

Report of the Working Group on Reducing Peak Water Demand

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Why Reduce Water Demand?



1. Water RELIABILITY

The water we conserve today is saved in Loch Lomond reservoir in case next year is a drought. Pending the implementation of a new water supply project, e.g. aquifer storage, this is our only interim water reliability strategy.

2. Wildlife HABITAT

The water we conserve today allows the City to leave more water in streams for fish habitat.

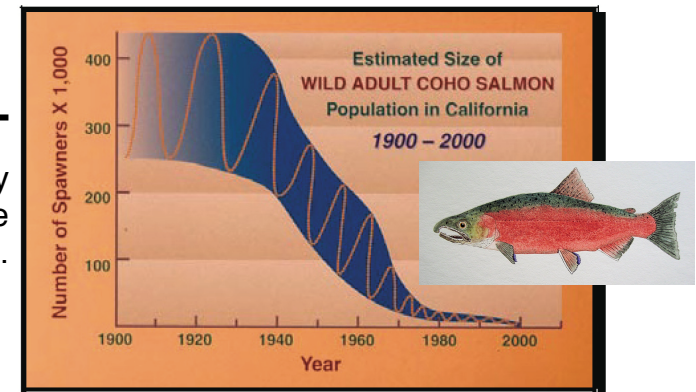
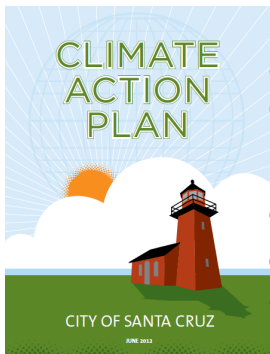


Figure 2: Visual Representation of Extinction Vortex of Coho Salmon (Peter Moyle, pers. comm.)



3. Reduced ENERGY

Conserving water reduces the energy used in pumping and treating water---and the energy used in heating water at the consumer end. "Goal: Continue to reduce per capita and total energy use within the Santa Cruz Service area." -Climate Action Plan

4. Avoided COSTS

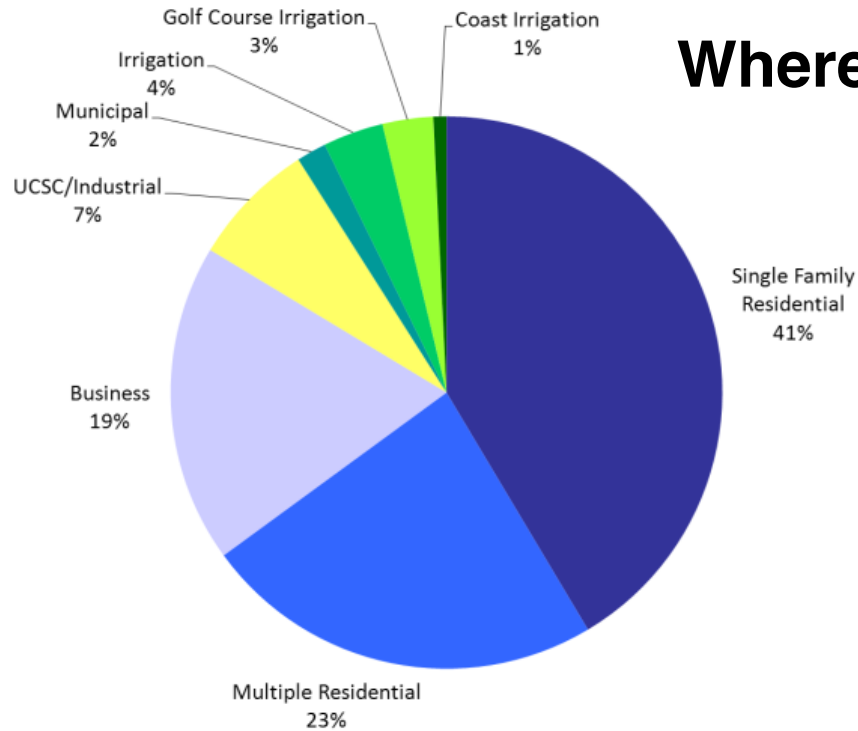
Reducing demand reduces the investment needed for new water supply infrastructure

	Yield	Cost
Water Transfers , including turbid water treatment, GHTP upgrade, interties, Tait diversion upgrade *	558 mil gals	\$92 mil
Conservation Program Crec**	205 mil gals	\$13 mil

* John Ricker presentation 4/15/15

**Maddaus, Draft Master Cons Plan

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Where can we find the **savings**?



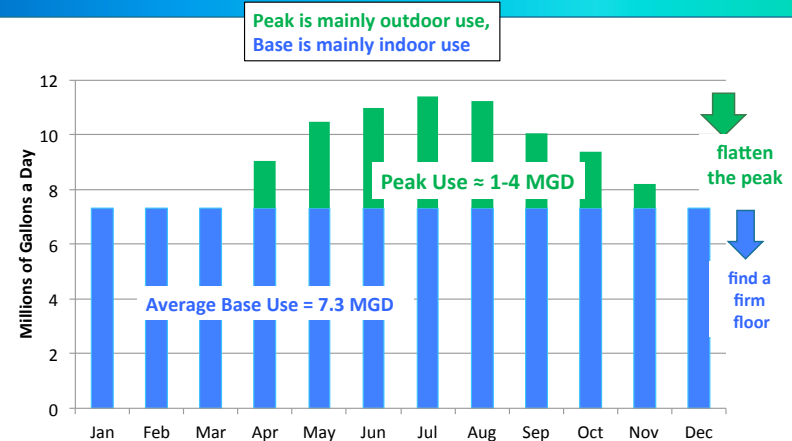
A. Reducing Peak Season Use

1. Residential outdoor use
2. Dedicated landscape accounts

B. Reducing Base (Indoor) Use

1. Residential washing machines
2. Commercial best practices
3. Code requirements

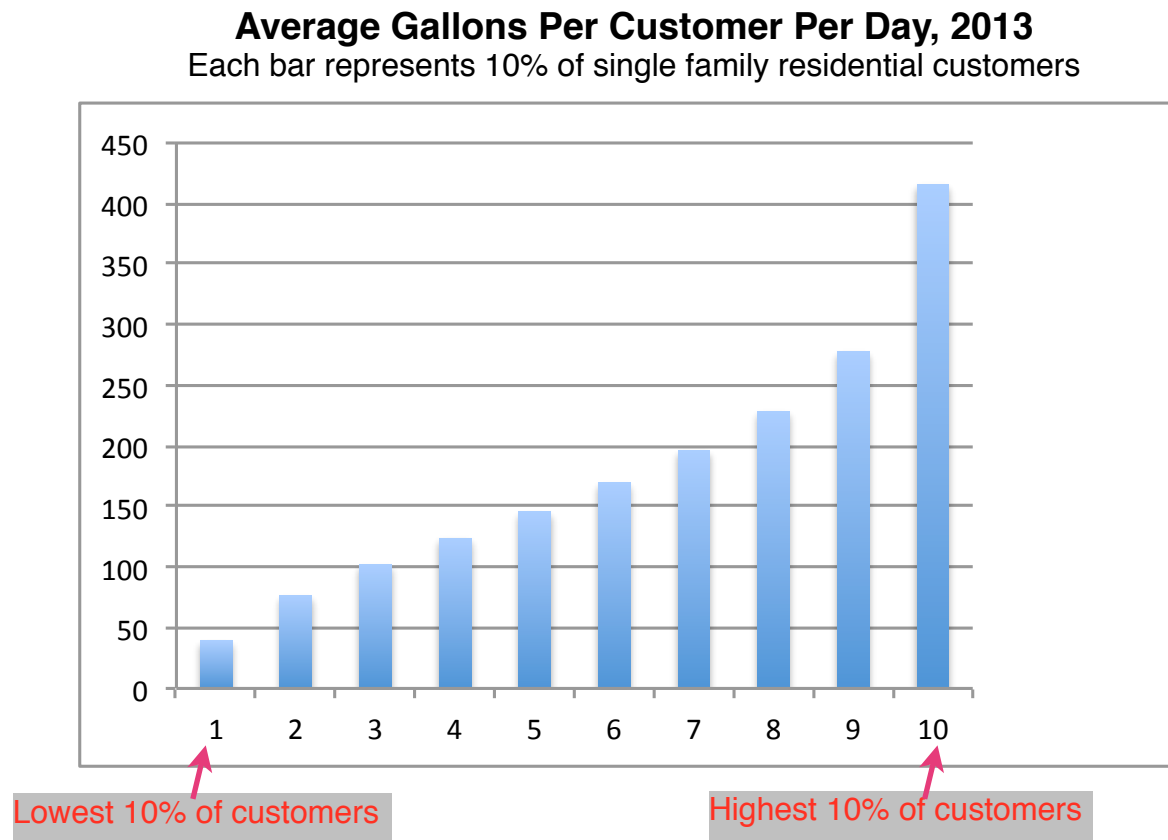
Base vs. Peak Water Use



Residential outdoor use:

Recommendations:

- **Promote social norms**
- **Personalized outreach to highest users & generic landscape budgets**
- **Climate-appropriate landscaping & rainwater infiltration**
- **Price incentives for all users**



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Residential outdoor use:

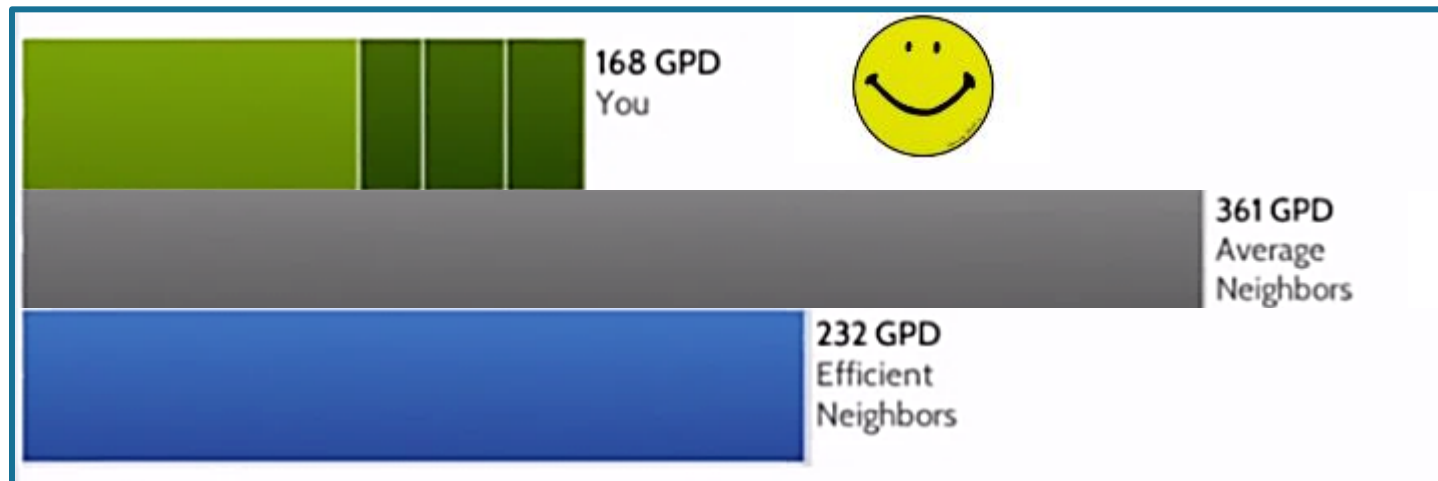
Recommendation: **Social Norms: Home Water Use Reports**

Evidence suggests that high water users are more influenced by the norms of their community than they are by price incentives. Home water use reports are part of the Program Crec. The Soquel Creek Water District has achieved a 5% reduction among recipients of home water use reports over a control group who do not receive the reports. This savings has held up even during the restrictions implemented in the 2014 drought. The cost per million gallons saved is lowest among conservation measures. Hence this program should be prioritized, with a goal of achieving 5% savings.

Recommendation: **Personalized Outreach to Highest Users & Generic Landscape Budgets**

We recommend that Home Water Use Reports be combined with personalized outreach to the top tiers of water users in order to connect those users to landscape professionals who are proficient in climate-appropriate landscaping. Highest residential users would be given generic water budgets based on lot size.

Sample Home Water Use Report



Residential outdoor use:

Climate-appropriate landscaping & rainwater infiltration



Drought tolerant plants require little dry season irrigation. Native plants require no irrigation or fertilizer, and provide habitat for native insects and birds.

Rainwater infiltration features such as swales or rain gardens capture water runoff from roofs and paved surfaces. Enhanced infiltration increases soil porosity, which provide moisture to trees and landscape plants during dry periods. This reduces stress on trees during droughts.

In some areas, rainwater that infiltrates the landscape recharges aquifers, adding to our water supply. For example, Kennedy/Jenks estimates that water infiltration modifications could add 300-500 acre feet per year to the aquifer beneath Scotts Valley.



In areas with less permeable clay soils, rainwater infiltration slows runoff into local creeks, reducing stormwater erosion and increasing creek flows during dry months, enhancing biodiversity.



Recommendations:

- **Increase turf conversion rebate**
- **Add rebate for conversion of turf to zero irrigation**
- **Require conversion of spray to drip for shrub irrigation**
- **Require rainwater infiltration feature with turf rebate**
- **\$upport local initiatives for climate-appropriate landscaping**



Recommendation: **Price incentives for all residential users**

In order to optimize a price reward for conservation, customers need to be able to experience a reduction in their water bill in response to their cutback on water use. This price responsiveness is diminished when the fixed charge for water makes up a high proportion of the monthly bill.

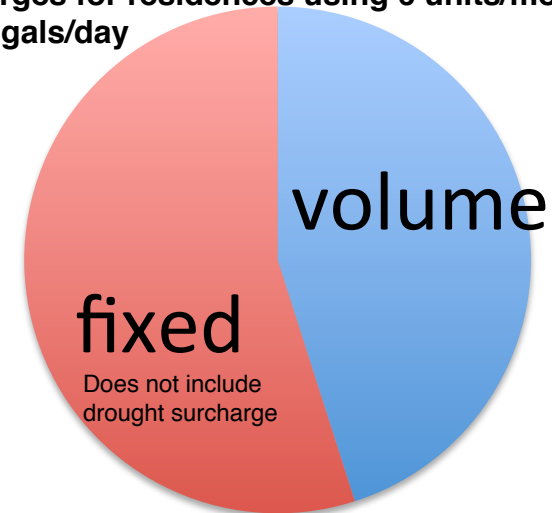
Currently, the fixed charge is higher than the volume charge for a majority of residential customers.

There are a variety of ways to revise the rate structure to make it more rewarding of conservation:

- Put tiers in the fixed charge based on levels of peak use.
- Increase the price differential between tiers.
- Update the tier steps in order to better differentiate outdoor use from indoor use.*
- Tiered sewer rates based on water consumption.

* The current residential rate structure identifies water use up to nine units per month as satisfying “average indoor needs”. Nine units per month is 225 gallons per day. In the past, that may have been average for indoor needs, but that is no longer the case.

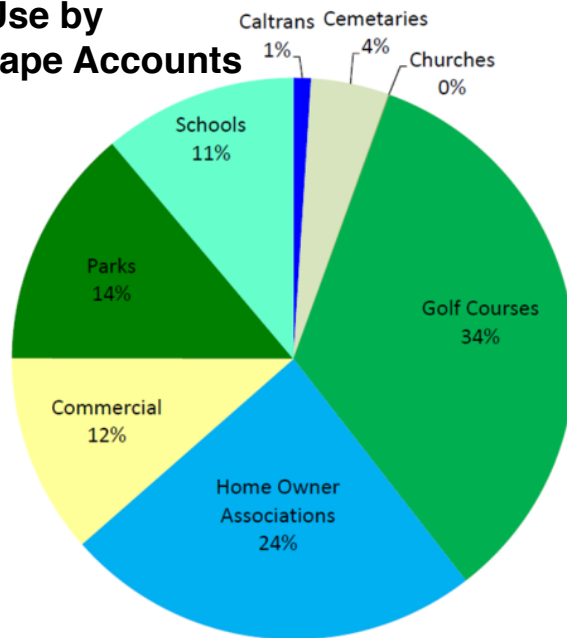
Charges for residences using 6 units/mo = 150 gals/day



Dedicated Landscape Accounts

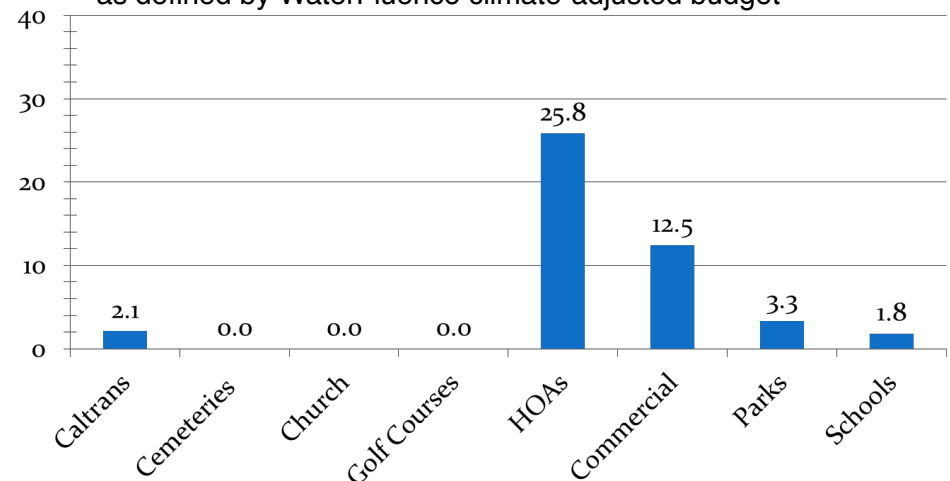
Recommendation: **Gradually shift landscape budgets towards climate-appropriate irrigation levels**

Water Use by Landscape Accounts



Over-watering by Landscape Accounts*

*as defined by WaterFluence climate-adjusted budget



The largest dedicated landscape accounts have irrigation budgets prepared by the WaterFluence program. We recommend that the water budgets be gradually reduced over time to encourage a shift in landscape plants towards drought tolerant and native plants. We also recommend that the price of water for landscapes be tiered---to reward customers who stay within their water budget. We recommend that water budgets be extended to all dedicated landscape accounts (see California Urban Water Conservation Council Best Management Practices).

Reducing Base (Indoor) Use

Recommendation: **Install efficient washing machines in residences**

Due to state and national standards for efficiency, washing machines are rapidly becoming more efficient. Just a few years ago a washing machine was considered efficient if it used under 30 gallons per load. Now machines are available for \$550 that use 16 gallons or less. Over time, with the natural attrition of older machines, the savings from efficient washing machines will cause a considerable reduction in residential demand.

Our initial consideration of cost effectiveness suggests that the City could benefit from supporting financing the installation of efficient washing machines in order to accelerate the timeframe for demand reduction.



The financing mechanism could be one of the following:

1. Pay as You Save (PAYS) program, financing home retrofits through the savings on water and sewer bills. Example: Windsor, Ca. <http://www.townofwindsor.com/index.aspx?nid=819>
2. Property Assessed Clean Energy (PACE) finances water and energy improvements through property tax bills. See the Sac Bee article on Sacramento's adoption of PACE: <http://www.greencitysac.com/Niagara-Sac-Bee.pdf>
3. City-owned machines. The City would purchase efficient and durable washing machines in bulk and install them in single and multi-unit buildings.

Reducing Base (Indoor) Use

Recommendation: **Offer commercial customers who employ best practices increased supply reliability and lower price**

For a business, the imposition of rationing during severe drought years hits the bottom line. This proposal suggests that the City's *Water Shortage Contingency Plan* be modified so that businesses who adopt best practices such as efficient plumbing fixtures, hotel laundry recycling, and climate-appropriate landscaping, would incur a lower level of curtailment in a severe drought.

For example, in a Stage 4 drought, with a system-wide goal of 35% curtailment, the current plan is to ration businesses to 87% of their normal year water use. Under our recommendation, businesses adopting best practices would be expected to cut back to 95% of normal use.

These businesses could also be rewarded with a lower rate for their water use.

As with residential clothes washers, the City could facilitate the financing of landscape retrofits, hotel laundry recycling, etc.



Hotel Laundry Recycling

EPA study – Grand Hyatt, Seattle, 457 rooms

- \$100,000 retrofit cost
- saved \$134,000 in first year,
- saved 38 GPD per occupied room
- Laundry uses 80% less water, 50% less heat

Code Requirements

Recommendation: **Convene a working group of planners, builders, conservation groups, and Water Dept personnel to evaluate possible additions to current codes and fee structures that would encourage water conservation.**

The Draft Master Conservation Plan Program Crec includes two mandates that go beyond current California Building Code:

- a. Requiring high efficiency washers in new development
- b. Require hot water on demand/structured plumbing in new development

Currently there is a spurt of innovation in water efficiency. A working group could evaluate innovative measures for cost effectiveness and recommend them for inclusion in local code. Some possible measures listed by Maddaus:

- a) Require .25 gal/flush urinals in new development
- b) Require efficient dishwashers in new development
- c) Require plumbing for gray water in new development
- d) Ordinance requiring fixture replacement in existing buildings (e.g. toilets)

Some other possible measures:

- Require efficient dish wash sprayers in restaurants.
- Require replacement of all toilets using more than 1.6 gallons per flush in existing buildings.
- Require low-flush urinals in existing buildings.
- Require highest efficiency toilets & faucets in new construction & retrofit upon sale
- Require weather-based controllers in new landscapes



Recommendation:

Establish an Innovation Incubator Program

Santa Cruz can continue its leadership in water stewardship by creating a program that: supports innovations in:

- Supports innovative new technologies, customer financing programs, and customer outreach programs
- Supports pilot projects to facilitate popular adoption of:

- rainwater for toilets & washers
- composting toilets in institutional buildings
- onsite recycling of graywater
- rainwater irrigated lawns
- promotion of native plant landscapes
- onsite recycling of graywater

