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# VOLUMETRIC PRICING FOR SANITARY SEWER SERVICE IN CALIFORNIA

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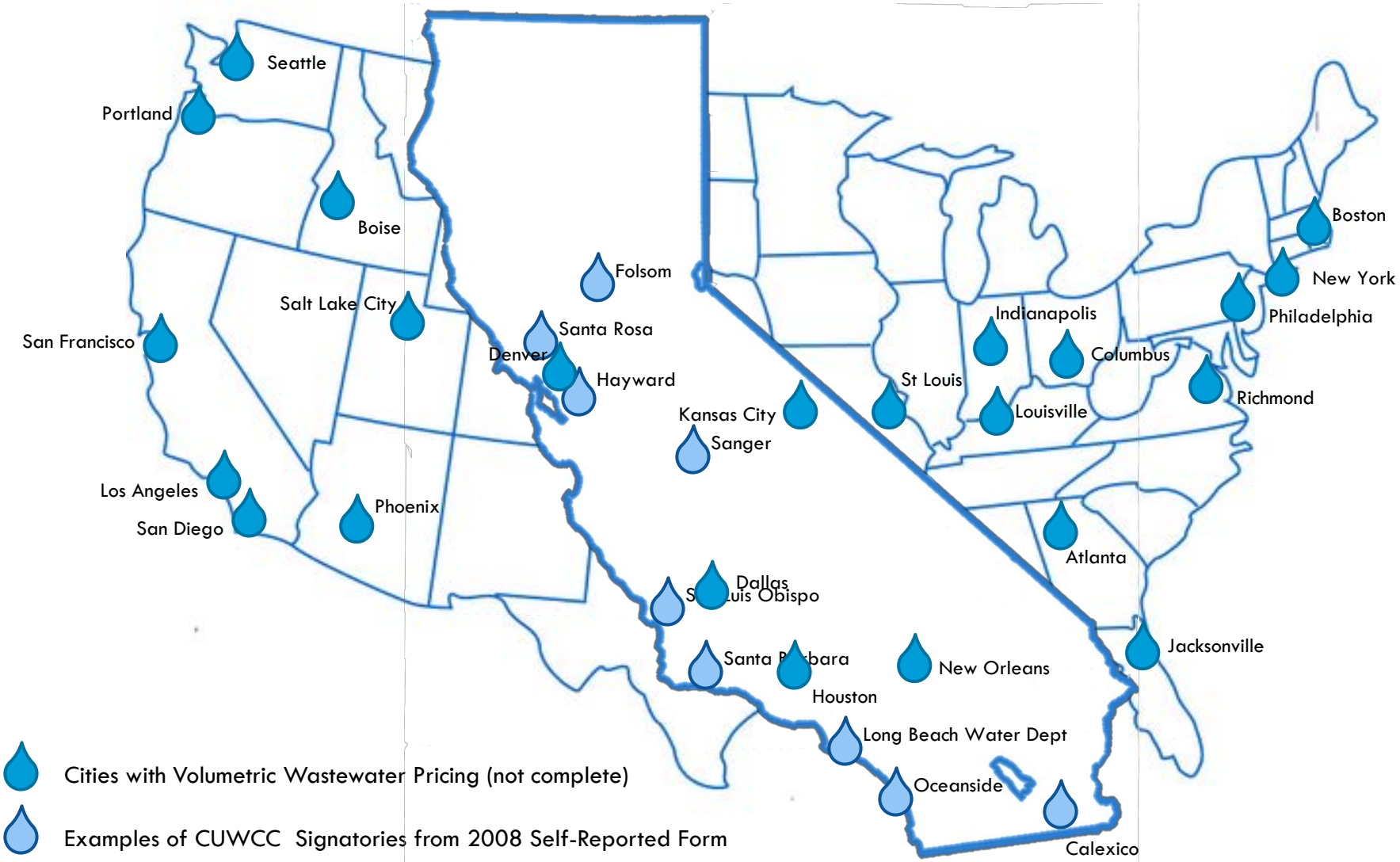
# What is Volumetric Wastewater Pricing?

- Simple concept of billing a customer for wastewater service based on water actually used vs. a flat charge.
- Based on water meter reading—no need for separate sewer meter—typically from winter water use.
- Most California households pay for water service based on the use recorded on each household's water meter, but
- Currently, about **70 percent** of California households that receive sanitary sewer service pay flat, non-volumetric rates.

# Sewer Systems Supported by VWWP



# Long-Established Policy Favors VWWP

California Urban Water Conservation Council Memorandum of Understanding --

- Directs signatory water suppliers who also provide sewer service to use conservation pricing (specifically barring flat, non-volumetric rates).
- Water suppliers who do not provide sewer service must make "good faith efforts" to work with local sewer service providers to adopt conservation pricing.

# Benefits of Volumetric Pricing in California

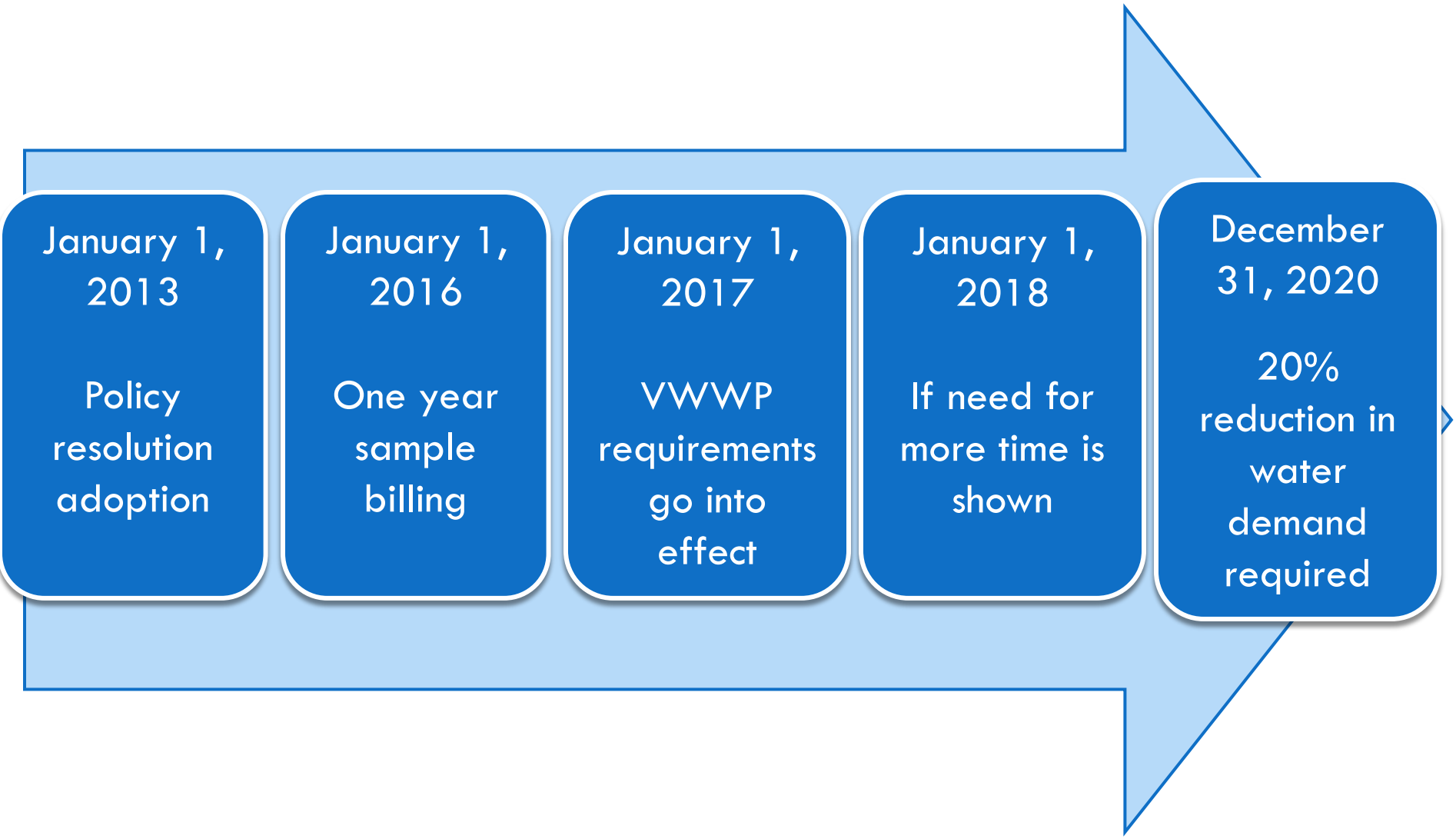
| Time from Implementation | Water Savings (AFY) | Water Demand Reduction (%) |
|---|---|---|
| Short Term (1-4 years) | 141,000 | 3.2 |
| Long Term (10-20 years) | 283,000 | 6.4 |

- **Equitable pricing**: Customers who conserve water can be rewarded on their sewer and water bills.
- Spurs **investment** in water-saving appliances, fixtures, and repairs throughout the state.

# Benefits of Volumetric Wastewater Pricing, cont.

- Benefits wastewater agencies by reducing base flows
  - Helps preserve WW collection and treatment capacity
  - Delays or eliminates the need for costly treatment plant expansion
  - Reduces operating costs and consumption of energy
  - Reduces sewer overflows in capacity-constrained collection systems

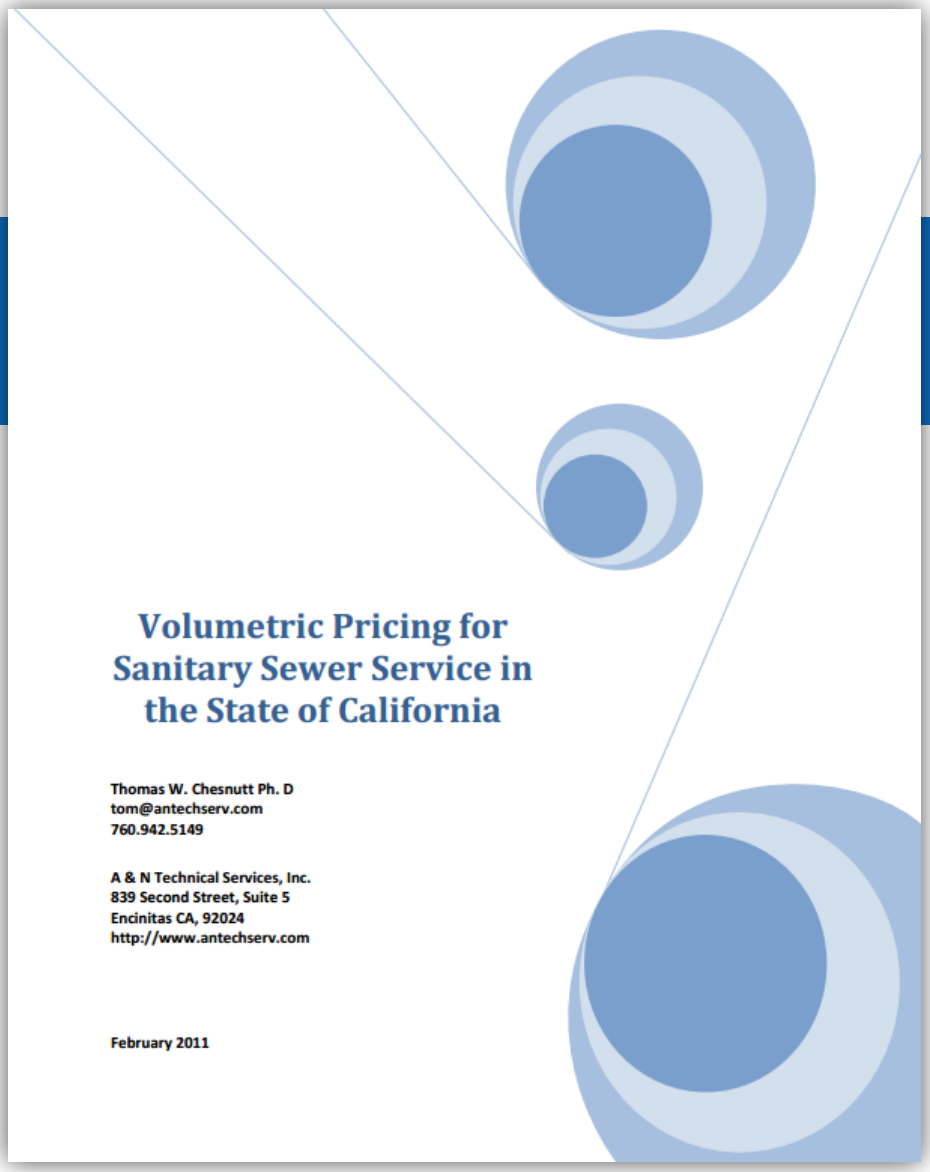
# Implementation Scenario



# Report

## Methodology

## Results



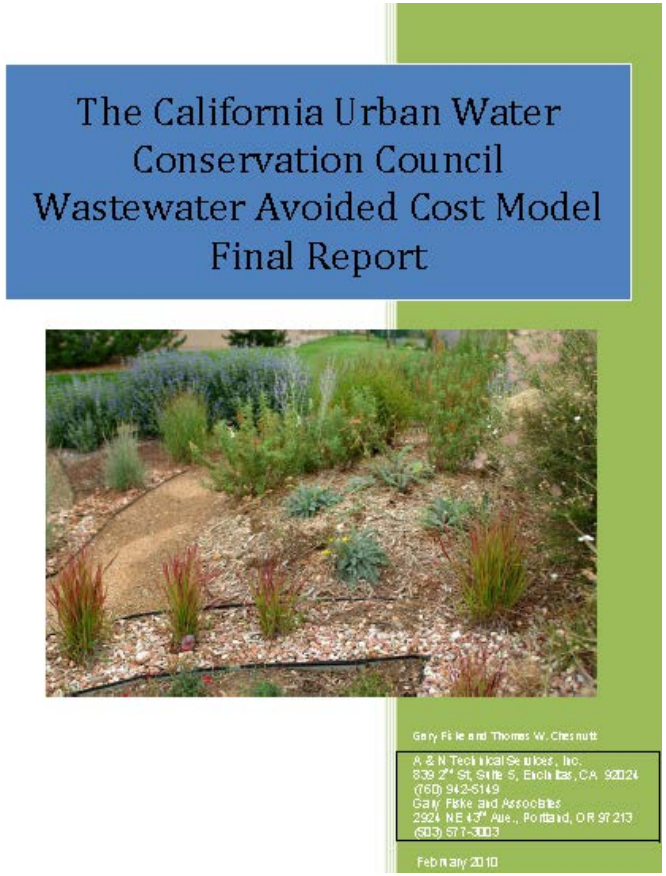

Report available at: http://www.cuwcc.org/WorkArea/showcontent.aspx?id=17206

# Wastewater Charges and Incentives

- Wastewater fixed charges and volumetric rates provided important incentives to customers.
- Fixed charges do not distinguish between customers' wastewater volume or loading.
- Fixed charges also do not provide signals to customers about the merits of on-site treatment versus treatment in a centralized wastewater treatment system.

# Wastewater Charges and Incentives

- CUWCC/EPA Wastewater Avoided Cost Model quantifies costs that could be avoided for wastewater utilities as a result of the permanent reductions in potable water demand that would result from an increase in the real price of water.




*The California Urban Water Conservation Council Wastewater Avoided Cost Model: Final Report*, A report for CUWCC and the US EPA, February 2010

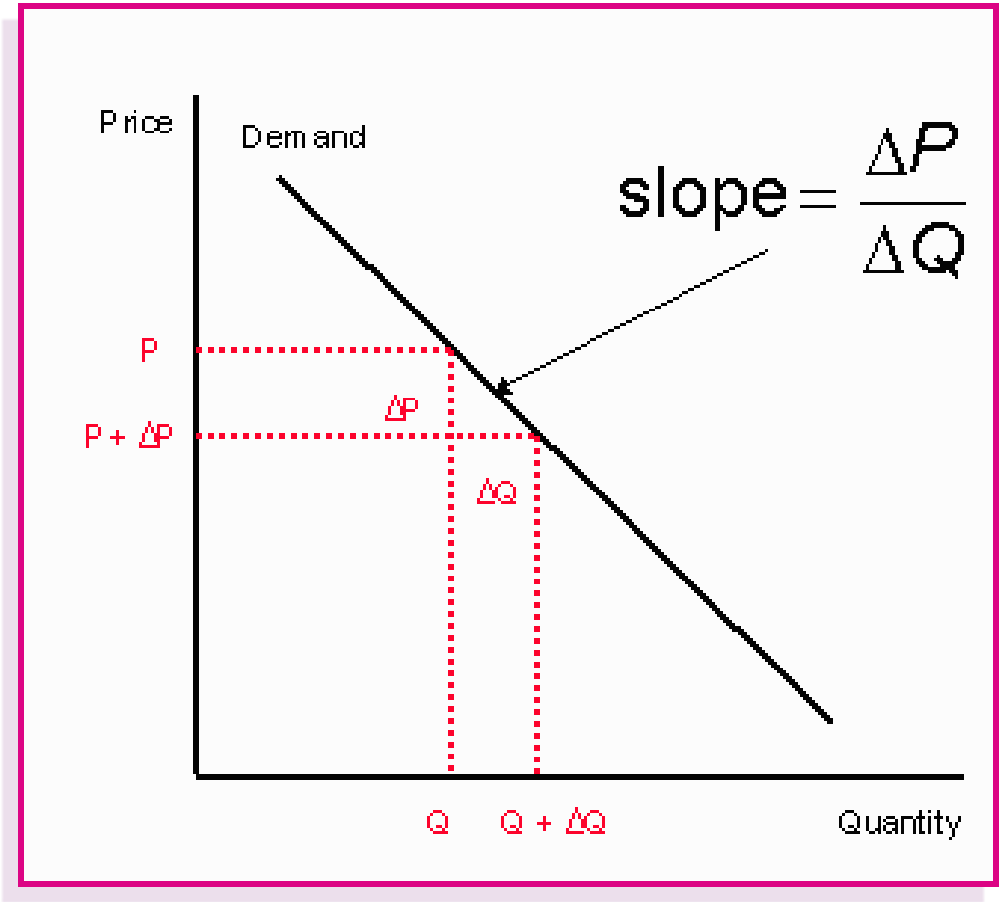
# Volumetric Pricing for Sewer Service

- About 78 percent of California households pay for sewer service through a flat non-volumetric charge.
- Why would shifting to volumetric pricing for sewer service affect potable water demand?
- Using estimates from the empirical literature, this analysis quantifies the predictable effect on residential water demand that will occur as a result of volumetric sewer pricing.

# Law of Demand

- The *law of demand* states that consumers buy less of a good when its price increases and more of a good when its price decreases
- This is why demand curves are downward facing
- Exceptions are some luxury goods and completely addictive drugs.
  - Potable water is not heroin

# Price elasticity of demand illustrated

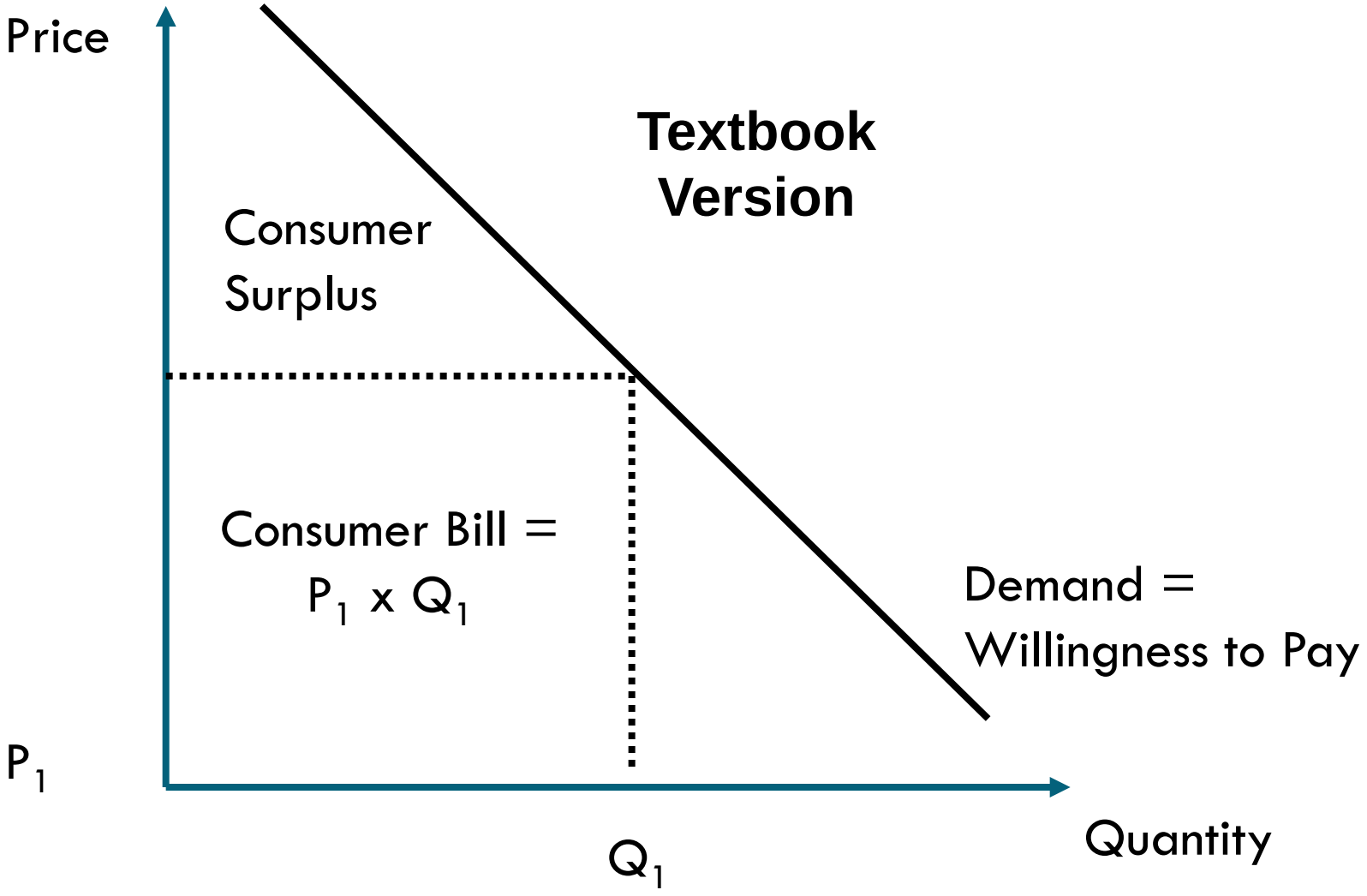


# Sample elasticities (general)

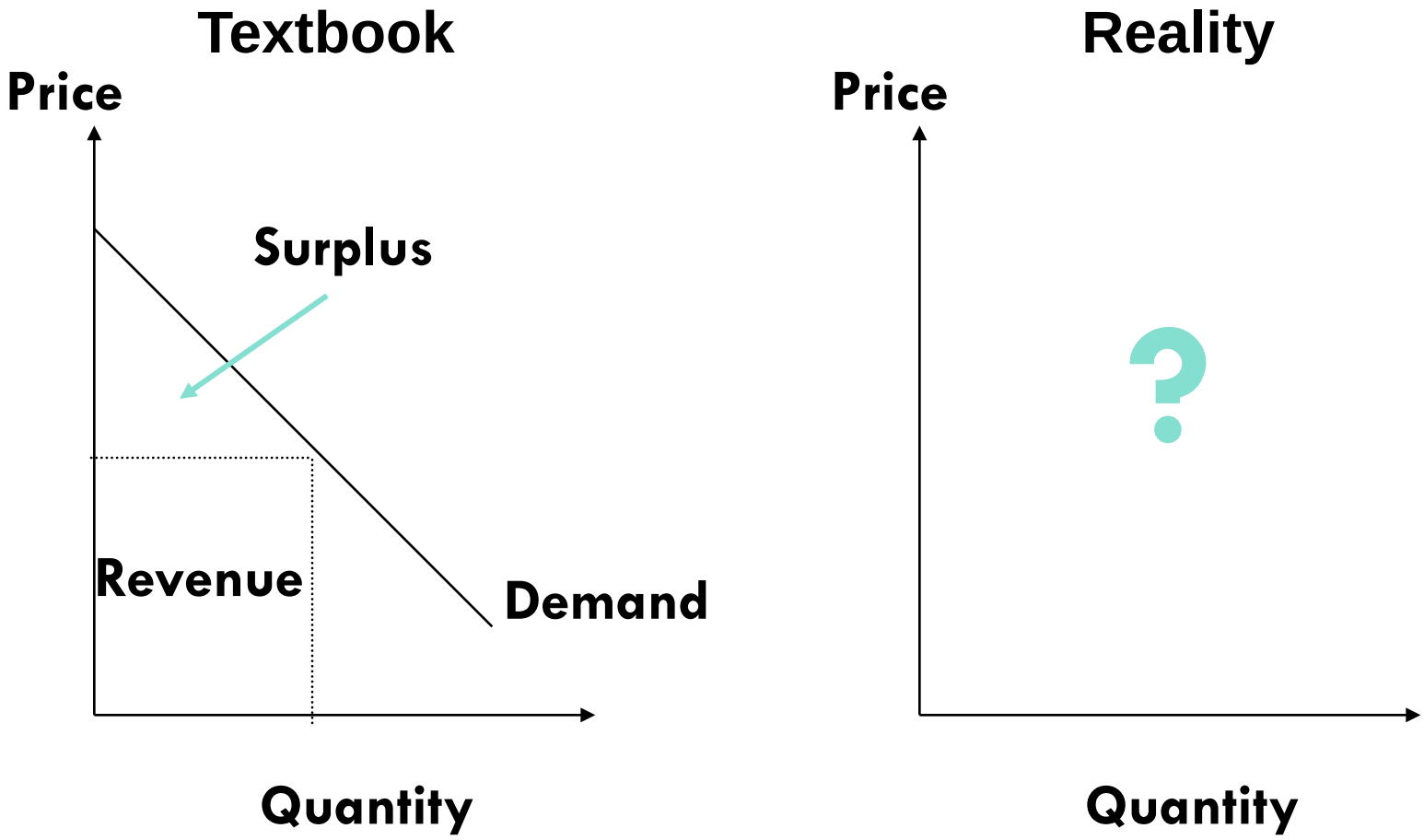
| | | |
|---|---|---|
| SALT, MATCHES, TOOTHPICKS | .10 | Relatively inelastic |
| NATURAL GAS (SHORT-RUN) | .10 | |
| AIRLINE TRAVEL (SHORT-RUN) | .10 | |
| GASOLINE (SHORT-RUN) | .20 | |
| COFFEE | .25 | |
| NATURAL GAS (LONG-RUN) | .50 | |
| PHYSICIAN SERVICES | .60 | |
| GASOLINE (LONG-RUN) | .70 | |
| MOVIES | .90 | Unitary elasticity |
| PRIVATE EDUCATION | 1.1 | |
| HOUSING (OWNER-OCCUPIED) | 1.2 | |
| RESTAURANT MEALS | 2.3 | |
| AIRLINE TRAVEL (LONG-RUN) | 2.4 | |
| FRESH GREEN PEAS | 2.8 | |
| CHEVROLET AUTOMOBILES | 4.0 | |
| FRESH TOMATOES | 4.6 | Relatively elastic |

Source: Gwartney and Stroup, 1997

# Individual Consumer Water Demand

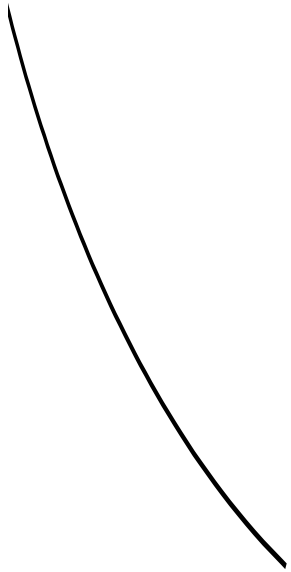


# What does Demand for Water Look Like?



# More accurately for Water Demand…

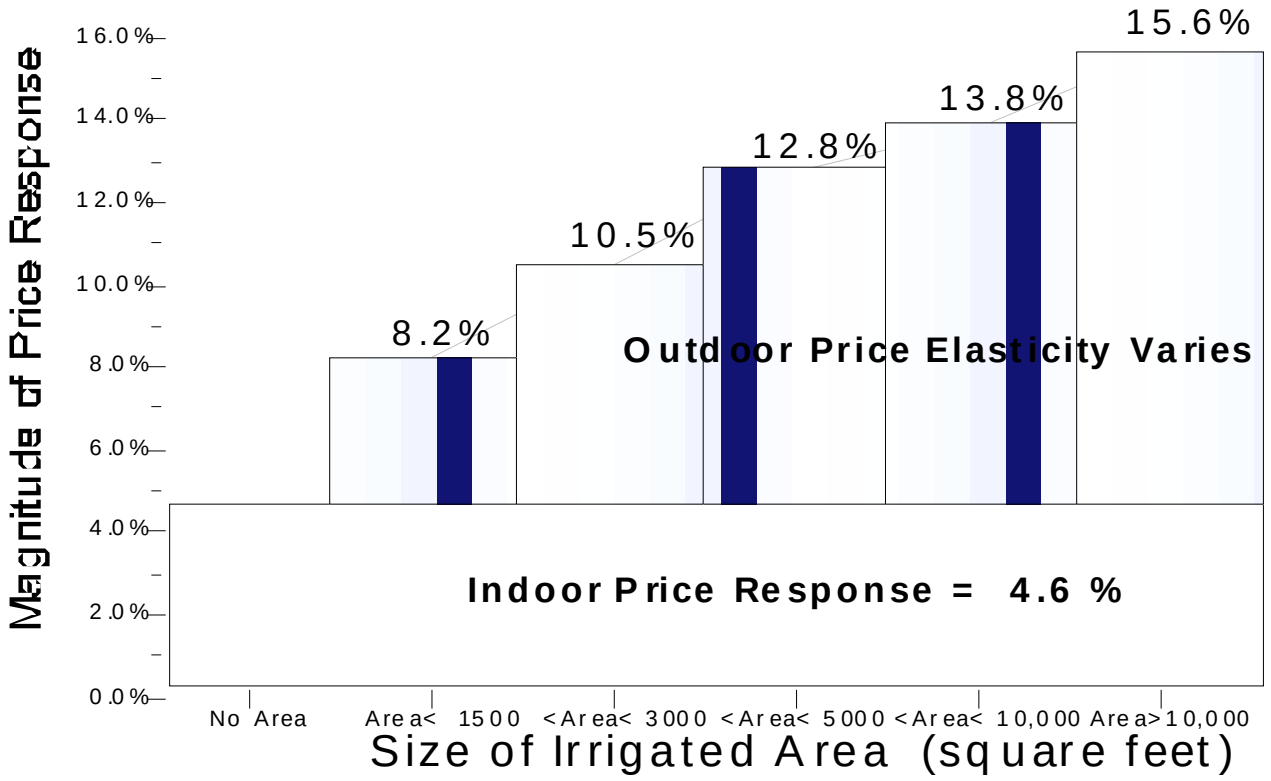
- Customers display significant willingness to pay for safe, reliable water
- Evidence from empirical studies of urban water demand suggest very inelastic demand
- Translated, this means water use is very valuable to customers



# Demand is more elastic in the long run

- In the short-run, customers are stuck with their existing water-using equipment; Only behavior changes
- In the long-run, customers can replace water-using fixtures.

# Price elasticity varies with End Use




**Source: Chesnutt, et al. (1995), *ULF Toilet Programs***

# Potable Water Demand Response

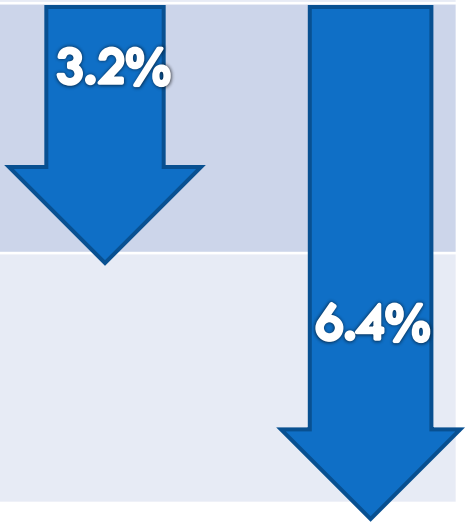
- Demand response for indoor end uses is very inelastic, -4.6%
- Demand is more elastic in the long run than in the short run.
  - In the short run, customers can mainly change their behavior
  - In the long run, customers can replace water-using fixtures with more efficient ones

# Report: Methodology

- **Affected Sewer Agencies**: Derive the number of potentially affected sewer agencies from SWRCB wastewater annual reports
- **Revenue/Volumetric Price Impacts**: Translate revenue generation from flat charges to a comparable volumetric price increase
- **Volumetric Potable Water Conservation**: Estimate price-induced water conservation of residential potable water demand using empirical parameters from the economic literature (price elasticities)

# Report: Results and Total Water Savings in California

| | |
|---|---|
| **Sum of Residential Revenue at Fixed Charge-Only Agencies** | $2,076,103,380 |
| **Total Est. Residential Use (AFY)** | 4,428,055 |
| **Est. Short Run Water Savings (AFY)** | ~141,700 |
| **Est. Long Run Water Savings (AFY)** | ~283,400 |



# Report: Gallons Per Capita Per Day Savings

| Hydrologic Region | Baseline GPCD (1995-2005, DWR) | Population (2000, DWR) | Demand AFY | GPCD-After, Short Run | GPCD-After, Long Run | 2020 Target | Contribution of Short Term Savings |
|---|---|---|---|---|---|---|---|
| North Coast | 165 | 644,400 | 119,100 | 164 | 163 | 137 | 3 % |
| San Francisco Bay | 157 | 6,105,650 | 1,073,755 | 153 | 150 | 131 | 15 % |
| Central Coast | 154 | 1,459,205 | 251,716 | 152 | 149 | 123 | 6 % |
| South Coast | 180 | 18,223,425 | 3,674,314 | 177 | 173 | 149 | 10 % |
| Sacramento River | 253 | 2,593,110 | 734,878 | 247 | 240 | 176 | 8 % |
| San Joaquin River | 248 | 1,751,010 | 486,423 | 245 | 242 | 174 | 4 % |
| Tulare Lake | 285 | 1,884,675 | 601,666 | 277 | 269 | 188 | 8 % |
| North Lahontan | 243 | 99,035 | 26,957 | 242 | 242 | 173 | 1 % |
| South Lahontan | 237 | 721,490 | 191,537 | 237 | 236 | 170 | De minimis |
| Colorado River | 346 | 606,535 | 235,075 | 345 | 343 | 211 | 1 % |
| **CALIFORNIA** | **192** | **34,088,535** | **7,331,340** | **188** | **185** | **154** | **10.5%** |

# 2020 Savings May be More or Less

- Factors ***decreasing*** possible savings by 2020 –
  - Remaining unmetered water service areas (e.g., Sacramento) not subtracted
  - Continuation of annual or semi-annual billing may blunt conservation effect
- Factors ***increasing*** possible savings by 2020 –
  - Population growth from 2008 to 2020 not estimated
  - Higher future sewer bills likely to increase customer response
  - Savings from conversion of commercial accounts not estimated
- Note: Fixed cost component of future rates modeled at 30%
  - Higher fixed share ***decreases*** savings; lower share ***increases*** savings

# Logistics

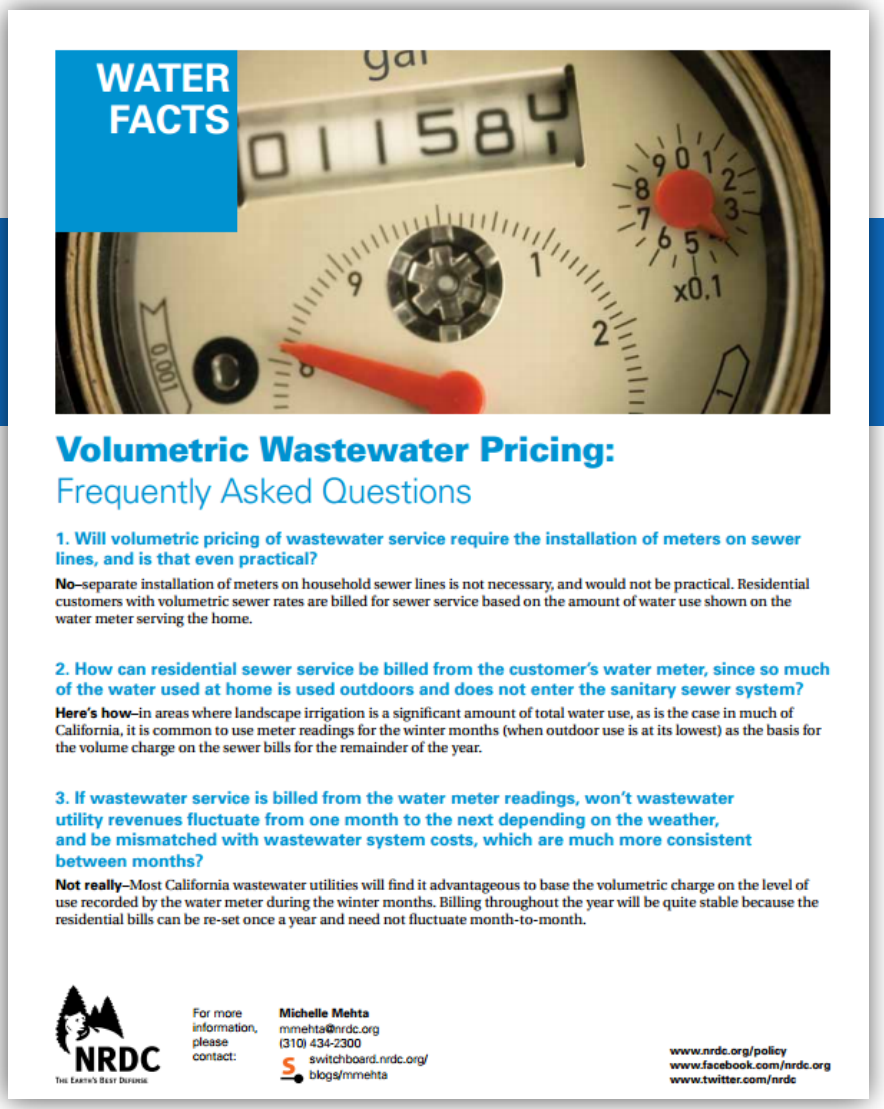
Summary

Billing Based on Flow

Billing Process

Effect on Residential Bills

Data-Sharing




FAQs available at: http://www.nrdc.org/water/files/Volumetric-Wastewater-FAQ.pdf

# Logistics Summary

- Policy should allow:
  - Use of existing water meters
    - Would not require installation of water or sewer meters
  - Local discretion in designing rate structure
    - Use of combinations of fixed and volumetric charges
  - Use of existing billing process and frequency
    - Billing on tax rolls still permitted

# Billing Based on Flow

- Many commercial sewer customers are already billed with volumetric wastewater rates
- Residential volumetric wastewater rates are commonly based on winter water use. Examples:
  - 90% of lowest average daily water consumption from previous Oct-April
  - 100% of 2 lowest readings from previous Nov-April
  - 85% of 2 lowest readings from previous Dec-May

# Billing Process

- Agencies that also provide water service
  - Add sewer charge to existing bills
- Agencies that do not provide water service
  - Acquire meter data from local water supplier/s
  - Add sewer charge to tax roll

  Or
  - Make arrangements to add sewer charge to water supplier's bill

# Effect of Conversion on Residential Sewer Bills

- Median customer will initially pay slightly less
- Above-average water users would see a bill increase (one-third of total residences)
- Below-average water user would probably see a bill decrease
- Customers can take action to lower their bills by conserving water

# Data-Sharing

- Relatively simple software upgrades in many cases
  - More complex upgrades would cost more, but benefits far outweigh cost.
  - Ongoing administration costs are pennies a month.
- Water suppliers have obligation to cooperate with wastewater agencies to facilitate conversion
  - Required of CUWCC signatories (MOU)
  - Required of all water providers seeking financial assistance (AB 1420)

# Contact Information

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