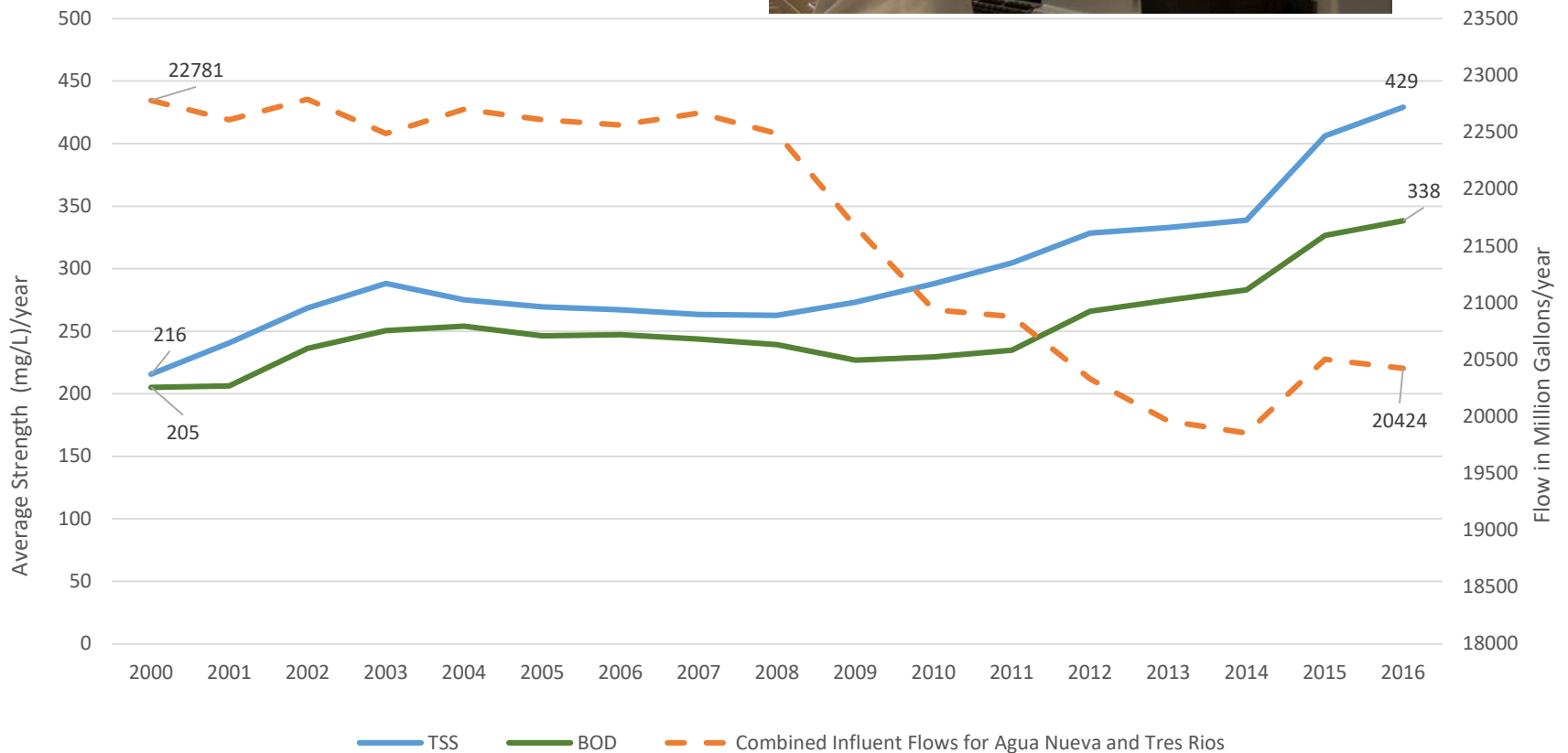
BREAKDOWN OF AVOIDED COSTS

Today, Tucson Water rates are **15% lower** and Pima County RWRD rates are **8.6% lower** than otherwise necessary if per capita water demand had not been reduced.

Total avoided costs:
\$350,862,732



STRENGTH OF SEWER FLOWS



LOWER FLOW IMPACTS TO THE CONVEYANCE PIPES

- Scour velocities may take longer to attain in newer developments with lower flows
- Flushing of pipes may be required
- Potential for more odors in pipes
- Potential for corrosion in pipes
- Terminal ends may require steeper slopes
- Cost goes up for deeper sewers



- Water and wastewater rates have increased because of the increasing costs of providing 24/365 service, while maintaining and improving infrastructure to meet regulatory treatment requirements.
- Decreasing demands are a balancing act: Revenue v. Resources
- **The typical Tucson single-family customer pays at least 11.7% less for water and wastewater service today, than if water efficiency had not been achieved.**

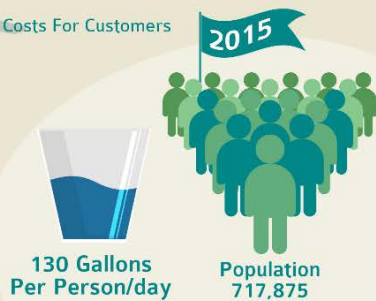
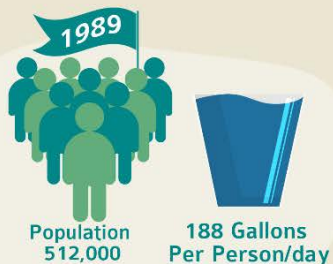
**Bottom Line: When Everyone
Conserves, Everyone Saves**

EVER WONDER WHY your water rates are going up, even though YOU'RE USING LESS?



Tucson, Arizona

Water Conservation Over 30 Years Reduced Costs For Customers



Population increased by 40%, while per person water use declined – **by 31%**

Because the community conserved,
the same family's bill is 11.7% lower



Why?

If per person use had not decreased, Tucson would have needed to invest \$350 million in new water and wastewater infrastructure to pump more water through the water system and treat more wastewater.

Primary conservation drivers:

Conservation programs (indoor and outdoor), youth and homeowner education, efficiency-oriented rates, national plumbing codes, equity

Primary water challenges:

Rising costs of water, rising costs of infrastructure maintenance, Public awareness of the value of water

So What Did We Learn?

When Everyone Conserves, Everyone Saves.

Water rates are rising, but when communities conserve, they don't go up nearly as much.

Each water and wastewater customer has avoided the costs of acquiring, delivering, and treating additional water supplies that would have been necessary - had they not conserved.

Individual actions add up! When everyone does their part to conserve, the entire community benefits from lower rates in the long-term, sustainable water supplies, and healthier watersheds.

To learn more, visit

www.FinancingSustainableWater.org



WORKING WITH WATER

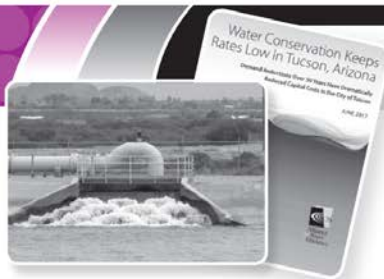
Ward 2 Council Member Paul Cunningham provides a perspective on water rates, usage and the long term benefits of conservation and using water efficiently. He explains how conservation has helped to temper utility capital and operating costs and to keep rates low, as detailed in an independent study by the Alliance for Water Efficiency released in June.

Back in Tucson's territorial days, water could be hard to come by. If you lived in town in the 1870s, chances are you didn't have a well and you had to buy water from someone who would bring it up in a wagon from springs in the Santa Cruz Valley south of town. You'd be charged a penny a gallon.

In today's dollars, that comes out to twenty-one cents a gallon. Tucson Water doesn't bill by the gallon, but by the Ccf, which is 100 cubic feet of water or nearly 750 gallons. You'd be paying the equivalent of \$158.97 per Ccf in the 1870s.

Which brings me to present time: as of July 3, we are paying a bit more for water.

The average single family household that uses 8 Ccfs per month will see an



increase of \$2.84 or about \$35 per year. I have a young family myself, so I know what even a modest price increase can mean for a tight budget. Still, I supported the rate increase.

Despite the fact that it is a part of city government, Tucson Water is self-funded and receives no money from taxpayers. Tucson Water is a public utility meaning it is owned by you and other citizens. The utility runs safely, efficiently, and in the public interest and, even with this rate increase, at rates below the average for other water utilities in Arizona.

Tucson Water has done a good job keeping costs low while maintaining council-mandated conservation and low-income programs. Still, the reality is that many of the utility's expenses continue to increase.

Which leads to a question that I get from constituents: Why am I going out of my way to cut down on water use if you are going to raise my rates anyway?

It's a valid question. Community members have done a lot to save water and use it more efficiently

Go to tucsonaz.gov/water for the June 2017 Alliance for Water Efficiency Study, "Water Conservation Keeps Rates Low in Tucson, Arizona."

than many other southwest towns and cities. After hitting its peak last decade, total water use by Tucson Water customers is now at the same level it was in 1985 when we had 200,000 fewer people. But what's the reward if water bills keep going up? Well, there is something called avoided costs.

There are expansions that Tucson Water has avoided because of lower water use, efficiency and conservation. A study by the Alliance for Water Efficiency estimates that Tucson Water's maintenance and operation costs would be 30% higher than they are now if old usage trends had continued. That's almost \$23 million.

Tucson Water has also managed to avoid having to build some expensive new infrastructure. Plans for an Avra Valley transmission facility were shelved because of the lack of need. That is \$140 million that Tucson Water didn't spend because use is down so much. Pima County Regional Wastewater Reclamation Department collaborated on this study. Lower water use has helped avoid nearly \$200 million in wastewater system expansion costs.

These savings are passed on to customers through lower water and wastewater rates. In all, your bill is 11.7% lower than it would be had we not been conserving.

The reality is that the cost of everything is going up, and that's reflected in our water bill. Still, much of what you've done as conscientious and efficient water users has kept those costs from increasing even more.

WATER CONSERVATION OVER 30 YEARS REDUCED COST FOR CUSTOMERS



CALL CLICK SOCIAL TDD WATCH

Public Information
English & Español:
(520) 791-4331

tucsonaz.gov/water



(520) 791-2639

[tucsonwater](http://tucsonwater.org)

AUGUST 2017



WATER MATTERS

inside this issue

Your Utilities:
Wastewater &
Environmental
Services

2-3

Working
with Water:
Conservation
Saves Capital
Costs

4-7

One City
One Team:
Educational
Tools about
Sustainability

8

Ward 2 Council
Member
Paul Cunningham
provides
information about
how conserving
water saves millions
of dollars, backed
by a recent study
by the Alliance for
Water Efficiency.

(See Working with
Water, pg. 4-7)



tucsonaz.gov/water

QUESTIONS?
THANK YOU!

CANDICE.RUPPRECHT@TUCSONAZ.GOV

PETER.MAYER@WATERDM.COM

