

Victoria Whitney
Deputy Director
Division of Water Quality
State Water Resources Control
Board



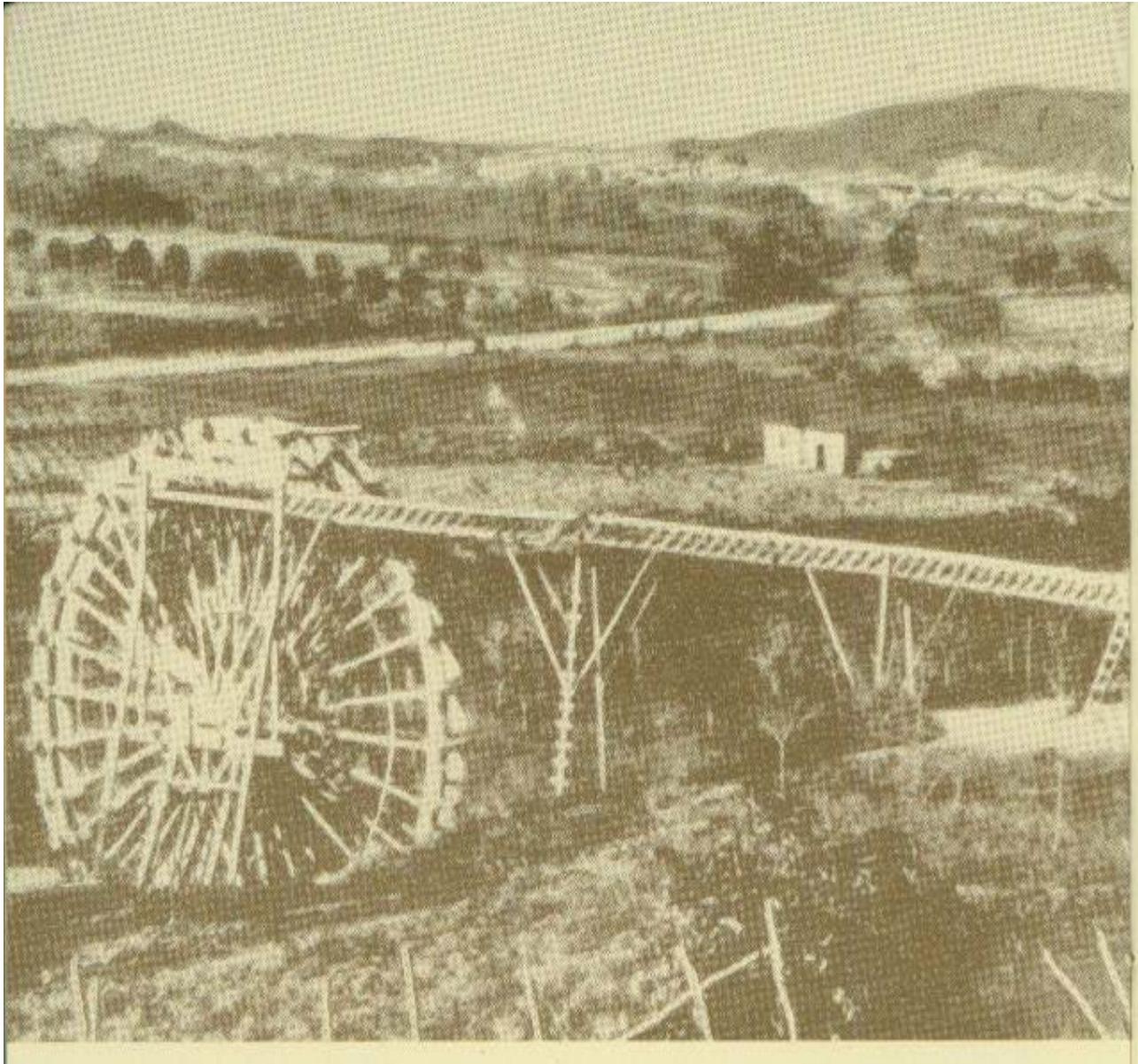
California's Water Situation





*A water carrier in the early days of the
Pueblo Los Angeles*

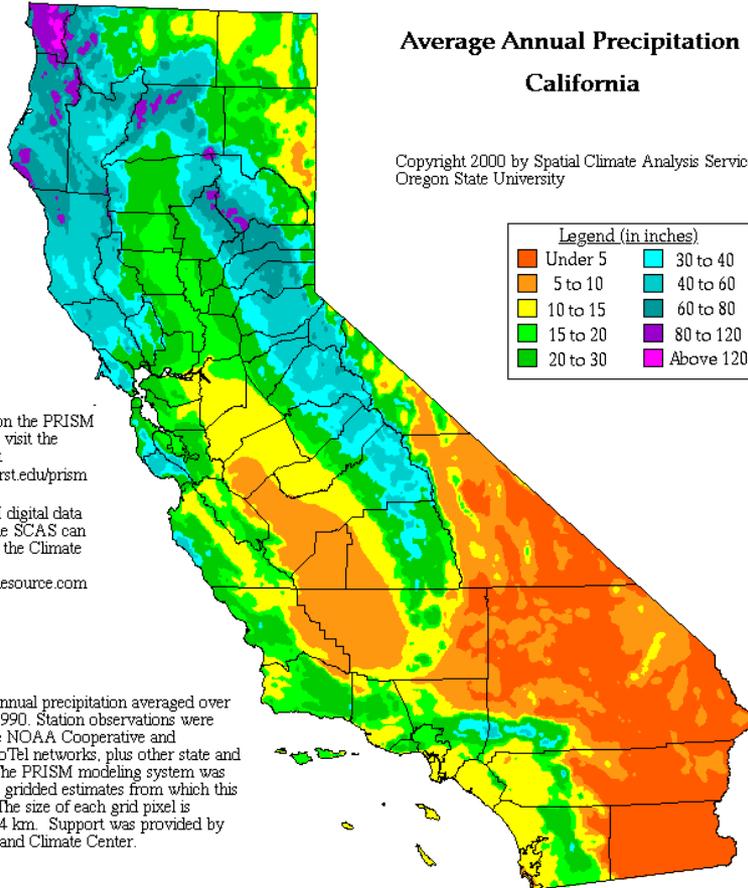
EPH.623.1.4



Water Distribution v Population

**Average Annual Precipitation
California**

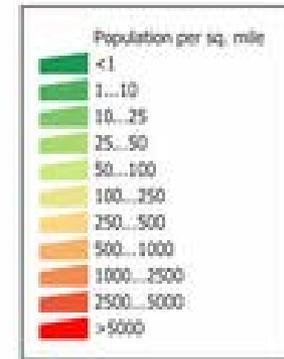
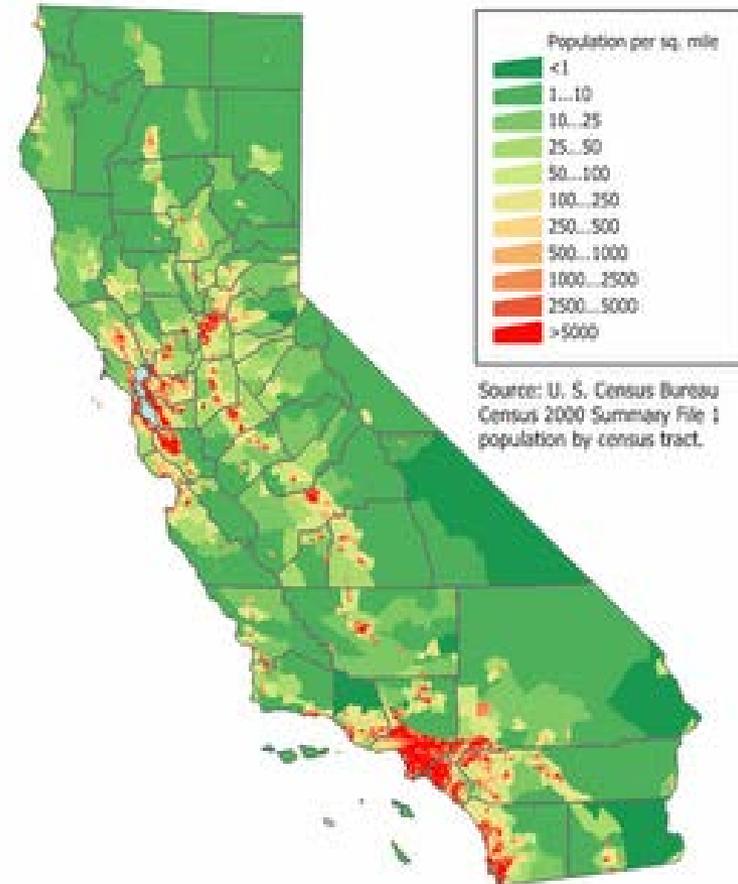
Copyright 2000 by Spatial Climate Analysis Service,
Oregon State University



For information on the PRISM modeling system, visit the SCAS web site at <http://www.ocs.orst.edu/prism>

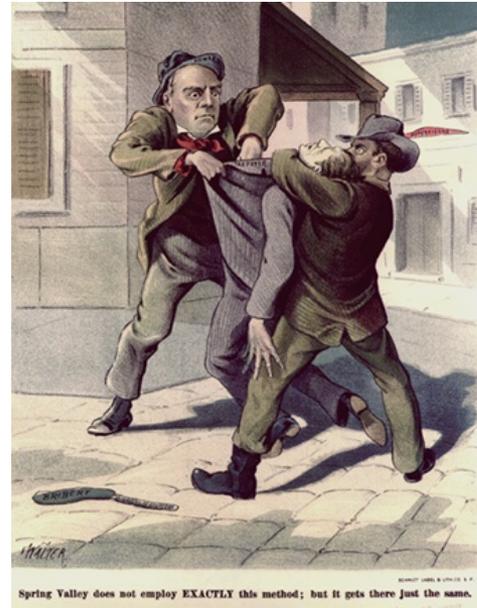
The latest PRISM digital data sets created by the SCAS can be obtained from the Climate Source at <http://www.climate-source.com>

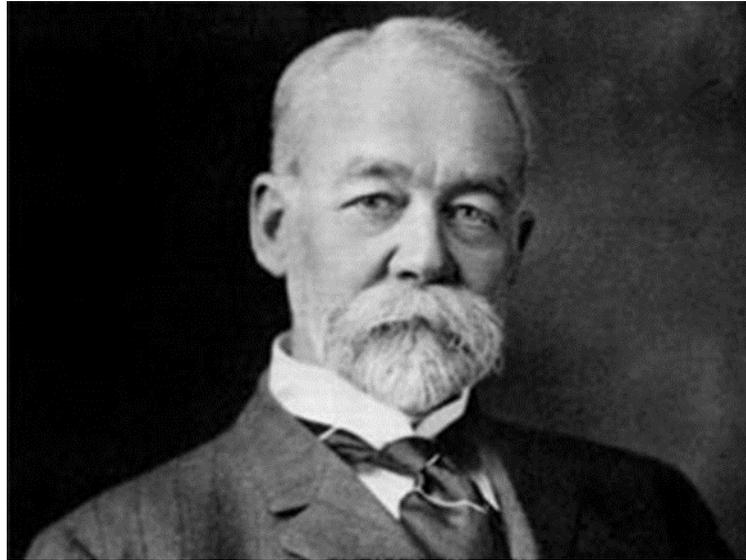
This is a map of annual precipitation averaged over the period 1961-1990. Station observations were collected from the NOAA Cooperative and USDA-NRCS Snotel networks, plus other state and local networks. The PRISM modeling system was used to create the gridded estimates from which this map was made. The size of each grid pixel is approximately 4x4 km. Support was provided by the NRCS Water and Climate Center.

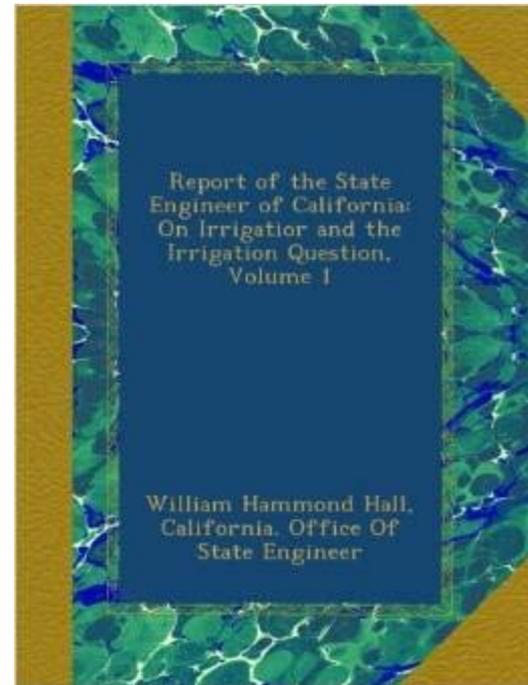
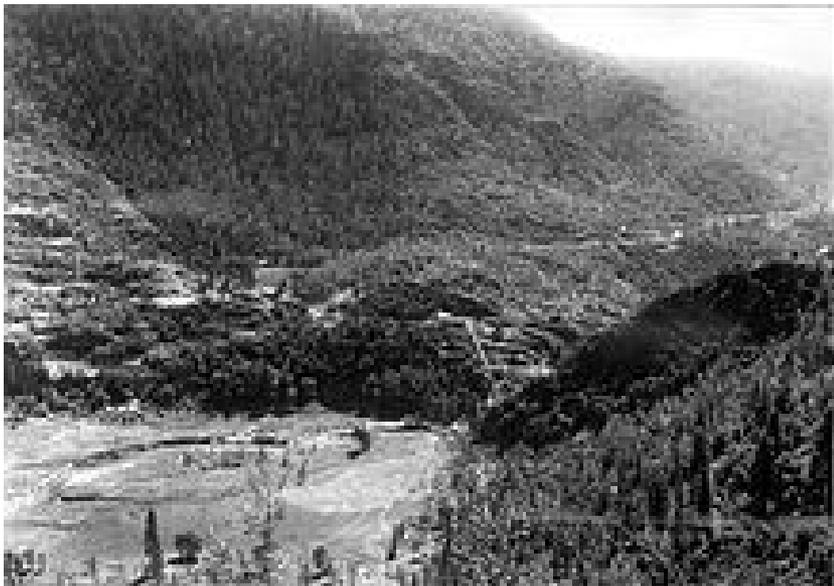


Source: U. S. Census Bureau
Census 2000 Summary File 1
population by census tract.









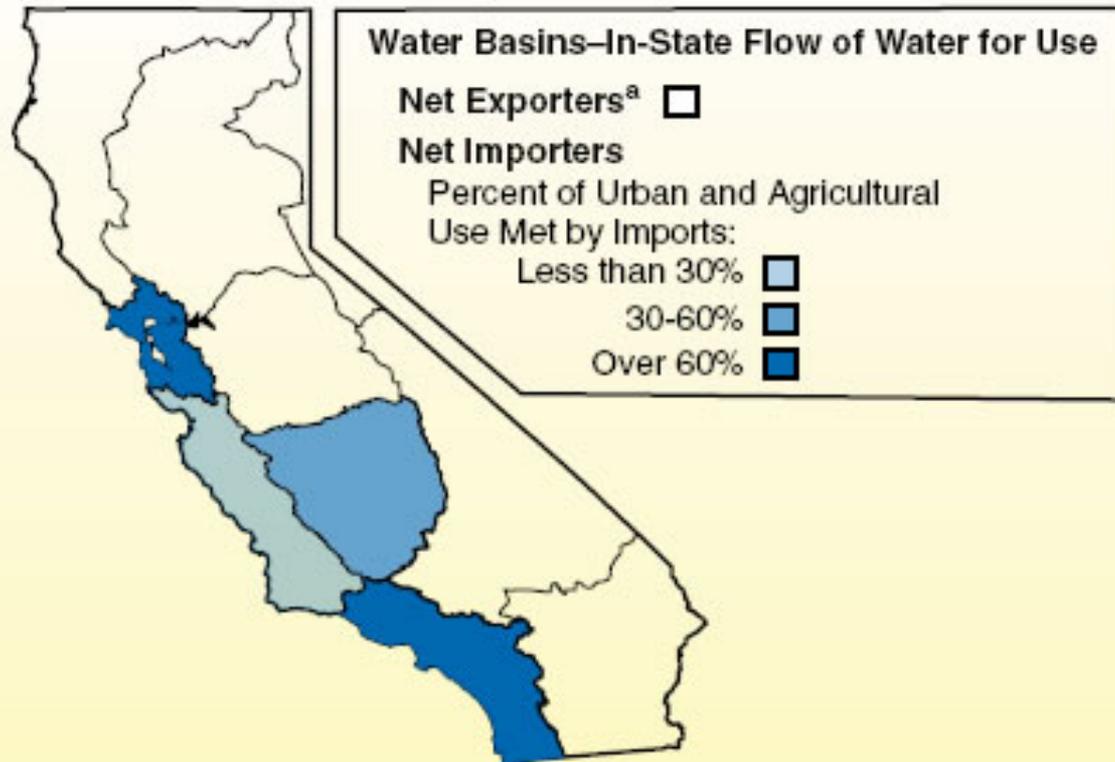




California's Water Supply Projects



Interbasin Transfers



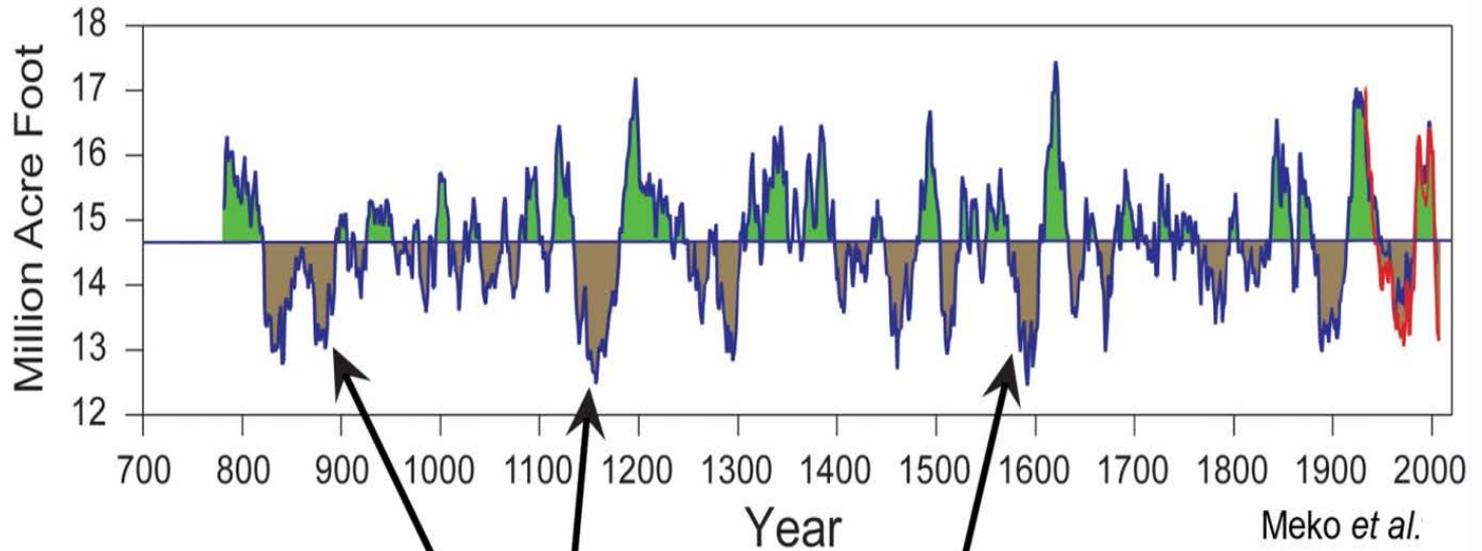
^aWhile the Colorado River region is a net exporter of water within California, its main source of water is imported from the Upper Colorado River Basin.

NASA Satellite Image

Impact of drought on
California's vegetation,
Jan 17 – Feb 1, 2014 against
average conditions for the same
period over the past decade.



NASA Earth Observatory image by Jesse Allen, Earth
Observatory, using data provided by Inbal Reshef, Global
Agricultural Monitoring Project.



Some droughts in the past have been more severe and longer lasting than any in the last century.



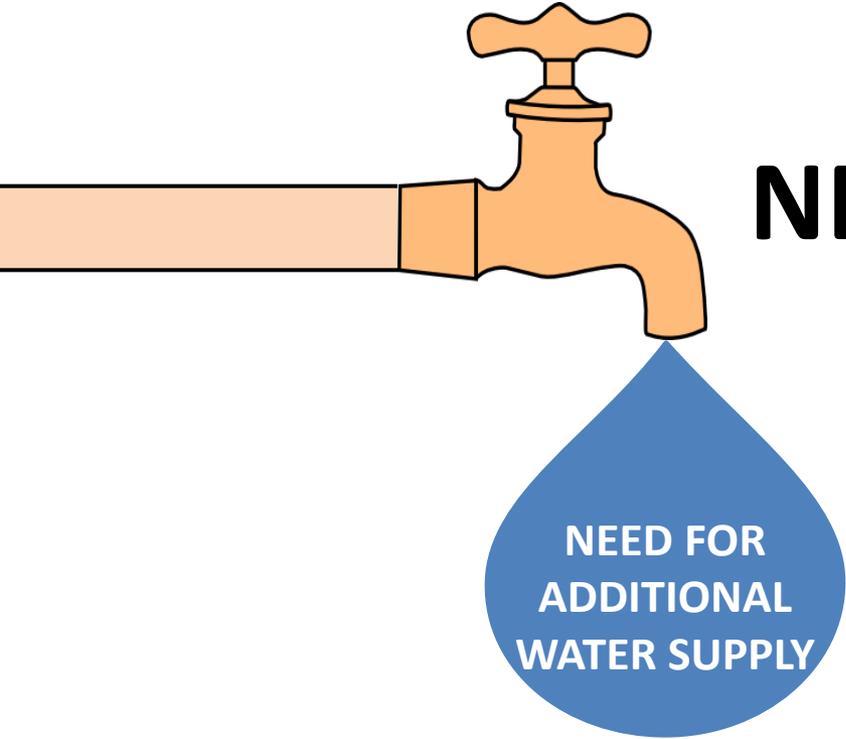


Folsom Lake - January 16, 2014



Drought and California's Water Supply

- Drought has accelerated need for conservation and alternative water supplies
 - Water recycling
 - Desalination
 - Conjunctive water use
 - Groundwater recharge
 - Storm water reuse
 - Groundwater remediation



NEED FOR ADDITIONAL WATER SUPPLY

- California is changing

California is Changing

- Population growth
 - 36.7 million in 2005 → 59.5 million by 2050
- Climate change
 - Drought State of Emergency
 - Extended dry years
 - Warmer temperatures

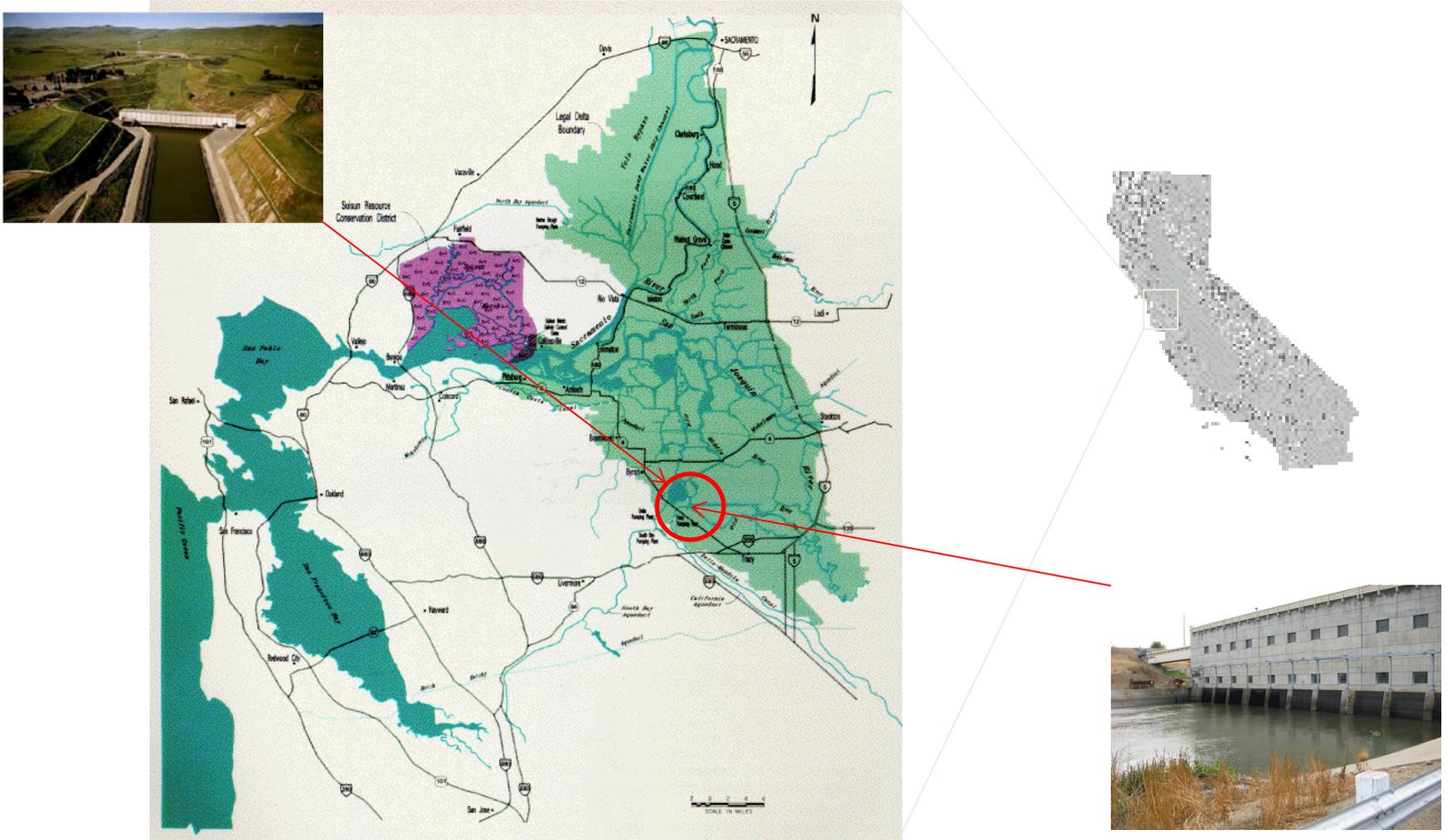


Traditional Local Supplies are Dwindling



San Clemente Dam near Monterey, CA

The Delta

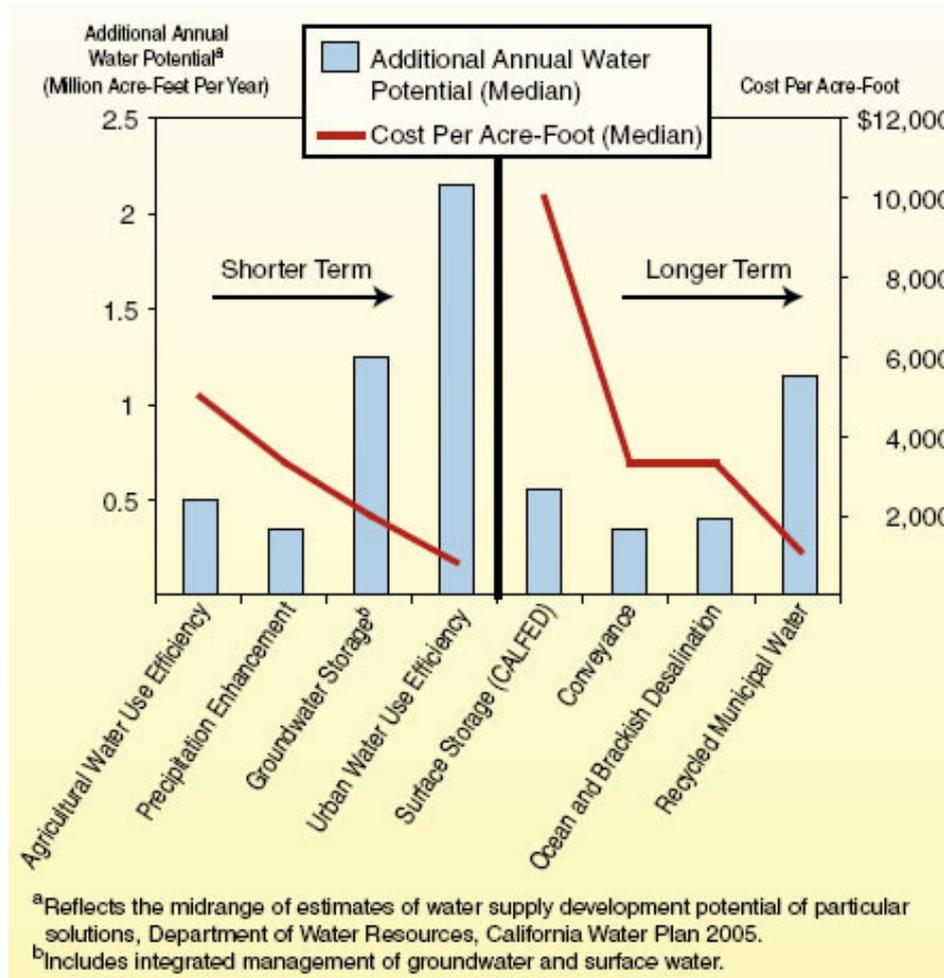


No New Interbasin Transfers



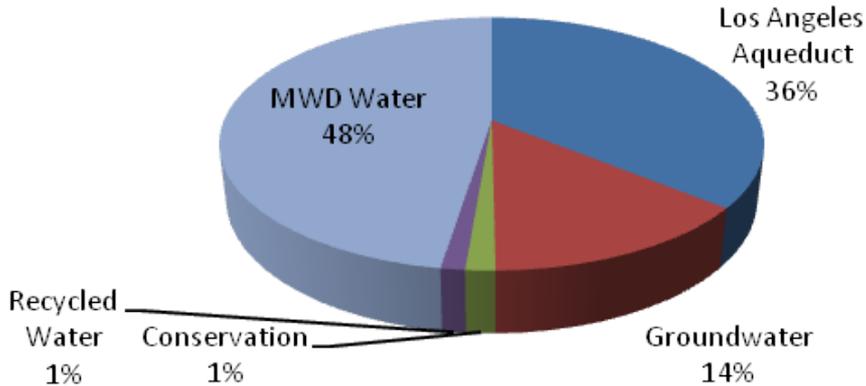
Options for Additional Supply

Benefits and Costs

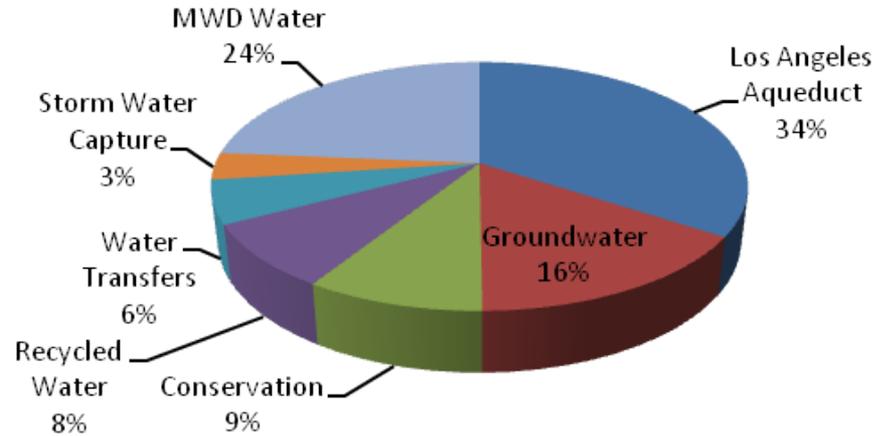


Future Supply: Los Angeles

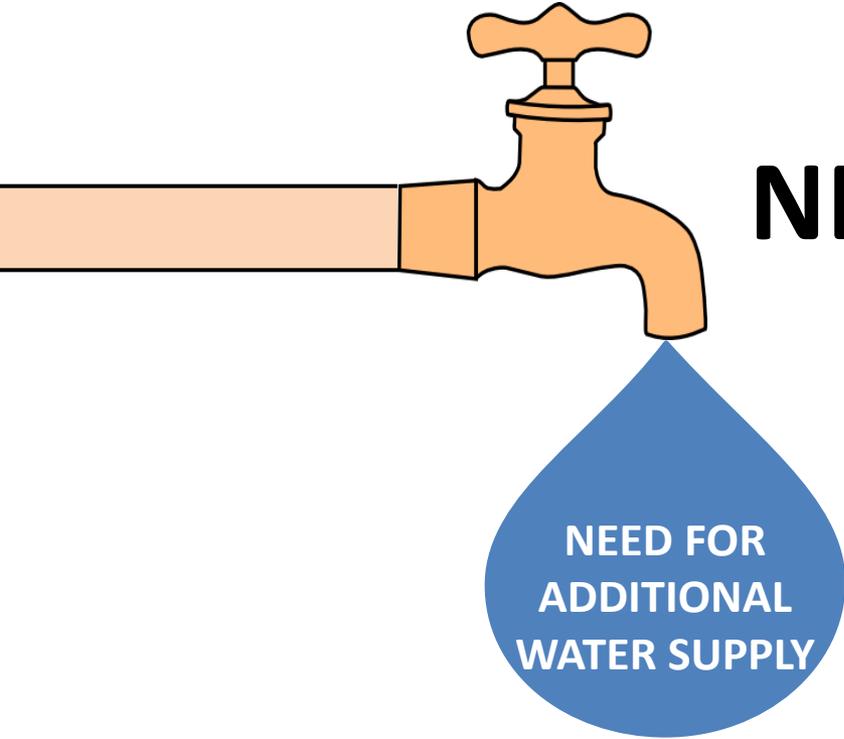
LADWP 2010



LADWP 2035



Note: "MWD Water" comes from the Delta and the Colorado River



NEED FOR ADDITIONAL WATER SUPPLY

- Recycled water defined
- Recycled water augmenting fresh water supply

Recycled Water Defined

- California Water Code Section 13050(n) :



**Treated
Wastewater**

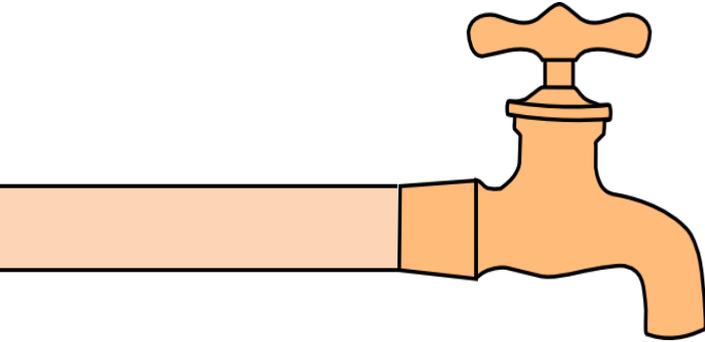


Beneficial Uses



**Valuable
Resource**

- Recycled Water in this presentation refers to treated municipal wastewater



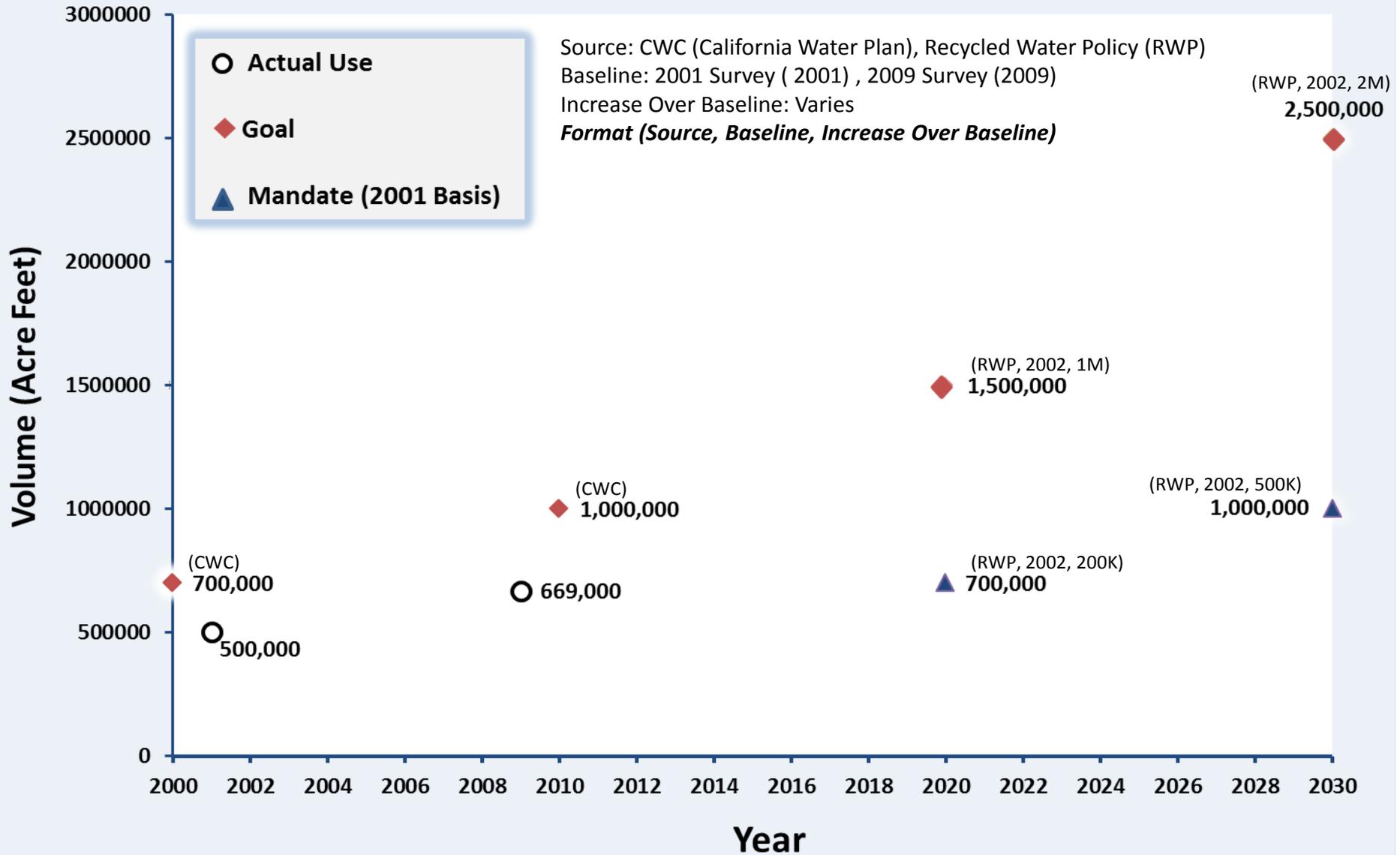
OVERVIEW OF RECYCLED WATER USE

NEED FOR
ADDITIONAL
WATER SUPPLY

OVERVIEW OF
RECYCLED
WATER USE

- Water recycling targets
- Trends in recycled water use

Recycled Water Use and Goals

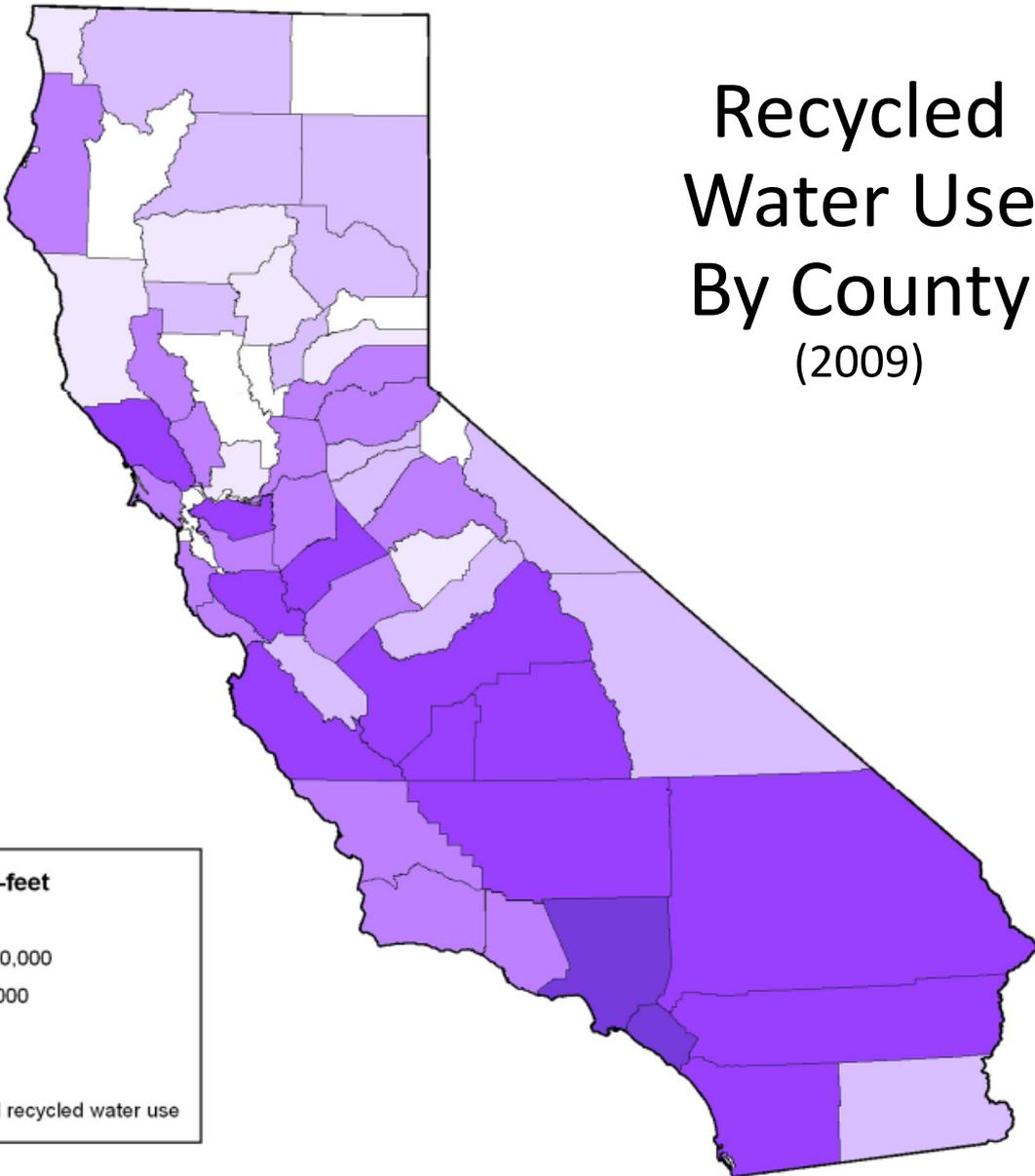
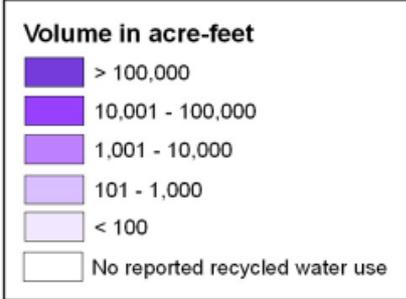


Water Boards Strategic Plan

Increase sustainable local water supplies available for meeting existing and future beneficial uses by 1,725,000 acre-feet per year, in excess of 2002 levels, by 2015, and ensure adequate flows for fish and wildlife habitat



Recycled Water Use By County (2009)



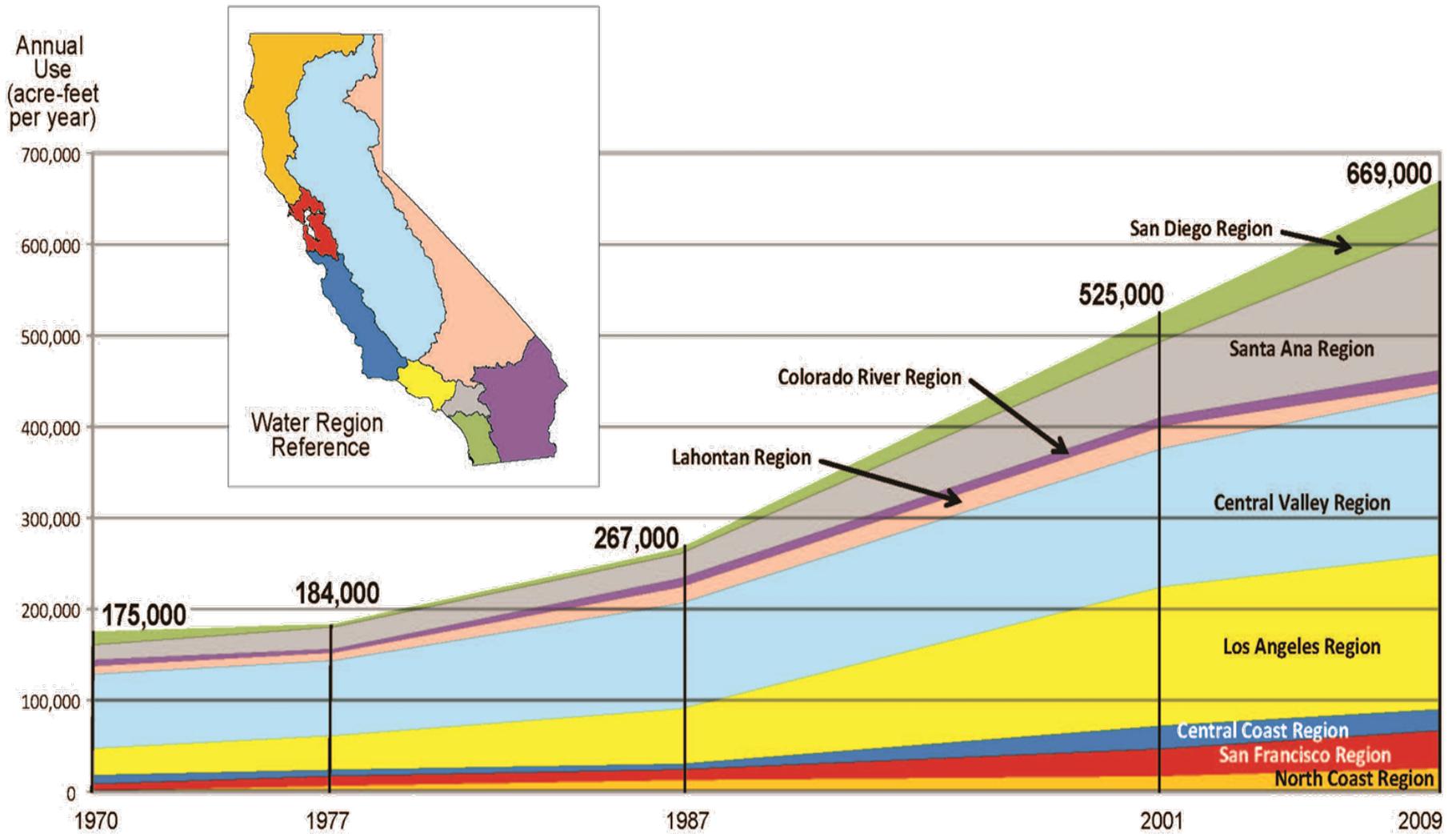
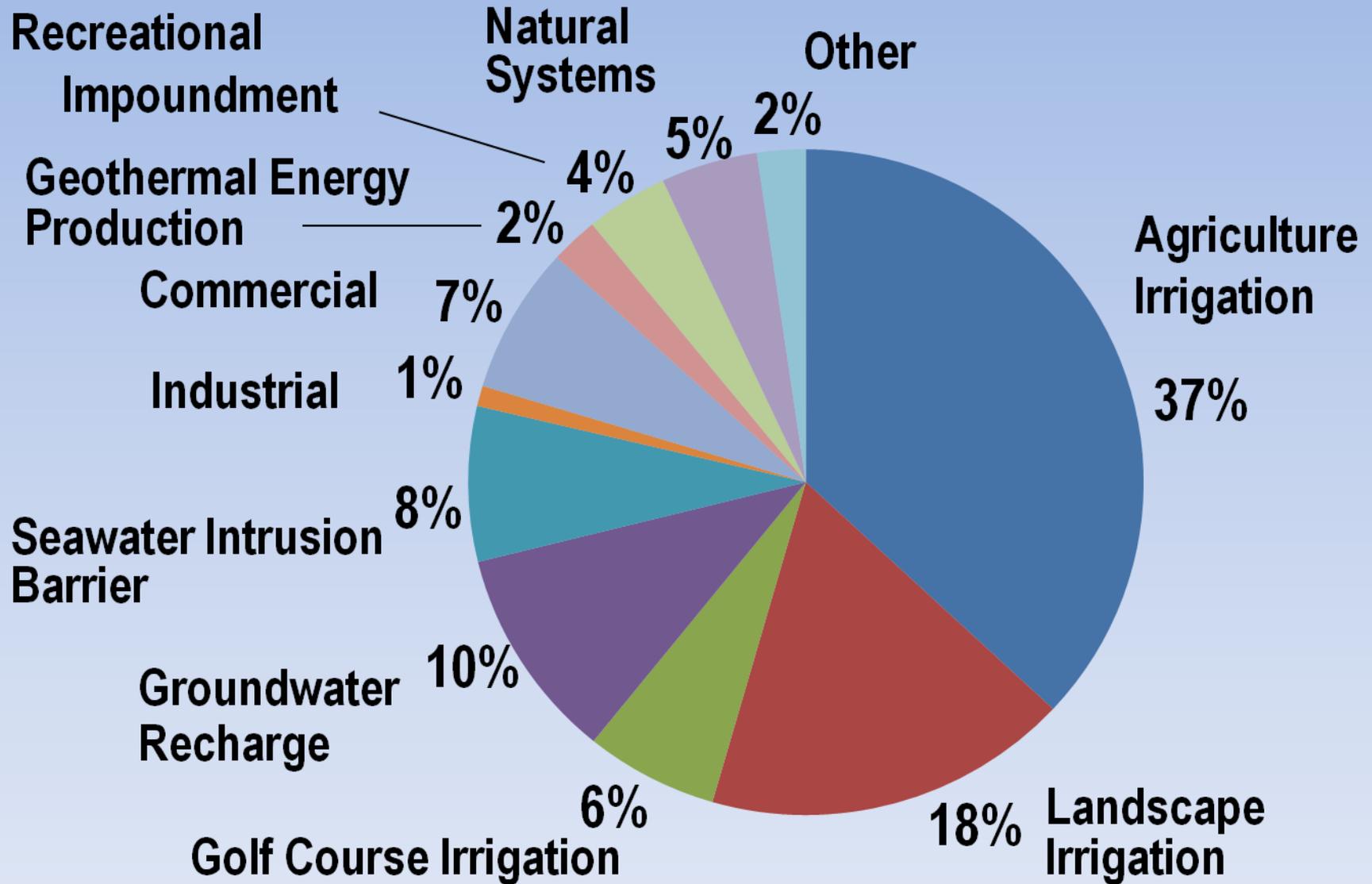
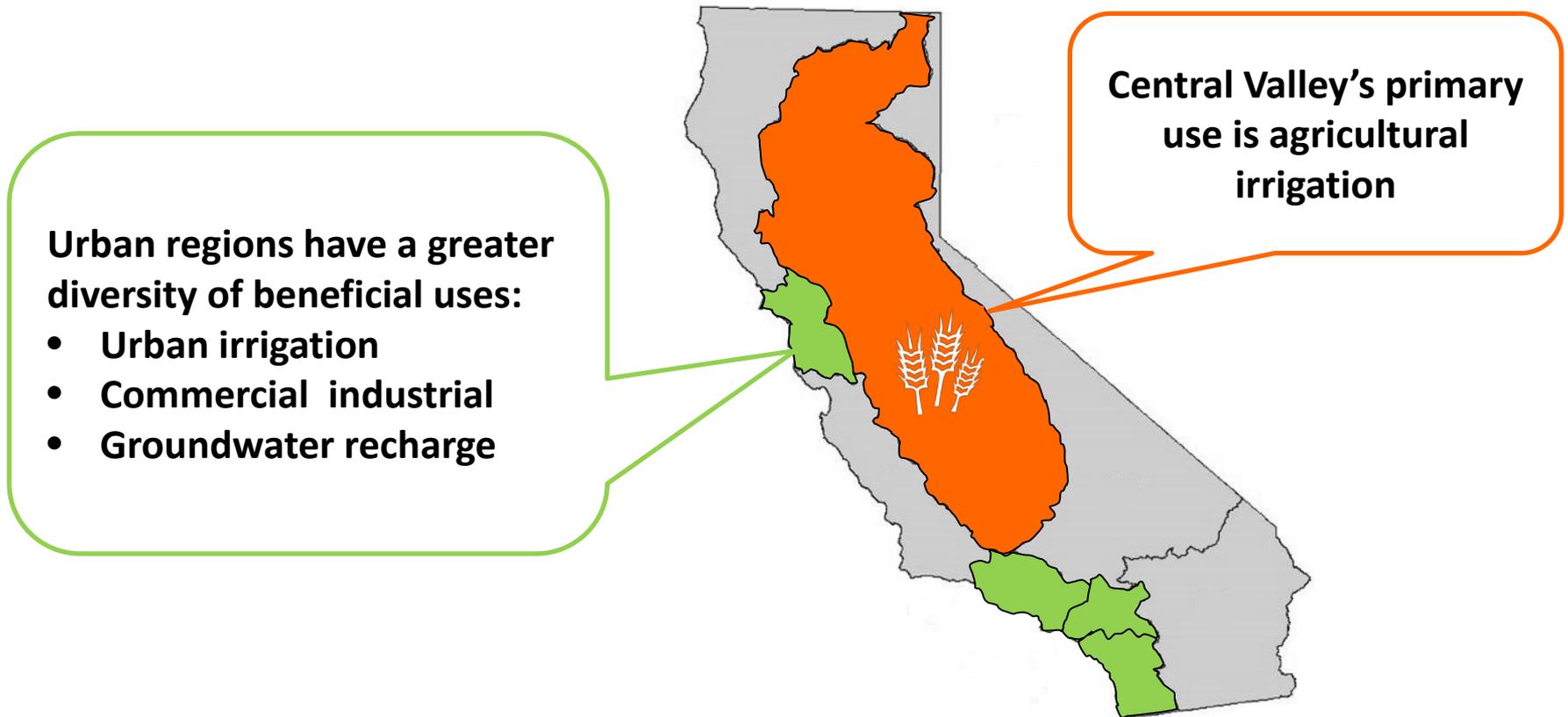


Image: State Water Resources Control Board, Division of Financial Assistance, Municipal Wastewater Recycling Survey

Types of Recycled Water Use in California, 2009

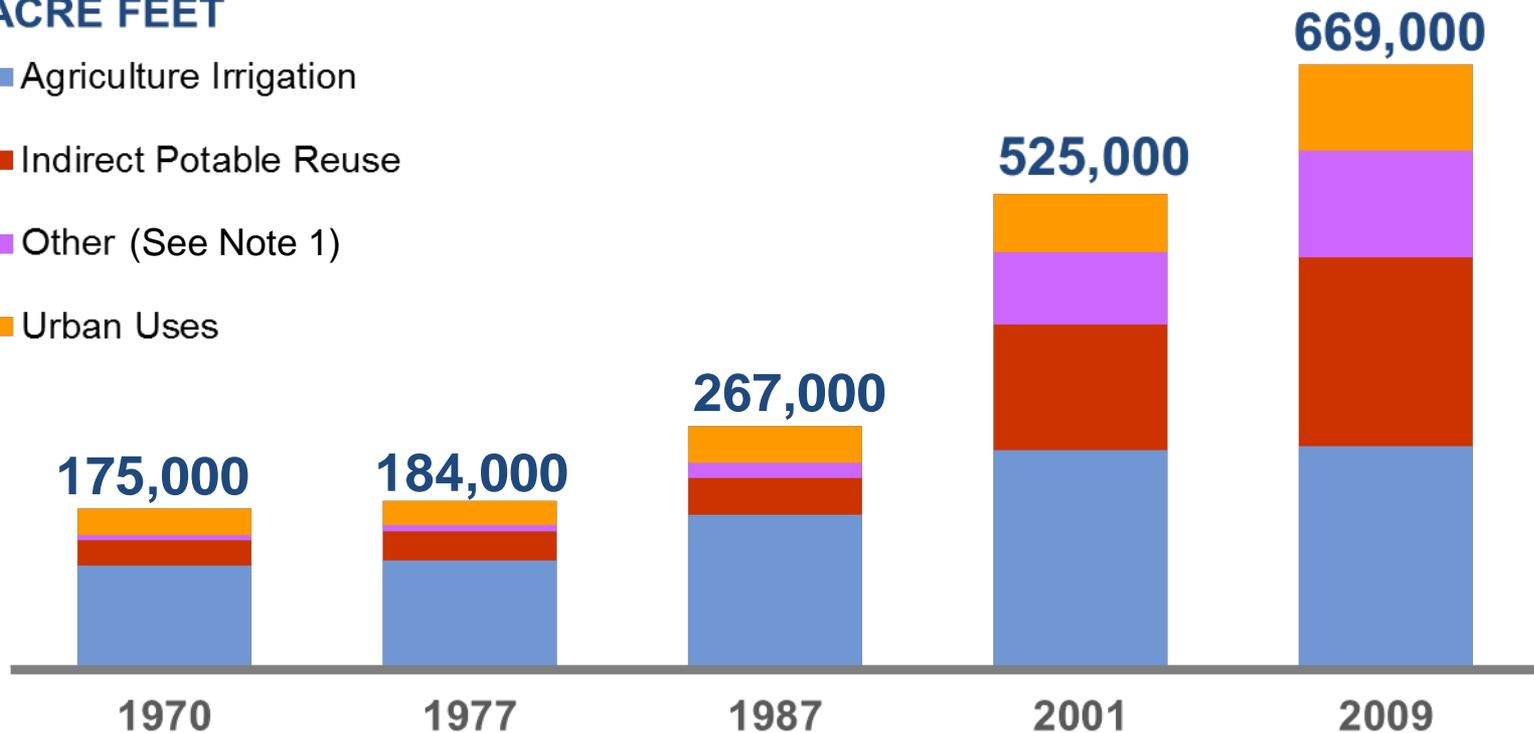


Variation of Recycled Water Beneficial Uses



Volume in ACRE FEET

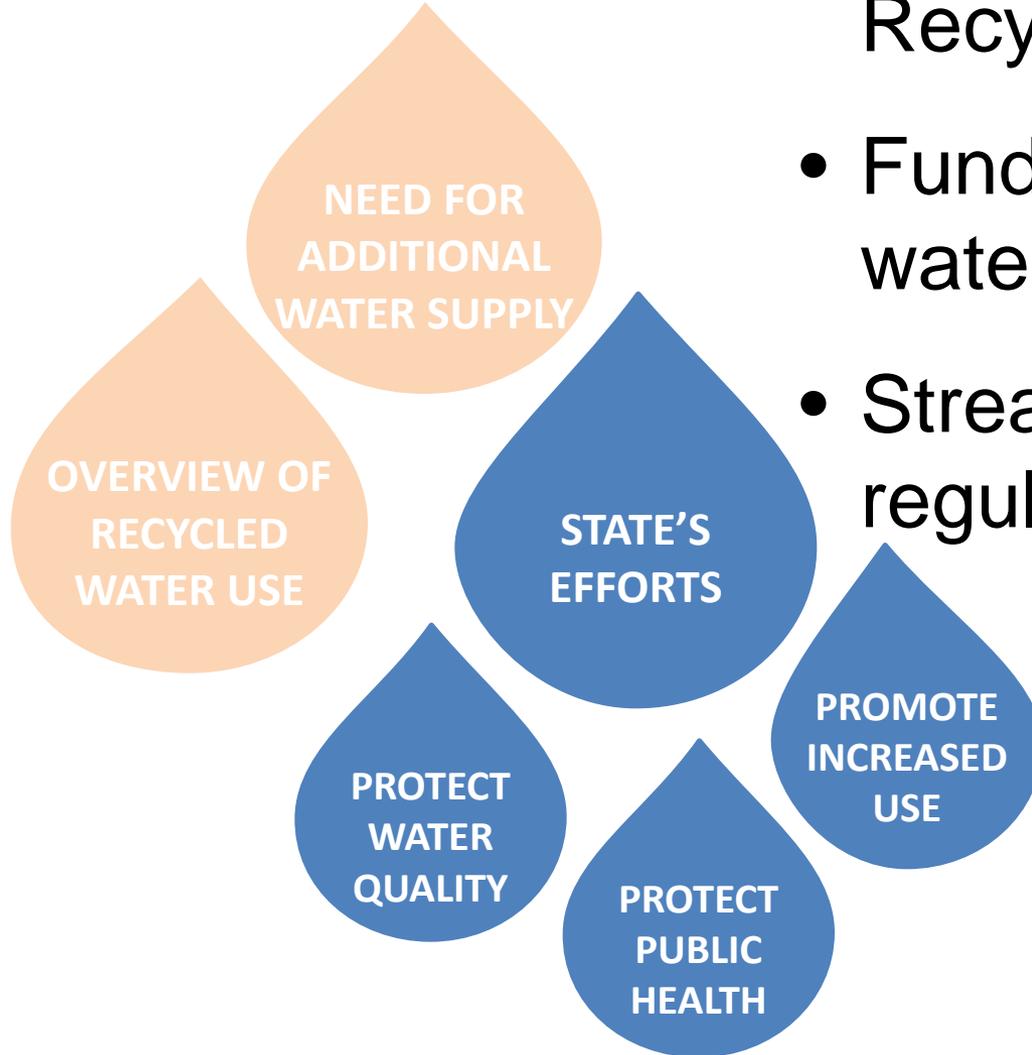
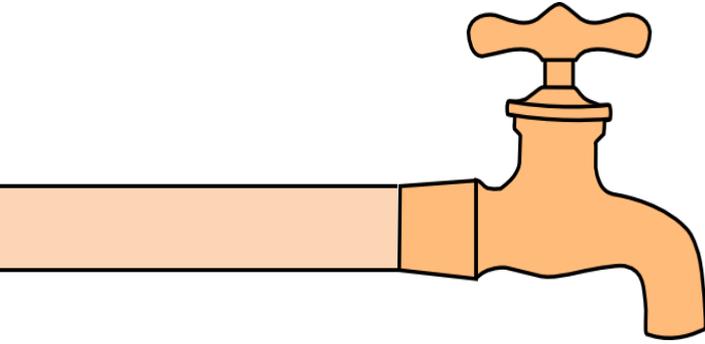
- Agriculture Irrigation
- Indirect Potable Reuse
- Other (See Note 1)
- Urban Uses



Note:

1. Other uses include: Natural system restoration, wetlands, recreational impoundment, geothermal energy production, seawater intrusion barrier

STATE'S EFFORTS



- Implementing Recycled Water Policy
- Funding recycled water projects
- Streamlining regulatory process

Recycled Water Policy Goals

- Increase the use of recycled water
- Streamline permitting of recycled water projects
- Maintain the quality of groundwater supplies

Recycled Water Policy

- Use of recycled water
- Landscape irrigation & groundwater recharge use
- Investigation for constituents of emerging concern (CECs)
- Regional Salt/Nutrient Management Plan (SNMP) for all CA basins by 2014
- Amended for monitoring of CECs (2013)

Water Recycling Funding Program

- Provided Over \$1.3 billion total funding
- Funded recycled water projects
- 396,000 acre-feet of recycled water proposed

234
PROJECTS
COMPLETED

\$1B
CWSRF
FUNDS

\$292M
BOND
FUNDS

CWSRF = Clean Water State Revolving Fund

Integrated Regional Water Management Grant Program

- Provided \$380 million total funding
- Funded recycled water projects
- 38,000 acre-feet of recycled water

17

PROJECTS
COMPLETED

\$53M

PROP 50
GRANT FUNDS

\$38M

LOCAL MATCHING
FUNDS

RECYCLED WATER PROJECT PERMITTING

Process

STEP 1: OBTAIN TITLE 22 REPORT APPROVAL



California
Dept of
Public Health



Title 22
Engineering
Report



30
Calendar
Days

Compliance with California Code of Regulations Title 17, California Code of Regulations Title 22, California Health and Safety Code

STEP 2: OBTAIN WDRs / WRR / MASTER RECLAMATION PERMIT



Regional
Water Boards



Report of
Waste
Discharge



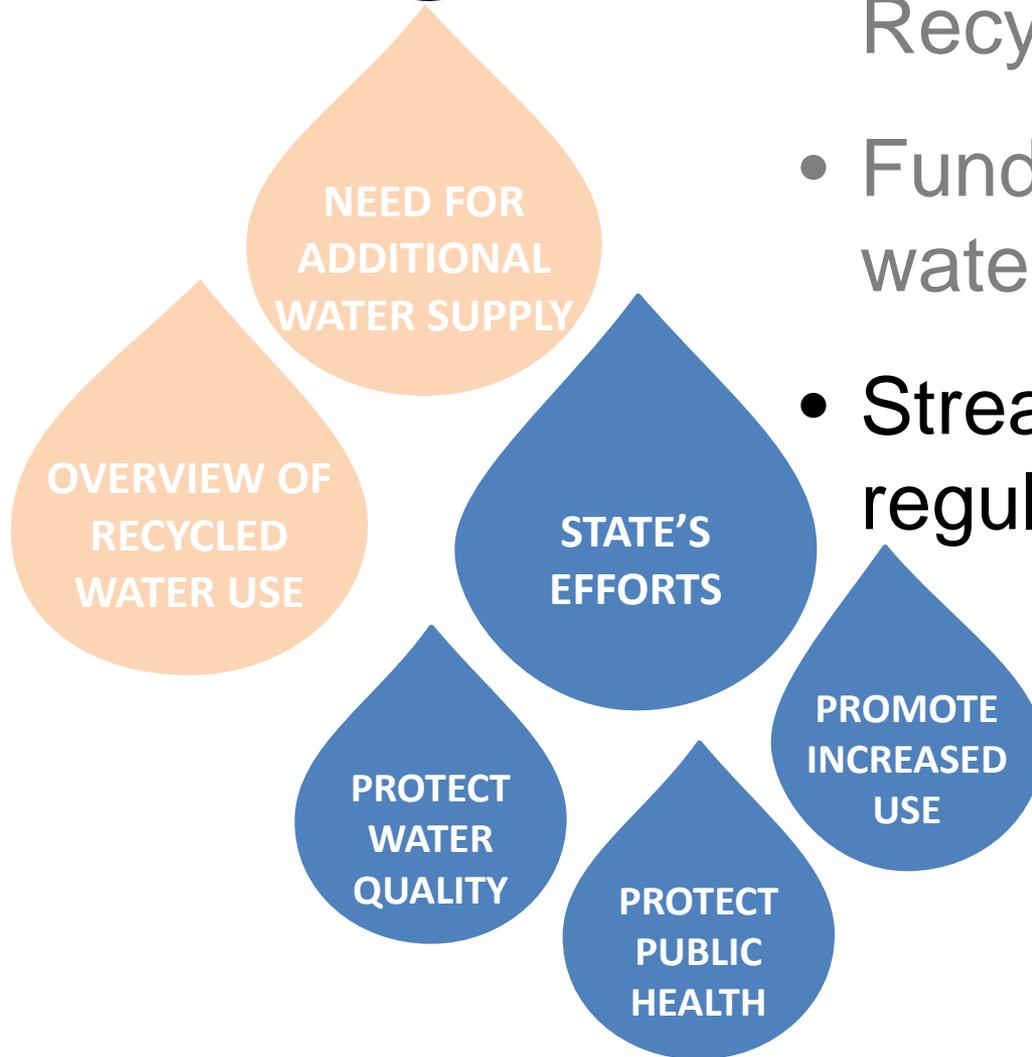
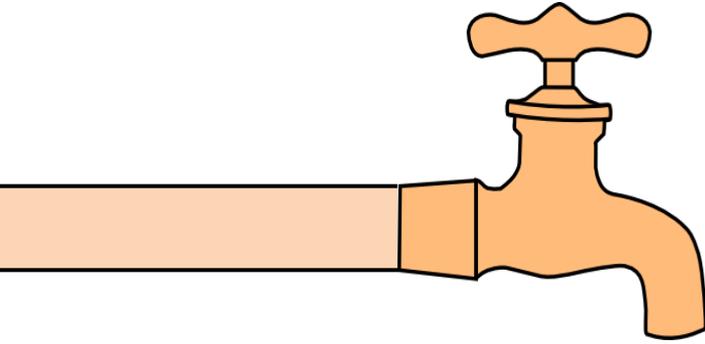
140
Calendar
Days

Compliance with California Water Code



YOU HAVE A PERMIT

STATE'S EFFORTS



- Implementing Recycled Water Policy
- Funding recycled water projects
- **Streamlining regulatory process**

Outline

- Drought and Desalination
- Environmental Impacts of Desalination Facilities
- Water Board's Regulatory Authority
- Current Desalination-specific Laws and Regulations
- Proposed Ocean Plan Amendments



Recycled Water General Order: Background

- Developed in response to the Governor's proclamations of a Drought State of Emergency on January 17, 2014 and April 25, 2014
- Recognized as an opportunity to conserve availability of local potable water supplies

Recycled Water General Order: Purpose

- **Streamline permitting for recycled water use** that typically presents a relatively low threat to water quality
- **Relieve new individual recycled water end users** from the requirements to apply for Water Recycling Requirements or individual Waste Discharge Requirements
- **Provide coverage for other recycled water uses** that are not currently addressed by other General Orders or Master Reclamation Permits

Recycled Water General Order: Coverage

- Allow producers and distributors of recycled water to facilitate recycled water use as water recycling administrators
- Limit source of wastewater to treated municipal wastewater
- Allow uses compliant with uniform water recycling criteria (California Code of Regulations title 22, division 4, chapter 3)

Coverage

Allowed Uses (title 22 §§ 60304-60307)

- Irrigation (agricultural, landscape)
- Impoundments
- Cooling / industrial
- Other purposes listed in title 22 § 60307 (commercial carwashes, artificial snow making, dust control, flushing sanitary sewer, mixing concrete, street cleaning, soil compaction, etc.)

Non Allowed Uses

- Potable Uses
- Groundwater recharge/replenishment (spreading basins or groundwater injection wells)

General Order Roles and Responsibilities

CDPH role and responsibility is at case-by-case and is not shown in this diagram

Regional Water Board

- Enroll dischargers
- Review and approve Water Recycling Program
- Conduct inspection and review monitoring reports
- Coordinate with CDPH to include title 22 engineering report approval requirements



State Water Board

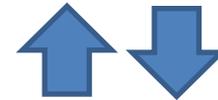
- Prepare and adopt GO
- Provide GO rollout/ implementation support for Regional Water Board



WATER RECYCLING PROGRAM

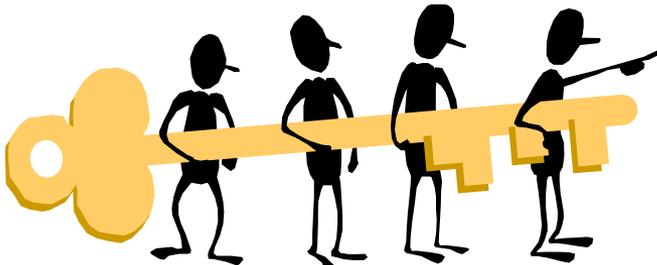
GO Applicants/Enrollees

Comply with GO requirements and assume responsibilities as Water Recycling Program Administrator



Recycled Water Users

Comply with Water Recycling Program requirements



Future of Recycled Water

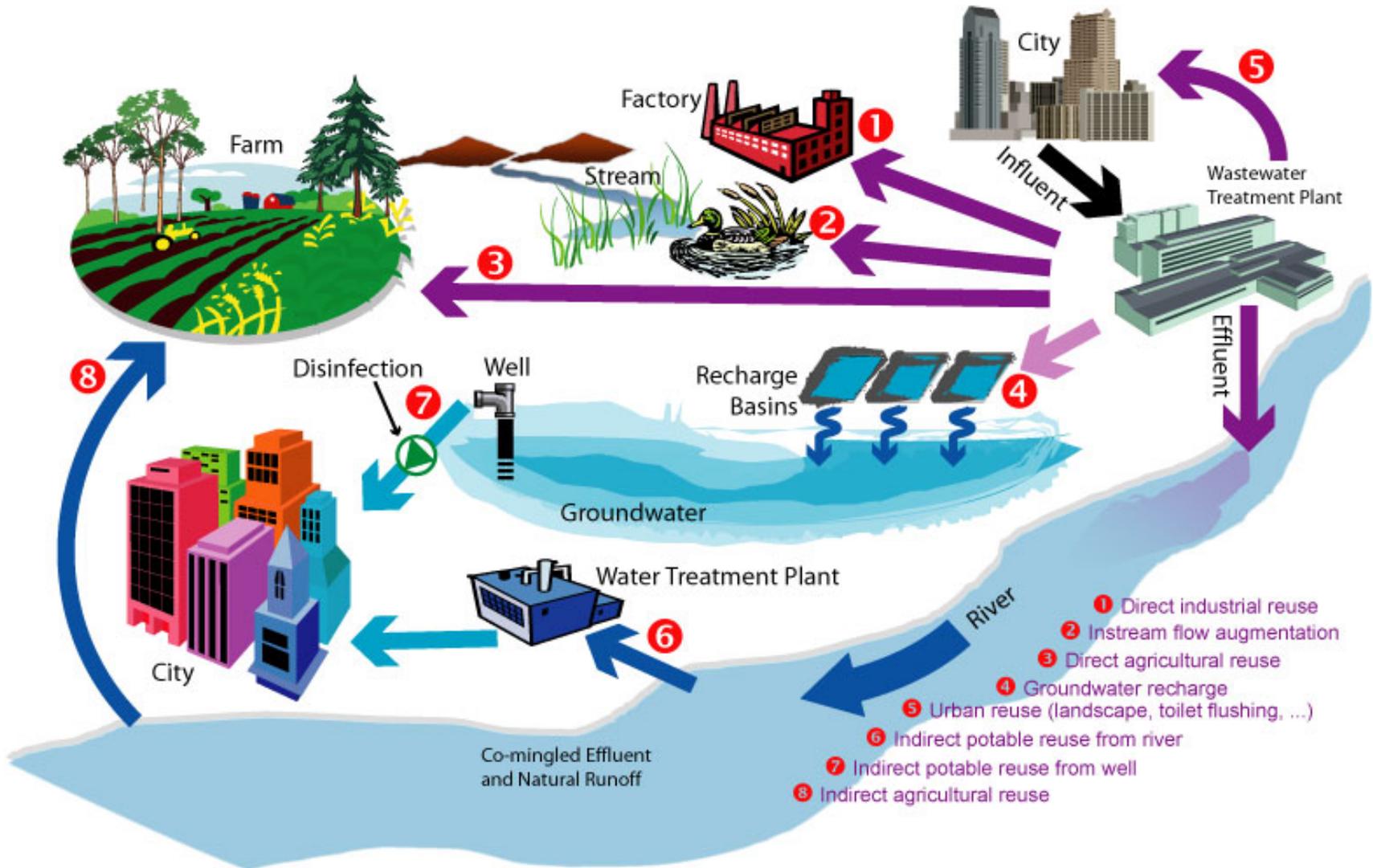
Continued integration and expansion of recycled water into California water supply portfolio



Recycled Water Augmenting Fresh Water Supply

- Currently satisfies 7% of State's annual water demand
- Is identified as resource management strategy to increase water supply
- Increases usefulness of water and enables conservation of higher quality water for appropriate uses.

Direct and Indirect Recycled Water Use



Potable Reuse Legislations

SB 918 (2010)

- Directs CDPH
 - Adopt groundwater recharge criteria by 6/30/2014*
 - Adopt surface water augmentation criteria by 12/31/2016
 - Investigate feasibility of direct potable reuse by 12/31/2016

* Amended by SB-104 (2014) Drought Relief

Potable Reuse Legislations

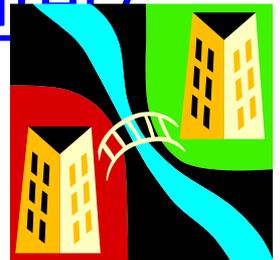
SB 322 (2013)

- Directs CDPH
 - Convene an Advisory Group
 - Convene Expert Panel
 - Investigate and report feasibility of uniform recycling criteria for direct potable reuse
 - Provide Expert Panel report by Dec 31, 2016

California Department of Public Health Drinking Water Program Transfer

- Governor's initiative
- Integrated water quality protection
- Coordinated funding for drinking water and wastewater programs
- Consolidated recycled water permitting

<http://www.waterboards.ca.gov/drinkingwater/>

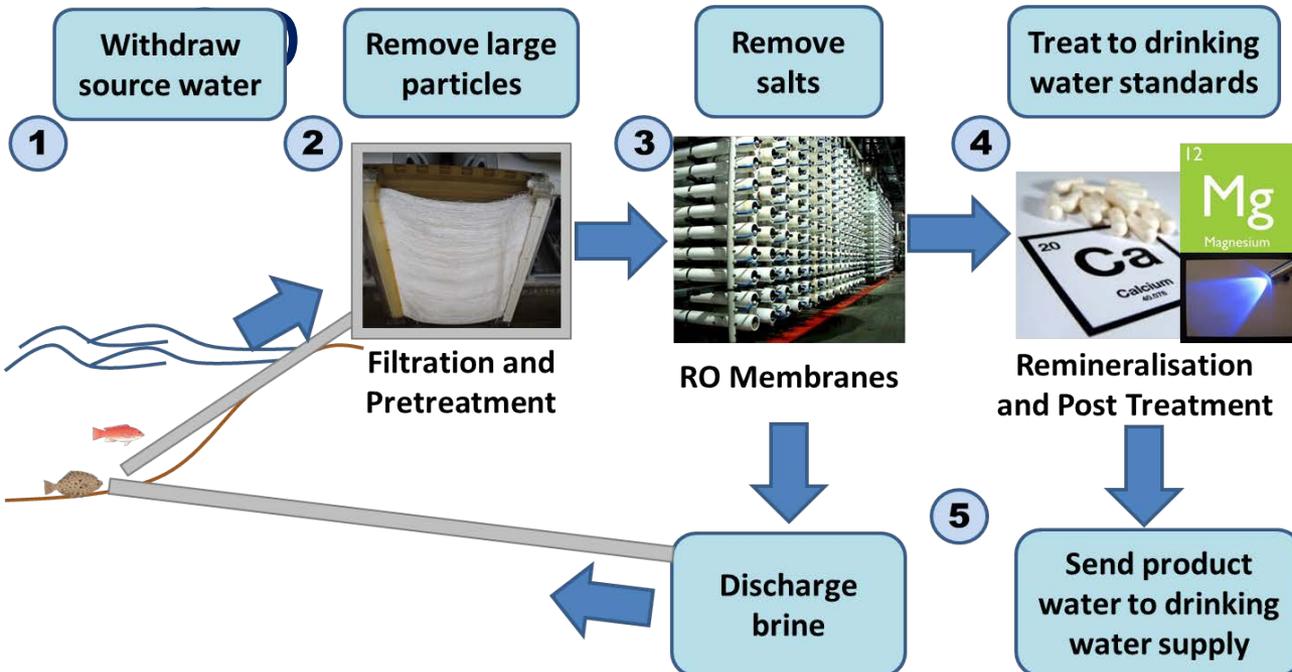


Amending Water Quality Control Plan for Ocean Waters to address Desalination Intakes and Brine Discharges



Desalination in California

- ~10 current facilities
- ~15 proposed facilities
- Production flows will range from <1 MGD to over 150



Statewide Proposed Desalination Facilities



1. Bay Area Regional Desalination Project
2. CA Water Service Company
3. Santa Cruz and Soquel Creek (scwd2)
4. Central Coast Regional Water Project
5. Regional Desalination Project, Cal Am Ocean View Plaza
6. Monterey Peninsula WMD
7. Cambria Community Services District
8. Oceano Community Services District
9. West Basin MWD
10. Huntington Beach Desalination Project
11. South Coast Water District
12. City of Oceanside
13. Carlsbad Desalination Project
14. San Diego County Water Authority

Legend

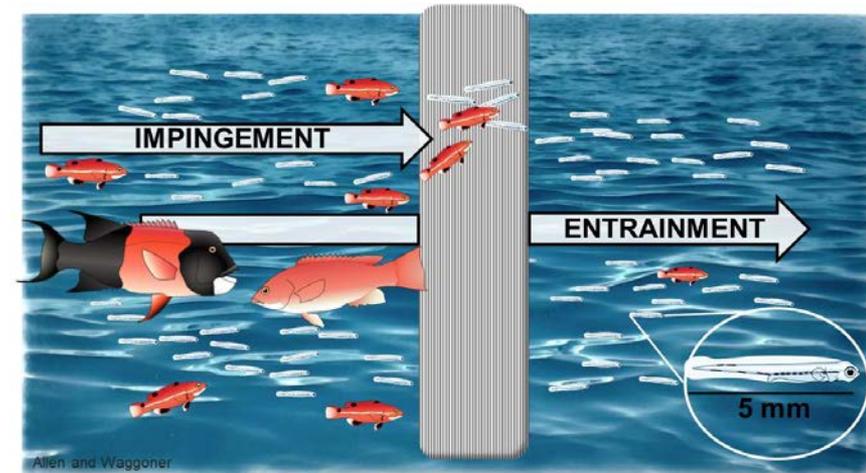
- Proposed Desalination Facilities**
- Capacity (MGD)
 - 0 - 10
 - 10 - 25
 - 25 - 50
 - 3nmLimit
- Enclosed Bays And Estuaries**
- Areas of Special Biological Significance (ASBS)
 - Marine Protected Area (MPA)
 - National Marine Sactuary (NMS)
 - Regional Board Boundary
 - County Boundary

Map created by J. Weston, C. Waggoner & L. Martien April 9, 2014

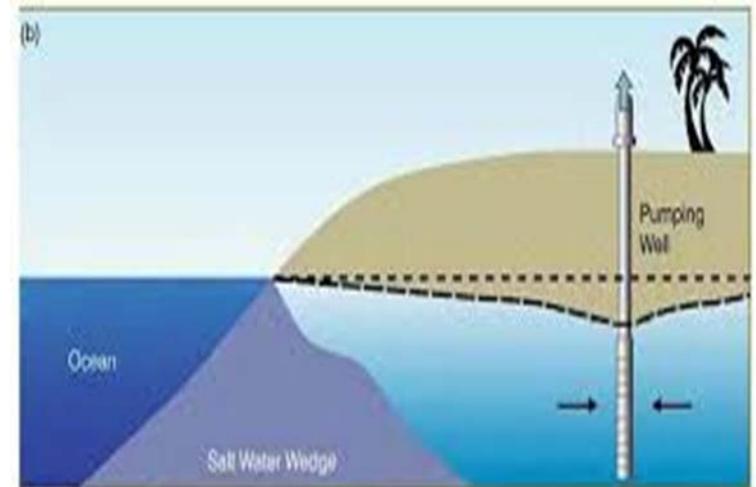
Desalination-related Impacts to Water Quality and Marine Life

- Surface intakes impinge and entrain marine life*
 - 9 M fish
 - 57 sea lions

* From California's 19 coastal power plants

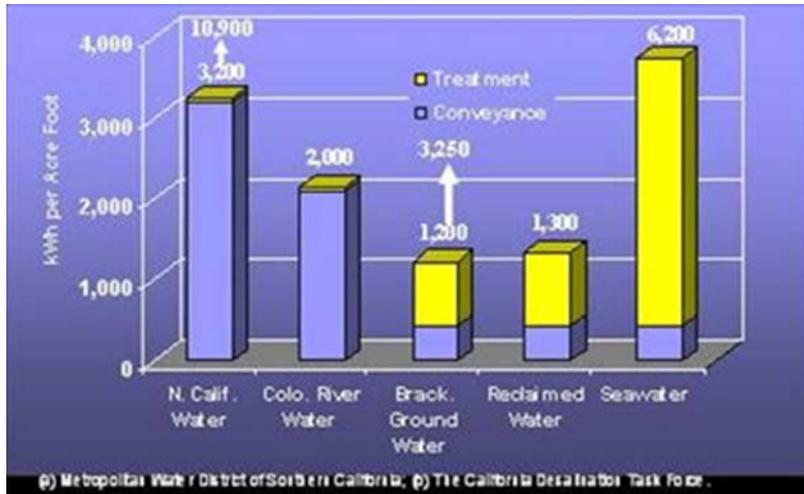


- Subsurface Pumping
 - Can Induce Seawater Intrusion
 - May divert fresh groundwater



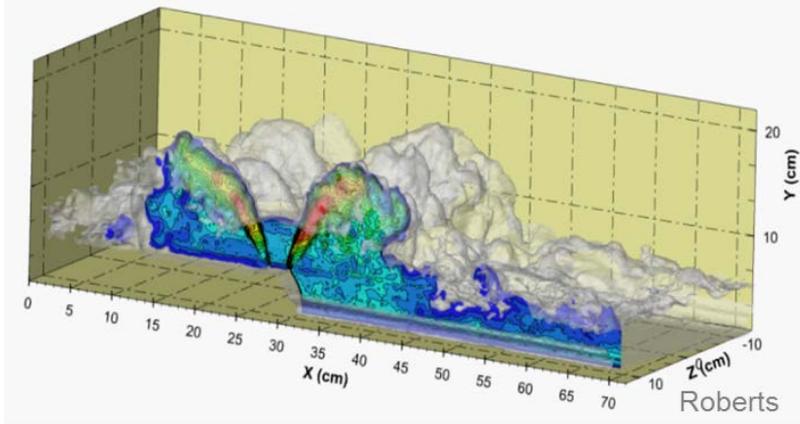
b) Current stage—Excessive pumping results in long-term decreases in groundwater levels, pushing the salt water wedge closer to the pumping well trying to reach equilibrium.

Desalination-related Impacts to Water Quality and Marine Life

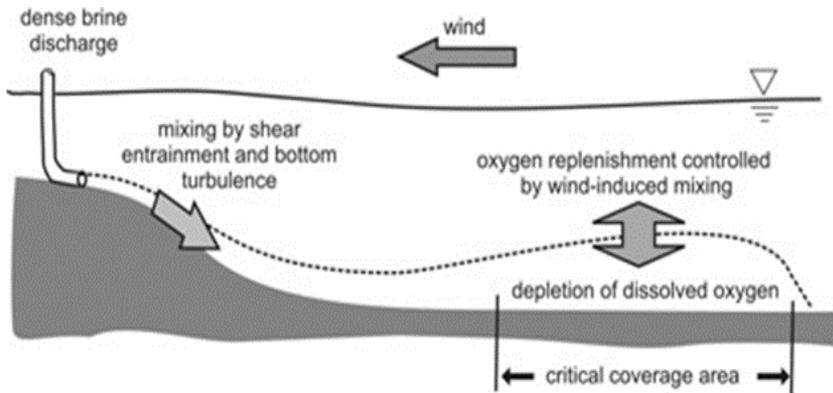


- High energy requirements, green house gases, ocean acidification

Desalination-related Impacts to Water Quality and Marine Life



- Discharges
 - Brine can be toxic
 - Plume may reduce oxygen availability
 - Methods may shear marine life



Current Regulations

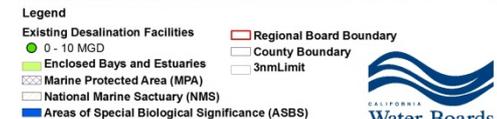
- The 2012 California Ocean Plan does not address intakes or brines discharges from desalination facilities
- Desalination facilities are currently regulated under WDRs or NPDES permits by Regional Boards on a project-specific basis



Statewide Existing Desalination Facilities



1. Monterey Bay Aquarium
2. Marina Coast Water District
3. Duke Energy, Moss Landing
4. City of Morro Bay
5. Duke Energy, Morro Bay
6. PG&E, Diablo Canyon
7. Chevron, Gaviota
8. City of Santa Barbara
9. US Navy, San Nicolas Island
10. SCE, Santa Catalina Island



Map created by J. Weston & C. Wiggoner February 25, 2013



Why Amend the Ocean Plan to Specifically Address Desalination Facilities?

- Desal facilities are not covered under 316(b) or adequately addressed by the Ocean Plan
- Promote interagency collaboration
- Statewide consistency for permitting
- Support the use of ocean water for desal
- Protect water quality and beneficial uses



Desalination

- Scientific Investigation
 - Toxicity of brines (University of California)
 - Proper methods for disposal of brines (SCCWRP)
 - Mitigation for impacts of intakes (California State Universities' Moss Landing Marine Labs)

- Policy development:

http://www.waterboards.ca.gov/water_issues





Proposed Amendments

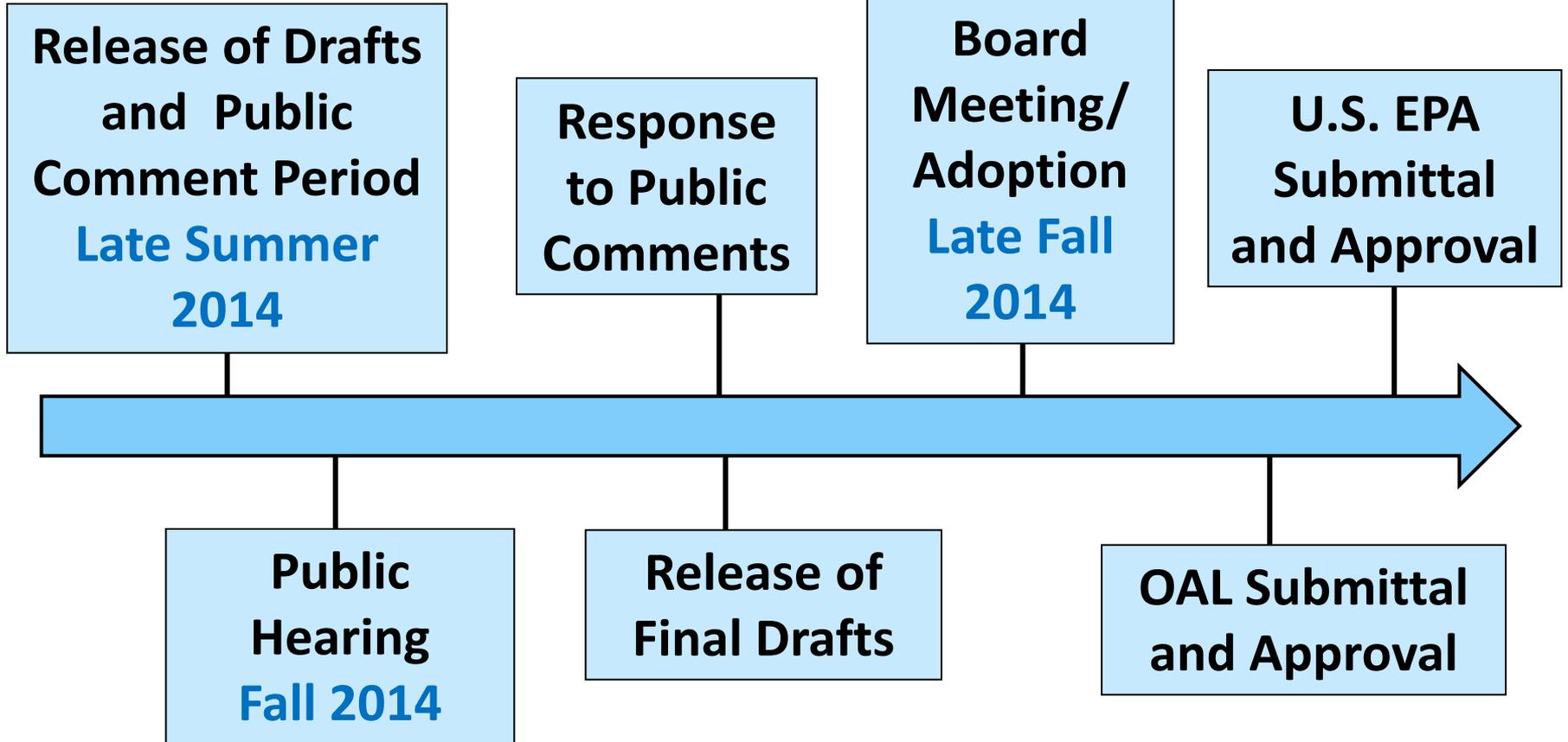
- Applicability: new, expanded, existing facility definitions. Conditionally permitted plants.
- Framework for 13142.5(b) determinations
 - Best site, design, technology, and mitigation measures feasible to minimize intake and mortality of marine life
 - Based upon findings of *Surfrider vs. California Regional Water Quality Control Board* (2012) 211 Cal.App.4th 557
- Narrative receiving water limit for salinity
- Monitoring and reporting requirements



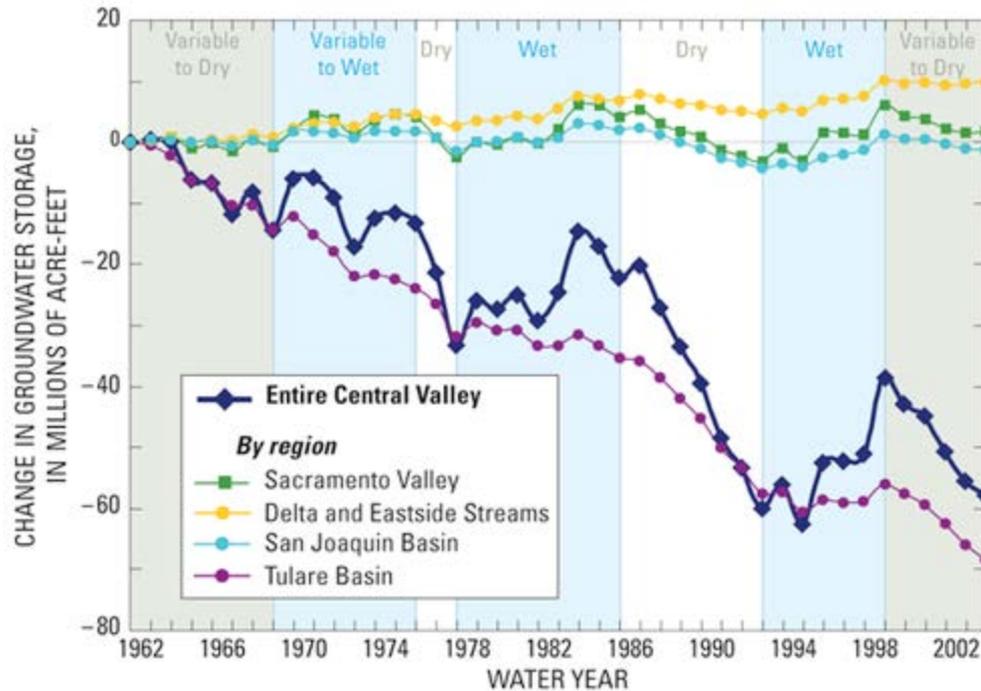
Proposed Amendments

- The Ocean Plan is a Certified Regulatory Program pursuant to Pub. Resources Code § 21080.5
- The State Water Board prepares substitute environmental documentation (SED) in lieu of an EIR
- **The Staff Report/SED will include:**
 - Project description and project goals
 - Environmental setting
 - Economic analysis
 - Issues and alternatives considered
 - Analysis of potential adverse environmental effects
 - Analysis of project alternatives

Next Steps



Conjunctive Use of Groundwater



Overdraft

- Annual statewide overdraft is estimated to be 1.4M ac-ft in a normal water year
- Impacts:
 - Increased pumping costs
 - Land subsidence
 - Sea water intrusion along the coast



Recharge Projects

- Estimated 9M acre-feet of aquifer storage space that can produce 500,000 acre-feet of additional yield.
- 65 local agencies operate recharge projects throughout the state.
- Success depends on their being able to purchase surface water supplies from other users.
- Core issue is groundwater management—long resisted by many Californians

General Premises

- Surface and groundwater are managed separately (except for subterranean streams)
- Groundwater is a property right belonging to the overlying landowner.
- Groundwater should be managed at the local level.
 - Agricultural interests have historically opposed comprehensive groundwater regulation for fear of pumping curtailments in drought years

Environment

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Rising Calls to Regulate California Groundwater



Gary Kazanjian for The New York Times

Despite the drought, Mark Watte, 57, a farmer in Tulare, Calif., does not want the government telling him how much water he can use on his land.

By FELICITY BARRINGER
Published: May 13, 2009

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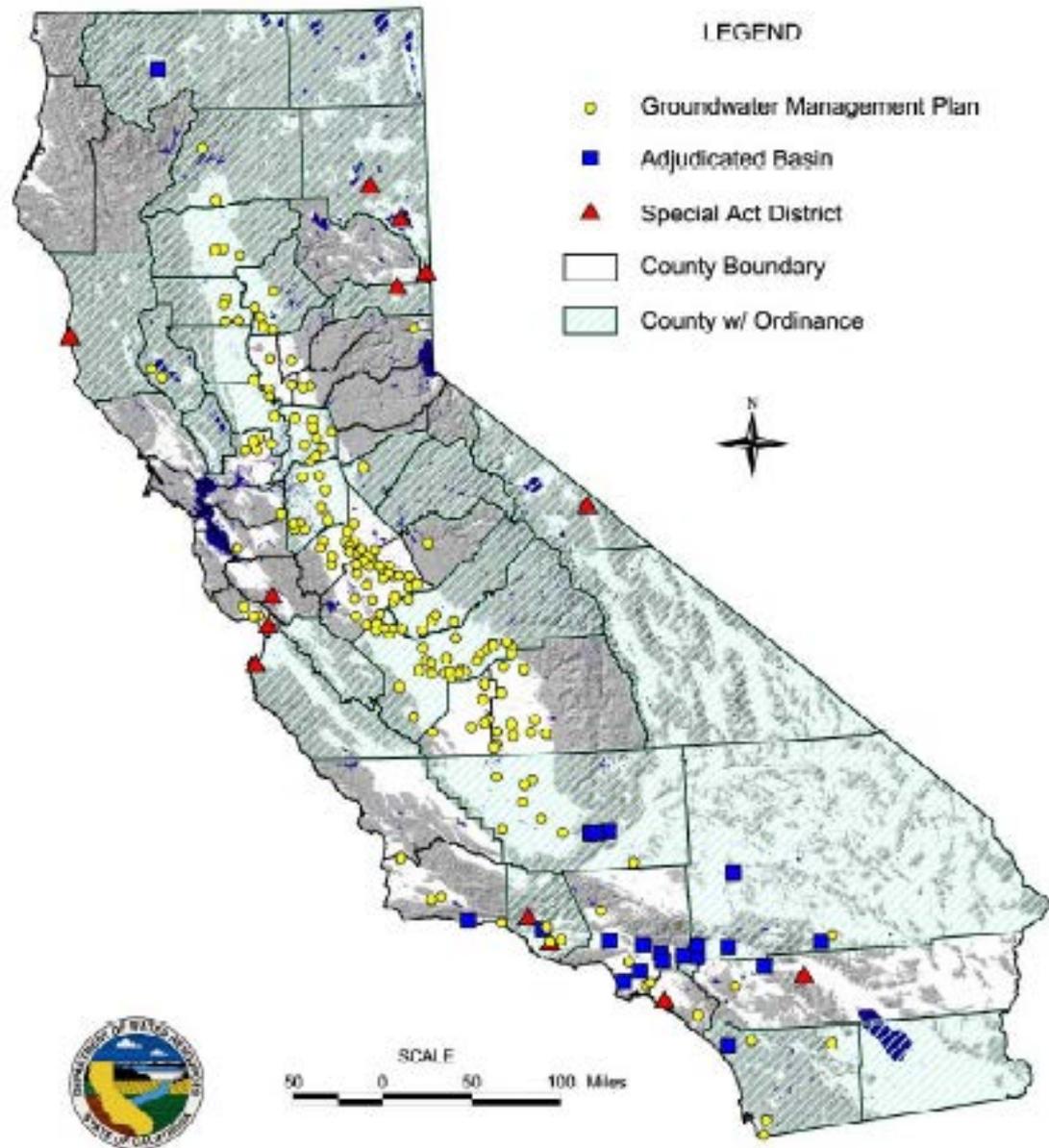
1. What's Lost as Handwriting Fades
2. MAUREEN DOWD: Don't Harsh Our Mellow,

Regulatory Schema

- Adjudication
- Special Legislative Districts
- Local Groundwater Management
- City and County Ordinances

OCWD replenishes the aquifer using its recharge facilities along the Santa Ana River in Anaheim.





Status of Groundwater Management in California
(as of December 2004)

Local Agencies

Types of Agencies with Statutory Authority to Manage Groundwater

- California Water District
- Community Services District
- County Sanitation District
- County Service Area
- County Water District
- County Water Works District
- Flood Control and Water Conservation District
- Harbor and Port District
- Irrigation District
- Joint Exercise of Powers Entity
- Metropolitan Water District
- Municipal Improvement District
- Municipal Utility District
- Municipal Water District
- Public Utility District
- Reclamation District
- Recreation and Park District
- Sewer and Sewer Maintenance Entity
- Water Agency or Authority
- Water Conservation District
- Water Replenishment District
- Water Storage District
- Water Maintenance District



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[NEXT STORY >](#) Paso's water gamble

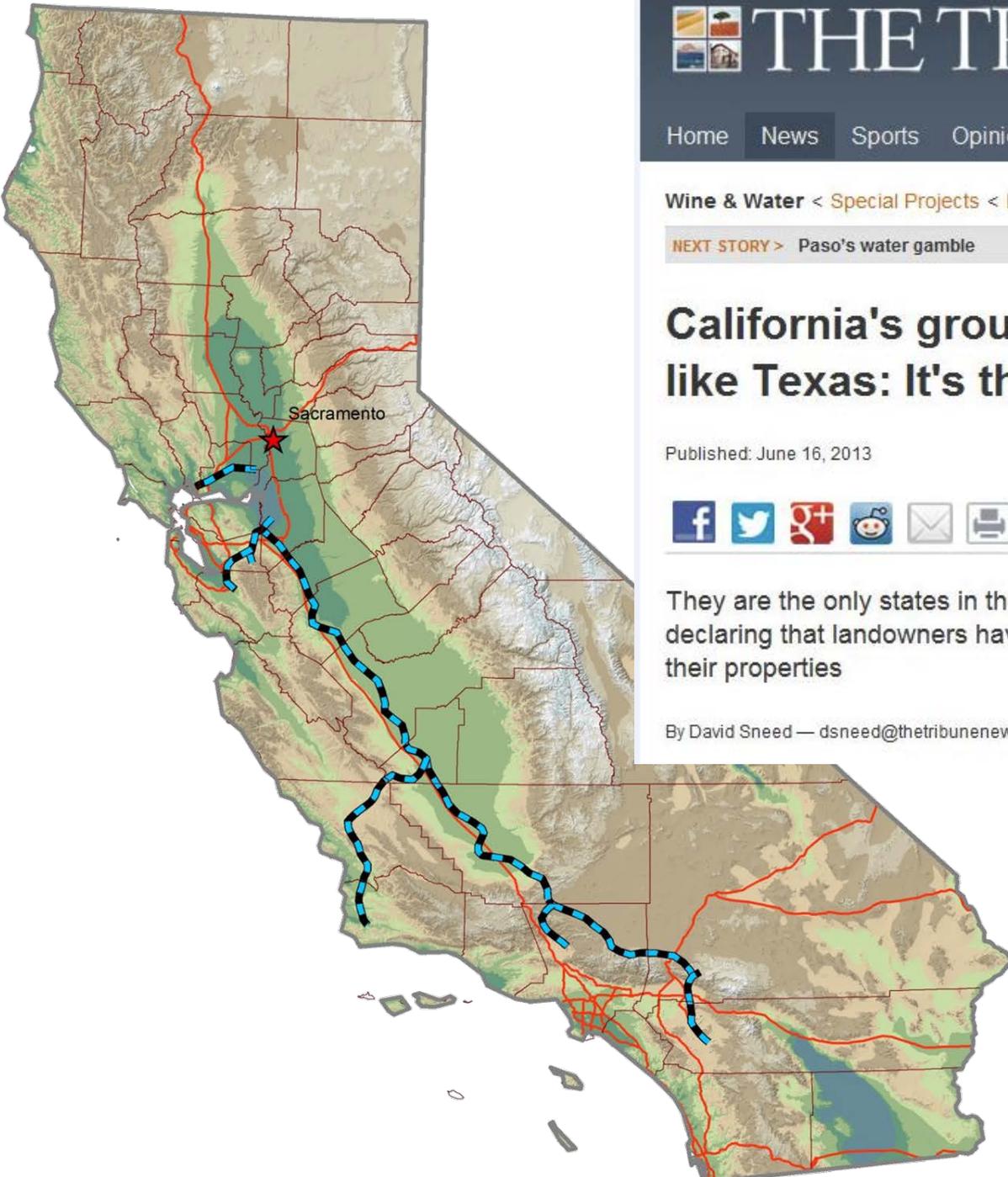
California's groundwater management is like Texas: It's the wild West

Published: June 16, 2013



They are the only states in the country that don't regulate the resource, declaring that landowners have the right to pump from the aquifers beneath their properties

By David Sneed — dsneed@thetribunenews.com



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California Edging Closer to Regulating Groundwater for the First Time

Craig Miller, KQED Science | April 22, 2014 | 9 Comments

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Print



An irrigation ditch in the Central Valley. When surface water is scarce, farmers pump more groundwater to make up the

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