



Why Water Management is Important to...

Running a Greener Building
April 18th, 2011

Paul Schultz CIC, CLIA, CLT-E
Irrigation Resource Manager



Cagwin & Dorward is a full service landscape provider specializing in:

- Landscape Maintenance
- Landscape Construction
- Tree Care
- Water Management
- Environmental Restoration





Becoming part of the solution... by committing to preserve the beauty that surrounds us and to heal our planet for future generations



Water Management

Sustainability Solutions





*“Whiskey is for drinking but
water is worth fighting
over!”*

– Mark Twain

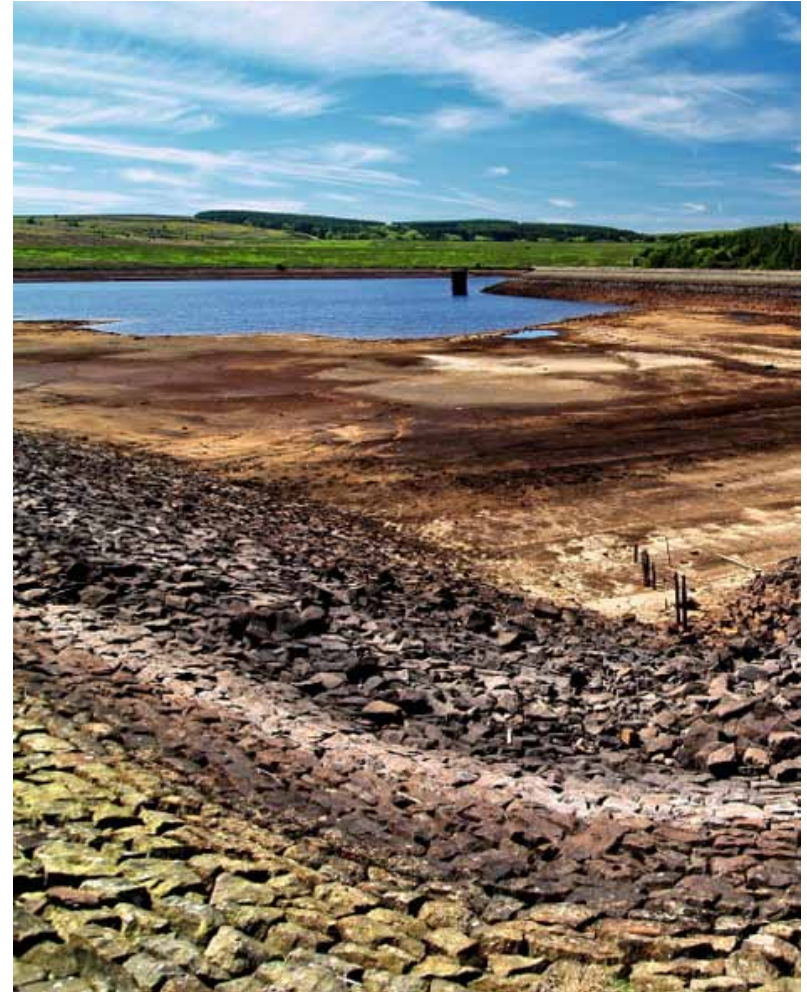


cagwin & forward



In the News

- California Snowpack at 61% of normal
- Lake Mendocino lowest point in 20 years. Mandatory water rationing of 30-50%
- Rainfalls
 - San Jose - 52%
 - San Francisco - 51%
 - Oakland - 55%
 - Santa Rosa, 38%

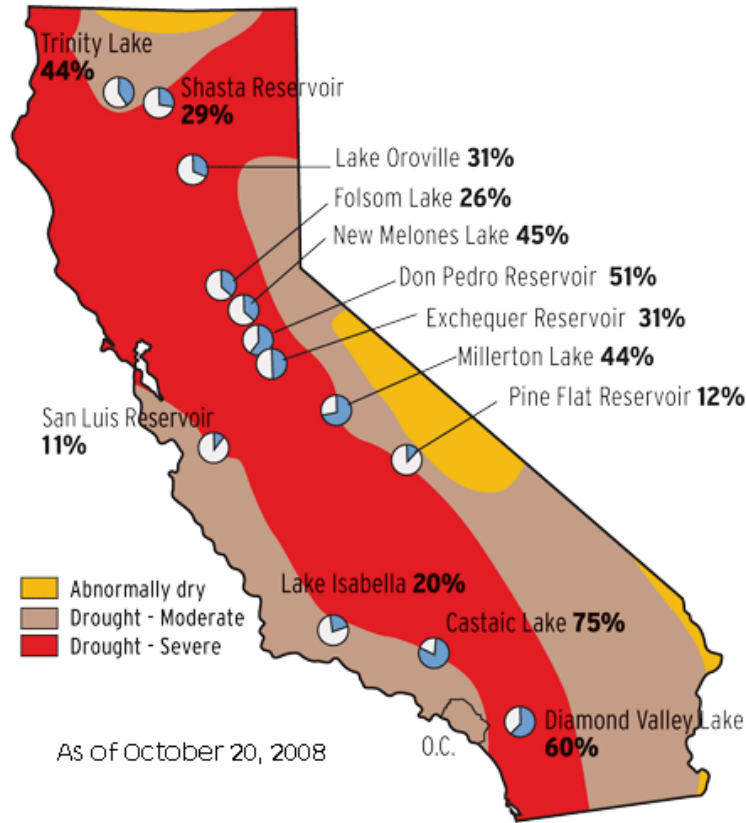




In the News

Reservoir capacity

Major California reservoirs, which range in total capacity from 4.5 to .3 million acre-feet of water, are at varying stages of fullness as of Oct. 20.



Sources: U.S. Drought Monitor, California Department of Water Resources

- Spring 2008 driest in 88 years
- 2008-2009 - Third driest year on record for California
- June 4, 2008 - Governor declares drought
- Court orders water reductions in the Sacramento Delta to protect Salmon and Smelt





Population Growth

The population of California grows by 1 person every minute, that means:

- **1,440** people every day
- **10,080** people every week
- **524,160** people every year





Supply and Demand

Infrastructure problems:



- Aging levees in the Delta
- Aging water delivery systems
- Many water delivery systems near capacity in summer
- Repairs and improvements are costly

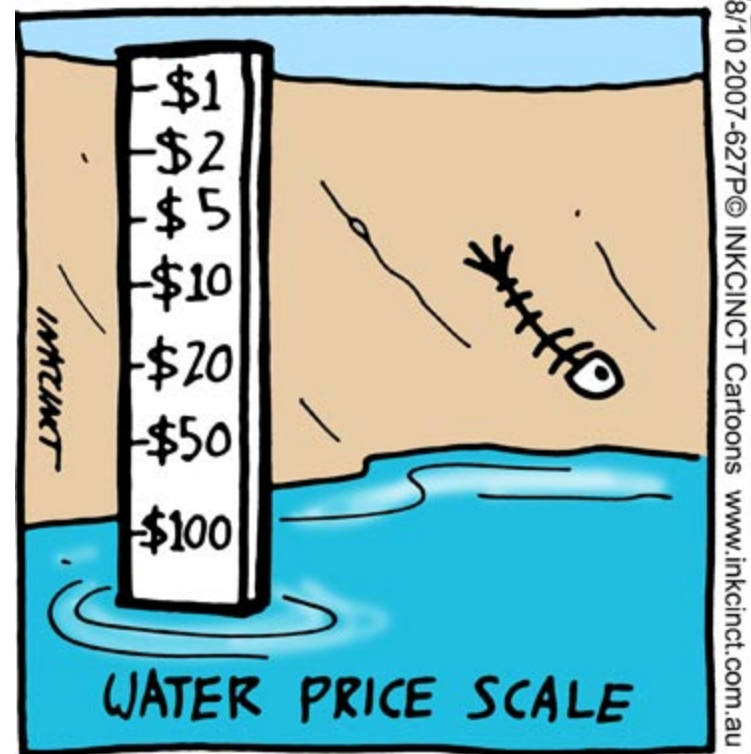


In the News

“About 180,000 customers of Cal Am Water in the Sacramento area face a 40.4% rate hike through 2014.”

“If a proposal before CPUC is approved in late 2011, the increases would come on top of rate hikes totaling 24.3% in 2010.”

- Sacramento Bee, 8/3/10





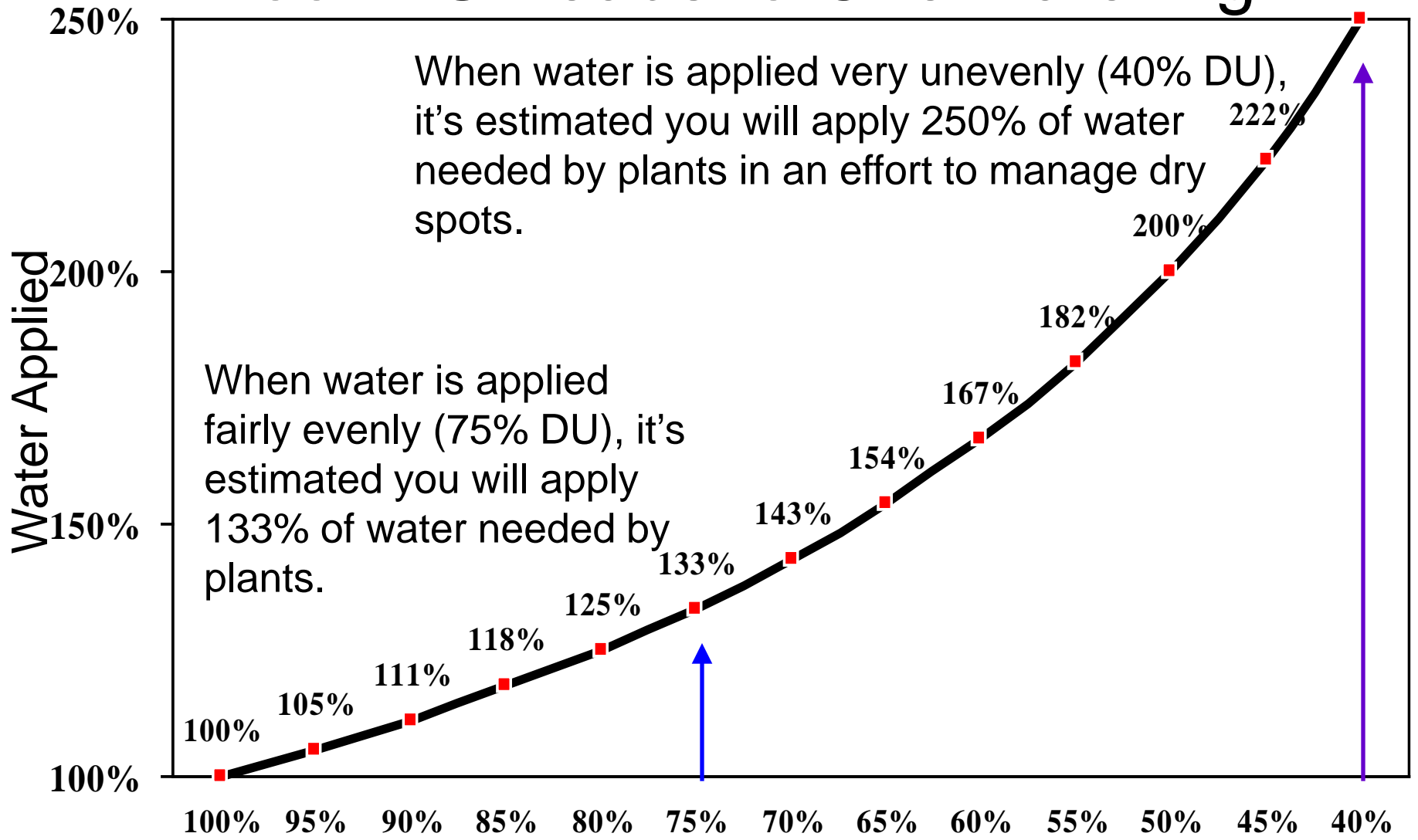
Legislation

Federal & State agencies recognize the importance of water conservation and have found that:

30% of water consumed in the US is devoted outdoor use

20% of water used on landscapes wasted

Poor DU Leads to Overwatering





Legislative Timeline

Model Water Efficient
Landscape Ordinance

Water Smart Landscapes for
California” report released
from Landscape Task Force

1990

1993

2004

2005

AB 325 - Water
Conservation in
Landscaping Act

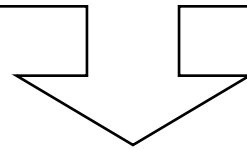
AB 2717 Landscape Task Force
convened and developed
recommendations to improve on
AB325



Legislative Timeline



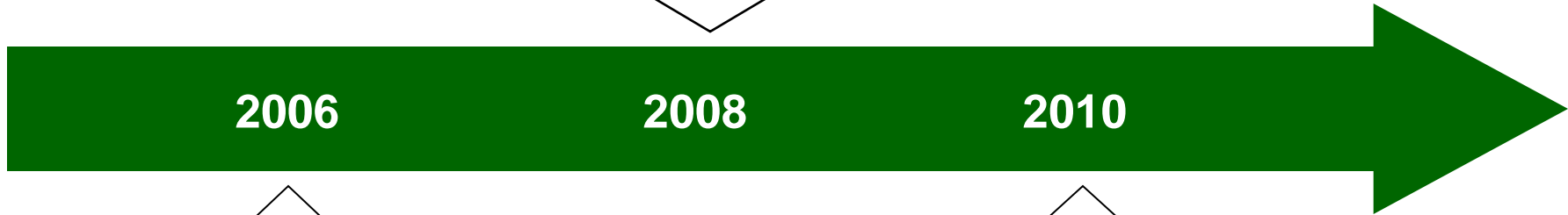
Gov. Schwarzenegger puts forward his 20 by 2020 Water Conservation Plan, a.k.a. SBX7-7



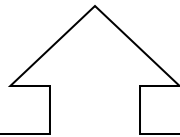
2006

2008

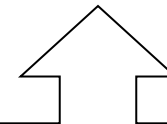
2010



AB 1881 Water Conservation in Landscaping Act directed DWR to update the Ordinance



AB1881 – Model Landscape Ordinance goes into effect





AB1881 - Major Provisions

- **Minimize overspray and runoff**
- **Group plants by “Hydro-zones”**
- **Use of “well-adapted” plants**
- **Use of (MAWA) Water Budget**
- **Increase stormwater retention**
- **Irrigation scheduling based on CIMIS, ETo data, or soil moisture sensors**



AB1881 - Major Provisions

- **Soil assessment and amendments**
- **Grading to promote healthy plant growth**
- **Mulch required in most planting**
- **Recycled water to be used where available**
- **Education of water users**
- **Fire prevention**
- **Sustainable landscape maintenance practices**





AB1881 – Applicable to:

- **2500 sq. ft or more landscaped areas**
- **Public agency (parks, schools, city properties)**
- **Private development (retail, industrial, commercial properties)**
- **Developer-installed single family and multi-family (master-planned communities)**

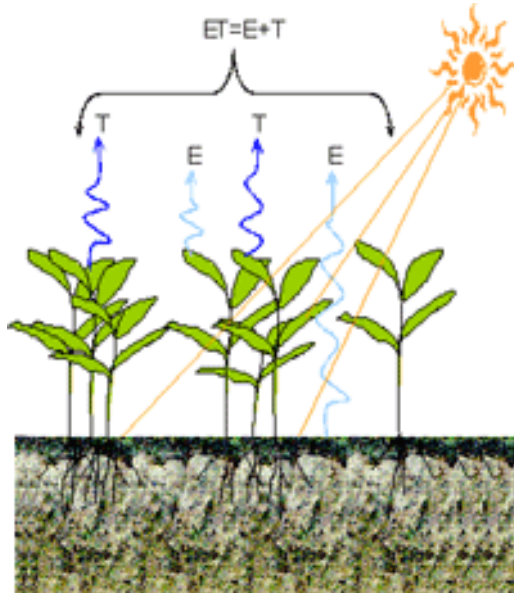




Evapotranspiration (ET)

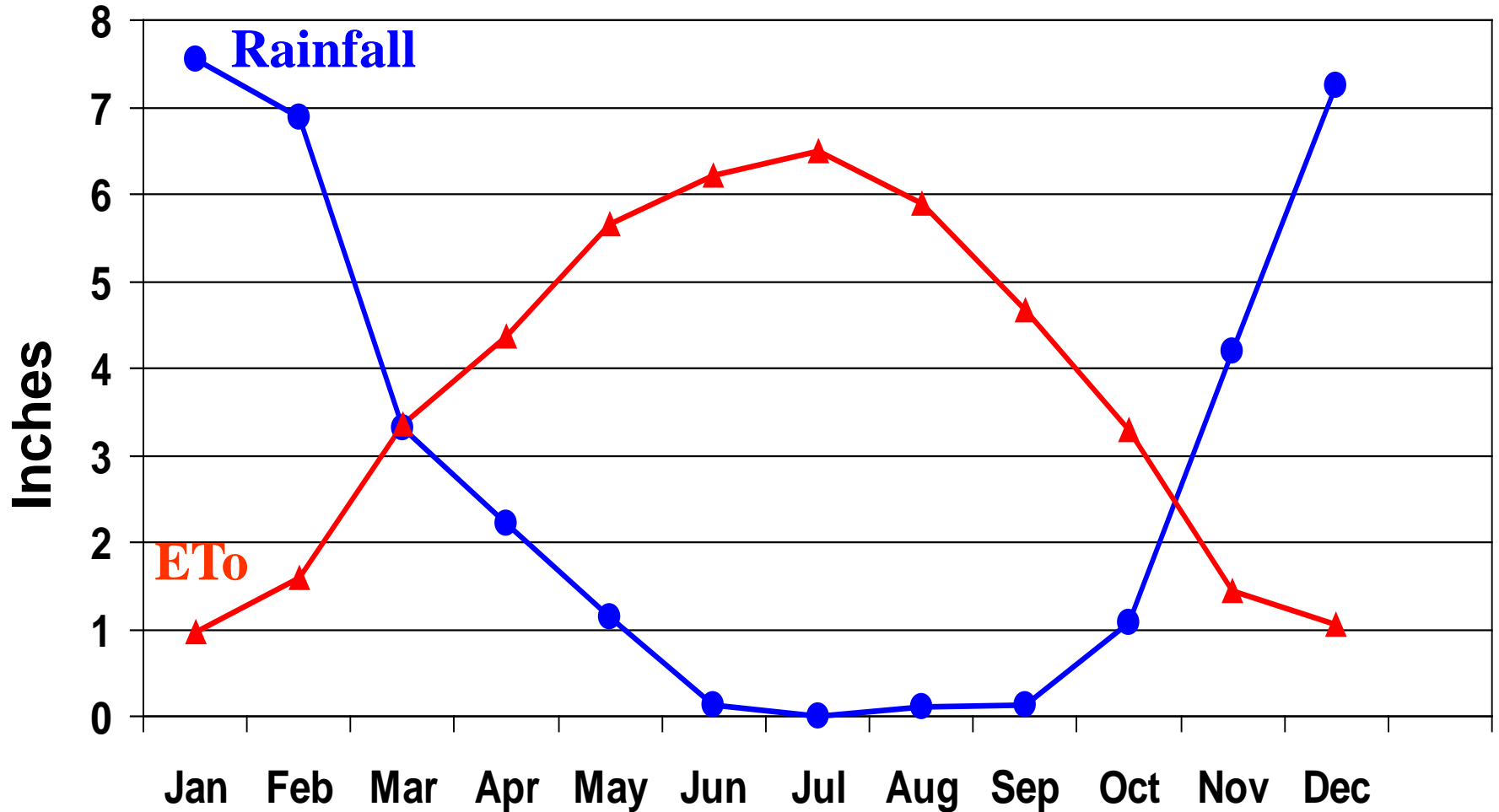
Water loss from landscape due to weather factors (sunlight, wind, humidity, temperature) which cause:

- Evaporation from soil and plant surfaces
- Transpiration by plants



Important - ET changes as weather changes.

Comparing ETo and Rainfall (Monthly Averages for 1995-2004*)

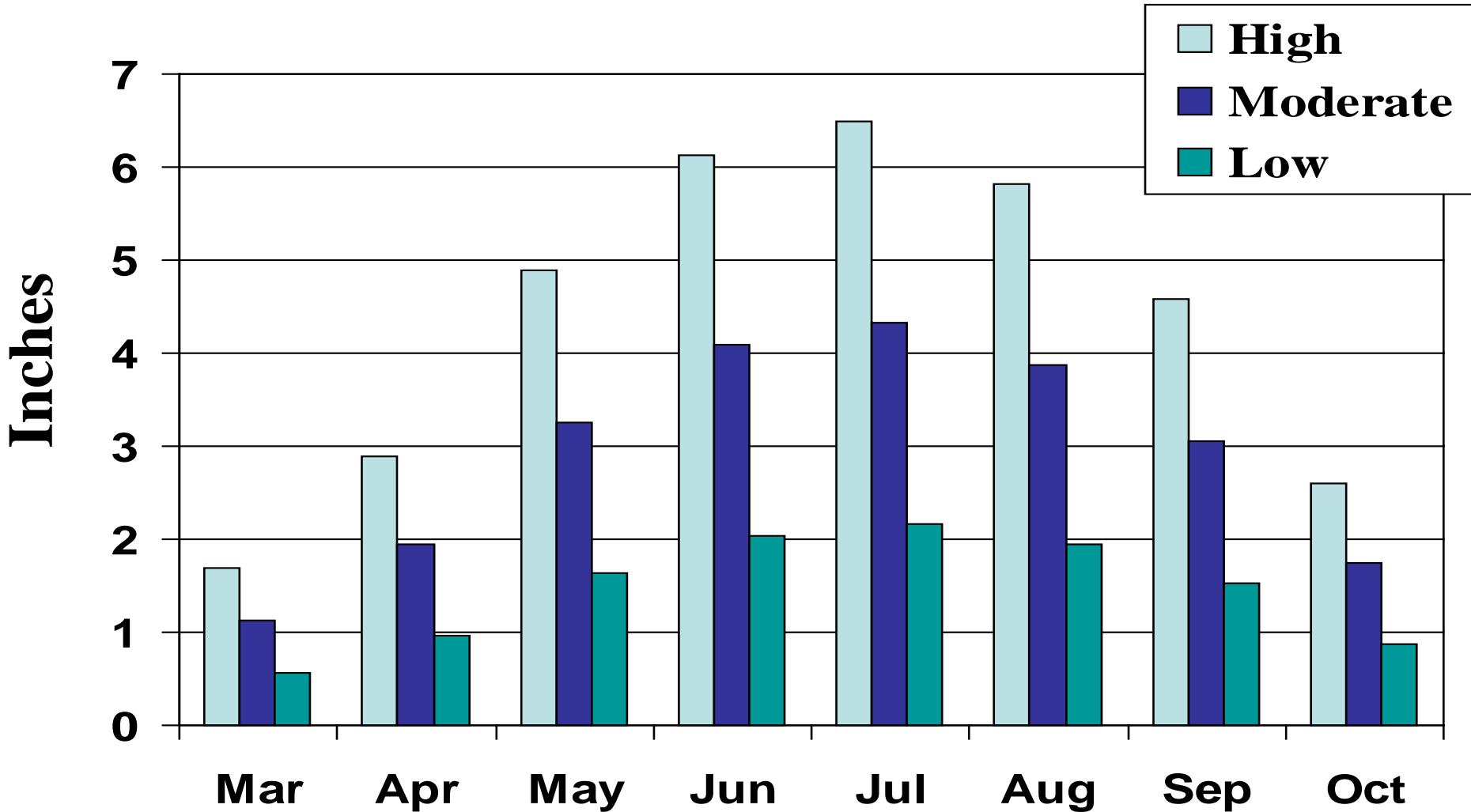


MAWA Calculations

- Eureka
 - 32.9" x 5000 sq ft x 0.7 x 0.62 = **71,393** gallons per year
- San Jose
 - 45.3" x 5000 sq ft x 0.7 x 0.62 = **98,301** gallons per year
- Palm Desert
 - 66.5" x 5000 sq ft x 0.7 x 0.62 = **155,365** gallons per year

The “Right Amount” of Water

ET and Plant Type



Landscape Design Plan



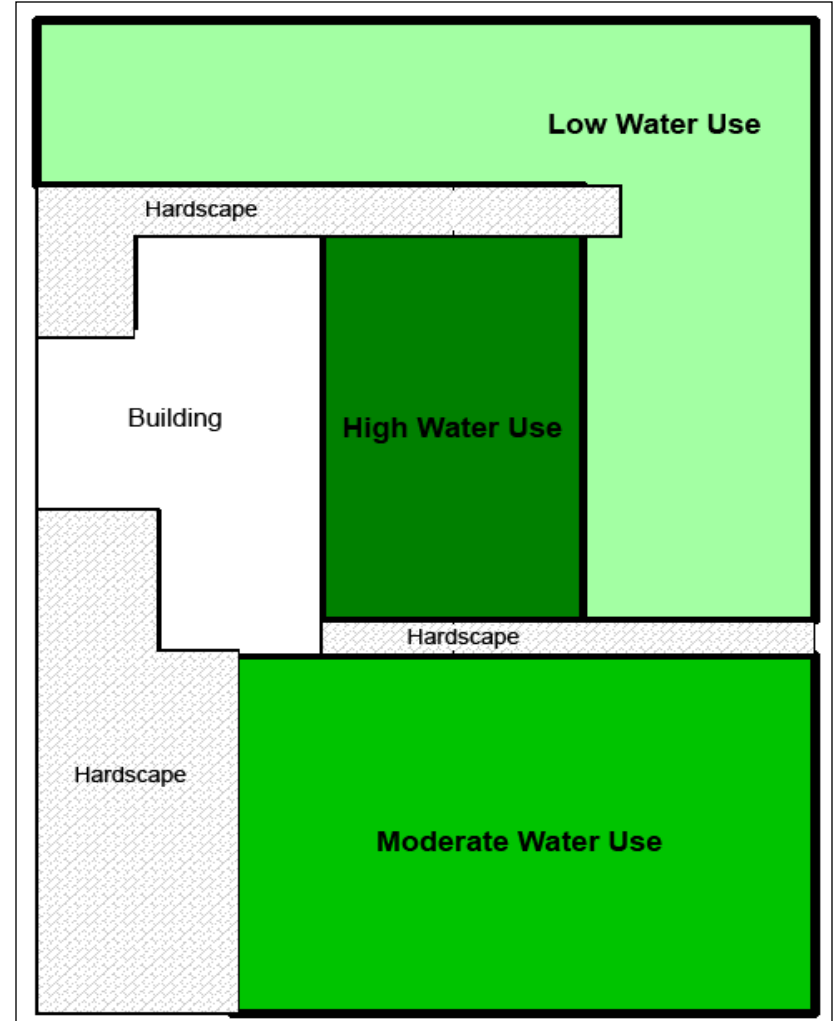
Low Water Use:



Moderate

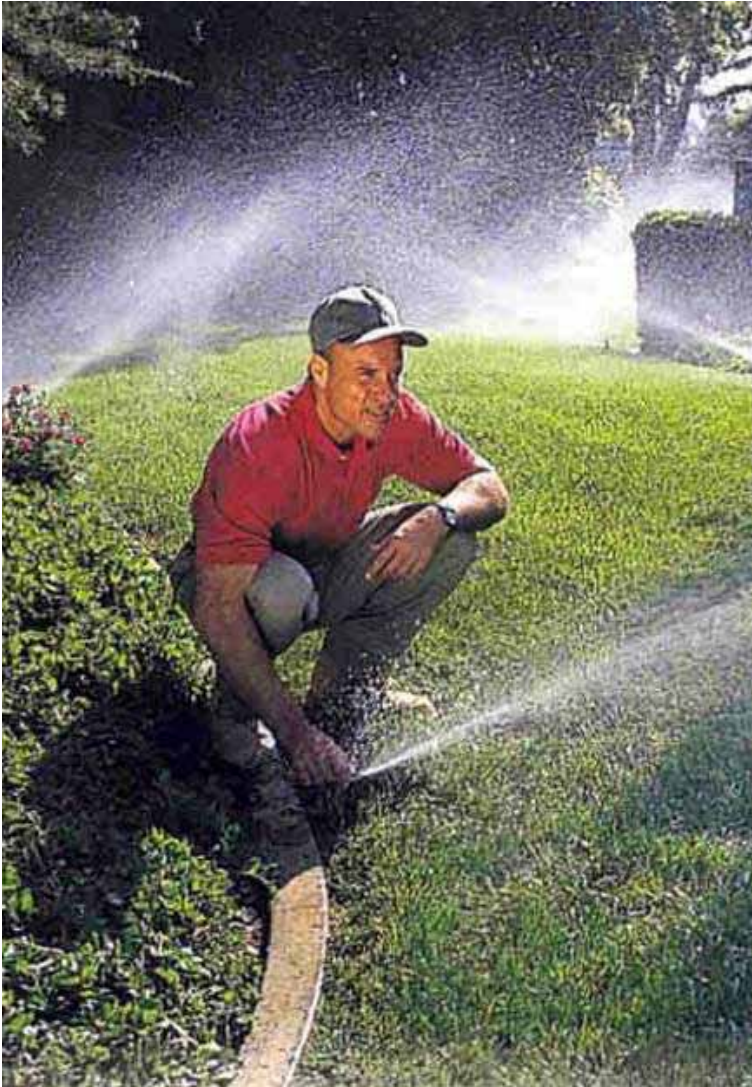


High



Assessment Tools

Observation



Soil Core Tool



CLIA - Cup Audit



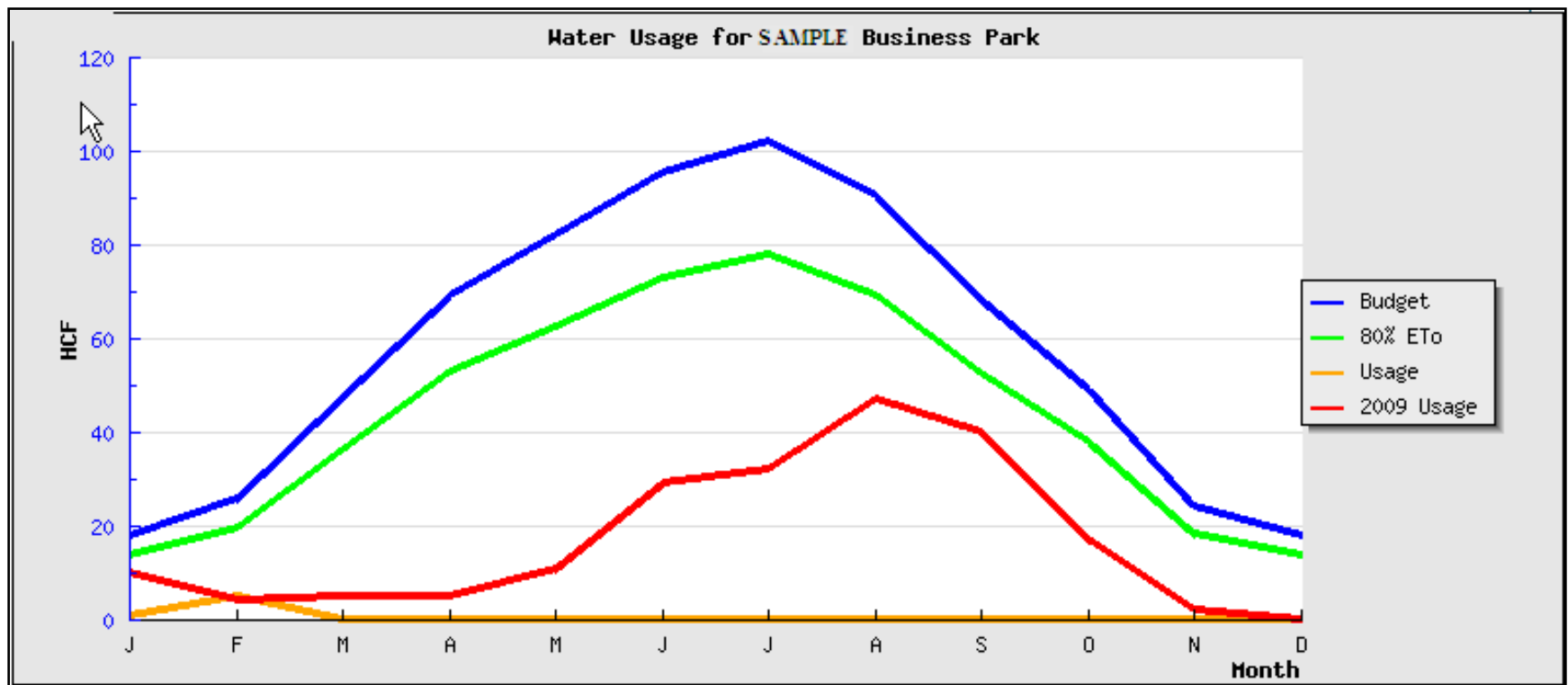


CLCA Certified Water Manager Program

- Pass a written test
- Complete an irrigation auditing course
- Demonstrate proficiency at required levels for one year on actual landscape sites, prior to achieving full certification status.



Example of Site Water Budget Report





Advanced Assessment Tools

Bay Friendly or River Friendly Guidelines

Soil Tests





Technology

“SMART” Controllers

- Lower water bills
- Reduced energy costs
- Fewer plant diseases and insect pests
- Less damage to pavement, fences, and buildings
- Reduced runoff
- Better air circulation in soil
- Satellite or on-site sensors





Technology

- Rain Sensors
- Moisture Sensors
- Master Valves with Flow Sensors
- Alert Notifications

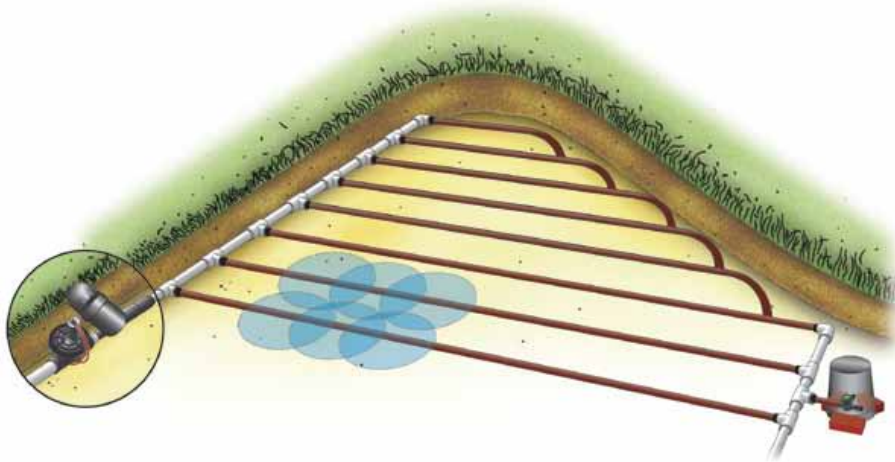




Technology

Rotary Stream nozzles:

- Improved coverage
- Reduced run off



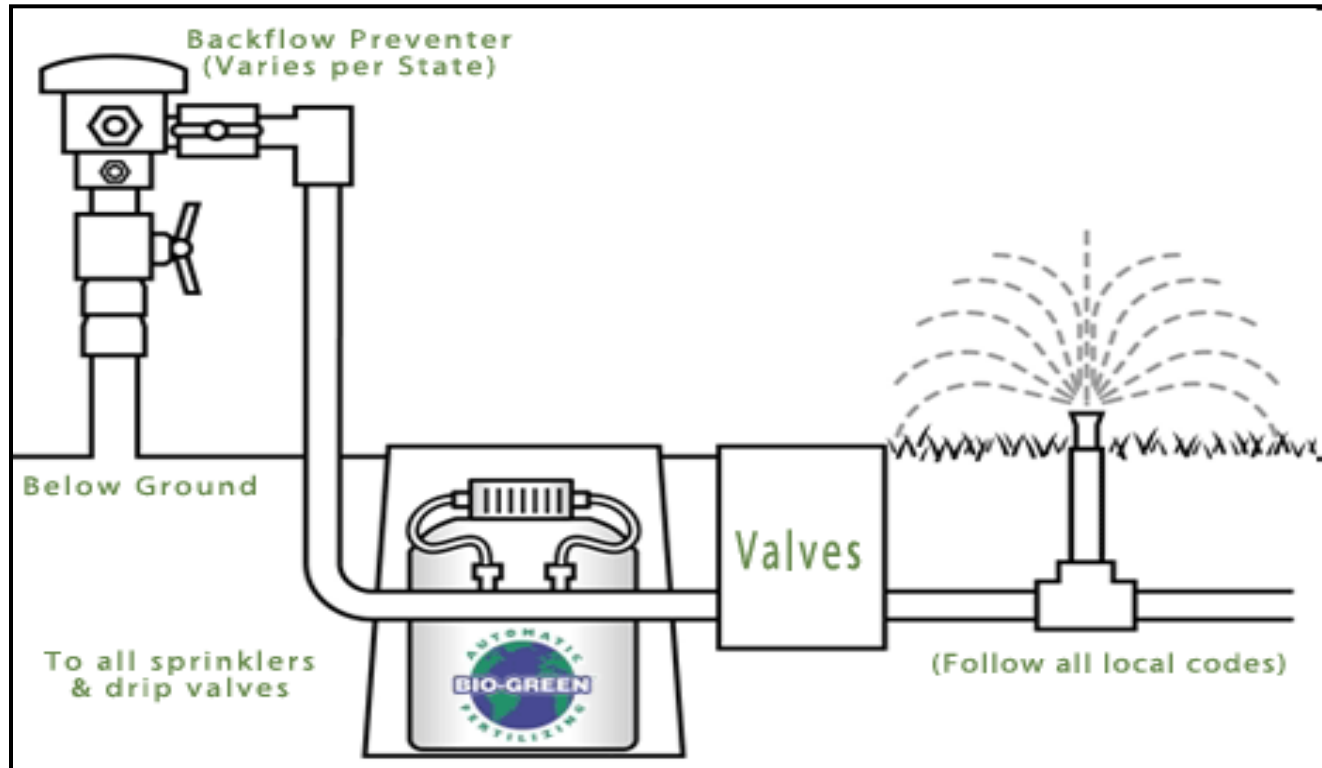
Sub-surface drip tube:

- Very efficient
- No overspray
- Shrub or Turf



Technology

“Fertigation” – Saves water, time, and reduces fertilizer run-off





Utilizing Bay Friendly Principles





Before

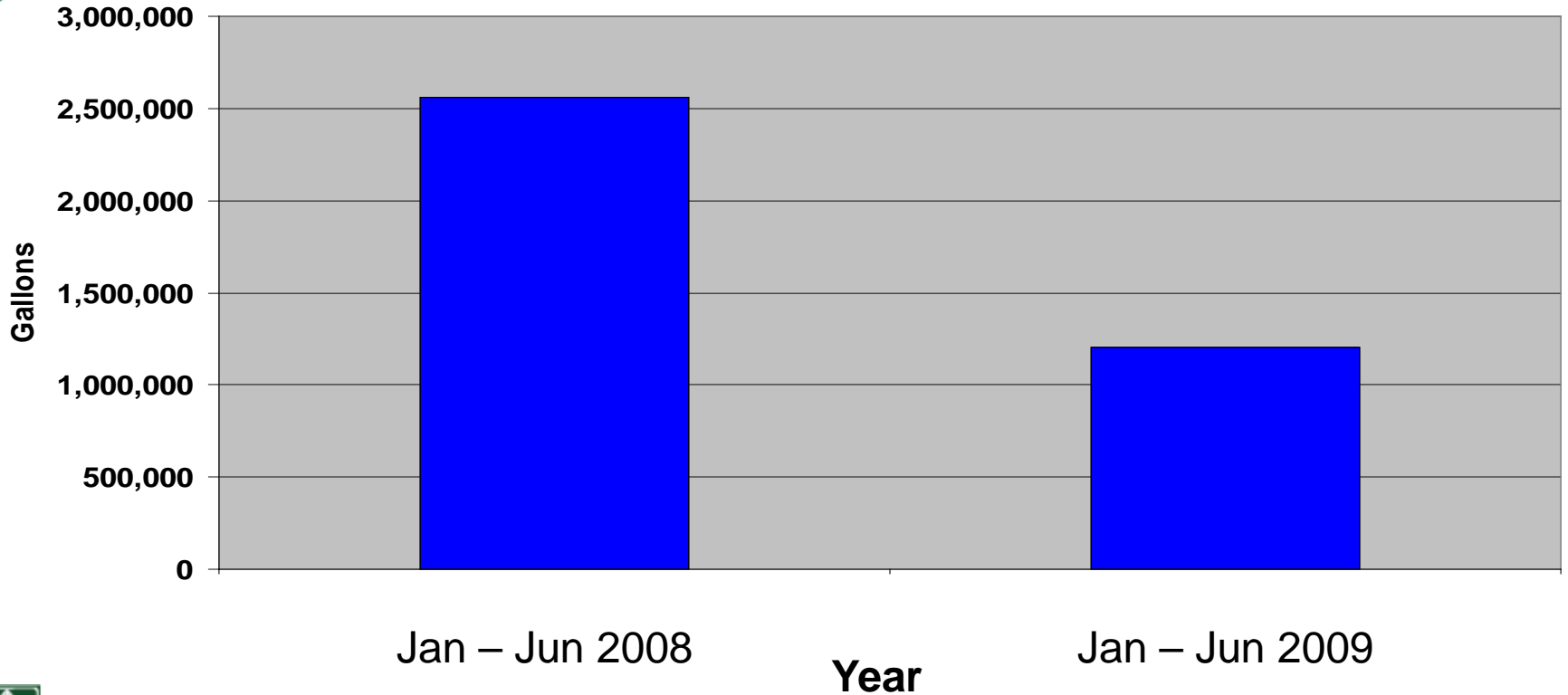
After





Results

- **53%** Reduction in water use
- **\$39,000** Saved

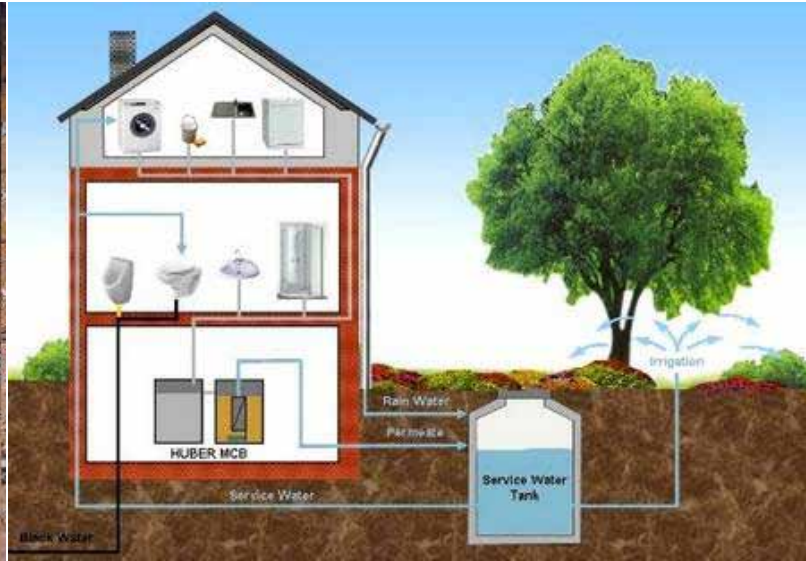




Technology

Making good use of existing water can include:

- Use of permeable surfaces
- Recycled water
- Rainwater harvesting





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- ✓ Bump up your thermostat
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Energy News

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This Summer, Save Money and Help Prevent Blackouts

Cash for Appliances Continues Over



East Bay HOA





Site Details



- 16 acres of Turf
- 14 acres of Shrubs
- 12 miles of parkway strips and medians



Challenges

- Water rates increasing by 7% annually
- 25 year old irrigation system
- Average rainfall May to September is only ½ inch
- Compacted clay soils throughout site





Customer Goals

Environmental:

- Improve irrigation efficiency
- Improve aesthetics of landscape
- Reduce synthetic pesticide and fertilizer use

Fiscal:

- Reduce annual water costs
- Complete irrigation improvements within budget



Solutions



- Reduced Turf in selected areas
- Utilized Organic products and services
- Improved irrigation efficiency





Medians Before

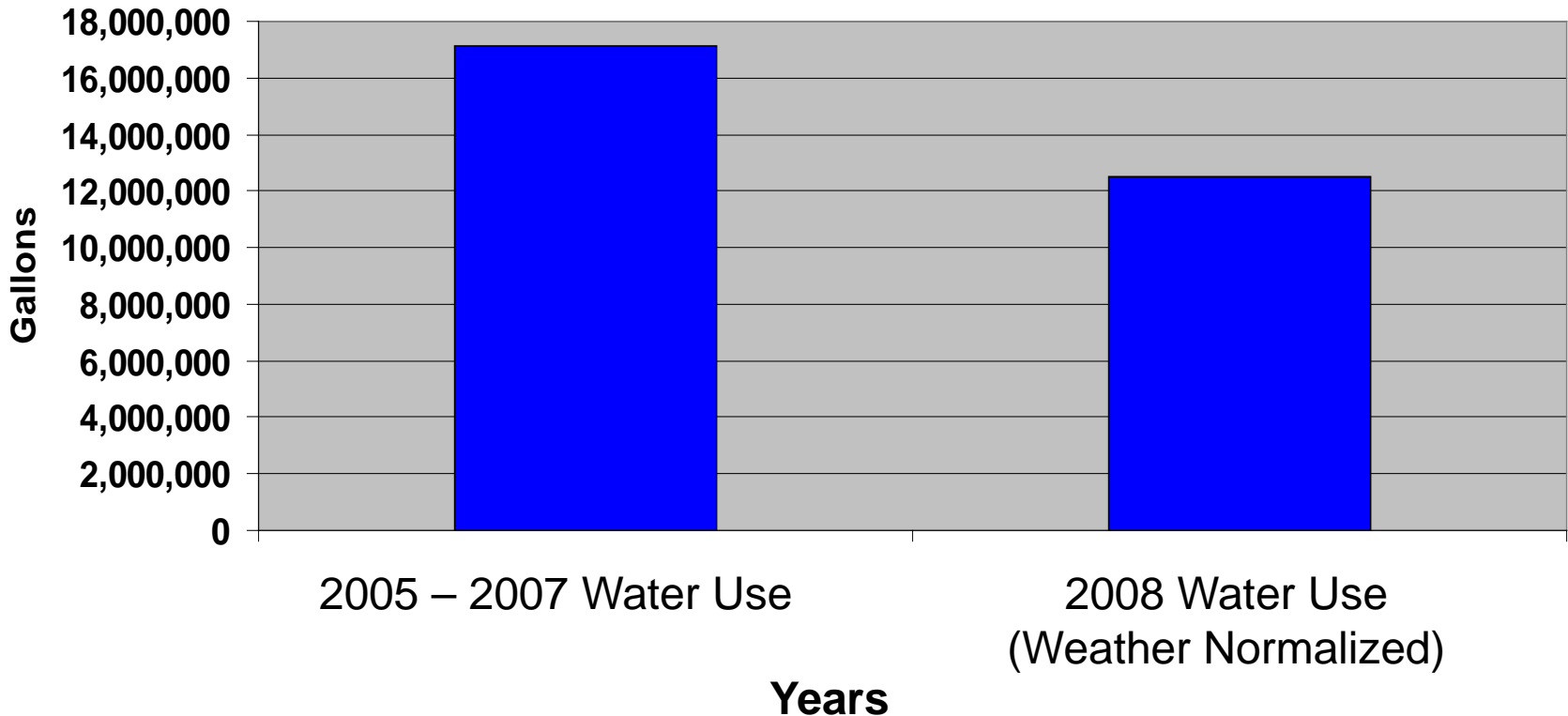
Medians After





Results

- **27%** Reduction in water use
- **\$51,000** Saved





Additional Benefits



EBMUD WaterSmart award recipient 2010



What questions do you have?



Thank you!