



CALIFORNIA URBAN WATER AGENCIES

Adapting to Change: Utility Systems and Declining Flows

May 16, 2018



Who is CUWA?

Member agencies collectively serve ~2/3 of the State's population.



Retail Agencies:

- Alameda County Water District (ACWD)
- City of Fresno, Department of Public Utilities (Fresno)
- East Bay Municipal Utility District (EBMUD)
- Los Angeles Department of Water and Power (LADWP)

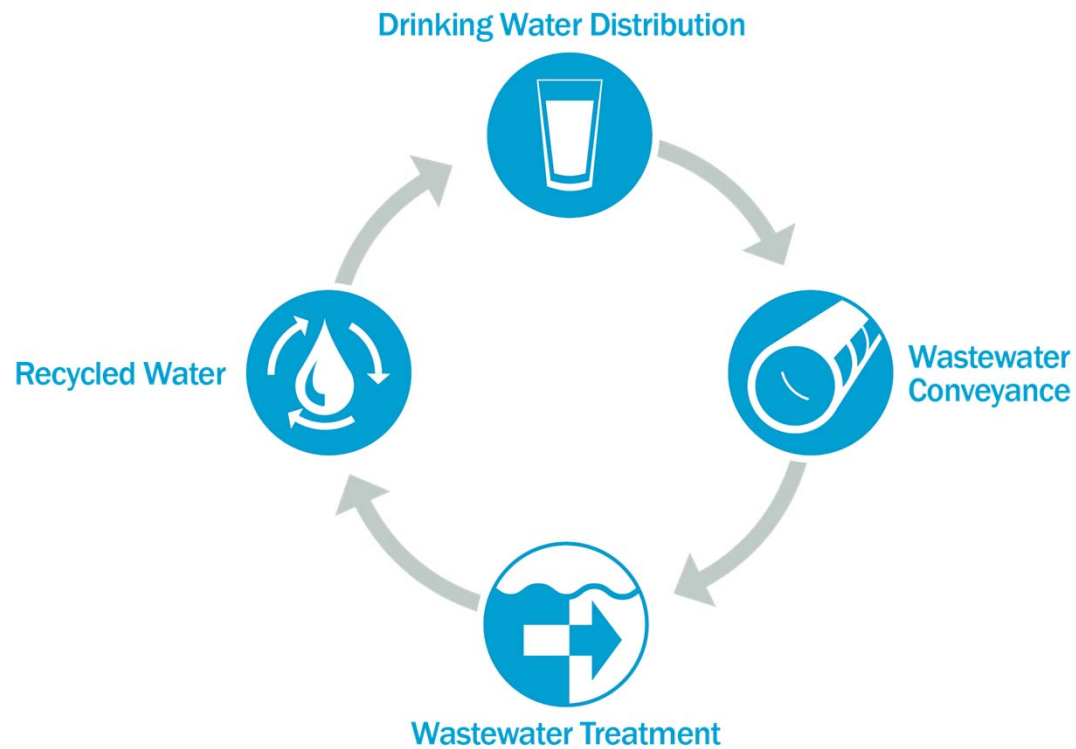
Retail/Wholesale Agencies:

- Contra Costa Water District (CCWD)
- City of San Diego (San Diego)
- San Francisco Public Utilities Commission (SFPUC)

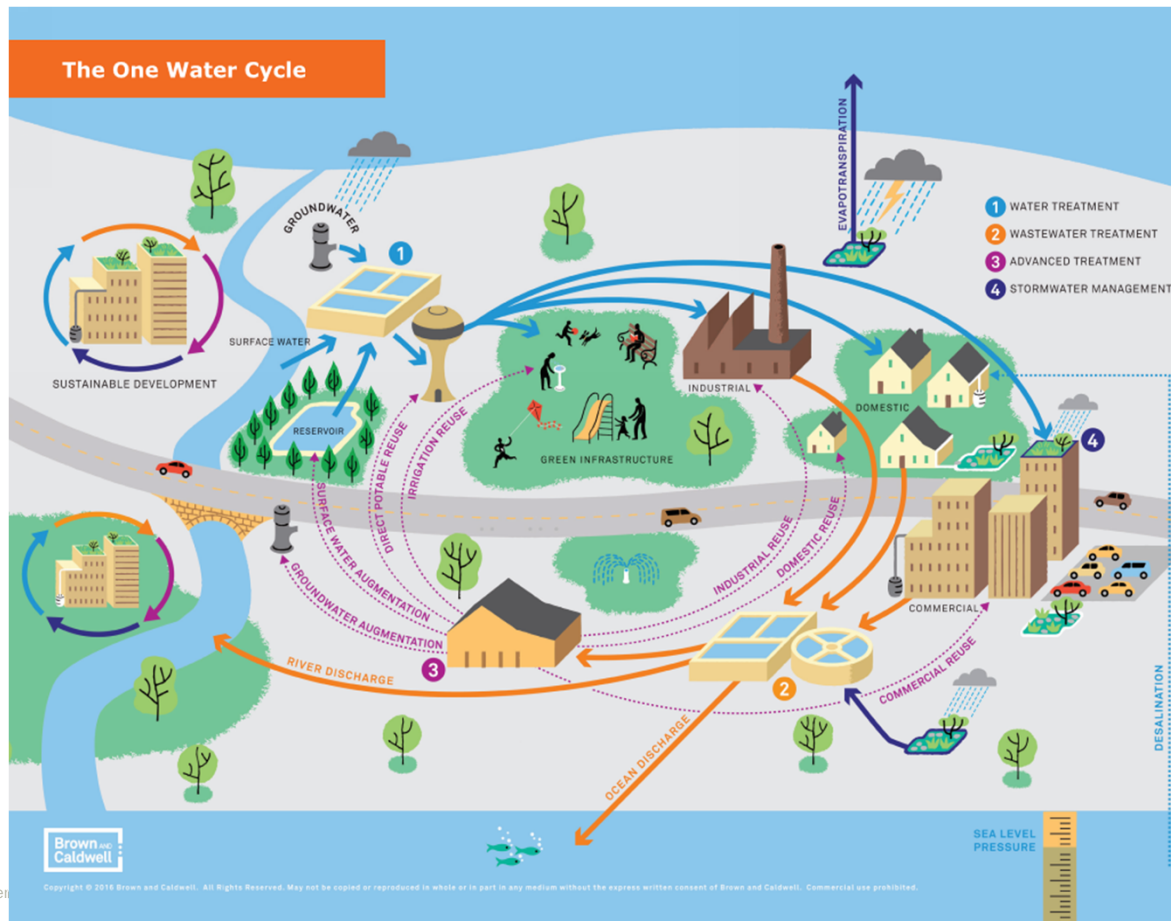
Wholesale Agencies:

- Metropolitan Water District of Southern California (MWDSC)
- Santa Clara Valley Water District (SCVWD)
- San Diego County Water Authority (SDCWA)
- Zone 7 Water Agency (Zone 7)

Research reveals declining flows have impacts on the interconnected urban water cycle



CUWA supports a holistic approach to addressing California's water supply challenges



Understanding how water use efficiency strategies affect the interconnected water supply system is critical to optimizing future water management.

CUWA is working with collaborative partners to better understand these impacts



California
Water
Environment
Association



Wise water use is encouraged through short term conservation and long term WUE

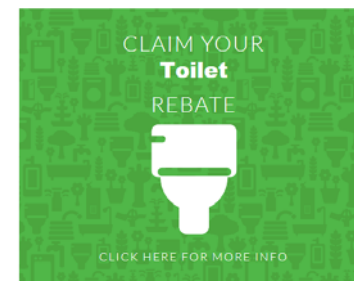
Conservation

Short-term, emergency response for demand reductions during a drought



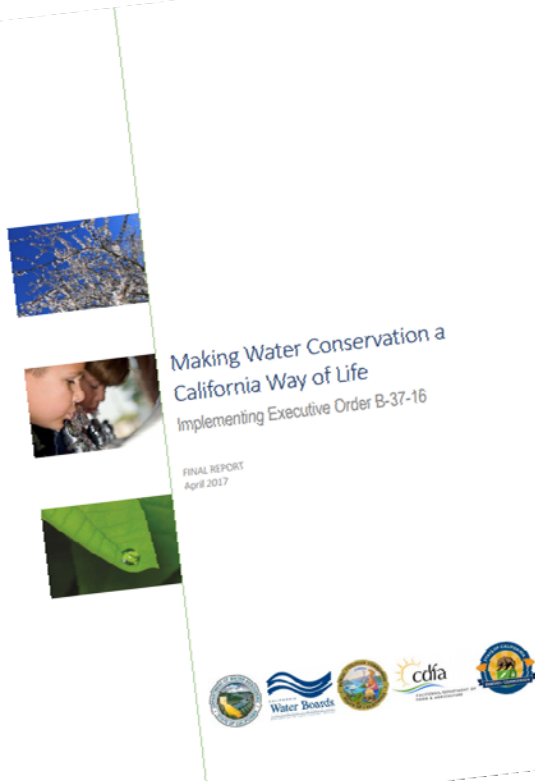
Water Use Efficiency

Long-term strategy for more sustained demand management



Source: Department of Water Resources

Our focus is on indoor water use since it has the greatest impact on the urban water cycle



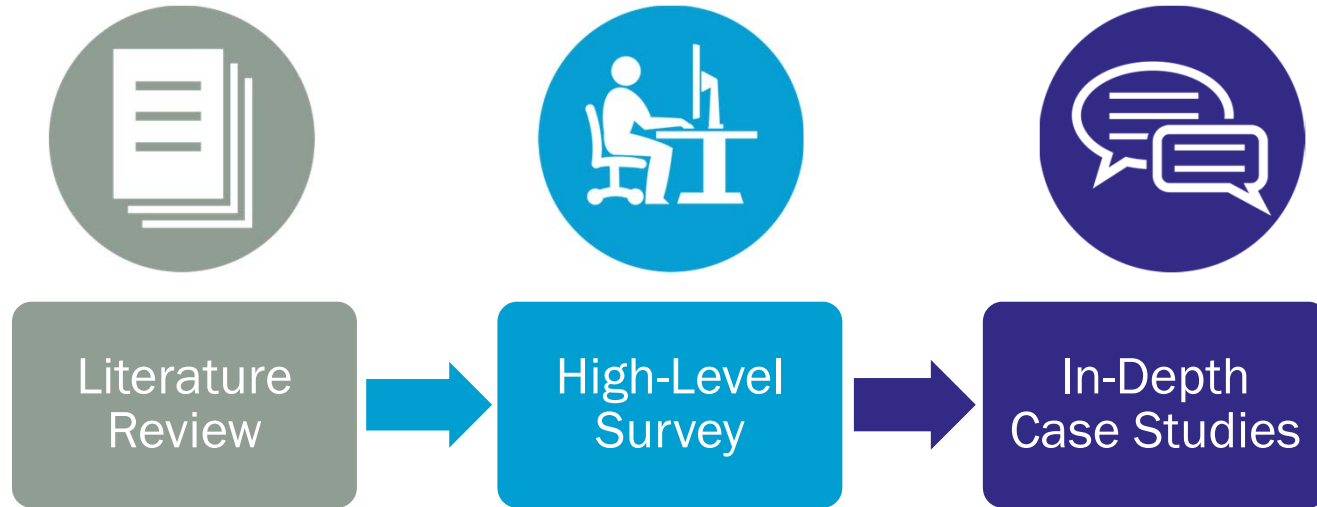
Supplier water use target is an aggregate of **indoor** water use, **outdoor** water use, and **water loss**.

This project focuses on **indoor** water use because it has the greatest impact on the urban water cycle.

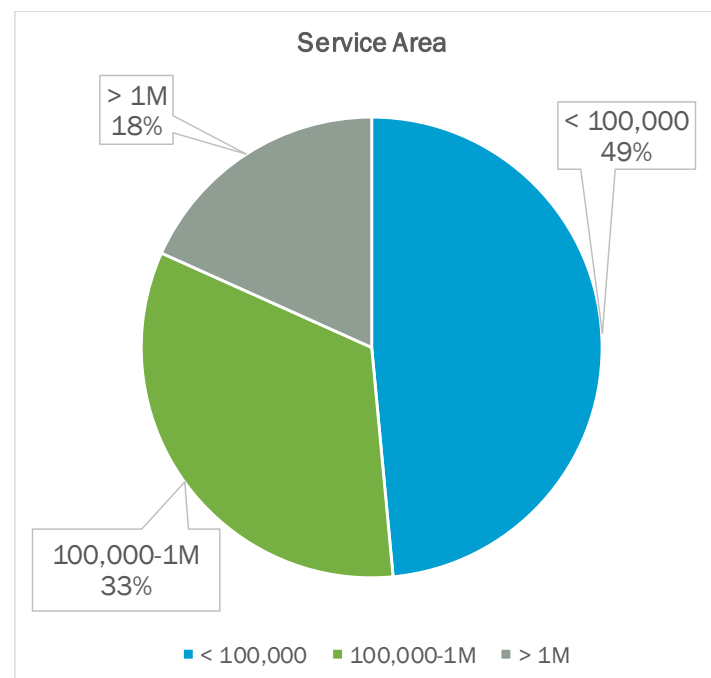
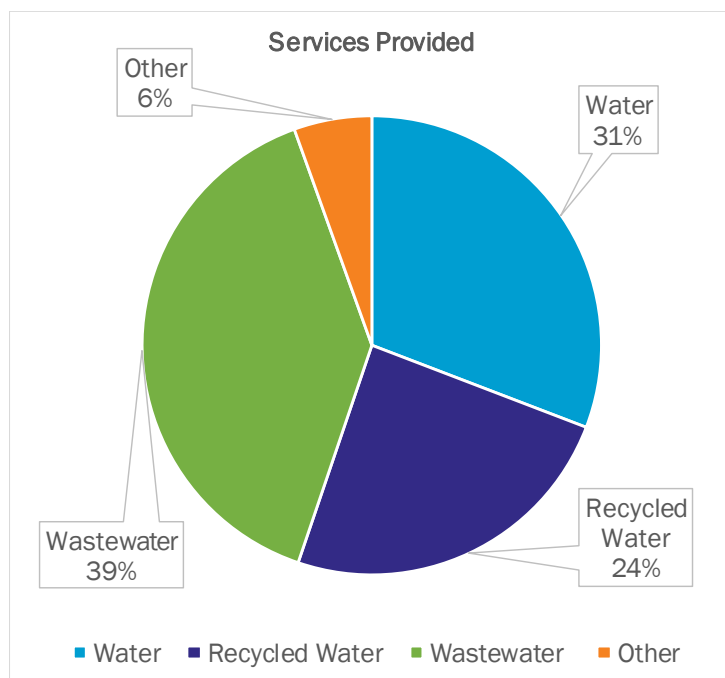
Our objective is to leverage utility experiences to inform water use efficiency (WUE) policy

- Californians successfully responded to the call to reduce water use during the recent drought.
- Significant reduction in water demands revealed some impacts from declining flows.
- Observations **offer a preview** into the potential impact of establishing permanent indoor water use targets at or below the thresholds achieved during the emergency conservation mandate.

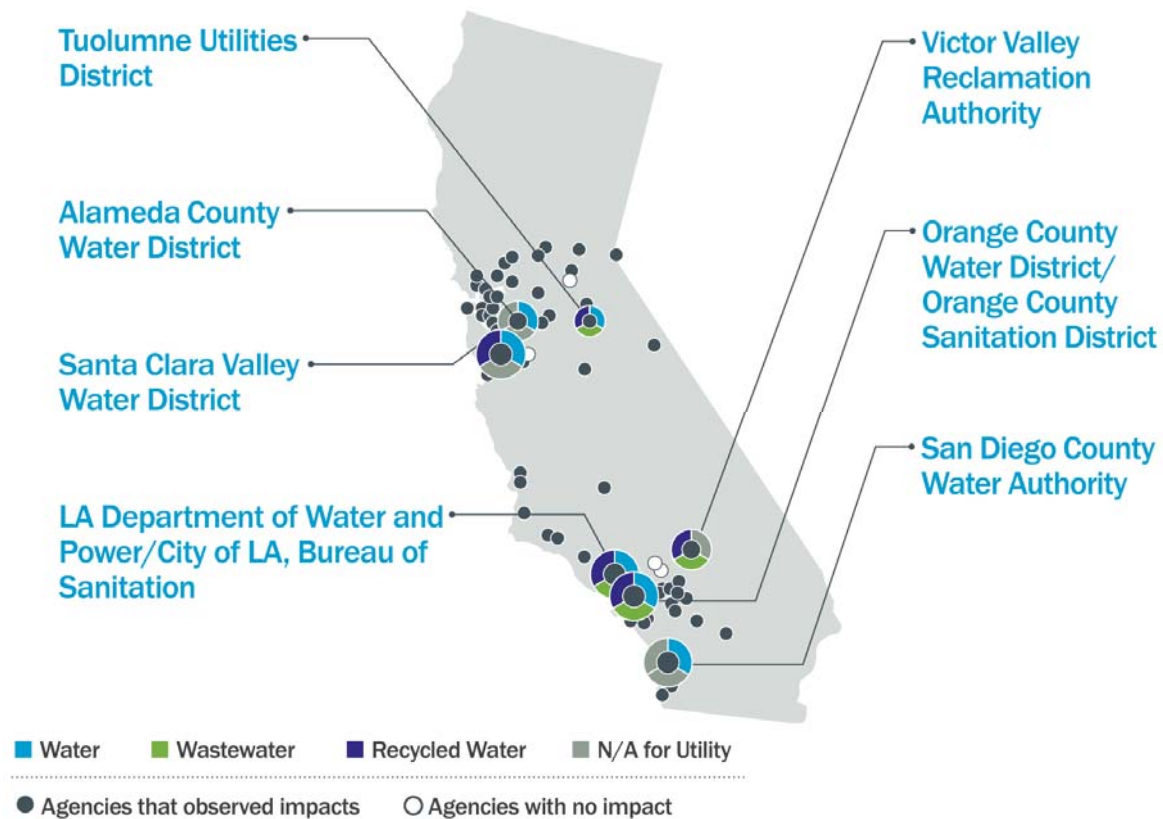
CUWA leveraged both literature and a survey of California utilities to develop the white paper



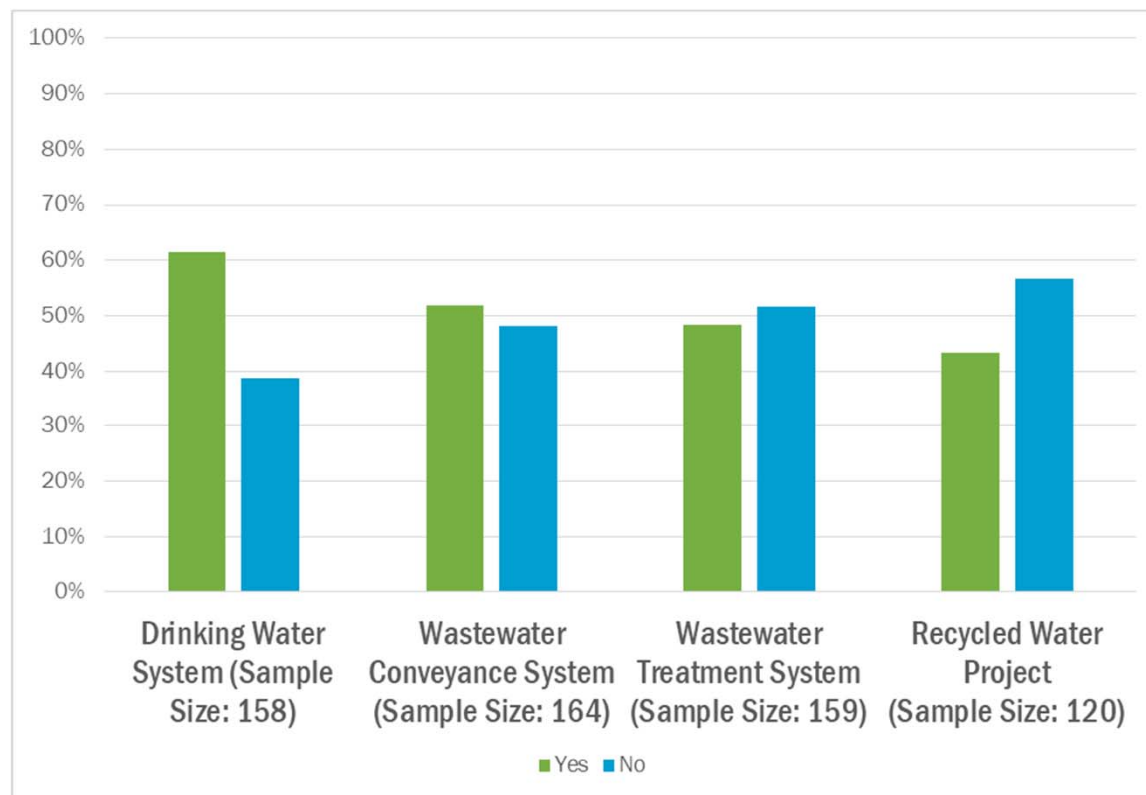
The high-level survey provided nearly 300 representative viewpoints



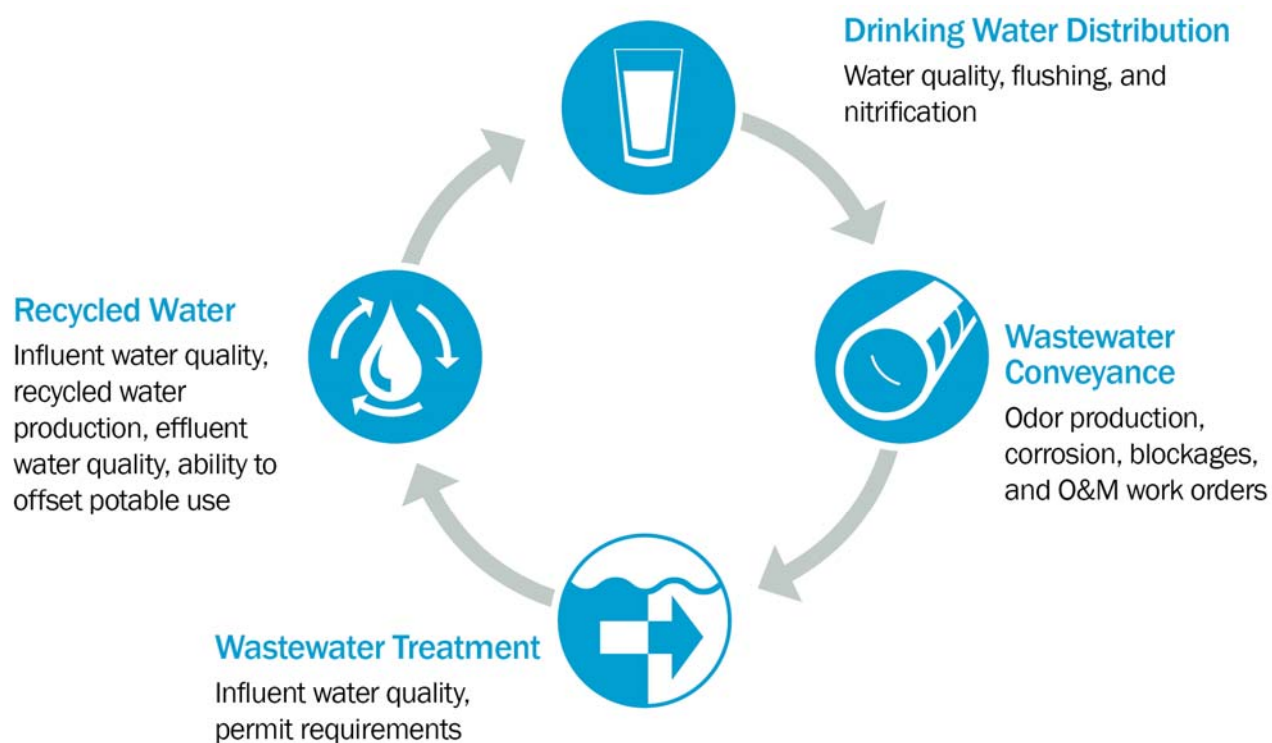
Many utilities are feeling the impacts and working to adapt



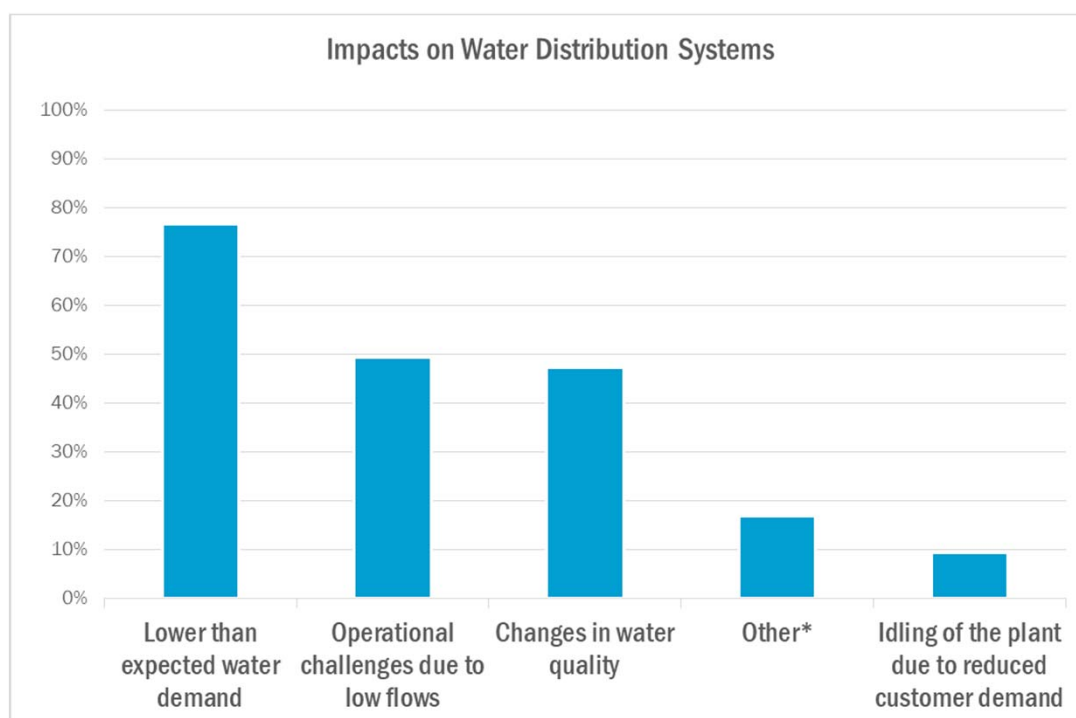
Nearly half of survey respondents have experienced impacts of declining flows



Impacts from declining flows experienced in all elements of the urban water cycle



Lower than expected water demand has led to impacts on water distribution systems



*Some items included in other: lower revenues, increasing rates, stranded storage assets.

Of the impacted water system respondents, **49% reported operational challenges** in water distribution systems due to low flows.

SDCWA has increased flushing of their aqueducts to adapt to declining flows

San Diego County Water Authority



Background:

- 24-member retail agencies
- 3.3 million people
- 150 square miles

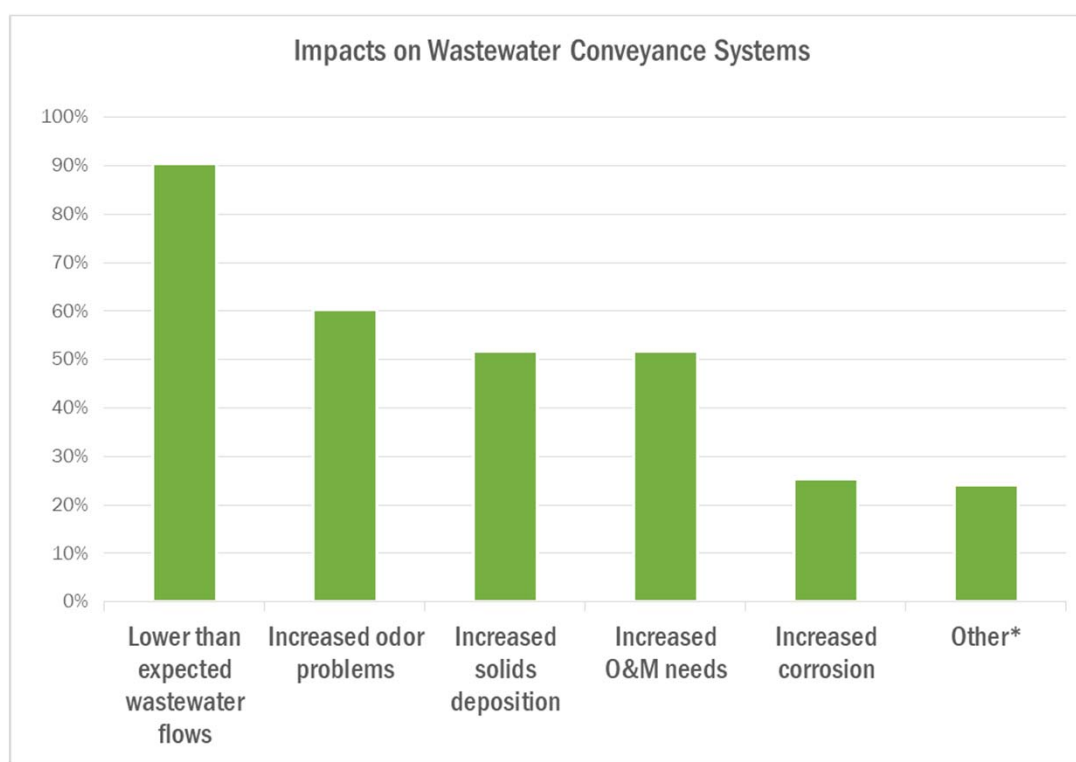
Impacts Experienced:

- Reduced conveyance system chlorine residuals
- Conveyance system nitrification

Adaptation Strategies & Financial Impacts:

- Increased flushing: costs of flushing increased from \$200,000/year to over \$2 million/year.
- Investment in online monitoring equipment: \$250,000 in new equipment.

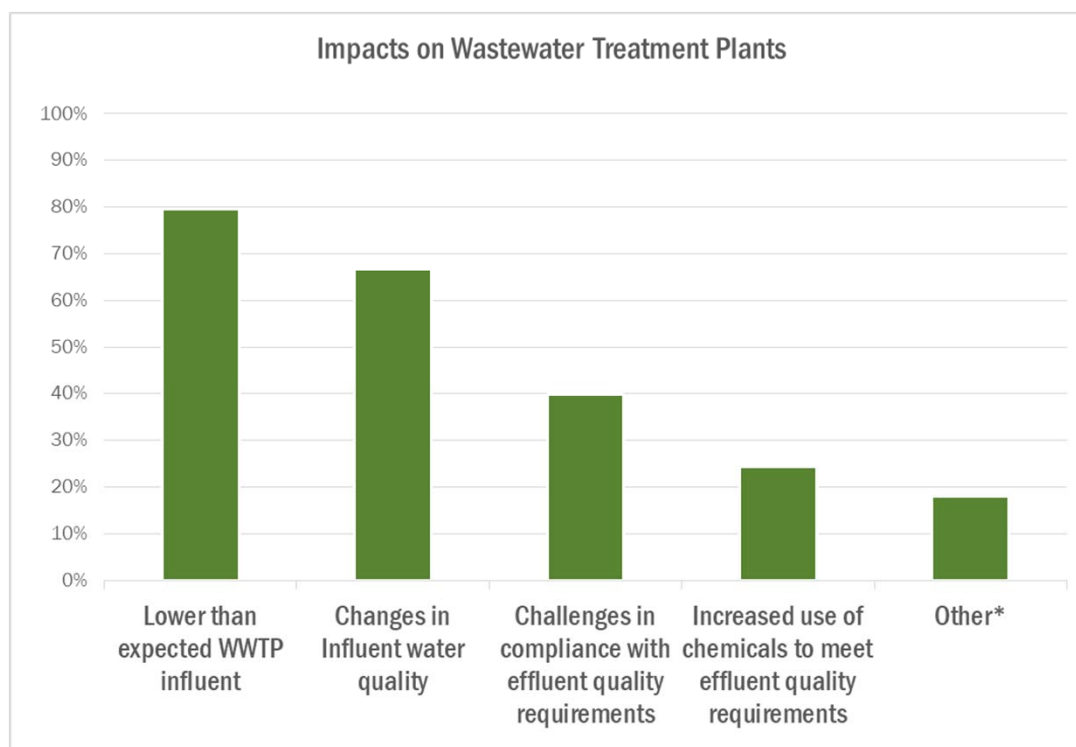
Lower than expected wastewater flows has led to impacts on wastewater conveyance systems



*Some items included in other: increased root intrusion, wastewater pH changes.

Of the impacted wastewater conveyance respondents, **50% indicated increased solids deposition, odor problems, and O&M challenges.**

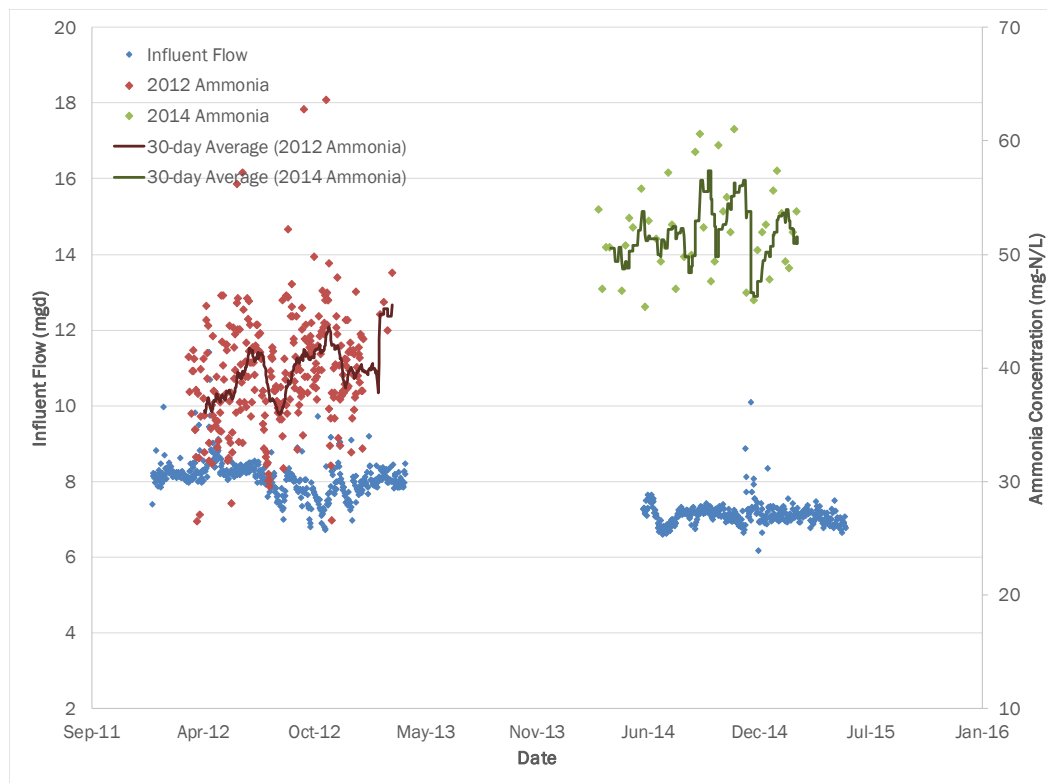
Lower than expected WWTP influent flow has led to impacts on wastewater treatment processes



Of the impacted wastewater treatment respondents, **68% indicated changes in wastewater influent quality.**

**Some items included in other: higher recirculation flows, staffing adjustments, plant upsets.*

Increasing Ammonia Concentrations Lead to Operational Adjustments



At the El Estero
WWTP in Santa
Barbara,
**increased
ammonia reveals
alkalinity
limitations.**

TUD invested in proactive pipe patching to mitigate increased root intrusion

Tuolumne Utilities District



Background:

- 44,000 residents
- 1.2 mgd of wastewater

Impacts Experienced:

- Increased sanitary sewer overflows and blockages
- Increased root intrusion

Adaptation Strategies & Financial Impacts:

- Increased maintenance of the collection system
- Invested in proactive pipe patching to counter increased root intrusion

Victor Valley invested in epoxy coating for their manholes to mitigate accelerated corrosion

Victor Valley Water Reclamation Authority (Wastewater Conveyance)



Background:

- 4 member agencies
- 42 miles of public sewers
- 10.7 mgd of wastewater

Impacts Experienced

- Increased odors and odor complaints
- Accelerated rate of corrosion and degradation of infrastructure

Adaptation Strategies & Financial Impacts:

- Operational improvements and increased rehabilitation and maintenance of manholes
 - Invested in \$300,000 per year of epoxy coating over the past 5 years

Victor Valley adjusted treatment operations to address increased ammonia concentrations

Victor Valley Water Reclamation Authority (Wastewater Treatment)



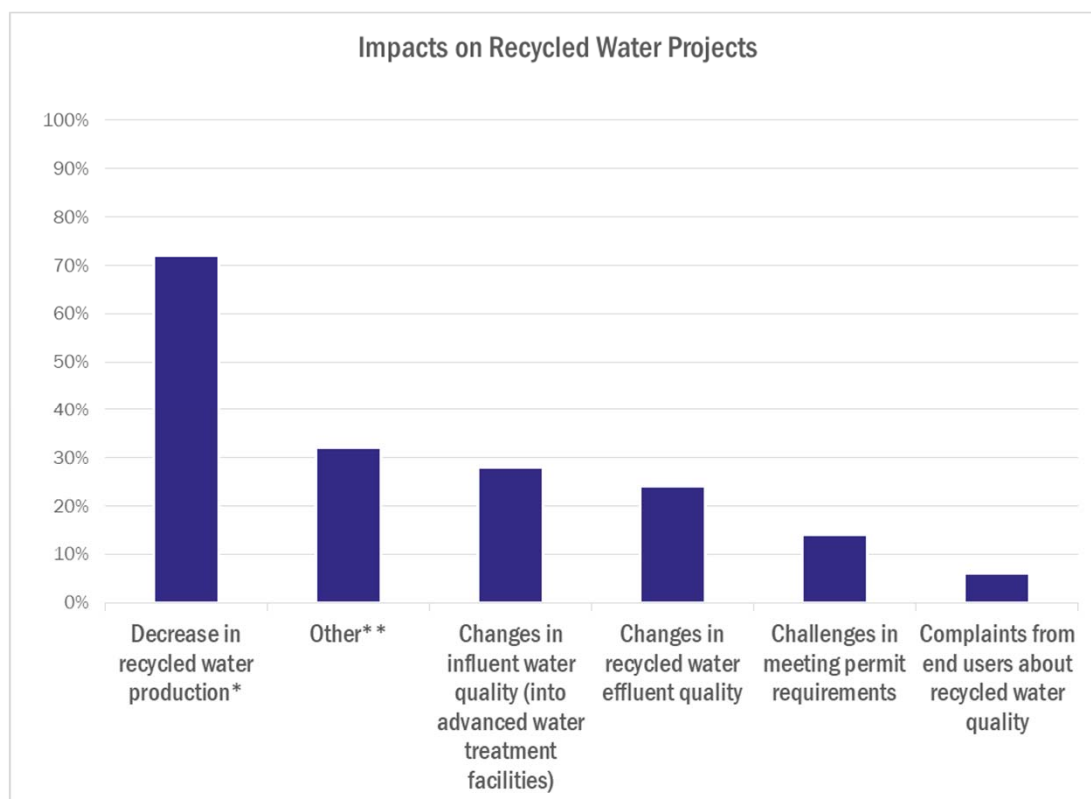
Impacts Experienced:

- Increased ammonia concentrations in wastewater influent
- Declining wastewater influent reduces recycled water volumes

Adaptation Strategies & Financial Impacts:

- Changed operations of the aeration basins to achieve the appropriate nitrification and denitrification
- Less recycled water available for reuse increases reliance on potable resources (groundwater)

Impacts on recycled water systems include changes in production and water quality



Of the impacted recycled water respondents, **70% indicated a decrease in recycled water production.**

*Decreases in recycled water (RW) production could be a result of various changes (e.g. decline in wastewater effluent or decline in RW demand)

**Some items included in other: decrease in recycled water influent, changes in recycled water demand.

OCSD & OCWD have invested \$60M to segregate high-salinity influent flows

Orange County Sanitation District & Orange County Water District



Background:

- 2.6 million people
- 2 wastewater treatment plants
- 100 mgd of highly purified water from the Groundwater Replenishment System (GWRS)

Impacts Experienced:

- Reduced flows at the WWTPs
- Increasing salinity from discharge effluent from upstream utilities

Adaptation Strategies & Financial Impacts:

- Supplementing GWRS feed water flows with Plant 2 effluent
- Investing \$60 million to segregate high-salinity flows

Insufficient wastewater flow could limit San Diego's ability to meet Pure Water goals

City of San Diego



Background:

- 1.3 million water customers
- 2.4 million wastewater customers
- 3 wastewater treatment plants
- Pure Water San Diego – multi-phased recycled water program to ultimately provide 83 mgd of pure water

Potential Impacts:

- Insufficient influent flow into the wastewater treatment plant
 - limit the City's ability to meet Pure Water supply diversification goals and commitments
 - reduce regional drought resilience capabilities

Policy Recommendations

*The policy principles can be downloaded in full on the CUWA website
(www.cuwa.org).*



Consider entire interconnected water cycle in long-term WUE policies

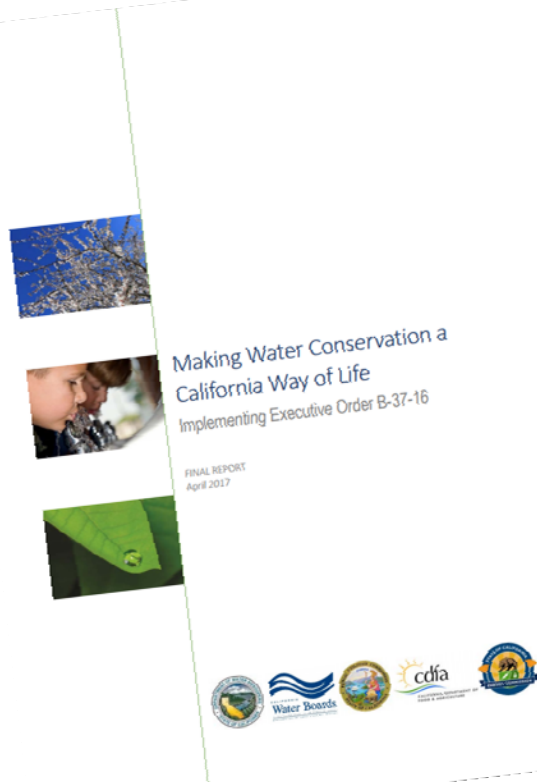
- Low flows can bring complications, and adaptations may not be straightforward or without significant costs.
- Policies must account for costs and time required to adapt to new flow expectations.
- The State should provide flexibility for utilities to adjust or **offer variances to account for local impacts and investments in water supply reliability**



Actions for long-term WUE differs from short-term, emergency water use reductions

- Some behavioral changes precipitated by emergency conditions may lead to positive lasting changes (e.g., California friendly landscapes)
- Other extreme measures (e.g., insufficient tree watering) carry adverse impacts and are not sustainable for extended periods.
- With a **holistic analysis of the urban water cycle**, long-term WUE programs can result in sustainable potable demand offsets that **support the economy, environment, and communities.**

More diverse supply and storage options help urban utilities address future uncertainties



- WUE is important, but not in itself sufficient to manage all future water demands.
- Acknowledging that declining flows have the potential to reduce the production of local, drought-resistant water supplies through water reuse, **California policy on long-term WUE should prioritize outdoor water use restrictions**, which will have a lower impact on interconnected water systems, to achieve statewide demand management goals.

Flexibility is critical for implementation and refinement of long-term WUE targets

- Water agencies should be provided **sufficient time and full flexibility** for implementing local and/or regional programs in the context of the entire interconnected water cycle.
- To lessen the financial impact on customers, particularly those in disadvantaged communities, water agencies **need adequate time** to fully achieve targets **to allow for incremental rate increases.**

Questions?

The white paper and policy principles is available for download at the CUWA website (www.cuwa.org).

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