

Water Conservation in California

Water Use Efficiency and Conservation Workshop

California Water Commission
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Outline

- Advances in Water Conservation
- Opportunities and Challenges
- How is the State Moving Forward?



Conservation vs Water Use Efficiency

- Conservation: Reducing the total amount of water used.
- Water Use Efficiency: Accomplishing more benefits with the same amount of water.



Advancing water conservation (Legislative/Administrative)

- 1983, AB 797: Urban Water Management Planning Act
- 1990, AB 3616: Agricultural Efficient Water Management
- 1991, California Urban Water Conservation Council MOU
- 1992, federal CVPIA
- 2006, AB 1881: Model Water Efficient Landscape Ordinance
- 2007, AB 1404: Ag water use measurement report
- 2007, AB 1420: Update Demand Management Measures
- 2009, SB X7-7: 20x2020 targets & AWMP and EWMPs Implementation
- 2012, EO B-18-12: 20% \times 2020 in state facilities
- 2013, DSC Regulation: reduced reliance on the Delta
- 2014, California Water Action Plan: By the Governor in January 2014, Action 1 is “Water Conservation a California Way of Life”
- 2014, Governor’s Drought Proclamation



Advancing water conservation (Incentives)

- 2002, Proposition 50
- 2003, Proposition 13
- 2006, Proposition 84
- 2014, Proposition 1
 - Water Conservation
 - IRWM grants



Advancing water conservation (accomplished/supported by)

- Growers
- Urbanite
- Agricultural and urban water agencies
 - Agricultural Water Management Council
 - California Urban Water Conservation Council and IRWM groups
 - California Urban Water Agencies
- State, federal, and local government
- Environmental organizations
- Universities and research institutes
- Irrigation industry



Urban Facts

Total Population *(April 2010)* -38 Million

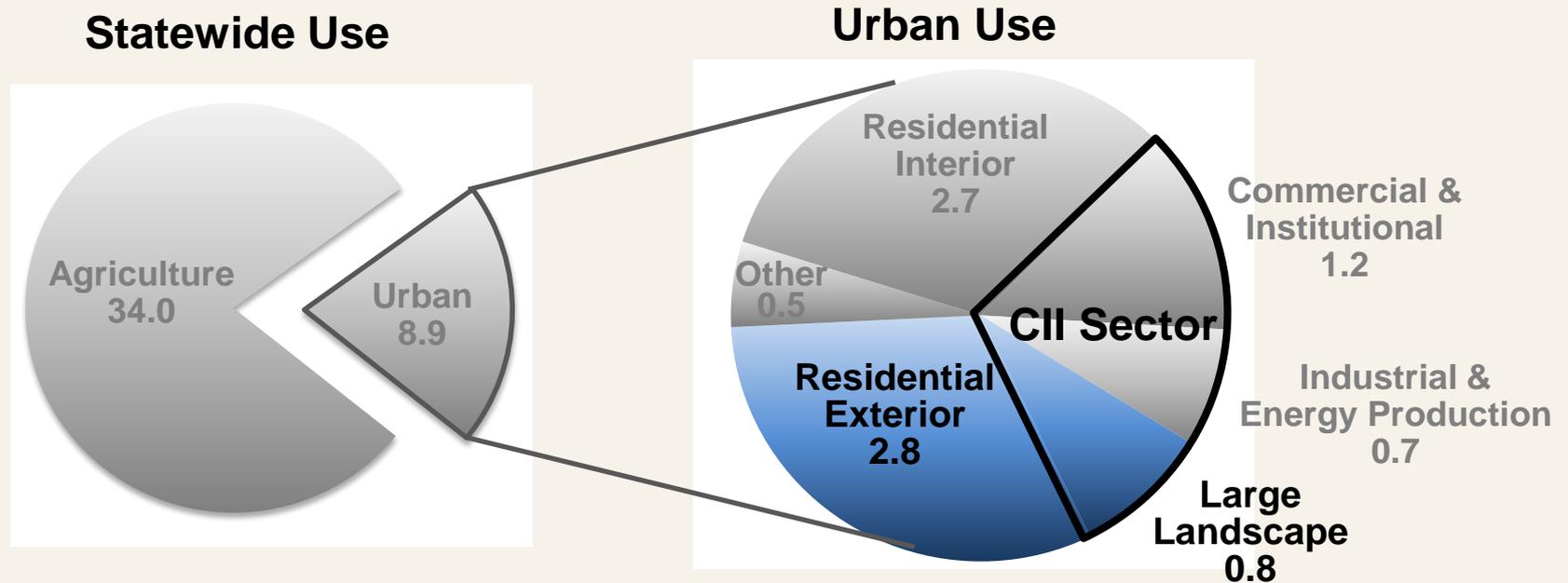
Water Provided by:

- Urban Water Suppliers - 94% (34.9 Million)
- Suppliers Under Reporting Threshold - 5% (1.75 Million)
- Self- supplied - 1% (0.65 Million)
 - Later two are the most vulnerable during drought

Water suppliers that submitted UWMPs reported on the water use of 90% of Californians (33.4 Million).



California water use: 40% of urban water use is exterior



DWR estimates that four million acre-feet of water is used across the state each year to sustain urban residential and commercial landscapes

Note: Based on 1998-2010 CWP averages. Volumes shown are in millions of acre-feet per year.

Urban water use reduction potential

| Use Type | Use, MAF | Use, GPCD | 20% reduction, AF |
|-----------------------|----------|-----------|-------------------|
| Residential Indoor | 2.9 | 81* | 580,000 |
| Residential Landscape | 2.8 | 78 | 560,000 |
| Large Landscape | 0.8 | 22 | 160,000 |
| Total | 6.5 | 181 | 1,300,000 |

*USEPA - WaterSense and Energy Star® fixtures and appliances water use: 43 gpcd



Urban water conservation (progress)

- Plumbing code changes and water meter requirements
- Water agencies (CUWCC) BMPs
- Legislative requirements, 20x2020
- Export limitations
- Public awareness
- Grant eligibility

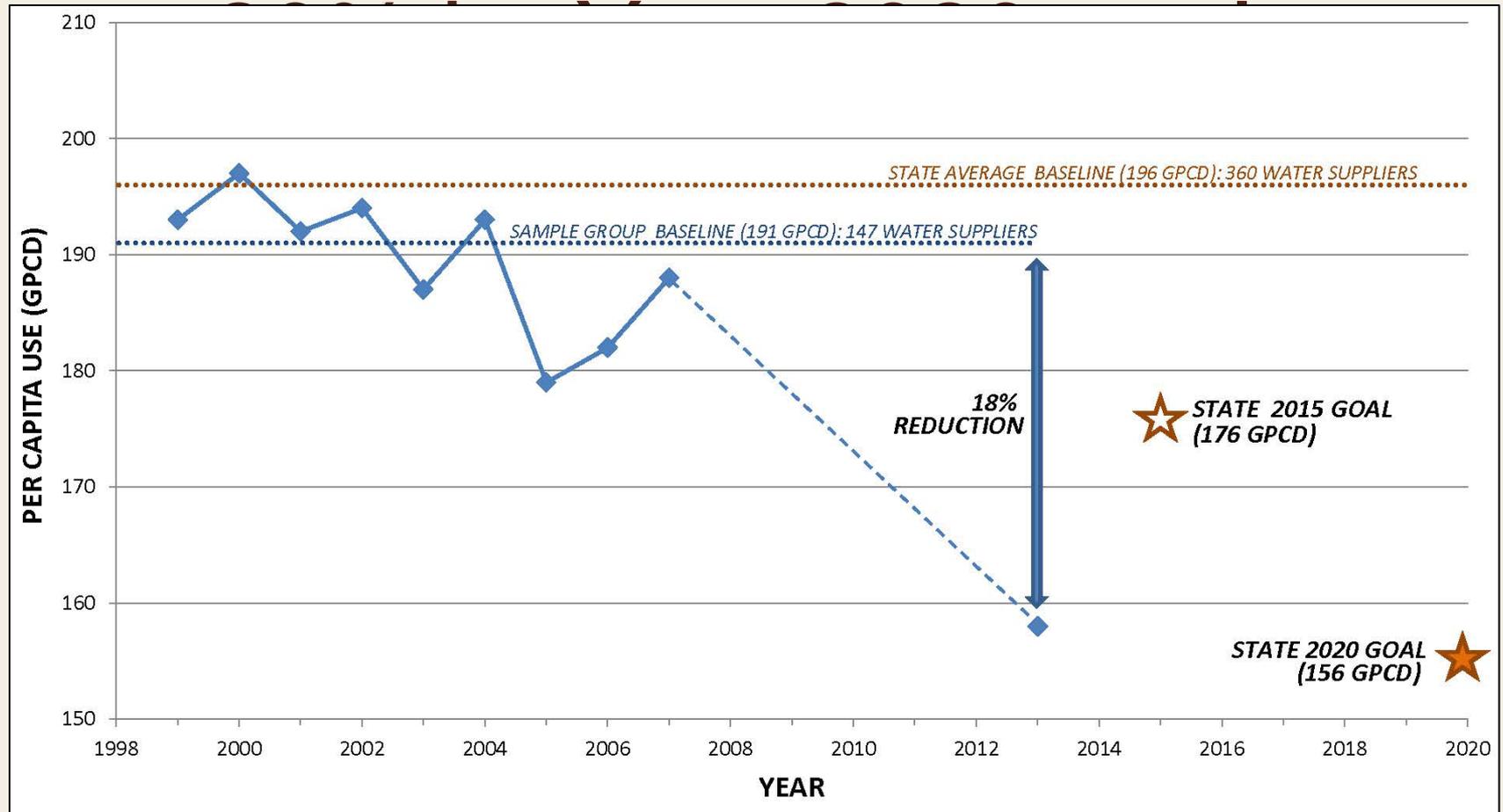


Water Conservation Act of 2009, SB X7-7, Urban

- Set a statewide goal of reducing per capita urban water use by 20% by the year 2020
- Urban retail water suppliers required to set baseline and 2015 and 2020 water use targets



Statewide progress towards meeting



Opportunities for urban water conservation

- Landscape
- Conservation Based Rates
- Utility technology updates, timely water use data to customers
- Leak repair



Urban Water Conservation

(challenges and implementation issues)

- Reduced water agency revenue
- Customers' inadequate awareness of their water use
- Inconsistent implementation of the landscape model ordinance by local agencies
- Infrastructure needing repair (leaks)
- Funding/Costs



Cost of Urban Water Conservation

- \$333-\$500/AF (Source-Alliance for Water Use Efficiency, 2008)
- \$150-\$1,000/AF (Estimated for San Diego area)



California Agriculture Facts



Source: Department of Food and Agriculture and DWR

- 82,000 farms & ranches in 2010
- 8.13 million irrigated crop acres in 2010
- 9.6 million irrigated acres in a typical year (9.0 million land + 0.6 million multi-crop) and 34 MAF of applied water
- In 2014, estimated peak summer land idling of 1.7 million acres; 700,000 acres more than 2011 (wet year)

Agriculture - water conservation progress made

- Increased crop production
- Advances in irrigation methods
 - Pressurized vs traditional
- Improved irrigation management
 - Scheduling, flexible delivery
- State and federal requirements
- Limited supplies



Agricultural water management plan (AWMP)

- CVPIA AWMP requirements
- SB X7-7 AWMP
 - Prepare Plan
 - Implement water measurement and pricing
 - Implement other EWMPs, if cost effective
 - Report efficiency improvements



Quantifying agricultural water use efficiency

One of the Methods of Quantifying Agricultural Irrigation Efficiency

Total water use fraction (AWUF)

$$TWUF = [Et_{aw} + AU + EU] / [AW]$$



Indicators of agricultural water use efficiency

Indicator of Irrigation System performance:

Distribution Uniformity (DU). A measure of irrigation system performance—how evenly water is applied and infiltrates into the soil across a field during an irrigation event.

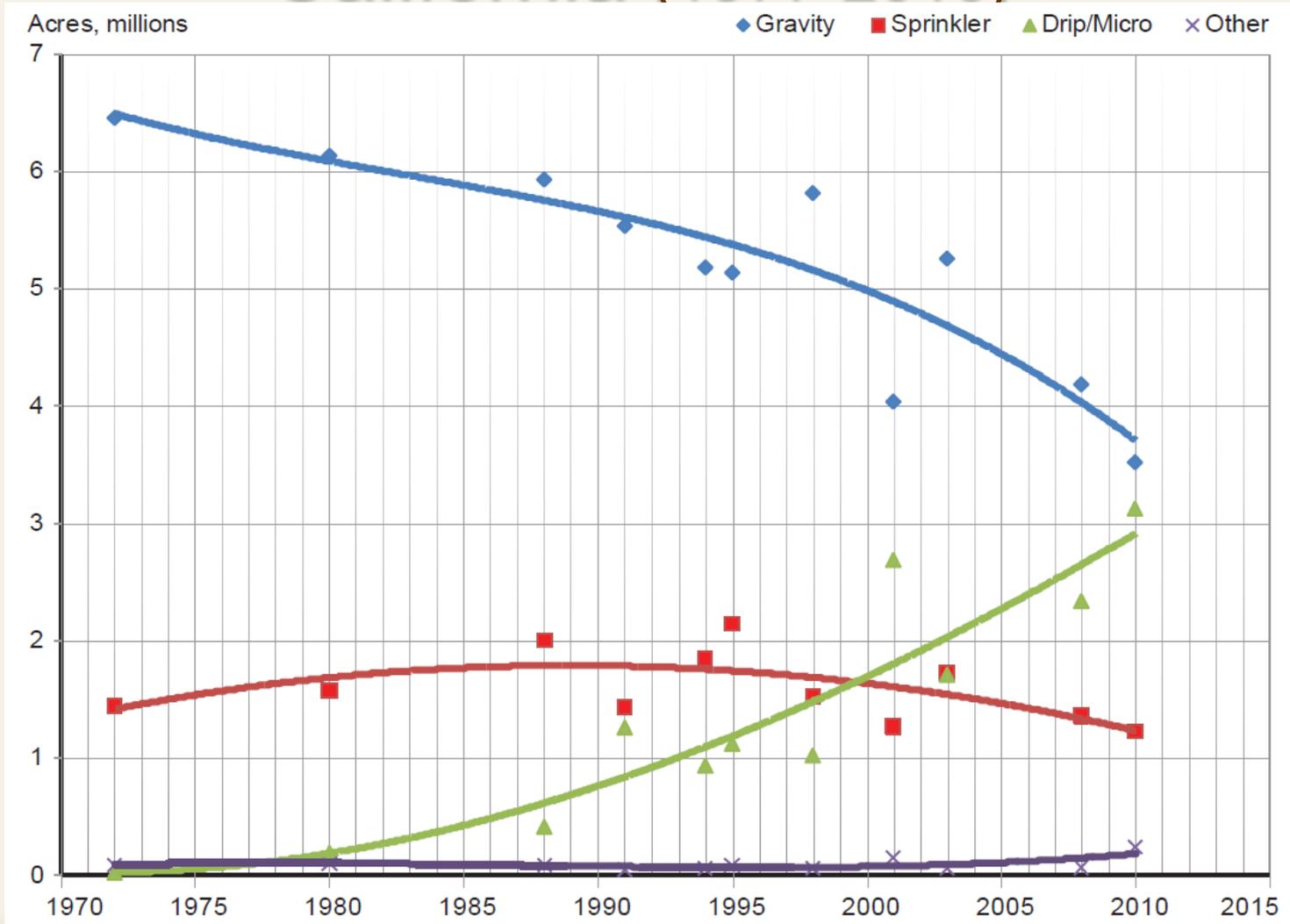


Irrigation System DU

| Irrigation System Evaluation, San Joaquin Valley (Cal Poly State University) | |
|---|---------------------------------------|
| Irrigation System | Average Distribution Uniformity |
| Microsprinkler | 94% |
| Microsprayer | 82% |
| Drip | 82% |
| Subsurface Drip | 78% |

Distribution Uniformity (DU). This is a measure of irrigation system performance—how evenly water is applied and infiltrates into the soil across a field during an irrigation event.

Change in Irrigation Methods in California (1977-2010)



Indicators of agricultural water use efficiency

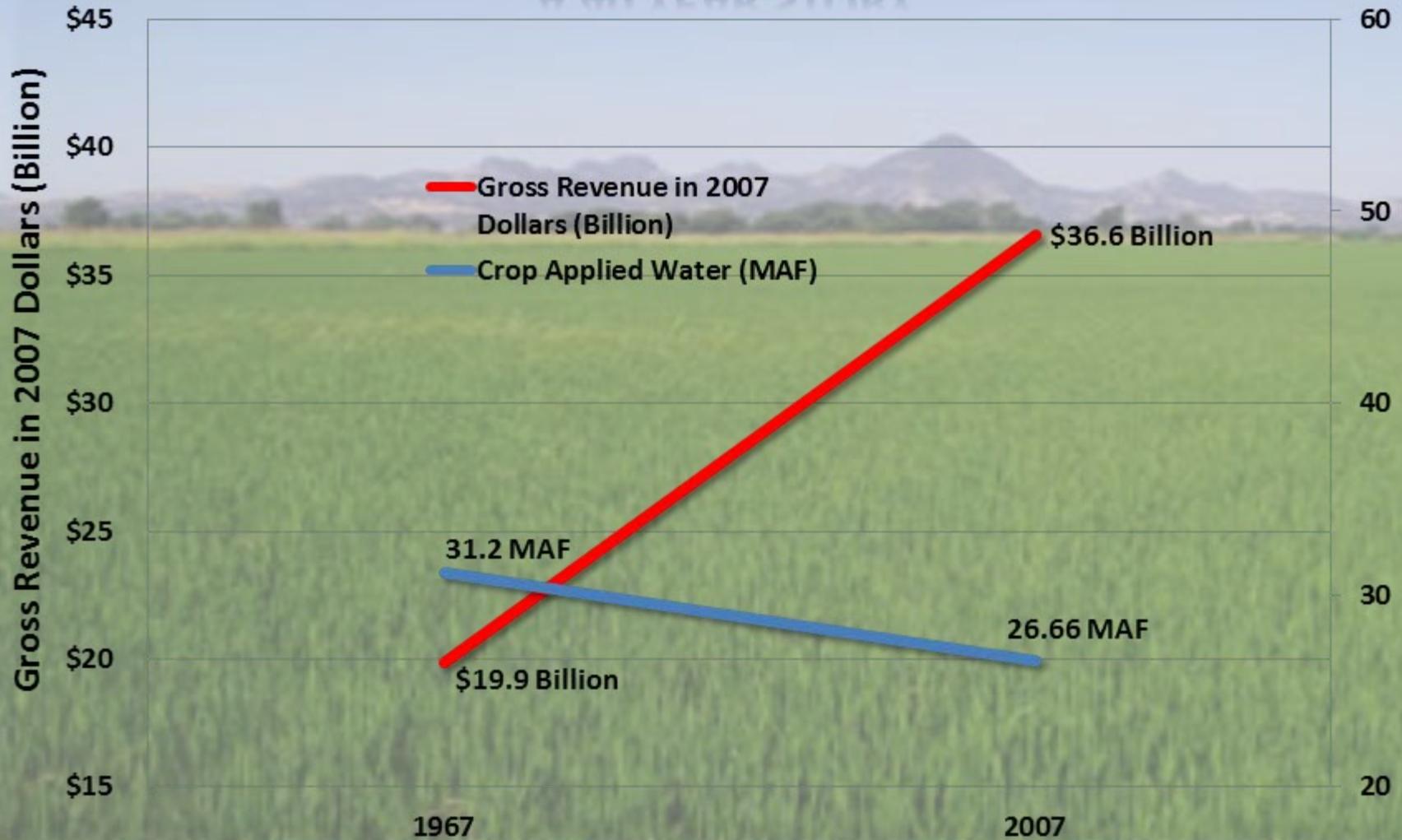
Indicator of Crop Productivity:

Value of Applied Water Fraction (VAW).

Illustrates the relationship (ratio) between gross crop value in dollars and the volume of applied water.



AGRICULTURAL WATER USE AND PRODUCTIVITY: A 40 YEAR STORY



Opportunities to improve agricultural water use efficiency

- Hardware: On-farm and water supplier delivery system
- Water Management: Reducing non-beneficial ET and better irrigation and delivery management
- Technology: fertilizers, cultural practices



Opportunities for Improvements



Hardware improvement -
on-farm irrigation systems

Hardware Improvement- Water Supplier Delivery System



Agricultural Water Conservation Implementation Issues

- Implementation: economic viability, feasibility, technical assistance, ability of growers, irrigation industry and water suppliers participation
- Energy impacts/benefits
- Education and Training
- Costs/funding



Potential reduction and cost of agricultural water conservation

- Potential reduction of Irrecoverable Loss:
 - 34,000 to 190,000 AF/Y (CALFED)
 - 330,000 AF/Y(CIT)
- Average costs of Irrecoverable Loss Reduction: \$100 to \$750/AF

Source: Water Plan Update 2013



How the State is Moving Forward

- California Water Plan Update 2013
 - Integrated water management and portfolio of resource management strategies
- Continued implementation of SB X7-7 of 2009
- Implementation of the Proposition 1 \$100M for water conservation
- Proposition 1, \$510 M for IRWM



Governor's Water Action Plan

A diverse water portfolio: 10 priority actions

1. **Make conservation a California way of life.**
2. Increase regional self-reliance and integrate water management across all levels of government
3. Achieve the co-equal goals for the Delta.
4. Protect and restore important ecosystems.
5. **Manage and prepare for dry periods.**
6. Expand water storage capacity.
7. Provide safe drinking water and secure wastewater systems to all communities.
8. Increase flood protection.
9. Improve operational and regulatory efficiency.
10. Identify sustainable and integrated financing opportunities.

California Water Action Plan



Make Conservation a California Way of Life

Expand Agricultural and Urban Water Conservation and Efficiency to Exceed SB X7-7 Targets.

- *Identify and remove impediments to achieving statewide targets and goals.*
- Provide Funding for Conservation and Efficiency.
- Promote Local Urban Conservation Ordinances and Programs
- *Evaluate and update targets for increased water use efficiency.*
 - This includes expanding the 20% x 2020 targets by holding urban water consumption at 2000 levels until 2030, achieving even greater per capita reductions in water use.



DWR Plan

Will develop Implementation Plan for Action #1 in coordination with other state and federal agencies, and partners with emphasis on three areas:

- Technical assistance
- Planning assistance
- Financial assistance





Conclusion

Increasing population, the climate change, and economic growth necessitate a sustainable water management strategy, and water conservation is an element of this strategy.



Save Our Water



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