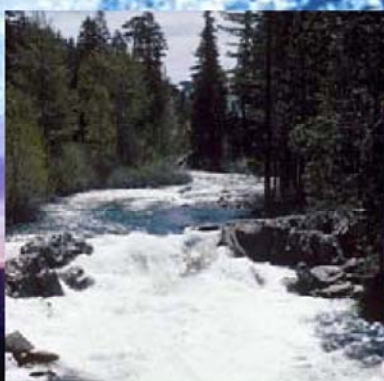


**MUNI/WESTERN EXHIBIT 10-19**  
**2005 CALIFORNIA WATER PLAN UPDATE,**  
**HIGHLIGHTS, COVER AND PAGE 14**



California  
**WaterPlan**  
A FRAMEWORK FOR ACTION **Highlights**

Department of Water Resources Bulletin 160-05 December 2005

## The California Water Plan Update 2005 is organized in five volumes:

Volume 1: Strategic Plan

Volume 2: 25 Resource Management Strategies

Volume 3: 12 Regional Reports

Volume 4: Reference Guide (60+ articles)

Volume 5: Technical Guide (Online documentation)

The final California Water Plan Update 2005 and the Water Plan Highlights briefing book were completed in December 2005. The five volumes of the update, the Highlights document, and the introductory video, "Water for Tomorrow," are contained on the CD and DVD below and also available online at [www.waterplan.water.ca.gov](http://www.waterplan.water.ca.gov). For printed copies of the Highlights, Volume 1, 2, or 3, call 1-916-653-1097. If you need this publication in alternate form, contact the Public Affairs Office at 1-800-272-8869.

# Director's Message

This is not just another update of the California Water Plan. Update 2005 represents a fundamental transition in how we look at water resource management in California. It also represents a fundamental transition in the way state government needs to be involved with local entities and interest groups to deal with water issues in the state.

The way we manage California's water resources is changing. We need to consider a broader range of resource management issues, competing water demands, new approaches to water supply reliability, and new ways of financing. Methods like storage and conveyance are being adapted to include more water conservation, recycling, desalination, and many other strategies. And today, local agencies and governments are beginning to work together to develop regional water plans that are more integrated, more inclusive, and more cost effective.

As the first update of the 21st Century, California Water Plan Update 2005 is a roadmap for meeting the state's water demands today and into the future. It identifies pressing issues and includes a strategic plan with goals, policy recommendations, and actions to ensure sustainable water uses and reliable water supplies in the face of uncertainty and change. The plan also outlines an array of management strategies and collaborative approaches to increase supply, use water efficiently, protect water quality, and restore the environment.

California's regions cannot meet all of their objectives with a single water strategy. Integrated regional water management is the future for California because it will help regions diversify their water portfolio strategies and get the most from local, state and federal resources and funding. While statewide water management systems such as the State Water Project will continue to be essential to the California economy, integrated regional water management enables regions to implement actions with multiple benefits and helps them become more self sufficient.

California needs to make substantial investments in water management activities to support a vital economy, a healthy environment, and a reliable water supply for its citizens. In recent years, voters have approved a series of bonds to finance many water management strategies with statewide benefits. While water bonds will continue to provide needed funding, communities throughout the state also need more reliable and stable funding sources. The Department of Water Resources will continue to support general obligation bonds and non-general fund revenue sources to carry out long-term improvements in statewide water management systems while providing all customers with reliable water supplies.

California Water Plan Update 2005 describes the water management strategies we must implement – and the investments we must make – to ensure California's water future.

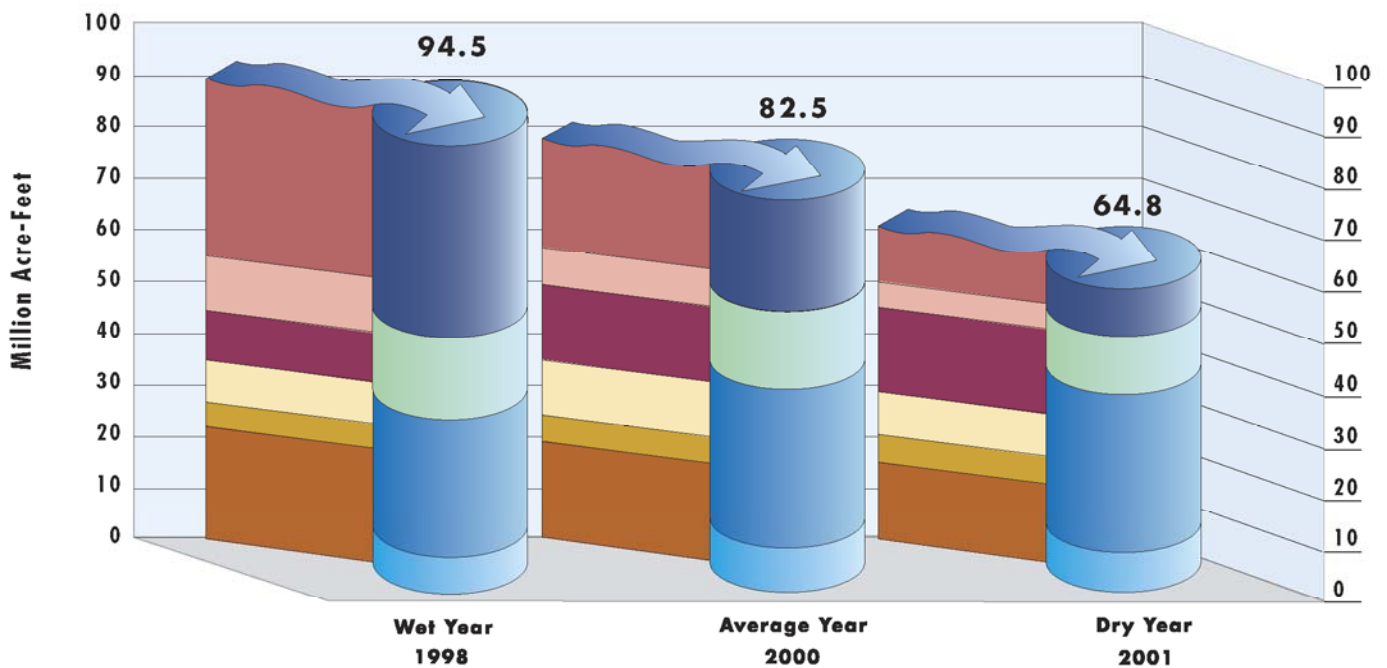


Lester A. Snow

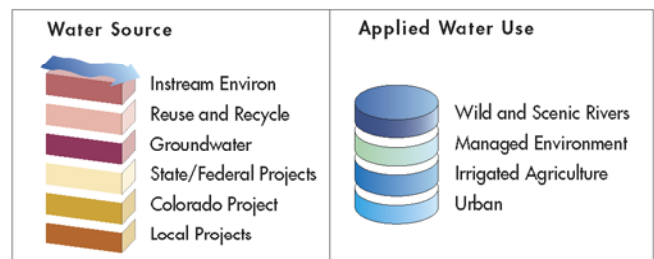


# California

## California Water Balance



California's water balance can vary significantly from year to year. Three recent years show a marked change in the amount and relative proportion of the following: water delivered to urban and agricultural sectors and water dedicated to the environment (applied water use); where the water came from (water source); and how much water was reused among sectors. Each year, applied water is only a portion of California's total precipitation and inflows. The rest—about 120 million acre-feet in an average year—either evaporates, is used by native vegetation, provides rainfall for agriculture and managed wetlands, or flows out of state or to salt sinks. (See Volume 3 for state and regional waterflow charts.)



# Water Today

California is a state of great diversity. Nationwide, no other state can match the variety of California's cultures, ecosystems, geography, and hydrology. This diversity brings distinct challenges to the management of California's groundwater and surface water resources. Most of the state's snow and rain fall in the mountains; most of the water is used in the valleys and coastal plains. Precipitation totals vary from year to year and from place to place. Wet years can bring the threat of floods; drought years put pressure on available water supplies.

On a statewide basis, California meets most of its agricultural, municipal, and industrial water management objectives in most years. Over the past 50 years, Californians have been able to meet water demands primarily through an extensive network of water storage and conveyance facilities, groundwater development, and, more recently, by improving water use efficiency.

A big challenge now and for the future is to make sure water is in the right places at the right times. Challenges will be greatest during

dry years (see year 2001 water balance; precipitation was 72 percent of average). In these years, water dedicated to the environment is curtailed sharply and less water is available for agriculture. Greater reliance on groundwater during dry years results in higher costs for many users. At the same time, water users who have already increased efficiency may find it more challenging to achieve additional water use reductions during droughts. As competition grows among water users, water management during dry years will become more complex and, at times, contentious.



*Over the past 50 years, we have been able to meet our water demands primarily through an extensive network of water storage and conveyance facilities, groundwater development, and, more recently, by improving water use efficiency.*



# California

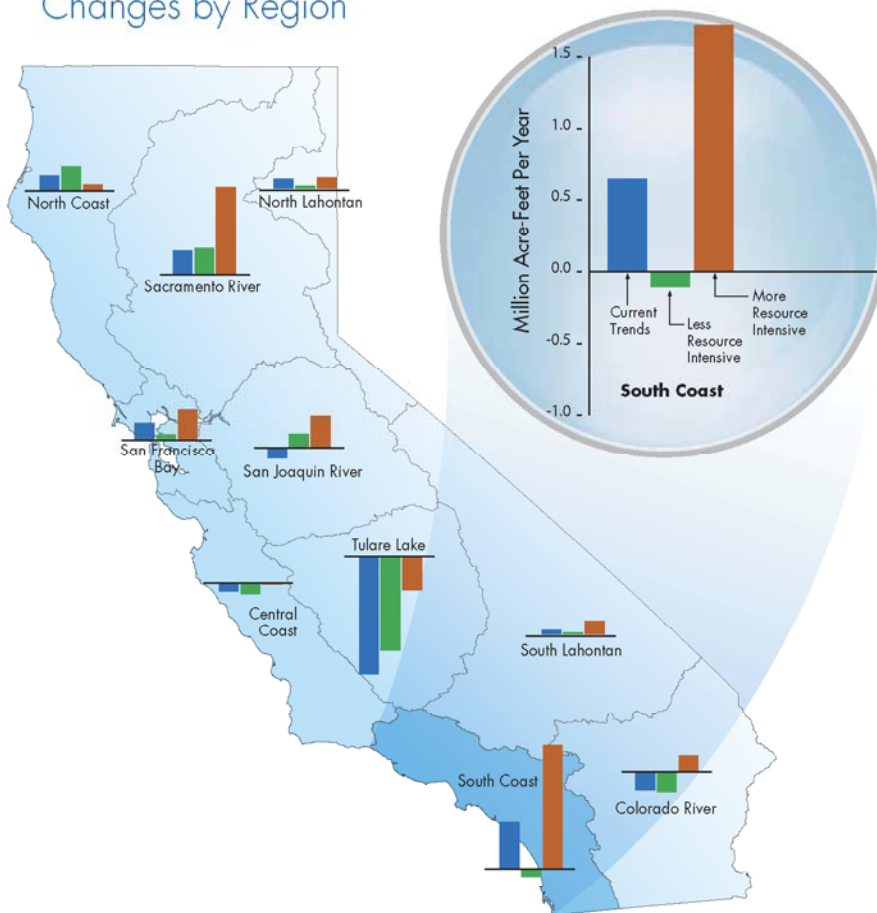
In the future, water management challenges will be more complex as population increases, demand patterns shift, environmental needs are better understood, and global climate change and other effects on the state's water resources and

systems become more evident. Because we don't know with certainty what will happen in the future, Update 2005 includes three plausible yet very different baseline scenarios for 2030, rather than a single "likely future."

These are not predictions and do not include new water agency-sponsored conservation programs or climate change effects. They are possible pictures of the future that depend on many assumptions and offer three water demand conditions for 2030.

## 2030 Water Demand Changes by Scenario

### Changes by Region



These charts show how water demands could change in average water years between 2000 and 2030 for three scenarios by region (left); statewide by sector (immediate right); and statewide plus groundwater overdraft (far right).

### Baseline Scenarios

These three scenarios include two kinds of water use efficiency actions: those that water users take on their own (called naturally occurring conservation), and those encouraged by water agency programs. Only naturally occurring conservation was varied among the scenarios; and all scenarios include the same continued implementation of cost-effective actions by water agencies.

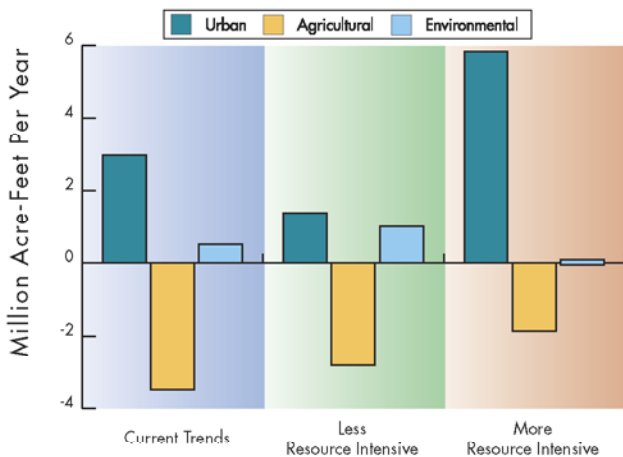
# Water 2030

Each scenario describes a different baseline for 2030, to which the water community would need to respond by implementing a mix of the management strategies shown on pages 14 and 15.

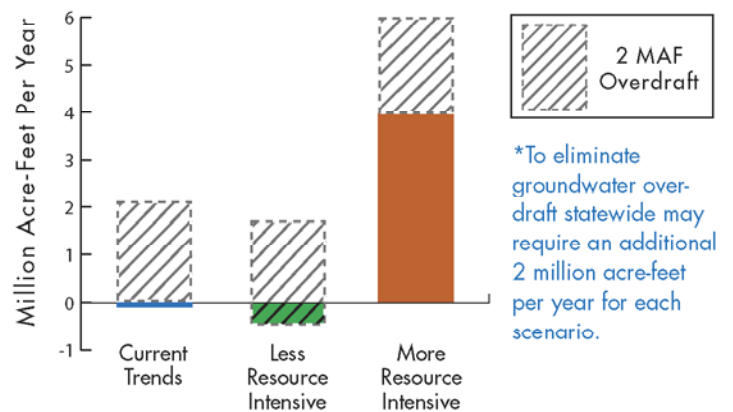
No single water management strategy is sufficient to meet future regional demands with so much variation possible from region to region and sector to sector. California needs to ensure that each

region can tailor responses to local conditions. We can achieve this most effectively by implementing integrated regional water management supported by strong statewide water management systems.

## Changes by Sector



## Changes Statewide Plus Groundwater Overdraft\*



\*To eliminate groundwater overdraft statewide may require an additional 2 million acre-feet per year for each scenario.

### Current Trends:

Recent trends continue for the following: population growth and development patterns, agricultural and industrial production, environmental water dedication, and naturally occurring conservation (like plumbing code changes, natural replacement, actions water users implement on their own, etc.).

### Less Resource Intensive:

Recent trends for population growth, higher agricultural and industrial production, more environmental water dedication, and higher naturally occurring conservation than Current Trends (but less than full implementation of all cost-effective conservation measures currently available).

### More Resource Intensive:

Higher population growth rate, higher agricultural and industrial production, no additional environmental water dedication (year 2000 level), and lower naturally occurring conservation than Current Trends.





# The Road



California needs sustainable water uses and reliable water supplies in 2030. To help make sure that our water use is sustainable, California water management must be based on **three foundational actions**:

- Use water efficiently
- Protect water quality
- Manage water in ways that protect and restore the environment

For our water supplies to be reliable, water management must pursue **two initiatives** that incorporate these actions:

- Promote and practice integrated regional water management
- Maintain and improve statewide water management systems, the backbone of water management in California

California Water Plan Update 2005 is a roadmap for meeting the state's water demands through the year 2030. It identifies the most

pressing water management issues and challenges affecting the state and its regions. It describes major implications of global climate change for California water supply, flood management, and ecosystem health. It also recommends policies, management strategies, and collaborative approaches that will help balance and guide future investments to make the most of our groundwater and surface water resources. These recommendations are listed at the end of the Highlights section and detailed in the Implementation Plan in Volume 1 of Update 2005.

# map to 2030

## Actions to Ensure Sustainable Water Uses

To minimize the impacts of water management on California's natural environment and make certain that our state continues to have the water supplies it needs, Californians must **use water efficiently** to get maximum utility from existing supplies. Californians are already leaders in water use efficiency measures such as conservation and recycling. Because competition for California's limited water resources is growing, we must continue these efforts and be innovative in our pursuit of efficiency. Water use efficiency will continue to be a primary way that we meet increased demand.

In the future, we must broaden our definition of efficient water use to include other ways of getting the most utility out of our groundwater and surface water resources and water management systems:

- Increase levels of urban and agricultural water use efficiency
- Increase recycled municipal water and expand its uses
- Reoperate water facilities to improve their operation and efficiency

- Facilitate environmentally, economically, and socially sound transfers to avoid regional shortages
- Reduce and eliminate groundwater overdraft

As California's population grows from 36.5 million to 48 million, there is bound to be an effect on California's environment. By wringing every bit of utility from every drop of water, Californians can stretch water supplies for continued economic, social, and environmental health.

California must also **protect water quality** to safeguard public and environmental health and secure the state's water supplies for their intended uses. Water supply and

water quality are inseparable in water management. While implementing projects to reduce water demand or to augment supply, water managers must employ methods and strategies that protect and improve water quality:

- Protect surface waters and aquifers from contamination
- Explore new treatment technologies for drinking water and groundwater remediation
- Match water quality to its intended uses
- Improve management of urban and agricultural runoff
- Improve watershed management



*California Water Plan Update 2005 is a roadmap for meeting the state's water demands through the year 2030.*



# The Roadmap to 2030

*In the future, water supplies and the environment must both be considered together.*

California must manage water in ways that protect and restore the environment. Water is a vital natural resource for people and the environment, so water management activities must occur in the context of resource management and environmental protection. Water development in California has a rich history of conflict, at times pitting water supply projects against ecosystem protection. Water supplies and the environment must be considered together.

Water managers must **support environmental stewardship** as part of their management responsibilities. As they develop and deliver water supplies, they can incorporate environmental stewardship in many ways:

- Integrate ecosystem restoration with water planning and land use planning
- Restore and maintain the structure and function of aquatic ecosystems
- Minimize the alteration of ecosystems through water management actions

- Improve watershed management
- Protect public trust resources
- Integrate flood management with water supply management

Water management activities will often have unavoidable environmental consequences. When water is removed from the natural environment for other beneficial uses, the environment is affected. In carrying out water management activities, Californians must acknowledge these environmental costs and make certain that restoration actions are taken to maintain and improve environmental health.

## **Initiatives to Ensure Reliable Water Supplies**

Two key initiatives in the California Water Plan outline ways to make sure that Californians have enough clean and affordable water supplies through the year 2030. These initiatives must be based on the foundational actions. The first initiative is to continue recent progress in **implementing integrated regional water management**. California Water Plan



Update 2005 identifies 25 strategies to help meet regional water management objectives in the context of broader resource management (see Volume 2 of this water plan). These strategies include water use efficiency, recycling, desalination, and storage; as well as improving water quality, management of floodplains, runoff and watersheds, and ecosystem restoration. By following these management strategies, communities can plan, invest, and diversify their water portfolios. These strategies will help regions become more self-sufficient with local supplies and will minimize conflicts with other resource management efforts.

Integrated regional water management is an approach that will help communities and regions incorporate sustainability actions into their water management efforts. Integrated regional programs will be most successful in providing reliable

water supplies when they use water efficiently, protect water quality, and restore the environment.

This initiative includes the following elements:

- Foster regional partnerships
- Develop integrated regional water management plans
- Diversify regional water portfolios

The second initiative is to **maintain and improve statewide water management systems**, including physical facilities and statewide water management programs.

Californians have developed a vast network of physical facilities that provide for the delivery of base water supplies throughout the state, transfer of water between users, treatment and distribution of water within service areas, protection from floods, and the sharing of supplies

during emergencies. These facilities make up the backbone of water management in California, and must be maintained and improved so that water is available when and where it is needed.

This initiative also includes statewide water management programs such as water quality standards, monitoring programs, and statewide water efficiency programs. These programs help meet major state government responsibilities for statewide water planning and ecosystem restoration. The state must continue to lead collaborative efforts to find solutions to water issues having broad public benefits such as protecting and restoring the Delta, Salton Sea, Mono Lake, Klamath basin, and Lake Tahoe.

This initiative includes the following actions by state, federal and local agencies and governments:

- Improve aging facilities
- Implement the CALFED Program
- Improve flood management
- Sustain the Sacramento-San Joaquin Delta



# Initiative 1

- Foster regional partnerships
- Develop integrated regional water management plans
- Diversify regional water portfolios

Over the past 50 years, California has met much of its increasing water demands with inter-regional projects. Although these state, federal, and local projects now serve as the backbone of California water management, by themselves they cannot provide for our growing population, changing agricultural production patterns, and environmental needs. However, regional partnerships can efficiently solve water management problems, and they can consider multiple resource issues.

Regions have opportunities not available to individual water suppliers. With state government leadership, assistance and oversight, regional water planning and management will help meet water needs through 2030. Integrated regional water management relies on a diversified portfolio of water strategies. The resulting regional plans can provide efficient solutions, consider other resource issues, and enjoy broad public support.

California Water Plan Update 2005 identifies near-term actions that will stimulate progress toward achieving integrated regional water management. It also specifies comprehensive actions that will foster success over the long term. Some of these key actions include the following:

*Promote integrated regional water management to ensure sustainable water uses, reliable supplies, better water quality, environmental stewardship, efficient urban development, protection of agriculture, and a strong economy.*

## Promote and Practice Integrated Regional Water Management

### Foster Regional Partnerships

Water suppliers that form partnerships with other entities in their region can accomplish projects and provide benefits that no single agency can do alone. For example, partnerships may allow agencies to improve their water supply reliability by establishing emergency connections with neighboring water suppliers; increase operational flexibility by participating in regional groundwater management and conjunctive use; protect water quality by participating in regional watershed management; reduce costs by cooperating with other agencies on water conservation and outreach programs; facilitate new projects by contributing to local habitat conservation plans; and help achieve many other regional resource management objectives.

Partnerships can lead to the preparation of integrated regional water management plans and regional eligibility for certain grant funds. Early coordination with land planning agencies may help water suppliers and land planners anticipate and plan for future growth, and make sure that additional regional growth will not exceed water suppliers' capabilities. Ultimately, regional partnerships will enable optimum management of water and other resources within a region.

### Develop and Implement Integrated Regional Water Management Plans

California is placing more emphasis on integrated regional water management. With this inclusive systems approach, local agencies and governments can be more flexible and act more efficiently. This approach makes better use of existing local resources. It integrates multiple aspects of managing water and related resources such as water quality, local and imported water supplies, watershed protection, wastewater treatment and recycling, and protection of local ecosystems.



*With state government leadership, assistance and oversight, regional water planning and management will help meet water needs through 2030.*



# Initiative 1 *Integrated Regional Water*

## *Principles of integrated regional water management*

- Use a broad, long-term perspective
- Identify broad benefits, costs, and tradeoffs
- Promote sustainable resource management
- Increase regional self-sufficiency
- Increase regional drought preparedness
- Use open forums that include all communities
- Promote coordination and collaboration among local agencies and governments
- Use sound science, best data, and local knowledge

The principles of integrated regional water management have a broad and long-term perspective. By applying the principles, regions develop plans that have multiple benefits. As an example, in some areas of the state, agricultural users have developed projects that simultaneously conserve water, reduce contaminants, preserve the agricultural economy, and improve aquatic habitat.

State government must help cities, counties, local water agencies, and private utilities to prepare useful integrated regional water management plans. With the state's help, local agencies and governments will put into effect existing legislation and state policies that improve coordination between water and land use planning.

## **Diversify Regional Water Portfolios**

Every region of California must build a diverse water portfolio that balances cost-effective water supplies and demands while protecting the environment. Every time water is wasted, money and a precious resource go down the drain. Continued investment in our existing facilities and carefully planned new water developments will provide the strong foundation to meet future needs. But Californians also must promote water conservation and recycling, enhance groundwater storage, provide adequate supplies of water for the environment, and support innovative water technologies such as desalination to reduce the impacts of droughts, support a vibrant economy, and meet water needs for the future.

## Management

California's regions cannot meet all of their water objectives with a single strategy. This water plan update describes 25 resource management strategies. These strategies are like individual tools in a tool kit. Just as the mix of tools will vary depending on the job, the combination of strategies will vary from region to region depending on the individual situations surrounding water supply and use, climate, projected growth, and environmental and social conditions.

A diverse portfolio of water management strategies is essential to provide the flexibility needed to cope with changing and uncertain future conditions.

### *Essential support activities*

*Water Plan Update 2005 also identifies the following support activities, which are essential to all the actions and initiatives.*

- Provide effective state government leadership, assistance, and oversight.
- Clarify state, federal, and local roles and responsibilities
- Develop funding strategies and clarify role of public investments
- Increase tribal participation and access to funding
- Ensure environmental justice across all communities
- Adapt for global climate change impacts
- Invest in new water technology
- Improve water data management and analysis
- Increase scientific understanding





# Investing in the

*By making the right choices, regions diversify their water portfolio, make the right investments, and meet their water demands in 2030. Each region chooses an appropriate mix of resource management strategies based on its own water management objectives and goals. These objectives reduce water demand, increase water supply, improve water quality, improve operational efficiency and transfers, and practice resource stewardship.*

## Reduce water demand

Water conservation has become a viable long-term supply option because it saves considerable capital and operating costs for utilities and consumers, avoids environmental degradation, and creates multiple benefits.

- Agricultural Water Use Efficiency
- Urban Water Use Efficiency

## Increase water supply

California's communities are finding innovative ways to generate new supplies.

- Conjunctive Management and Groundwater Storage
- Desalination—brackish/seawater
- Precipitation Enhancement
- Recycled Municipal Water
- Surface Storage—CALFED
- Surface Storage—Regional/Local

## Range of Additional Annual Water for Eight Resource Management Choices

*This graph shows the potential range of more water demand reduction and supply augmentation each year for eight resource management strategies. Low estimates are shown in the lower (dark blue) section of each bar. Estimates are from different studies described in Volume 2.*

