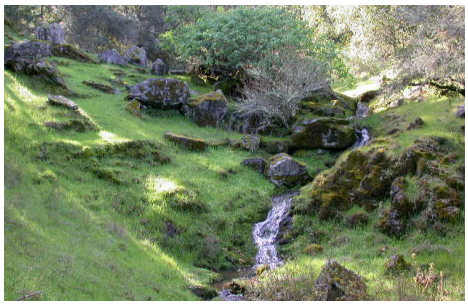
Salmon Creek Water Conservation Program

Conservation Strategy No.7: Water Rates for Rural Coastal California Communities

Coastal Conservancy



Overview

The amount of water used by customers on metered water systems is responsive to the water rate structure. In coastal California water is generally a scarce commodity, and rate structure design can be an effective tool to send a "price signal" to customers to reduce use. Rate structures can guide overall water use toward community goals for sustainable water supply.

Water rate structures can also be used to influence customers' discretionary uses during the critical periods of the year for aquatic habitat. Approaches such as seasonal rates, increasing block rates, or individual "goal" rates can achieve reduced water use during critical life stage periods for aquatic species such as the listed Salmonids in Sonoma County's Salmon Creek Watershed. Rate structures to implement these approaches are discussed in the implementation section of this Strategy.

Water purveyors have many options for rate structure design. Most rates are made up of two components:

1) a "fixed" charge that is assessed regardless of the amount of water used, and

2) a commodity fee for each unit of water used.

Not all rate structures have the commodity fee; for example, with a "flat fee" rate structure, a water customer pays a fixed charge each month regardless of the amount of water that is used. This means there is no financial incentive to use water efficiently. An "increasing block rate" structure usually has both a fixed and commodity charge: a fixed monthly fee regardless of use, and a commodity charged for all water used, with higher rates per unit for successive blocks (fixed quantities). The increasing block rate structure is conservation-oriented and results in a measurable pay-back when efficient fixtures are installed and use is reduced.

Target community

The community water system purveyor is the target for this Conservation Strategy. The water purveyor is responsible for setting water rates for customers of public, private or mutual water systems. Privately-owned water systems must have their rates approved by the California Public Utilities Commission.

Potential effect

Generally, customers respond to the price signal sent by water rates in making decisions about how they use water. Different rate structures send different price signals. In general, water use goes down as the price of water goes up, and rate structures that price the commodity high result in the greatest reduction in water use. The income level of the community may influence how effective a rate structure is in reducing water use; in affluent communities rates might have to be coupled with additional regulatory requirements, such as water flow restrictionfor customers that exceed their goal or allotment, to change water use levels.

Implementation

Setting water rates and deciding on the water rate structure is just one component of the financial decision-making process all water utilities face. Water utility managers must establish and design water

rates that meet revenue requirements and are fair and equitable to all customer classes, including single-family residential, multi-family residential, commercial, industrial, and any special customer classes that are recognized by the utility. Rates must be set in such a way that no customer class subsidizes another customer class. Rate-setting involves the following procedures:

- Determining the water utility's total annual revenue requirements, including reserves, for the period for which the rates apply.
- Determining service costs by allocating the total annual revenue requirements to the water system components and distributing these costs to the various customer classes according to their service requirements.
- Designing water rates to recover the cost of service from each class of customer while maintaining rate equity between customer classes. This step is the focus of the discussion that follows.

This financial analysis and rate-setting process is covered in detail in the US Environmental Protection Agency's guide Setting Small Drinking Water System Rates for a Sustainable Future at: http://www.epa.gov/waterinfrastructure/pdfs/final_ratesetting_guide.pdf

The focus of this Conservation Strategy is on designing water rates that support water conservation and reduce dependence on water supply from sources critical for aquatic habitat. This is only one step of the process outlined above.

Water providers can expect to achieve any or all of the following goals when they adopt water conservation rate structures:

- reduce peak use
- reduce seasonal use
- reduce total system demand

The **community benefits** from water conservation rates because these rates:

- communicate an overall conservation consciousness
- reward efficient users
- surcharge nonessential and inefficient water users

Utilities can also achieve economic goals through water conservation rate structures, including:

- establishing price equity among customers
- maintaining revenue stability

There are two key elements to evaluate in the design of a conservation water rate structure:

1) the proportion of utility costs that is recovered through fixed versus commodity charges, and

2) the structural form of the commodity rate.

These elements are described in detail below. Water utilities need to evaluate all of these options before deciding which structure most effectively carries out the community goals for financial stability, water supply reliability, and environmental health.

Fixed versus commodity rate components

Water rates typically have a monthly fixed charge (based on meter size) that is assessed whether water is used or not. Historically, this charge has been designed to cover the "fixed costs" the utility faces regardless of the volume of water sold – the cost of running the distribution system, fixing leaks, reading meters, etc. As conservation rate structures have become the predominant approach to water rate setting in California, the percent of overall revenue from the fixed charges has been declining. As a result, some of the utilities' fixed costs are typically covered by the commodity-charge revenue.

The second part of a typical water rate is the commodity charge, which is a charge per unit for the quantity of water used. Water is typically billed in either the 1,000 gallon unit or the hundred-cubic-foot unit (1 HCF=748 gallons). The commodity charge sends a signal that the bill will increase as water use increases. The nature of the price signal depends on the amount of the commodity charge. This commodity component of water revenues tends to be more "volatile" than the fixed charge revenue; concerns about volatility can be alleviated by establishing a "rate stabilization reserve fund" to provide adequate revenue during years of low water usage.

A key element of conservation-based rates is having a high percentage of total revenue for water sales coming from the commodity charge rather than the fixed charge. In general, the higher the portion coming from the commodity charge, the greater the price signal is to the consumer. The California Urban Water Conservation Council considers a rate structure conservation-oriented if 70% or more of the revenue from water sales comes from the commodity charge.

The example that follows illustrates how the price signal changes when the rate structure changes. The table below compares a water bill for 5,000 gallons of water use with two different rate structures: a high fixed charge/low commodity charge scenario (in italics), and a low fixed charge/high commodity charge scenario. The same rate structure is then applied to a 3,000 gallon water bill to illustrate how a low fixed charge delivers a greater prices signal (a 32% reduction rather than an 8% reduction) when water use goes down. This example demonstrates how critical it is to have a high ratio of commodity to fixed charge for sending a price signal to the customer.

Comparison of Two Variations of Fixed and Commodity Charges

	Water Use (gal)	Fixed Monthly Charge	Commodity Charge per 1000 gal	Total Commodity Charge	Water Bill	Percent Change in Bill
	5,000 GALLON USE MONTH					
High Fixed/ Low Com.	5,000	$20.00	$1.00	$5.00	$25.00	
Low Fixed/ High Com	5,000	$5.00	$4.00	$20.00	$25.00	
	3,000 GALLON USE MONTH					
High Fixed/ Low Com.	3,000	$20.00	$1.00	$3.00	$23.00	-8.00%
Low Fixed/ High Com	3,000	$5.00	$4.00	$12.00	$17.00	-32.00%

Water rate structures

There are numerous ways to structure the commodity water rates. The following sections briefly define non-conservation-based rate structures and more fully define the most common conservation-based rate structures.

Non-Conservation -Based Rate Structures

Flat Fee Rates have no commodity charge and the customer received the same bill regardless of the level of water use. Most often systems with flat fee rates do not have water meters.

Decreasing Block Rates have a commodity charge that decreases as the quantity of water consumed increases.

Uniform Rates have a commodity charge that is constant for each unit of water sold regardless of the quantity of water consumed. Uniform rates can be considered conservation-based if a very large portion of overall revenue is from commodity charges and the unit rate is high. Regardless of the unit charge, a uniform rate does not send as strong a message as an increasing block rate.

A simple illustration of the difference in pricing structures between the decreasing block rate, uniform rate and increasing block rate is presented in the table below.

Comparison of Three Commodity Charge Structures

Block Size	Decreasing Block	Uniform	Increasing Block
Block 1	$5.00/1000 gal	$3.50/1000 gal	$1.50/1000gal
Block 2	$3.00/1000 gal	$3.50/1000 gal	$3.00/1000gal
Block 3	$1.50/1000 gal	$3.50/1000 gal	$5.00/1000gal

Conservation -Based Rate Structures

Increasing Block Rates separate consumption levels into two or more blocks, with rates per unit increasing as the level of consumption increases. Customers with higher levels of water use face higher rates and higher water bills. It is not uncommon for the highest block of an increasing block rate to be tied to the cost of new water sources.

One requirement of maintaining rate equity among customer classes with block rate structures is that rates and block break-points must be set so that the average rate paid within each customer class is equal across all classes. This assures that no customer class subsidizes another customer class.

Seasonal Rates have water prices varying by season. The design of the seasonal rate, the particular season used and the difference in price between seasons should be based on the community circumstances and unique characteristics. Seasonal rates can be blended with increasing block rates. For coastal California communities, seasonal rates have the greatest potential to achieve reduced water use during the critical habitat period for the aquatic species.

Simple Seasonal Rate Example

Season	Water Rate	
Winter (November - March)	$4.00	per 1,000 gal
Spring/Fall (April, May, October)	$7.00	per 1,000 gal
Summer (June - September)	$12.00	per 1,000 gal

Individualized "Goal" Rates are most often a special application of the increasing block rate structure, but with the block sizes and block break-points set for each customer designed to provide for a use "goal" which is based on efficient water use for the needs of that customer. The "goal" for customers should be linked to the water utility and community goals. Individualized "goal" rates are more administratively intensive than most other rate structures.

Here is an example of the individualized "goal" rate: the initial block may be set at efficient indoor use for the number of people in a given home; any use above the initial block may be charged at a higher unit cost. Goal rates can be coupled with both increasing block rates and seasonal rates for a more customized rate structure.

Excess Use Rates impose a higher rate on excessive water use. The customer pays more for water use that is considered higher-than-average. This structure requires the utility to establish a threshold level for excess consumption for each type of user. The residential threshold is often based on average per capita water use. The non-residential thresholds might be based on a standard for a certain kind of industry. Like the goal-based rate structure, excess use rates require special billing capability and account-specific information for each customer.

Tools

US Environmental Protection Agency's *Setting Small Drinking Water Rates for a Sustainable Future* guides water managers through the steps of assessing cost of service and setting rates:
http://www.epa.gov/waterinfrastructure/pdfs/final_ratesetting_guide.pdf

Boise State Environmental Finance Center has several easy to use computer programs (*CapFinance, Ratio8*, and *RateCheckup*) to help water systems with financial decisions and rate structures at:
http://efc.boisestate.edu/efc/Tools/tabid/58/Default.aspx

The California Urban Water Conservation Council (CUWCC) *Memorandum of Understanding for Urban Water Conservation in California* has a definition of a water conservation rate structure at:
http://www.cuwcc.org/mou/bmp1-utility-operations-programs.aspx

Coastal Conservancy

This conservation strategy was produced by Virginia Porter Consulting for the Salmon Creek Water Conservation Program (SCWCP). The SCWCP is a multi-year, multi-stakeholder effort focused on developing alternative water supply solutions that support human needs while protecting and restoring instream flows for fish and wildlife.