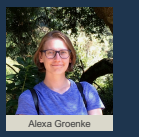
Analysis of California water conservation programs for low-income communities

Decision support systems for utility planning



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Re-Inventing the Nation's Urban Water Infrastructure (ReNUWIt)

Background

Both government agencies and water utilities administer programs to encourage household water conservation. As droughts become more severe and more common, these programs are gaining in importance. Common programs include free low-flow appliances, rebates on home and landscaping improvements, and educational outreach. Energy utilities have similar conservation programs, and have been critiqued in the past for primarily benefitting middle- and upper-class ratepayers.

Research questions:

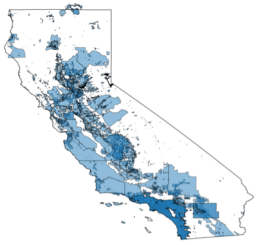
- What type of water conservation programs exist in California?
- Are these programs accessible to low-income ratepayers? Are program benefits distributed equitably?
- How do these programs and their distribution of benefits compare to energy conservation programs?

Approach

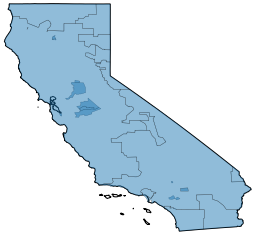
Using an exploratory approach focused on qualitative data, I:

- Conducted a review of residential conservation programs administered by energy and water utility providers in California
- Reviewed documents from various state agencies on their role in regulating water and energy utilities
- Interviewed staff members at utility providers and state agencies
- Analyzed spatial socioeconomic and utility service data using GIS software
- Reviewed data from Urban Water Management Plans submitted by utilities across the state

Water Providers In California[1,2]



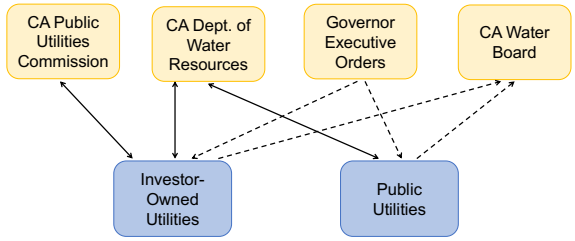
Electricity Providers In California[1,3]



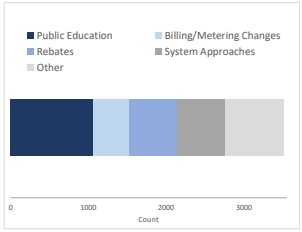
Results

While there are only a handful of electricity providers in California, there are thousands of water providers. Water utilities differ in size, customer base, and management/ownership structure. Many state agencies play a role in regulating how utilities implement demand management and conservation programs.

Overview of Water Utility Regulation Structure

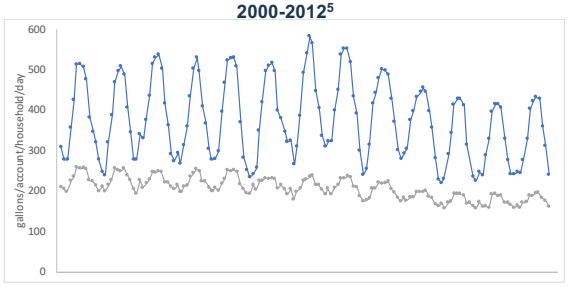


Conservation Strategies Reported in 2015 Urban Water Management Plans[4]



Low-income ratepayers are not targeted by utilities for conservation programs because they are perceived as using little water. Rebate programs are often inaccessible to low-income ratepayers because they require an up-front investment. Changes in billing and metering often do not directly impact multifamily-housing residents because of the lack of sub-metering.

Single Family Households (Blue) Use More Water than Multifamily Households (Gray): gallons/account/household/day, 2000-2012[5]



Conclusions

- The electricity sector has more standardized and robust programs targeting low-income ratepayers, and can be used as inspiration for improving water conservation programs.
- Due to the number and heterogeneity of water providers in California, state legislation could productively support program and data collection standardization.
- Multifamily buildings without sub-metering provide a challenge to engaging residents in many common conservation programs.
- As California moves towards a "culture of conservation," novel programs for engaging low-income ratepayers will be needed.
- Low-income ratepayers face many other water-related challenges that are likely high priorities, like unaffordable water prices, drought-related job loss, and poor water quality.

Next Steps

- Analyze proposals for statewide low-income ratepayer assistance program
- Explore ways that ratepayer assistance programs can be used to engage low-income customers in conservation programs
- Review the feasibility of tools for collecting unit-specific water usage data in multifamily buildings
- Study the social impact of being excluded from culturally-important conservation programs
- Evaluate the regional variability in needs of low-income ratepayers

Citations

1- United States Census Cartographic Boundary Shapefiles 2017, https://www.census.gov/geo/maps-data/data/cbf/cbf_state.html (Accessed: 30 April 2019)

2- California Department of Water Resources Water Plan 2017 GIS Data, www.water.ca.gov/waterplan/gis/index.cfm (Accessed: 4 August 2016)

3- Kavvada, O. GIS layer. 2017

4- California Department of Water Resources Urban Water Management Plan 2015 Data, https://wuedata.water.ca.gov/uwmp_export.asp (Accessed: 2 May 2018)

5- Kiefer J. and Krentz L. Water Use In the Multi-Family Housing Sector. Water Research Foundation, 2018.

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