

Conserving Our Water

Richard Harris
Water Conservation Manager
East Bay Municipal Utility District

Board Member
Alliance for Water Efficiency



Alliance *for* Water Efficiency

A VOICE AND
A PLATFORM
PROMOTING THE
EFFICIENT AND
SUSTAINABLE
USE OF WATER



Presentation Overview

- A Perfect (*Dry*) Storm
- The California Water Challenge
- The Water and Energy Connection
- Future Trends in Water Efficiency
- Turning *Green* Building *Blue*

A goldfish is swimming in a clear glass fishbowl. The fish is positioned in the lower right quadrant of the bowl. The water is clear and blue. The fishbowl is partially filled with water, and the top edge of the bowl is visible at the top right of the image.

A VOICE AND
A PLATFORM
PROMOTING THE
EFFICIENT AND
SUSTAINABLE
USE OF WATER

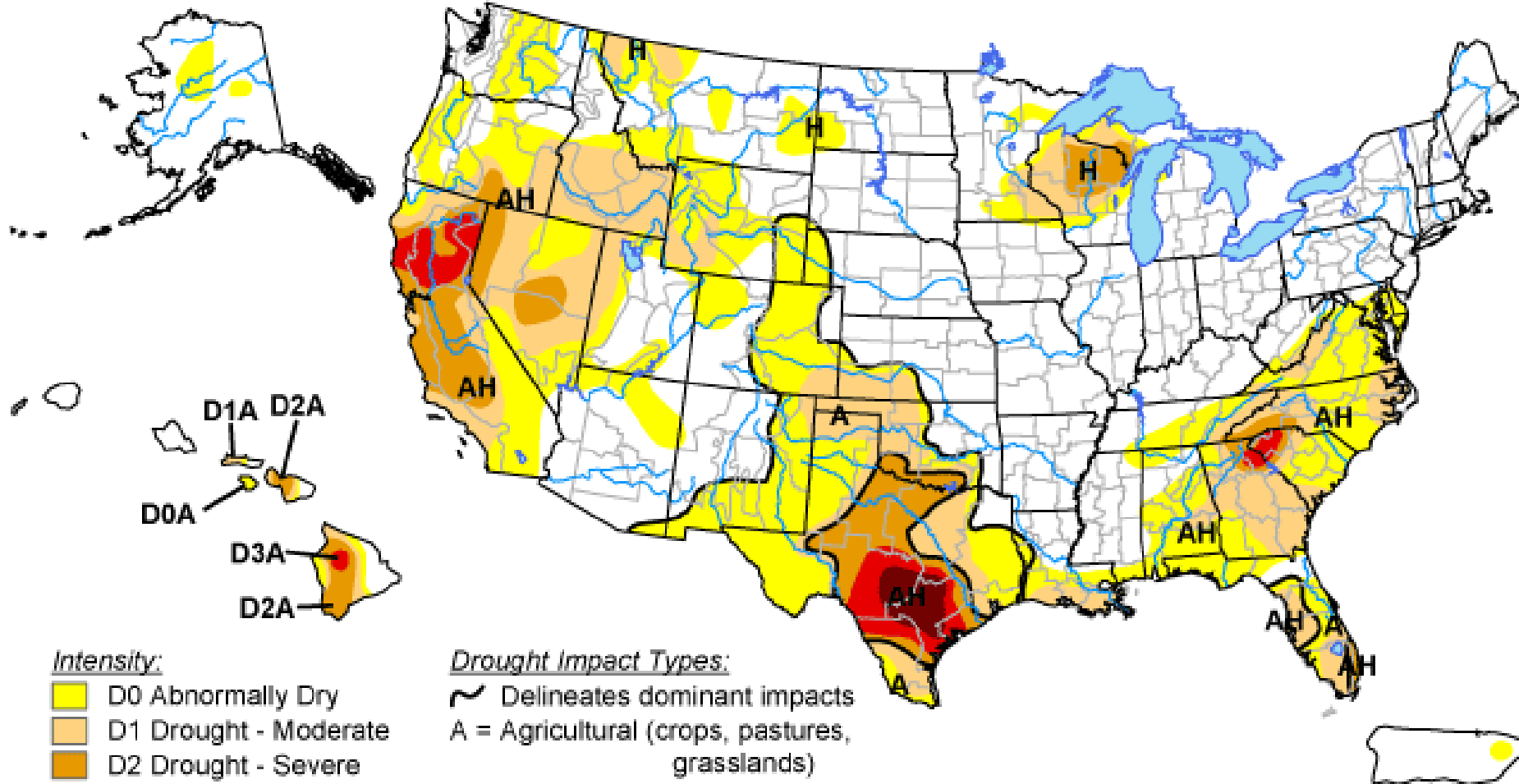


Alliance *for* Water Efficiency






U.S. Drought Monitor

February 24, 2009


Valid 8 a.m. EST



Intensity:

-  D0 Abnormally Dry
-  D1 Drought - Moderate
-  D2 Drought - Severe
-  D3 Drought - Extreme
-  D4 Drought - Exceptional

Drought Impact Types:

-  Delineates dominant impacts
- A = Agricultural (crops, pastures, grasslands)
- H = Hydrological (water)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://drought.unl.edu/dm>



Released Thursday, February 26, 2009
Author: Rich Tinker, Climate Prediction Center, NOAA



Statewide Water Supply Status

Storage in Thousand Acre-Feet (January 12, 2009)

Reservoir (TAF)	Capacity	WY 2008	WY 2009	Percent of Average	Supply Condition
Trinity	2,448	1,398	976	58	Poor
Shasta	4,552	1,974	1,383	46	Critical
Oroville	3,538	1,267	973	46	Critical
Folsom	977	254	218	49	Critical
New Melones	2,420	1,463	1,153	71	Poor
Fed. San Luis	966	679	270	38	Critical
Millerton	520	203	197	65	Poor

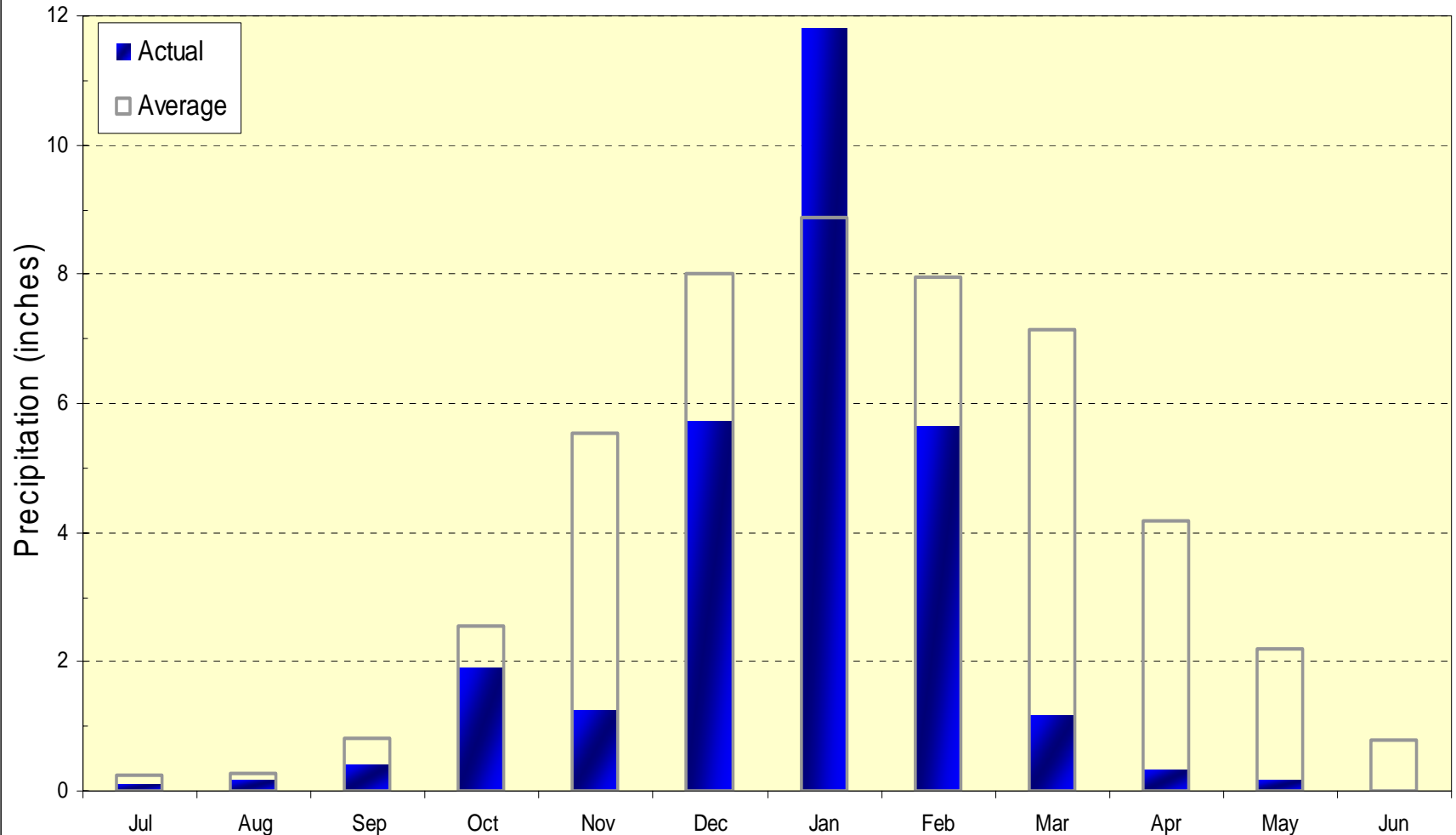
EBMUD	752	484	418	71	Poor
--------------	-----	-----	-----	----	------

EBMUD	752	484	418	64	Poor
--------------	-----	-----	-----	----	------

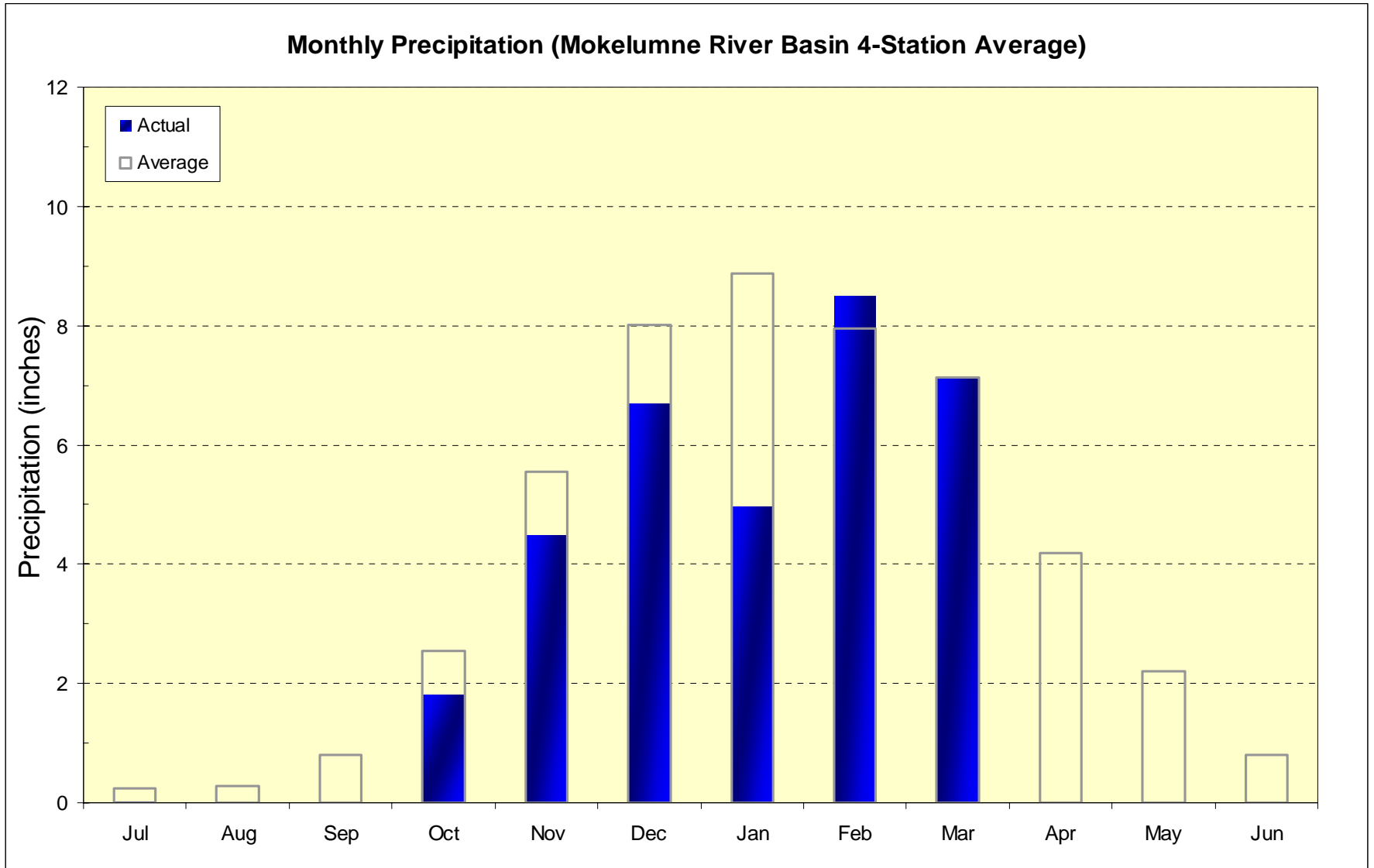
Data as of March 8

2007-08 Monthly Precipitation – Mokelumne

Mokelumne River Basin 4-Station Average



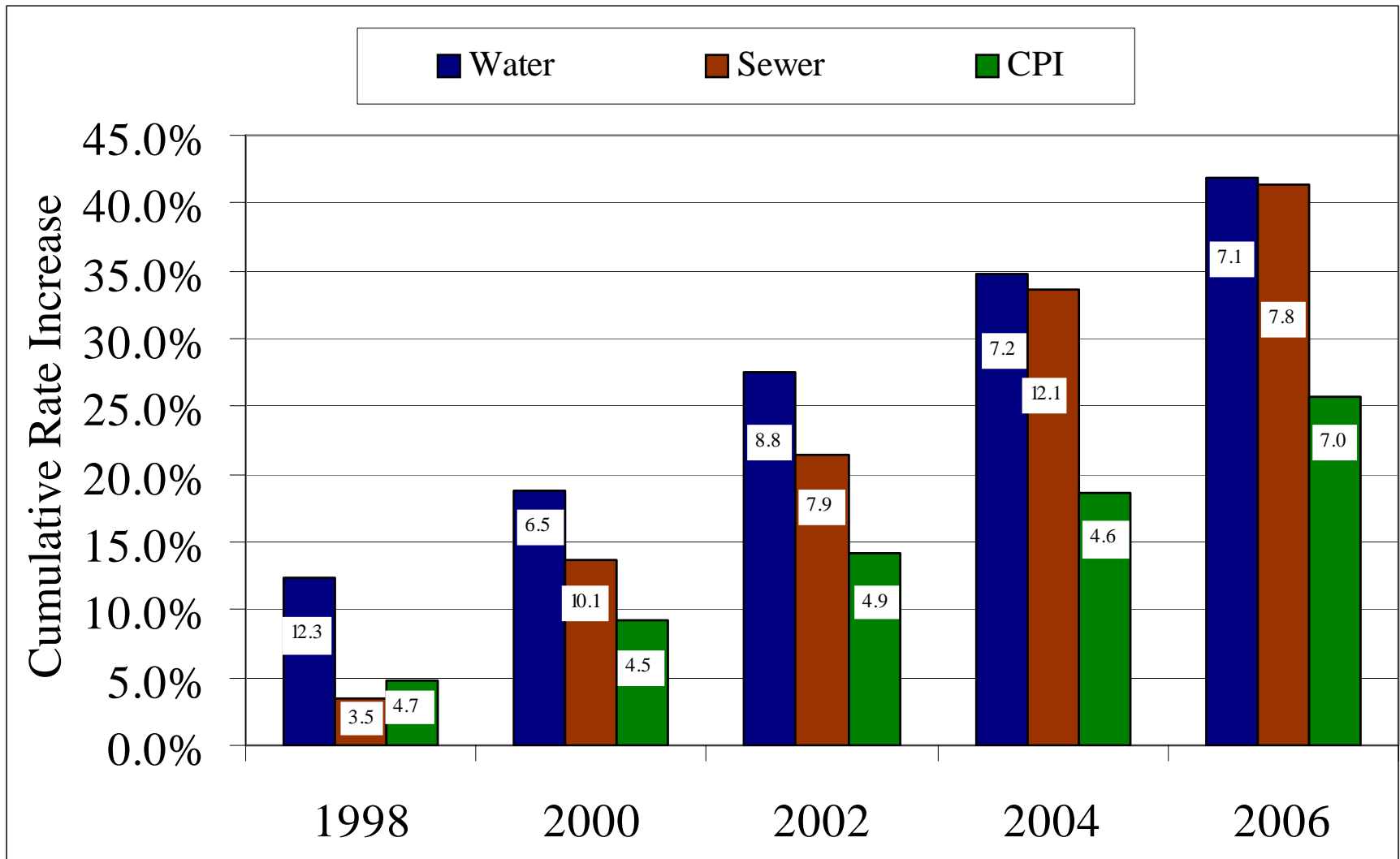
2008-09 Monthly Precipitation – Mokelumne



EBMUD Camanche Reservoir



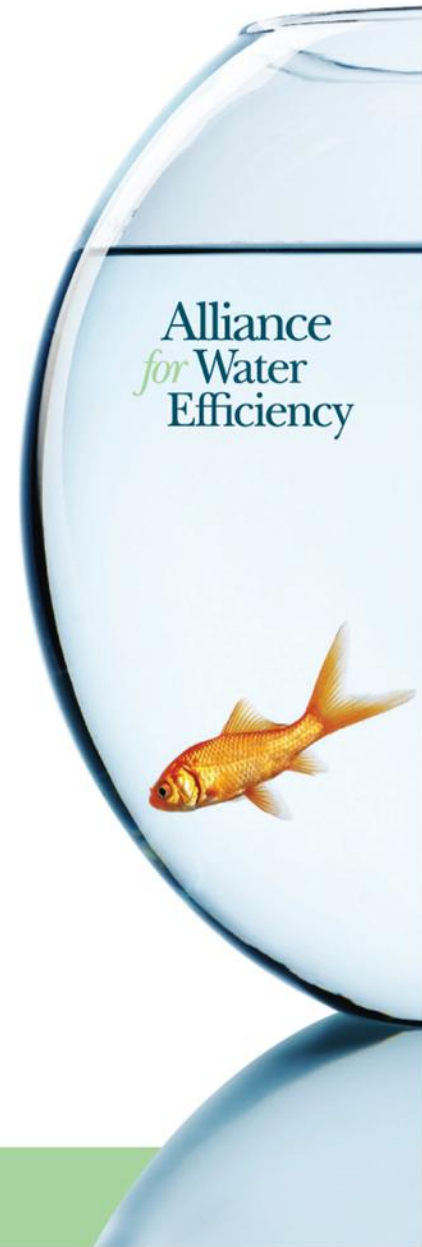
U.S. Water and Sewer Rate Increases



Source: AWWA/Raftelis Financial Consultants, Inc.

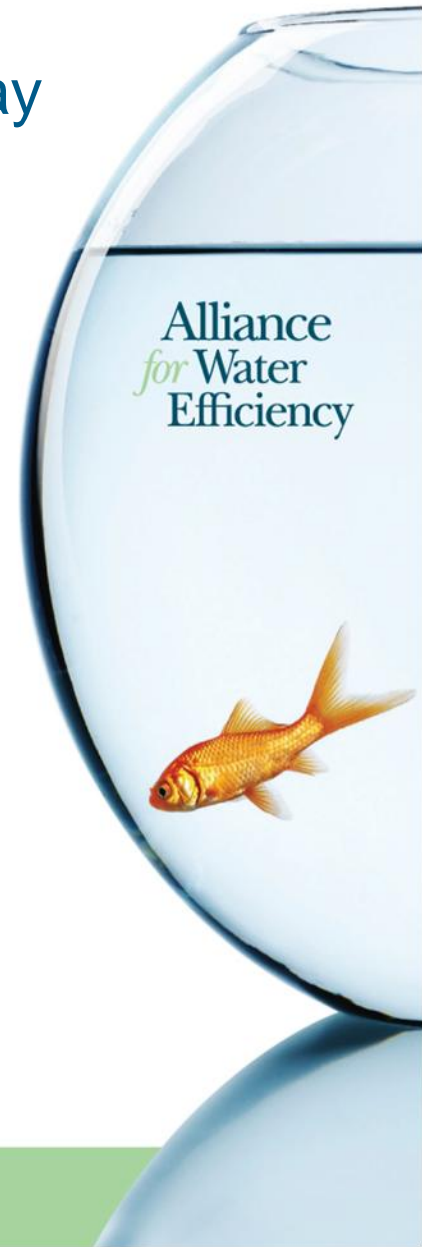
20x2020 and Drought Challenges

- Governor's call to action
- New conservation planning approach
- Looking at urban sectors
- Regional level, not utility level
- Agricultural to be addressed elsewhere
- Drought intercedes

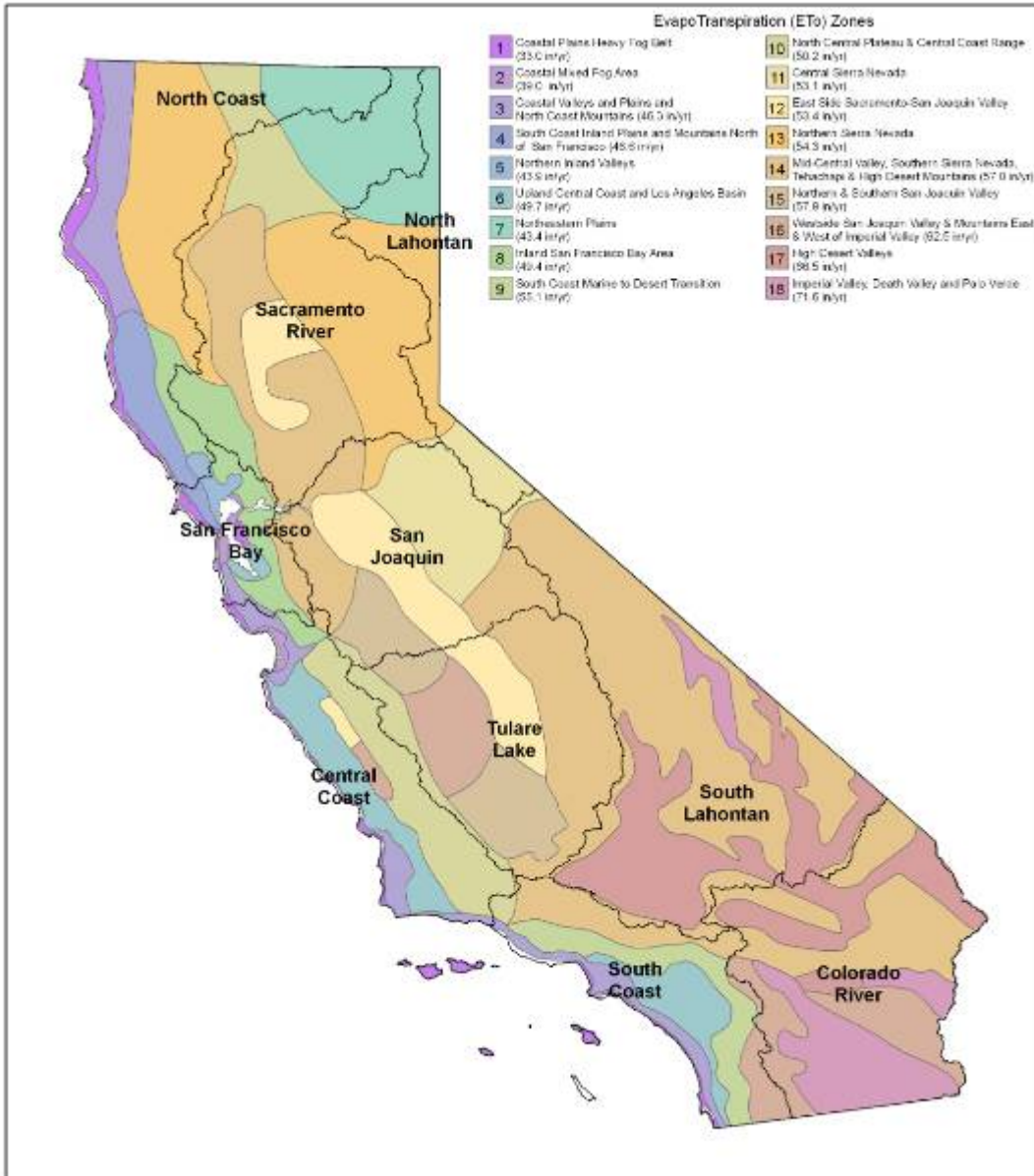


Statewide Approach

- Some processes needed for 20% reduction may need changes in State law
- Initially needed a statewide view
- Agency team recognized there are regional variations
- Mechanism for review already exists via hydrologic regions
- Overall Statewide Baseline value = 192 GPCD
- Overall Statewide Target value = 154 GPCD



Regions and ET Zones



REGION	Weighted 1995-2005	GPCD Range
1	165	141-170
2	157	149-173
3	154	141-177
4	180	171-198
5	253	237-272
6	248	236-250
7	285	242-341
8	248	242-385
9	237	221-286
10	346	272-387

Urban Water Conservation Accomplishments



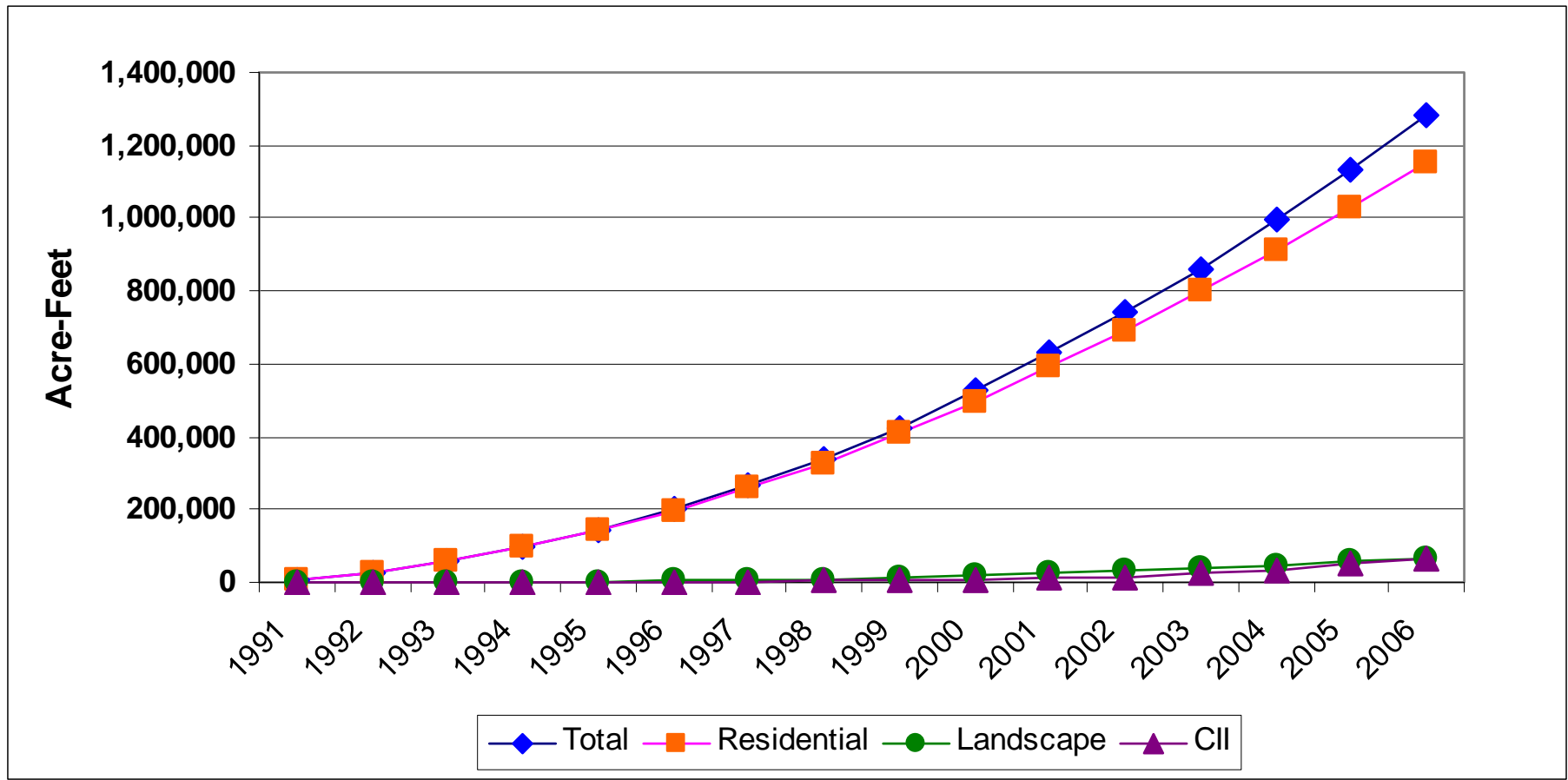
California Urban Water Agencies

December 2008

Alliance
for Water
Efficiency

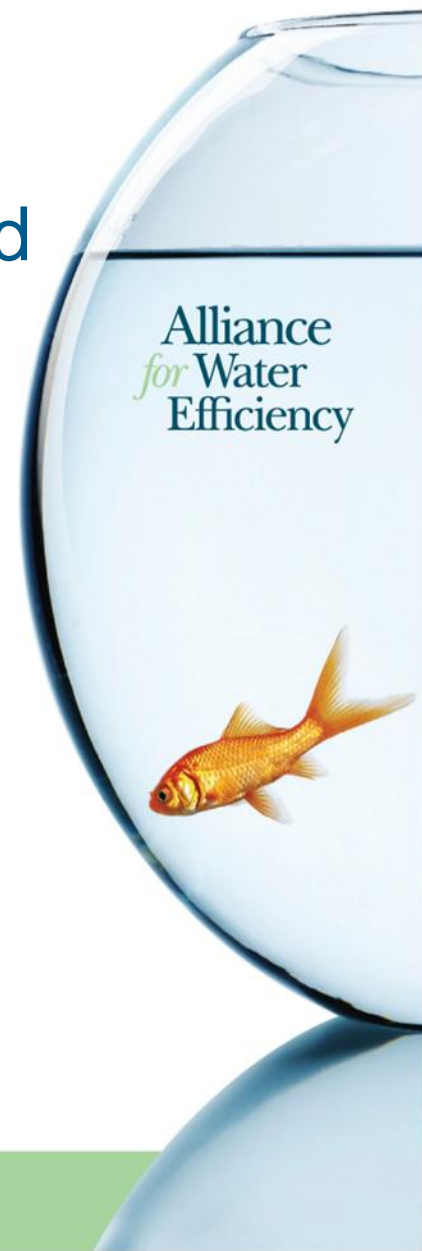


California Water Agencies Association Cumulative Water Savings



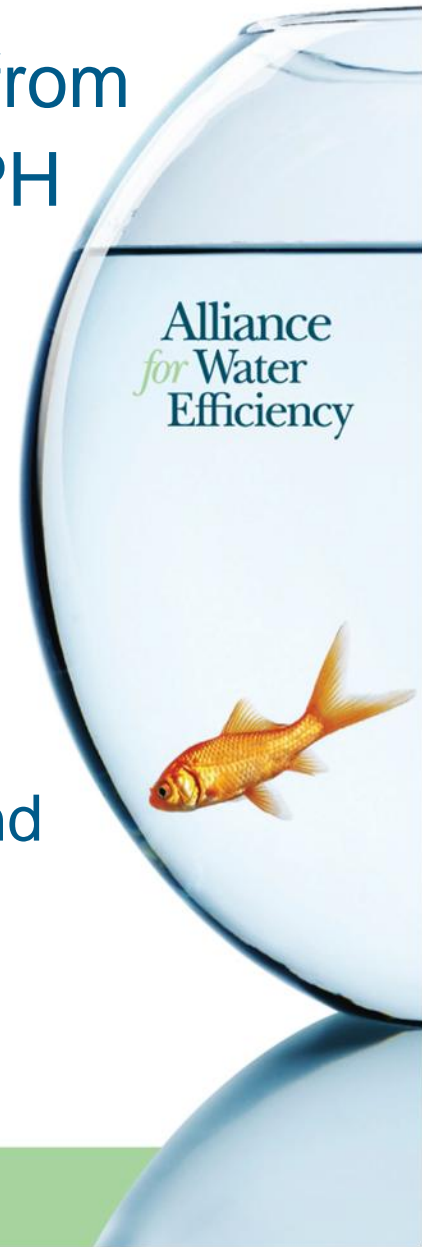
Best Practices

- Full metering and billing by volume
- Indoor fixture retrofits for both homes and businesses
- Urban landscape irrigation reduction
- Industrial process water conservation
- Conservation pricing
- Non revenue water (loss) reduction
- Consumer and school education
- 14 CUWCC BMPs revised in Dec. 2008

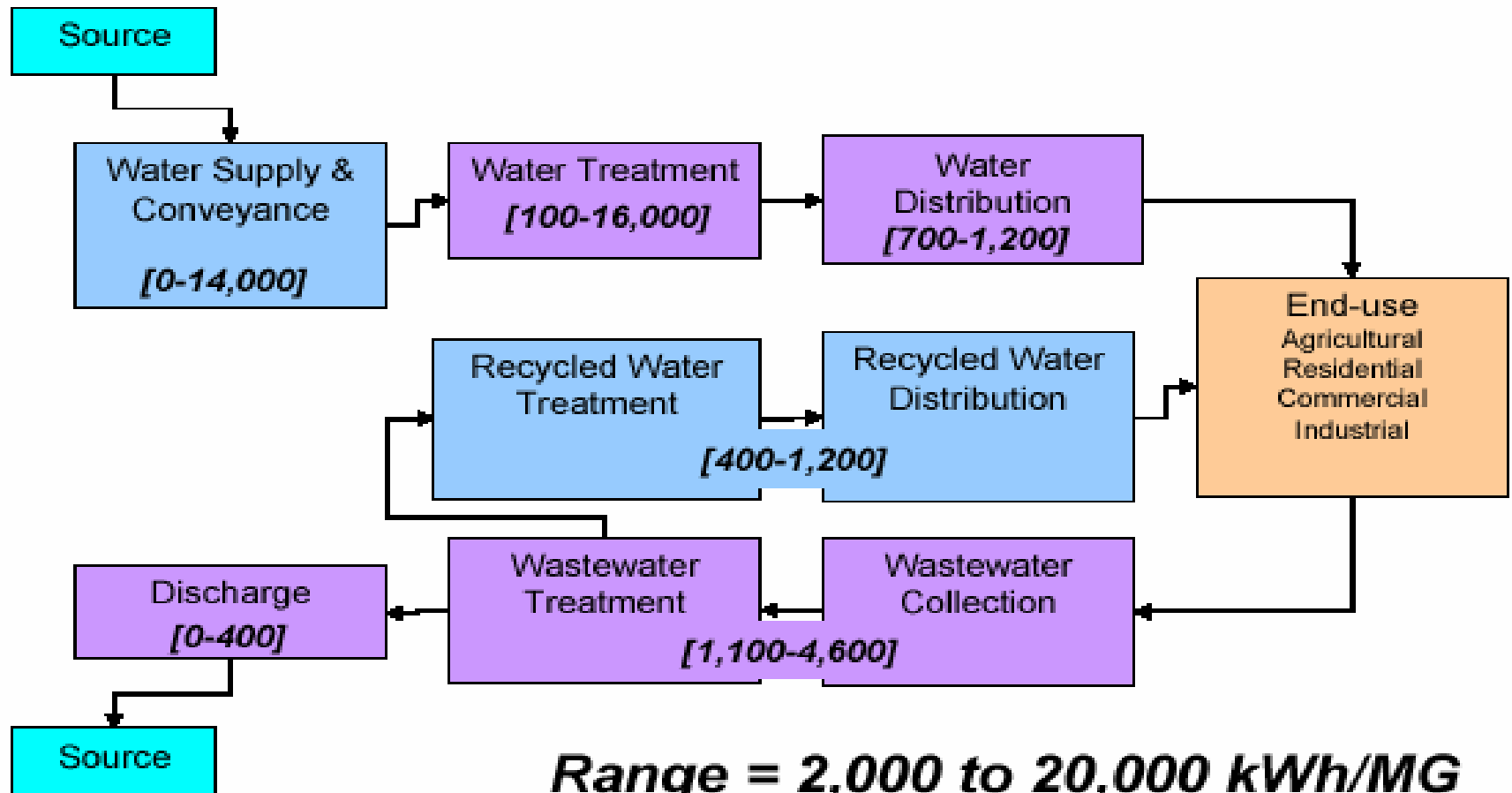


Limitations and Qualifications

- First time State has compared datasets from DWR, CPUC, CUWCC, SWRCB and DPH
- Data required significant review
- Future Improvements needed:
 - More data for Regions 8 and 9
 - Statewide data collection standards
 - Data needed from all utilities
 - Need standardized measurement at state and utility levels
- First time able to compare all data from different sources

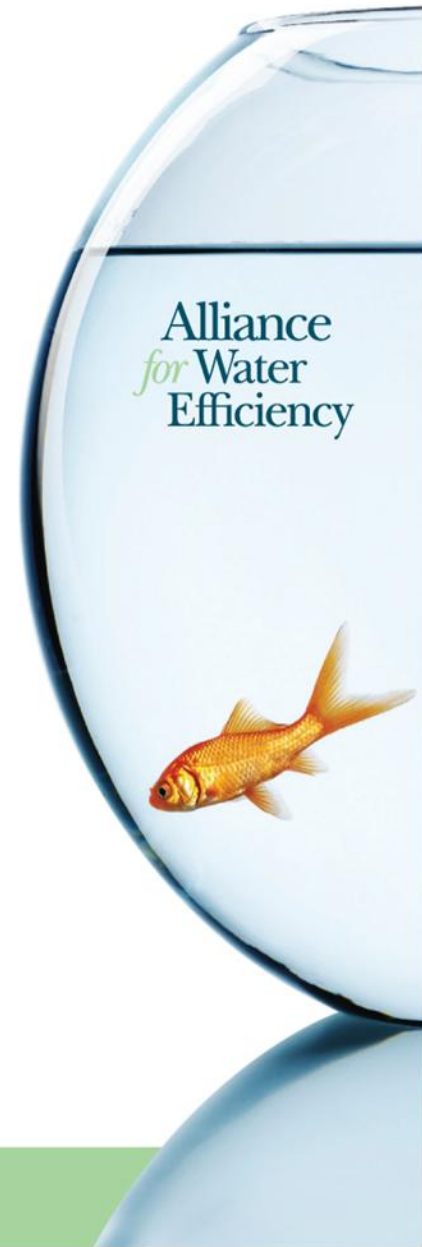


The Water-Energy Connection



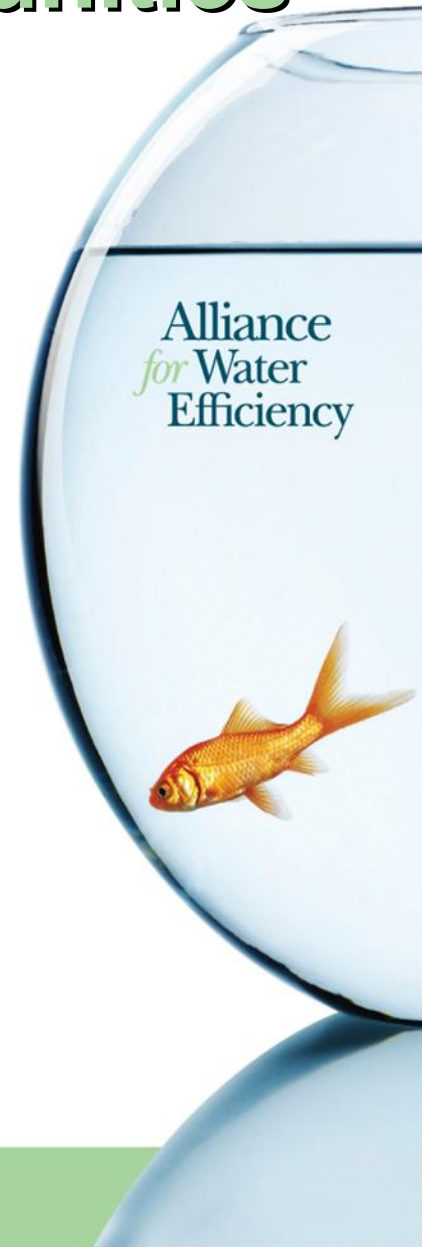
Embedded Energy Value

- Energy embedded in entire water cycle
- California numbers:
 - **19%** of CA electric energy load
 - **32%** of CA natural gas energy load
- Saving water ⇒ saves energy ⇒ saves greenhouse gas emissions
- This can be modeled for any water utility



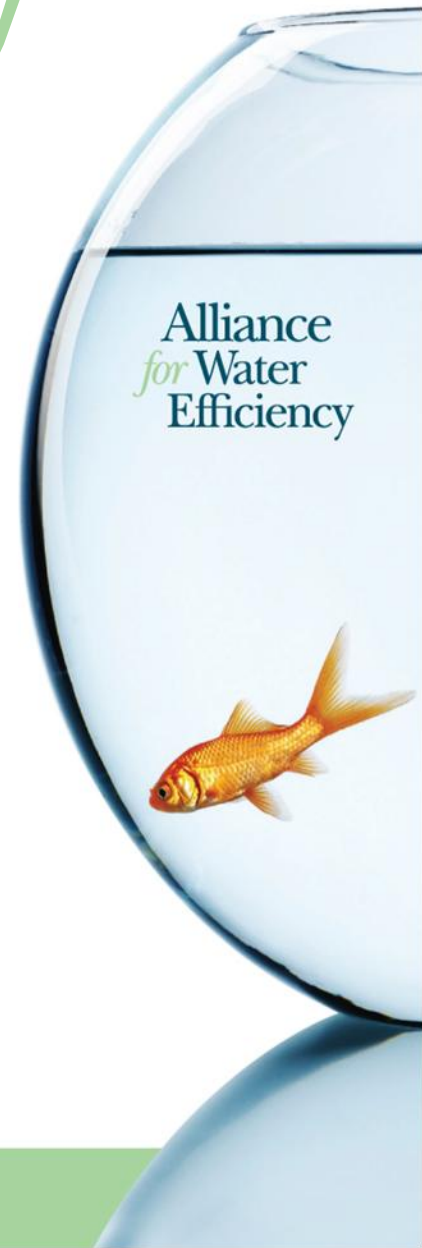
Joint (Water & Energy) Opportunities

- Residential clothes washers
- Commercial clothes washers
- High-efficiency toilets and urinals
- Landscape conservation
- Residential and business audits
- Commercial dishwashers
- Pre-rinse spray valves



Food Service Water and Energy Efficiency One Stop Pilot Study

- 3-year \$0.8M study (2008-2010)
- EBMUD and PG&E partnership
- CPUC and DWR co-sponsors
- Bakeries, beverage manufacturing, packaging
- “no-cost”, “low-cost” and “investment-grade” recommendations and incentives
- Outreach/market transformation thru local green building and community-based programs
- Report on water, wastewater, energy and greenhouse gas savings

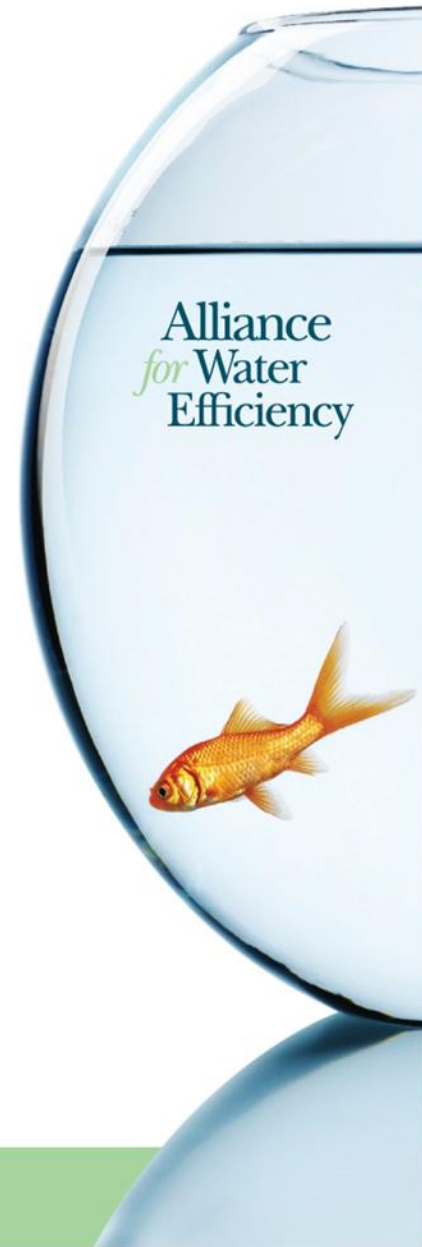


How water and
energy efficient
dishwashers really
work...



Conservation Trends

- Heavy focus has been on indoor residential programs
- CII is growing and will be more important in future
- Landscape savings are more difficult to obtain due to human behavior, lack of control by water agencies



Trend: Increasing Densities



Shower panel or shower tower?



Landscape Irrigation Water Budgets

EBMUD Landscape Water Use Estimate



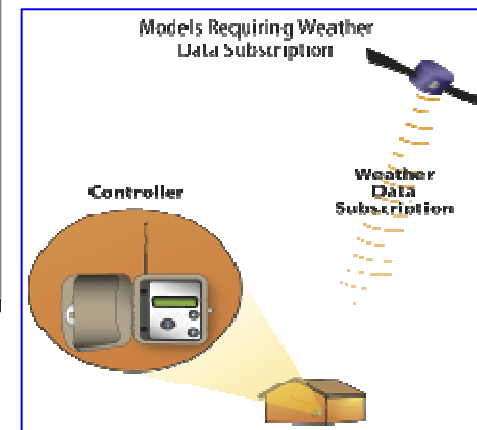
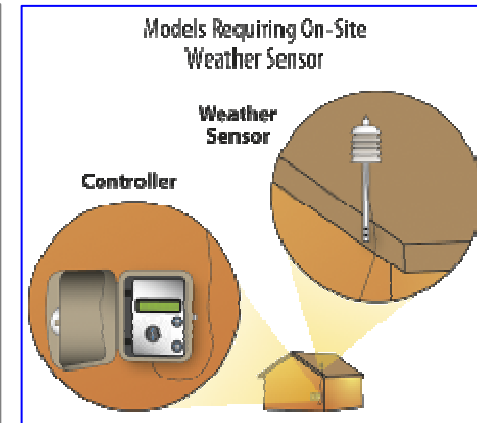
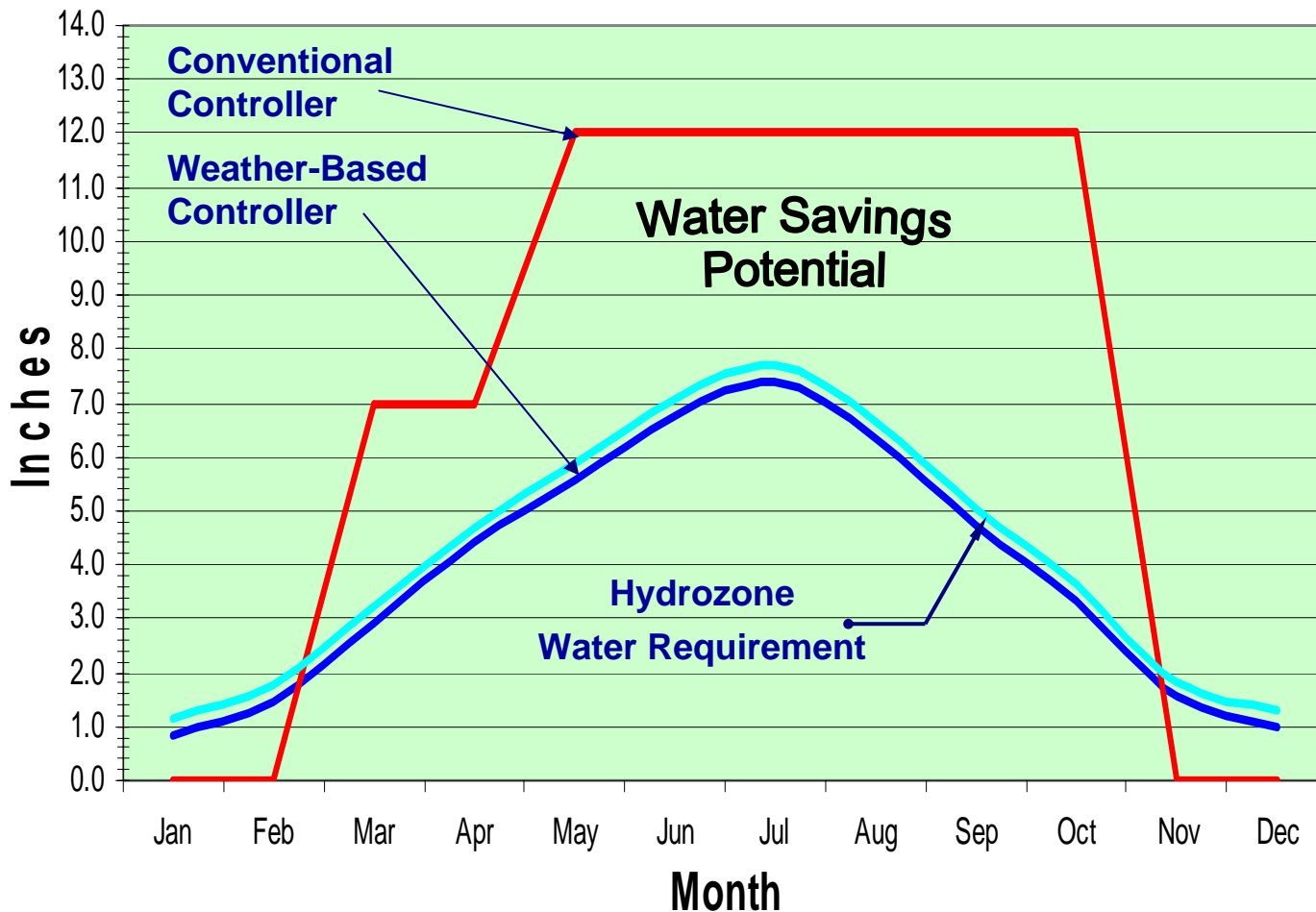
Customer: **Meridian Place HOA**
 Project Name: Common Area Landscape
 Project Address: Sutton Circle
 Account#: 5022304-2, 5022301-2, 5022364-2, 5022317-2
 City: Danville
 Date: 2/13/2001

	TURF	SHRUBS/ GROUND COVER
Total irrigated landscape:	<input type="text" value="72765"/> Square feet	<input type="text" value="59,601"/> Square feet
ET:	<input type="text" value="48"/> Inches/Year	<input type="text" value="48"/> Inches/Year
Peak ET:	<input type="text" value="0.24"/> Inches/Day	<input type="text" value="0.24"/> Inches/Day
Percent of ET:	<input type="text" value="100%"/>	<input type="text" value="60%"/>
Annual water use requirement:	<input type="text" value="314,925"/> Gallons/Year <input type="text" value="420"/> CCF/Year	<input type="text" value="1,059,385"/> Gallons/Year <input type="text" value="1,425"/> CCF/Year
Target Goal for Site (80%-60% ET)		<input type="text" value="1,844"/> CCF/Year
Maximum (Ceiling) Use for Site (100% ET)		<input type="text" value="2,899"/> CCF/Year
1999 Site Consumption:		<input type="text" value="1,863"/> CCF/Year

Water Use Budget - Common Area

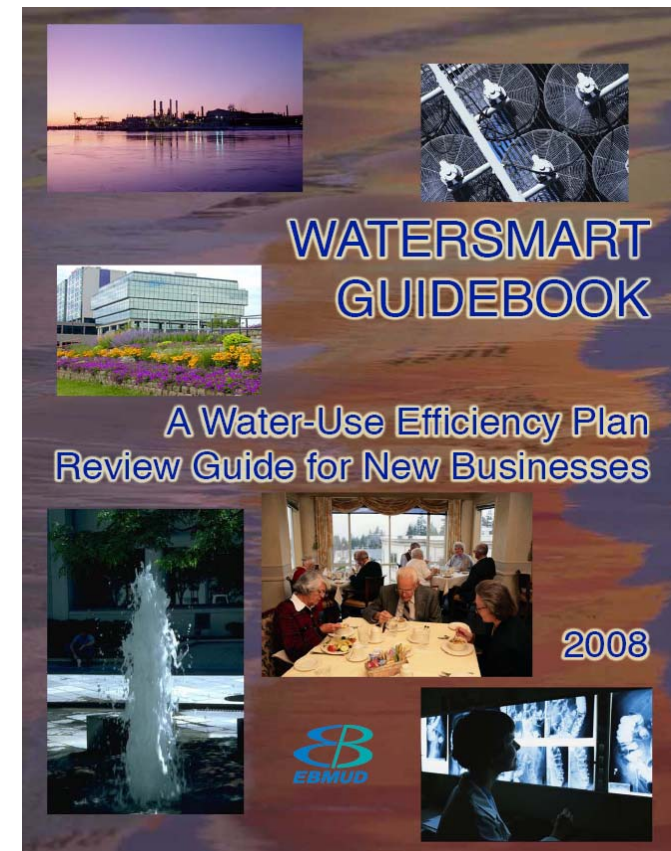


The Evapotranspiration (ET) Curve Supplemental Monthly Irrigation



WaterSmart Development Guidebook

- A reference document on CII water-use efficiency
- Applies 15+ water use technologies
- Covers 20+ different business types
 - Description of end uses
 - Water savings hardware and processes
 - Cost-benefit analyses
 - Hardware and customer profiles
 - Permit process
 - Marketing plan
 - Appendices



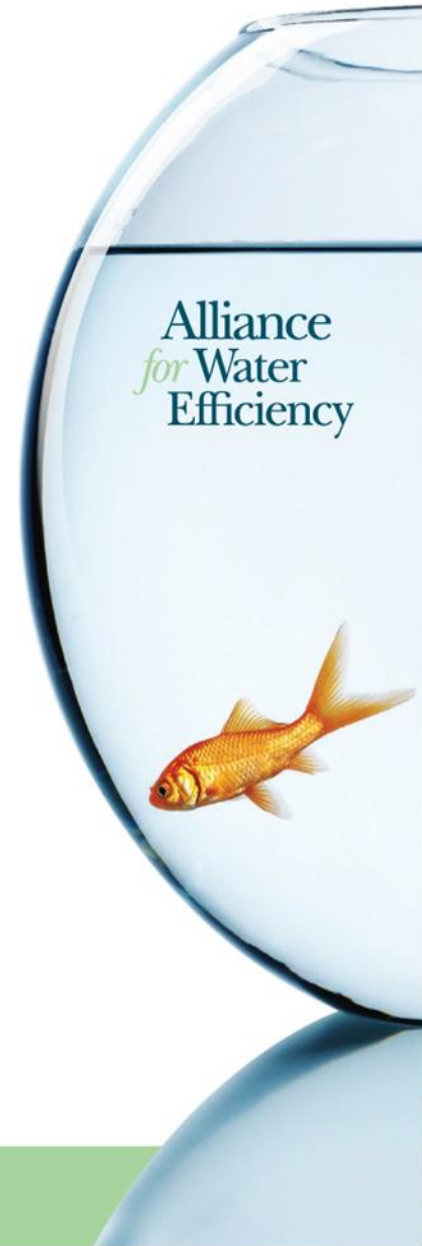
Matrix of Operations

Type of Business (20)

- Offices
- Schools
- Restaurants
- Retail
- Hotel/Motel
- Grocery
- Medical facilities
- Laboratories
- Laundries
- Manufacturing
- Vehicle washing
- Bakeries
- Automotive
- Printing

Water Using Technology (15)

- Plumbing fixtures
- Landscaping
- Pools, spas & fountains
- Water treatment
- Alternate water sources
- Thermodynamic processes
- Food service
- Wash down & sanitation
- Laundry
- Submetering
- Process water
- Photo & film processing
- Medical & laboratory
- Vehicle wash





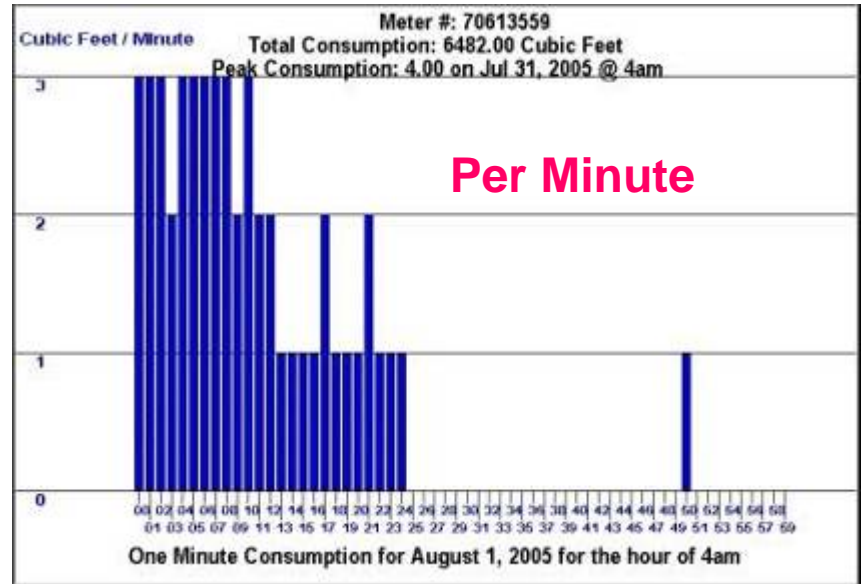
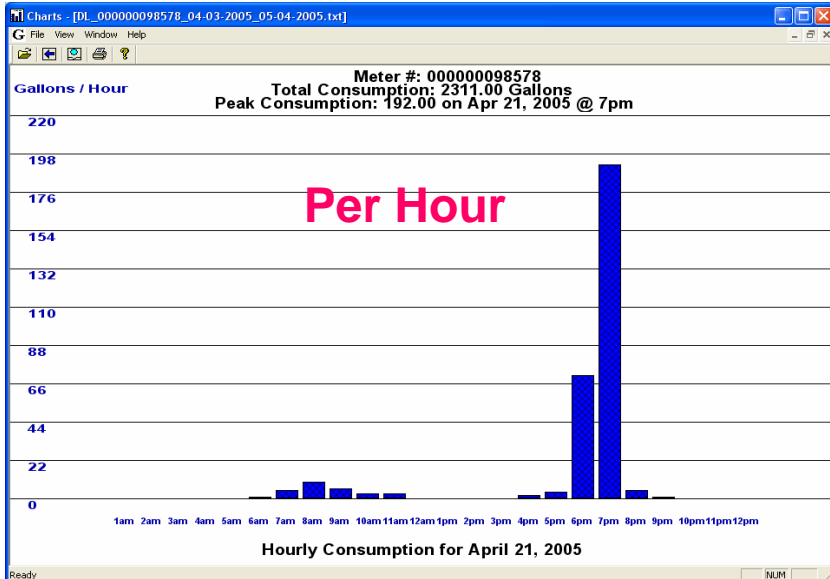
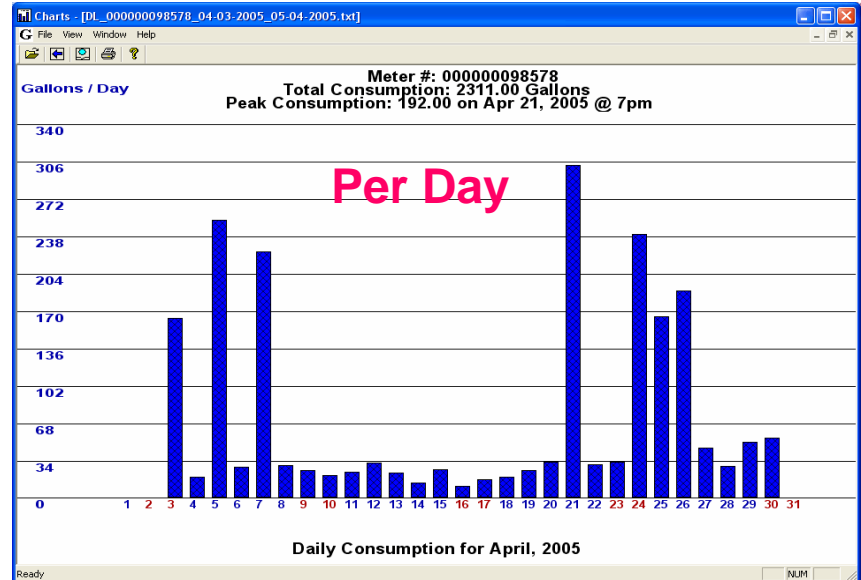
**A Meter Reader during
World War II**



**A Meter
Reader
today**

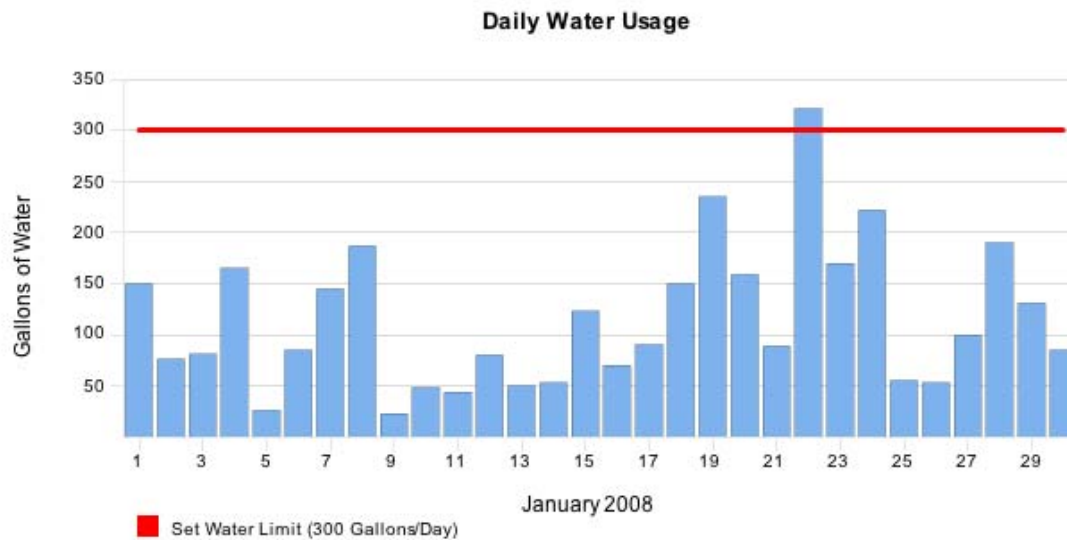


Sample Customer Profiles



EBMUD Blackhawk Customer Interface

(daily usage showing budget level)



VIEW TYPE

TIMEFRAME

CLIMATE

-  Temperature
-  Precipitation
-  ET Data

ALERTS

Daily Limit: **ON** (300 G/day)

Leak Detection: **OFF**

[Edit Settings](#)



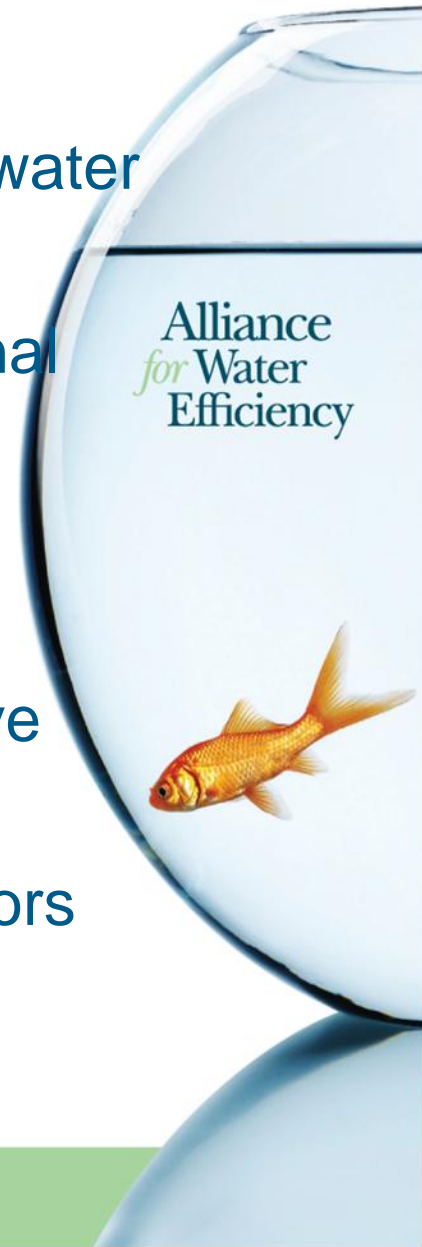
Table View



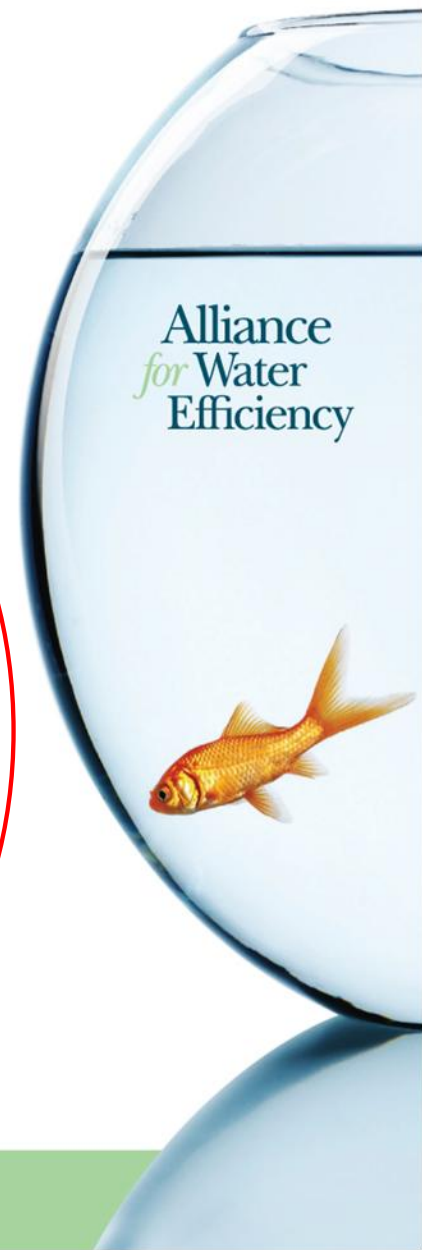
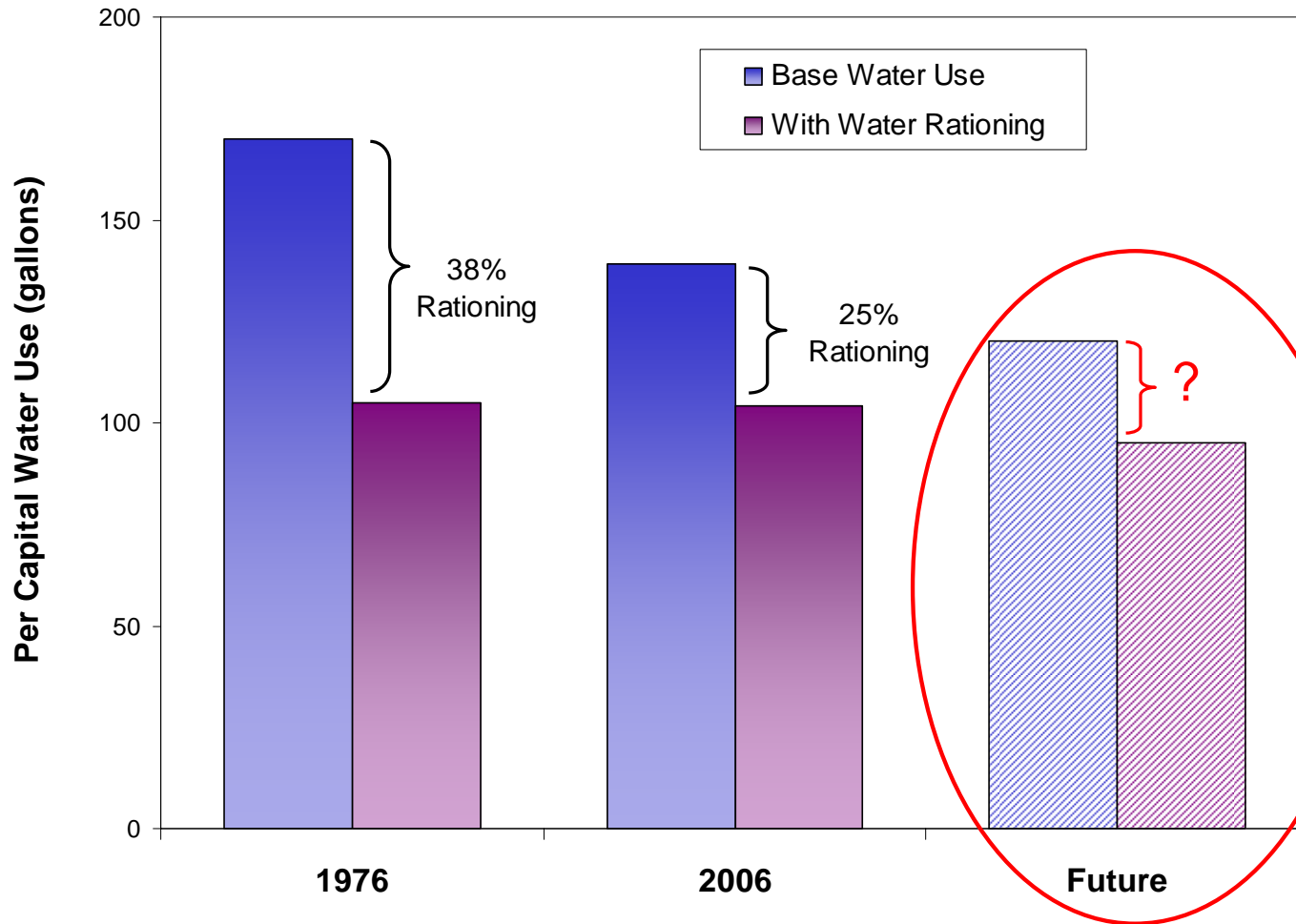
Export

System Optimization Review: Evaluating Advanced Metering Infrastructure Benefits

- Customer Service: meter and billing accuracy, water conservation
- Operations: real time operational data, additional SCADA intertie, water quality
- Engineering: facility sizing based on real time demand, energy optimization
- Maintenance: asset management and predictive maintenance, leak detection, meter repair
- Water Supply Planning: Better forecasting, factors that influence demand
- Other: New developing applications

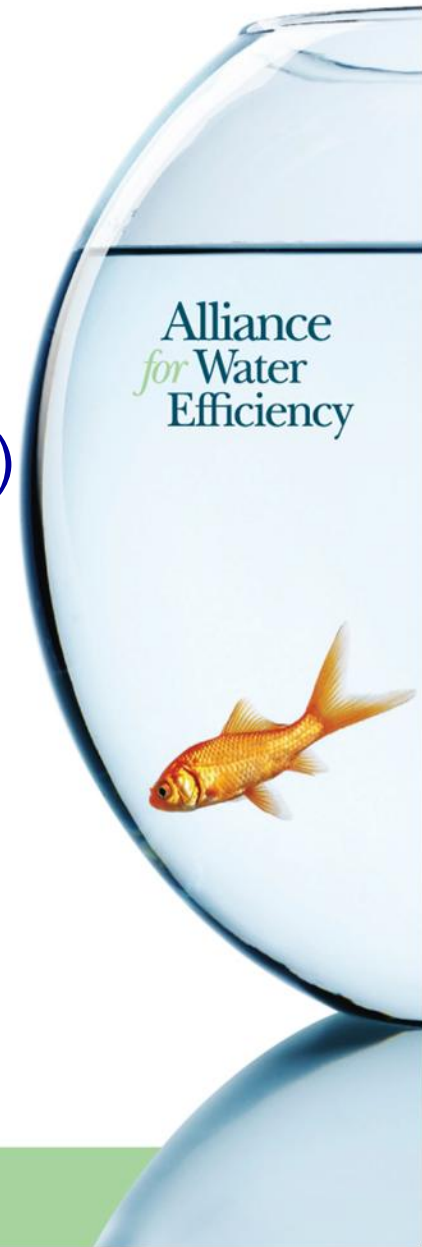


What is the Potential Demand Hardening Effect on Future Ability to Ration?



“*Bluish Green Building*”?

- Working to increase water efficiency credit among national green building programs...
- USGBC LEED Program
- Green Globes-Green Building Initiative draft standard (all comm'l, only residential > 3 stories)
- ASHRAE draft Standard 189.1 for High Performance Bldgs (all comm'l, only resid. >3 stories)
- ASHRAE Standard 191 for Water Efficiency (begun July 1 '08)
- NAHB draft National Green Building Standard (for homes)
- U.S. EPA WaterSenseSM for New Homes



WaterSense Labeled Products 2006 to 2008

- Independent Certification
 - To earn the WaterSense label, products must pass **independent, third-party testing**
- High-Efficiency Toilets (HETs)
 - 300+ labeled models
- Faucets
 - 750+ labeled models
- Find Products
 - www.epa.gov/watersense



WaterSense Products Near-Term Specifications



High-Efficiency Urinals
2009



Irrigation Controllers
2009 - 2010

Showerheads
2009 - 2010

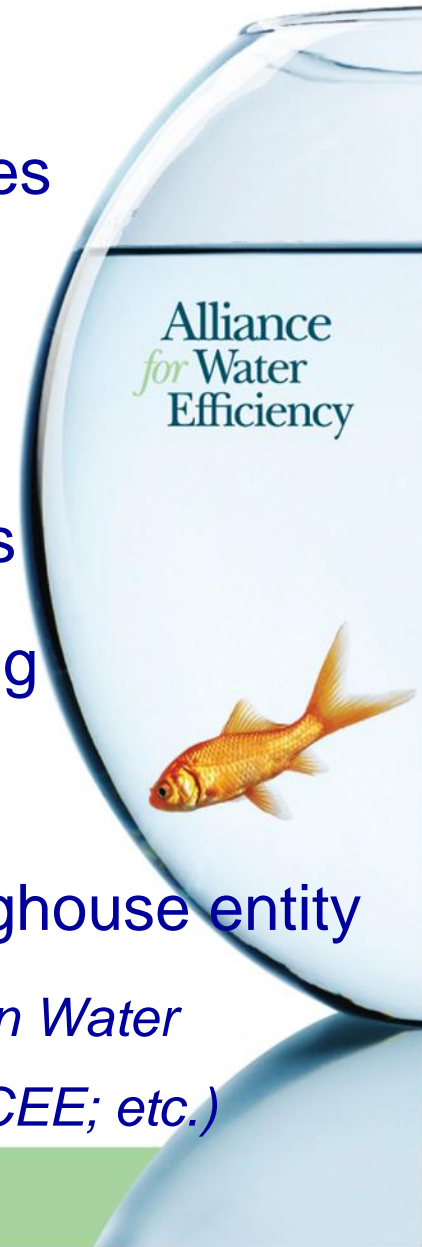


Pre-rinse Spray
Valves
2010



California Water Efficient Product Rating and Labeling Initiative (2008-10)

- \$0.8M seed funding from DWR and water utilities
- Select/shortlist candidate products
- Establish test procedures
- Develop directory/independent testing of ratings
- Develop performance specifications and labeling
- Evaluate standards and codes applications
- Establish voluntary incentive programs, clearinghouse entity
(e.g. USEPA WaterSense; Energy Star; California Urban Water Conservation Council; Alliance for Water Efficiency; CEE; etc.)





Resource Library

Welcome to the Alliance for Water Efficiency's Resource Library. AWE strives to provide the best on-line resources on water conservation and efficiency. Search through our collection and discover the wealth of useful, technical information assembled. Enter keyword(s) in the search box below or select an library section from the list on the right. Search instructions and tips are available [here](#).



Resource Library Search Tool

Use the tool below to search the Alliance for Water Efficiency library:

Basic Search Advanced Search

Site

[Definition of Terms](#)

Recent Library Updates



- 10/30/2008 Water Efficiency Watch Listing
- 10/30/2008 Szann, A (2008) Australia - Water Wastage of Instantaneous Gas Water Heaters
- 10/30/2008 Tucson rainwater ordinance
- 10/30/2008 Heinrich, M (2008) New Zealand - Water Use in Auckland Households
- 10/29/2008 Commercial Food Service Introduction

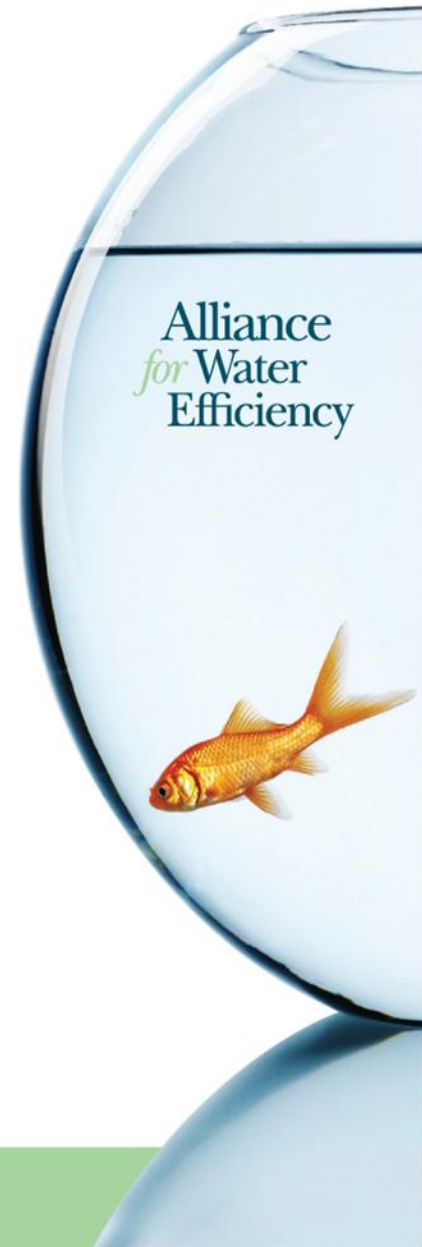
AWE Library Sections



- Residential Water Efficiency
- Landscape and Irrigation
- Commercial Institutional and Industrial
- Non-Residential Fixtures, Appliances and Equipment
- Alternate Water Supply
- Codes and Standards
- Drought

AWE Advisory Committees

- **Three** standing member committees:
 1. Education and Outreach Committee
 2. Water Efficiency Research
 3. WaterSense and Water Efficient Products
- First in-person meetings Oct. 2008
- Regular business by conf. calls
- Manage AWE priorities and projects





WaterSense and Water-Efficient Products Committee

Co-Chairs: Rob Zimmerman, Kohler Co., and Jill Hoyenga, Eugene Water & Electric Board

Purpose: To encourage and support improvement in the efficiency of water use in North America through the adoption of performance criteria for water-using products and equipment, urban landscapes, whole buildings, and related professional services. The Committee provides multi-stakeholder input regarding the timing, scope, efficiency metrics, and partner activities for products and services being considered by the voluntary WaterSense and Energy Star programs. The committee also provides a multi-stakeholder forum for consideration and advocacy of federal and state/provincial minimum water efficiency standards for new products and

Committee Calendar



Indoor Subcommittee Conf Call
2:00 p.m. Central, Monday, Feb 23rd

Outdoor Subcommittee Conf Call
3:00 p.m. Central, Monday, Feb 23rd

Call-in information & agenda(s) will be sent to subcommittee members prior to the call

Committee Information



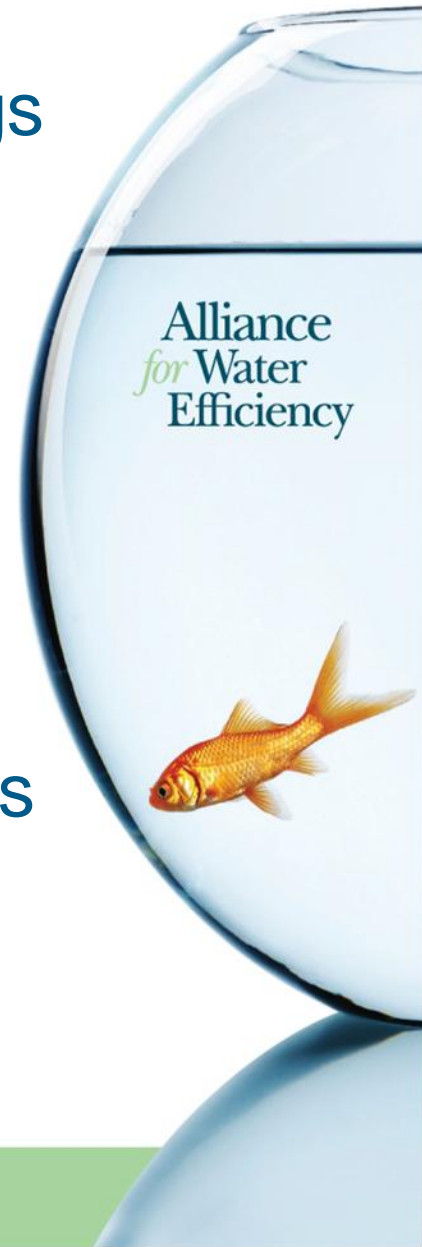
Committee Roster (as of 02/20/09)



January 22, 2009 Meeting Notes

Alliance Conservation Planning Model

- Mechanism for tracking long-term savings
- Metric units
- Fully customizable for any water utility
- Ties into existing and available models
- Graphical output for utility staff/customers
- Beta testing begins in March, 2009



Conservation Program Water Savings Calculator



Enter Common Assumptions:

Analysis Start Year	2008	2010	2020	2030	2040
Service Area Population	350,000	353,000	365,000	380,000	395,000
Service Area Population in 1990	300,000				
Peak-Season Start Date ('month/day')	31-May				
Peak-Season End Date ('month/day')	31-Oct				
Nominal Interest Rate	6.00%				
Inflation Rate	3.00%				
Persons Per Household - Single-Family	2.25				
Persons Per Household - Multi-Family	1.50				
Full Bathrooms Per Household - Single-Family	1.75				
Half Bathrooms Per Household - Single-Family	0.75				
Full Bathrooms Per Household - Multi-Family	1.00				
Half Bathrooms Per Household - Multi-Family	0.25				
Single-Family Housing Units Built before 1991	60,000				
Multi-Family Housing Units Built before 1991	30,000				

Choose Units of Measurement:

Water Volume Units

Million Gallons (MG)

Acre-Foot (AF)

Cu. Meters (M³)

Units Displayed in Model

Flow:	MGD
Volume:	AF

Select Water User Classes (click button below to define classes)

Select Water User Classes

Enter Customer Utility Rates:

Water User Classes in Model	Current Customer Utility Rates				Nominal Rate of Increase			
	Water Rates (\$/Thou Gal)	Rates (\$/Thou Gal)	Rates (\$/KWh)	Gas Rates (\$/Therm)	Water Rates (%/Yr)	Rates (%/Yr)	Electric Rates (%/Yr)	Gas Rates (%/Yr)
Single Family	\$ 2.50	\$ 0.70	\$ 0.15	\$ 1.50	3.5%	3.0%	3.3%	3.3%
Multi Family	\$ 2.00	\$ 0.70	\$ 0.15	\$ 1.50	3.5%	3.0%	3.3%	3.3%
CI	\$ 2.25	\$ 0.70	\$ 0.15	\$ 1.50	3.5%	3.0%	3.3%	3.3%

1. Common Assumptions

2. Specify Demands

3. Enter Utility Avoided Costs

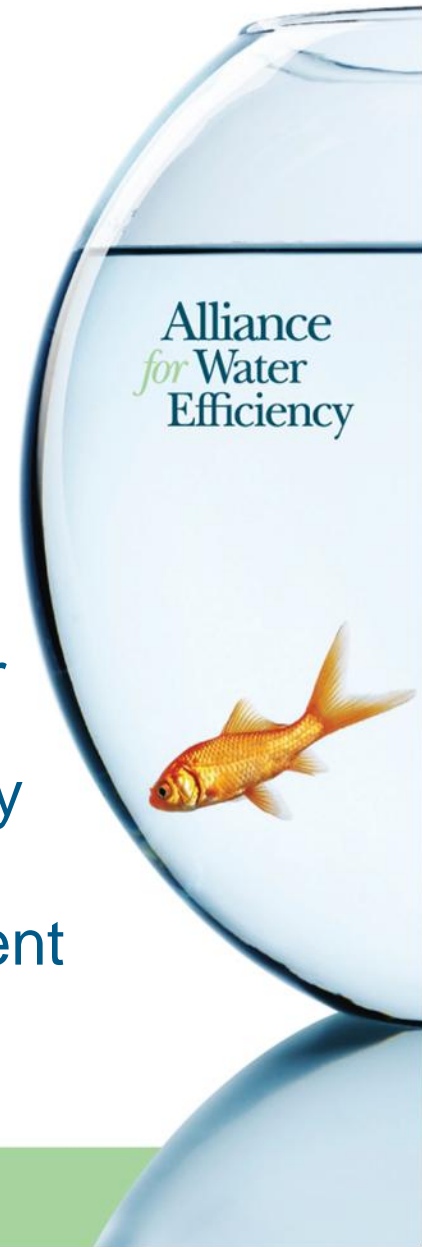
4. Define Activities

5. Enter Annual Activity

D

Benefits of Water Efficiency

- Drought Tool: short-term relief
- Planning Tool: lessen demand & supply gap
- Economic Tool: defer water and wastewater capital facilities
- Environmental Tool: provide more water for aquatic habitat, water quality and reduce energy
- Energy Tool: reduce energy in water treatment and delivery





Alliance *for* Water Efficiency

A VOICE AND
A PLATFORM
PROMOTING THE
EFFICIENT AND
SUSTAINABLE
USE OF WATER

www.a4we.org

(866) 730-A4WE

TOLL-FREE

