

Building Strong Collaborative Relationships for a Sustainable Water Resources Future:

STATE OF CALIFORNIA

SUMMARY OF STATE WATER PLANNING

U.S. Army Corps of Engineers
Civil Works Directorate
441 G Street NW
Washington, DC 20314-1000

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The findings contained in this report are based on the information collected from the literature search and interviews for this initiative and should not be construed as an official Department of the Army position, policy or decision unless so designated by other official documentation.

STATE OF CALIFORNIA

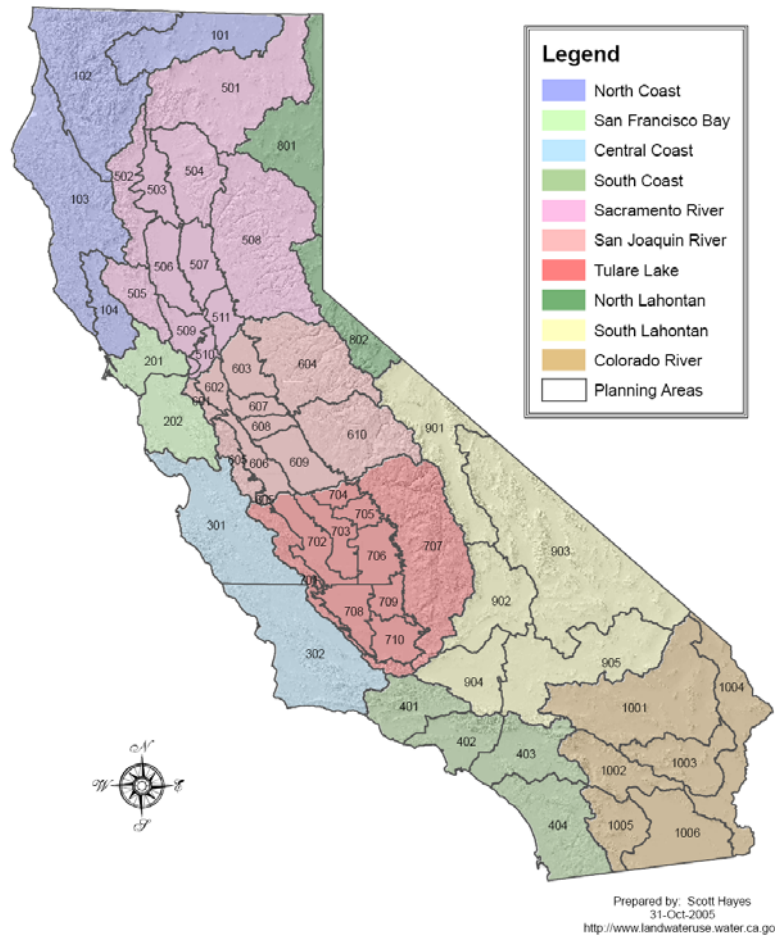


Figure 1. California's Major Planning Areas (a mountain area has also been evaluated which covers the central/eastern portion of Sacramento River and eastern half of San Joaquin River planning areas, a Bay Delta area has also been added)

1. RESPONSIBLE STATE AGENCIES/REGIONAL ENTITIES

The California Department of Water Resources (<http://www.dwr.water.ca.gov/>) is responsible for developing and updating the State's Water Plan.

Key Contacts at California Department of Water Resources (CDWR):

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California Department of Water Resources
P.O. Box 942836, Room 1115-1
Sacramento, CA 94236-0001

Street Address:
1416 - 9th Street, Room 1115-1
Sacramento, CA 95814

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 California Department of Water Resources
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 Phone (916) 651-9567
 Fax (916) 651-9289
 Email: jandrew@water.ca.gov

The following organization chart of CDWR provides an overview of other key contacts and their role in water resource management.

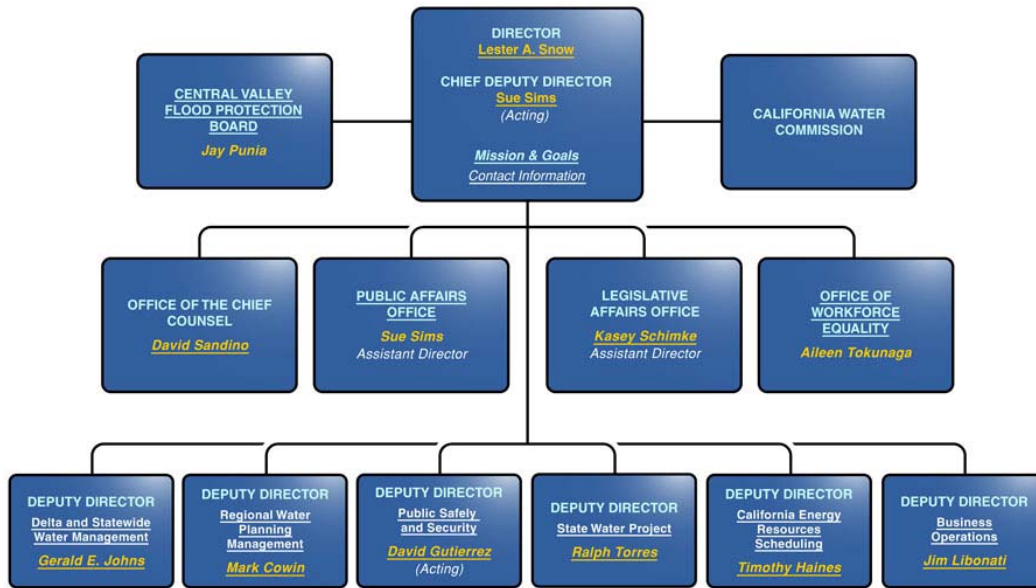


Figure 2. Organization Chart for California Department of Water Resources

The California Natural Resources Agency (<http://resources.ca.gov/>) is also involved in several aspects of water resource management. The mission of the California Natural Resources Agency is:

To restore, protect and manage the state's natural, historical and cultural resources for current and future generations using creative approaches and solutions based on science, collaboration and respect for all the communities and interests involved.

Key Agency Contact:

Mike Christman, Secretary secretary@resources.ca.gov
 Natural Resources Agency
 1416 Ninth Street, Suite 1311
 Sacramento, CA 95814
 (916) 653-5656; (916) 653-8102 fax

A brief listing of some of the significant Division and Programs and Projects of the Natural Resource Agency and a list of Natural Resources Boards and Commissions is provided below (please see website for additional detail <http://resources.ca.gov/>).

Divisions

- [Bonds & Grants](#)
- [Energy & Climate Change](#)
- [Legal Affairs](#)
- [Legislation](#)
- [Oceans](#)
- [Small Business Liaison](#)

Programs and Projects

- [Bay Delta Conservation Plan](#)
- [California Biodiversity Council](#)
- [Salton Sea](#)
- [Stewardship Council](#)
- [Enforcement Responsibilities](#)

Boards & Commissions

- [California Coastal Commission](#)
- [California Energy Commission](#)
- [California State Lands Commission](#)
- [San Francisco Bay Conservation and Development Commission](#)
- [Delta Protection Commission](#)
- [Colorado River Board of California](#)
- [State Reclamation Board](#)
- [Board of Forestry](#)
- [Fish and Game Commission](#)
- [Mining and Geology Board](#)
- [Native American Heritage Commission](#)
- [Parks and Recreation Commission](#)
- [State Historical Resources Commission](#)
- [State Off-Highway Motor Vehicle Recreation Commission](#)
- [California Water Commission](#)
- [California Boating and Waterways Commission](#)
- [Wildlife Conservation Board](#)

Please see <http://resources.ca.gov/> for more information.

2. STATE/REGIONAL WATER PLANNING STATUS

California has been extensively involved in water resource planning for over 100 years. The California Water Code requires the Department of Water Resources to publish an update of the *California Water Plan* every five years. The last published final water plan is from December 2005. However, California is currently undergoing public comment of

their update (Update 2009) to the 2005 Plan. Update 2009 was released for public comment in January 2009.

California has published several historic planning documents as a series of Bulletins. The Bulletin 160 series evaluates water supplies and assesses agricultural, urban, and environmental water uses to quantify the gap between water supplies and uses. The following are available for review from their website.

Bulletins

- Bulletin 160-05, published December 2005
- Bulletin 160-98, published November 1998
- Bulletin 160-93, published October 1994
- Bulletin 1, (pdf, 80 MB) published 1951
- Bulletin 25, published 1930
- Irrigation of Twelve Million Acres in the Valley of California, published 1919

It is important to note that the information summarized in this document includes information from both the 2005 Water Plan and the Draft 2009 update to the 2005 Plan. Water use and other statistics and trends have not yet been finalized for the 2009 update. Consequently, in some cases information from the 2005 Plan are summarized. In addition, where appropriate information on both the 2005 and 2009 update is presented to provide as much detail as possible on the planning process.

The State of California has an extensive series of water planning programs. The following topics demonstrate the breadth and complexity of water resource management and planning in California (hyperlinks provided).

Planning Related Topics

- [Agricultural Water Management Planning Program](#)
- [Agricultural Water Use Program](#)
- [Arroyo Grande-Nipomo Mesa Water Quality Assessment](#)
- [Border Environmental Program](#)
- [California Data Exchange Center \(CDEC\)](#)
- [California Irrigation Management Information System \(CIMIS\)](#)

California Water Plan Related Topics

- [Analytical Tools, CA Water Plan](#)
- [Assumptions and Estimates, CA Water Plan](#)
- [California Water Plan \(Bulletin 160\)](#)
- [Climate Change, CA Water Plan](#)
- [Data, CA Water Plan](#)
- [Future Scenarios, CA Water Plan](#)
- [Regional Outreach, CA Water Plan](#)
- [Regional Reports, CA Water Plan](#)
- [Resource Management Strategies, CA Water Plan](#)
- [Technical Guide, CA Water Plan](#)

[Tribal Communication, CA Water Plan](#)
[Water Code, CA Water Plan](#)
[Central Basin Judgment, Southern California](#)
[Central Valley Flood Protection Board](#)
[Climate Change](#)
[Climatologist](#)
[Current Reservoir Conditions-Graphic](#)
[Deer Creek Water Exchange Pilot Program](#)

Delta

[Bay-Delta](#)
[Bay-Delta Levees Program](#)
[CALSIM-II Model Peer Review Process](#)
[Carriage Water Studies](#)
[Comparison of Levee Break Repairs, Sacramento-San Joaquin Delta](#)
[Conveyance, Bay-Delta](#)
[DRMS Risk Analysis](#)
[Delta Atlas](#)
[Delta Cross Channel Re-Operation and Through-Delta Facility](#)
[Delta Island Consumptive Use](#)
[Delta Levee Breach Modeling](#)
[Delta Simulation Model II \(DSM2\)](#)
[Delta-Suisun Status & Trends](#)
[Flow and Salinity Estimates, Sacramento-San Joaquin Delta and Suisun Marsh](#)
[Flow and Water Quality Analysis, CALFED Studies](#)
[Franks Tract Project](#)
[Hydrology and Operations, Bay-Delta](#)
[Integrated Water Flow Model \(IWFM\)](#)
[Levee System Integrity Plan, CALFED](#)
[Modeling Support, Bay-Delta](#)
[Models, Bay-Delta](#)
[Models, North Delta](#)
[North Delta Alternatives](#)
[North Delta Facts](#)
[North Delta Flood Control Projects](#)
[Recirculation Program, South Delta](#)
[SWP Delivery Reliability](#)
[Sea Level Rise Due to Climate Change](#)
[Seismic Risk, Sacramento-San Joaquin Delta](#)
[South Delta](#)
[South Delta Improvements Program \(SDIP\)](#)
[Temporary Barriers Program, South Delta](#)
[Drought Preparedness](#)
[Economic Analysis](#)
[Environmental Impact Report \(EIR\), Salton Sea Ecosystem Restoration](#)
[Fish Passage Improvement](#)

[Flood Preparedness Guide, Levee Maintaining Agency
Floodplain Management Task Force
Grants and Loans](#)

Groundwater

[California's Groundwater, Bulletin 118](#)
[Conjunctive Water Management Program \(CWMP\)](#)
[Groundwater Information Center](#)
[Groundwater Management Act \(AB 3030\)](#)
[Groundwater Management Program \(GWMP\)](#)
[Groundwater Technical Assistance Programs](#)
[Land Subsidence, Groundwater](#)
[USBR Groundwater Project Areas](#)
[Guidebook for Implementing SB610 & SB221](#)
[Hetch Hetchy Restoration Study Report](#)
[Land Use Data](#)
[Land and Water Use Data](#)

Sacramento - San Joaquin

[Agricultural Drainage, San Joaquin Valley](#)
[Comparison of Levee Break Repairs, Sacramento-San Joaquin Delta](#)
[Flow and Salinity Estimates, Sacramento-San Joaquin Delta and Suisun Marsh](#)
[River Management, San Joaquin Valley](#)
[Salt Budget, San Joaquin Valley](#)
[Seismic Risk, Sacramento-San Joaquin Delta](#)
[Shallow Groundwater and Electrical Conductivity Maps, San Joaquin Valley](#)
[Subsidence, Sea Level Rise, and Seismicity in the Sacramento-San Joaquin Delta](#)
[Watershed Mapping, San Joaquin Valley](#)
[Safety of Dams Mission, DSOD](#)
[Salton Sea Ecosystem Restoration](#)
[Statewide Water Analysis Network \(SWAN\)](#)
[Surface Storage Investigations](#)

Surface Storage Investigations

[In-Delta Storage Program](#)
[Los Vaqueros Reservoir Expansion Project](#)
[North-of-the-Delta Offstream Storage](#)
[Shasta Lake](#)
[Upper San Joaquin River Basin](#)
[Urban Streams Restoration Program, Grants](#)
[Water Conditions-Factsheet](#)
[Water Data Library \(WDL\)](#)
[Watersheds](#)
[Well Standards](#)
[West Coast Basin Judgment, Southern California](#)
[Yuba Basin Modeling Forum](#)

(From - <http://wwwdwr.water.ca.gov/nav/nav.cfm?loc=t&id=101>)

3. WATER MANAGEMENT VISION AND GOALS

The Department of Water Resource has adopted the following mission and goals for water resource management/planning in California.

Mission

To manage the water resources of California in cooperation with other agencies, to benefit the State's people, and to protect, restore, and enhance the natural and human environments.

Strategic Planning Goals

Goal 1: Develop and assess strategies for managing the State's water resources, including development of the California Water Plan Update.

DWR is responsible for promoting California's general welfare by ensuring beneficial water use and development statewide. To guide development and management of the State's water resources, DWR is responsible for preparing the [California Water Plan Update](#) (California Water Code 10004-10013) ([Water Code section 10000 et seq.](#)).

The Plan is updated every 5 years to address challenges currently facing California, such as satisfying the needs of the State's growing population (projected to reach about 53 million by 2030), quantifying water demands and supplies based on sound information, and identifying management strategies to diversify the regional portfolio assets.

DWR is authorized to conduct other planning functions, including those related to urban and agricultural water use, fish and wildlife, recreation, groundwater, agricultural drainage, and water quality. It also investigates and identifies water management strategies, such as conservation, water recycling, water transfers, conjunctive management, and structural measures.

DWR represents the State on interstate water policy issues concerning the Klamath, Truckee, Carson, and Walker Rivers; it also helps develop interstate water policy on the Colorado River and is designated as the State administrator of interstate water-related compacts.

Goal 2: Plan, design, construct, operate, and maintain the State Water Project to achieve maximum flexibility, safety, and reliability.

DWR operates California's State Water Project (SWP), the largest State-built multipurpose project in the United States. The SWP was designed in the 1950s and 1960s. Most SWP construction was done during the 1960s and 1970s, with some later additions.

The SWP, spanning more than 600 miles from Northern California to Southern California, includes 32 storage facilities, 17 pumping plants, 3 pumping-generating plants, 5 hydroelectric power plants, and approximately 693 miles of canals and pipelines, including the newest section, the East Branch Extension located in Southern California.

DWR operates and maintains the SWP and delivers, on average, 2.4 million acre-feet of water per year to the 29 water agencies who are repaying the cost, plus interest, of financing, constructing, operating, and maintaining the SWP storage and conveyance facilities. Through the SWP, DWR supplies good quality water for municipal, industrial, agricultural, and recreational uses and for protecting and enhancing fish and wildlife.

Goal 3: Protect and improve the water resources and dependent ecosystems of statewide significance, including the Sacramento-San Joaquin Bay-Delta Estuary.

The ability of DWR to meet many of its goals hinges on achieving and maintaining a healthy ecosystem in the Bay-Delta Estuary. Maintaining such an ecosystem requires understanding, collaboration, and reasonable agreement among many partners to resolve Bay-Delta issues.

DWR is collaborating and coordinating with the California Bay-Delta Authority and California Bay-Delta Program (CALFED) agencies to carry out its responsibilities of controlling salinity, providing water for use in the Delta, planning long-term solutions for environmental and water use problems, and administering Delta levee maintenance reimbursements and special flood control projects ([Water Code section 12200](#)).

Goal 4: Protect lives and infrastructure as they relate to dams, floods, droughts, watersheds impacted by fire and disasters, and assist in other emergencies.

DWR has the responsibility of protecting public health, life, and property by regulating the safety of dams, providing flood protection, and responding to emergencies. DWR meets these responsibilities through the following activities:

- Continually supervising design, construction, enlargement, alteration, removal, operation, and maintenance of more than 1,200 jurisdictional dams.
- Encouraging preventive floodplain management practices; regulating activities along Central Valley floodways.
- Maintaining and operating specified Central Valley flood control facilities.
- Cooperating in flood control planning and facility development.
- Maintaining the State-Federal Flood Operations Center and the Eureka Flood Center to provide flood advisory information to other agencies and the public.
- Cooperating and coordinating in flood emergency activities and other emergencies. ([Water Code section 6000 et seq.](#))

Goal 5: Provide policy direction and legislative guidance on water and energy issues and educate the public on the importance, hazards, and efficient use of water.

Educating the public on the importance of water, its efficient use, and its dangers, as well as collecting, analyzing, and distributing water-related information to the general public and to the scientific, technical, educational, and water management communities are important DWR responsibilities.

Goal 6: Support local planning and integrated regional water management through technical and financial assistance.

DWR provides technical and financial assistance to local agencies; cooperates with local agencies, groups, and individuals on water resources investigations; supports watershed and river restoration programs; encourages water conservation, explores conjunctive use of groundwater and surface water, provides planning and advice on water recycling and desalination programs, administers local assistance grant and loan programs, facilitates voluntary water transfers and, when needed, operates a State drought water bank.

Goal 7: Perform efficiently all statutory, legal, and fiduciary responsibilities regarding management of State long-term power contracts and servicing of power revenue bonds.

During the 2001 energy crisis, the Governor and the Legislature gave DWR the statutory authority to purchase and schedule all electricity used by the three nearly bankrupt major power utilities in the State.

DWR used its authority to enter into long-term contracts with power producers to stabilize the volatile wholesale energy market and to provide the revenue certainty needed by suppliers to secure financing for construction of necessary new power plants.

DWR has been charged with the responsibility of managing the long-term contracts, including renegotiating their terms and conditions when possible.

Goal 8: Provide professional, cost-effective, and timely services in support of DWR's programs, consistent with governmental regulatory and policy requirements.

California has also identified vision, mission, and goals for their water plans. The 2005 State Water Plan identifies the following:

Vision

California's water resource management preserves and enhances public health and the standard of living for Californians; strengthens economic growth, business vitality, and the agricultural industry; and restores and protects California's unique environmental diversity.

Mission

To develop a strategic plan that guides State, local, and regional entities in planning, developing, and managing adequate, reliable, secure, affordable, and sustainable water of suitable quality for all beneficial uses.

Goals

- State government supports good water planning and management through leadership, oversight, and public funding.
- Regional efforts play a central role in California water planning and management.
- Water planning and urban development protect, preserve, and enhance environmental and agricultural resources.
- Natural resources and land use planners make informed water management decisions.
- Water decisions and access are equitable across all communities.

(From - http://www.waterplan.water.ca.gov/docs/cwpu2005/Abstract/waterplan_abstract_03-05-2007.pdf)

The following figure provides a graphic summary of California's approach to water resource planning.

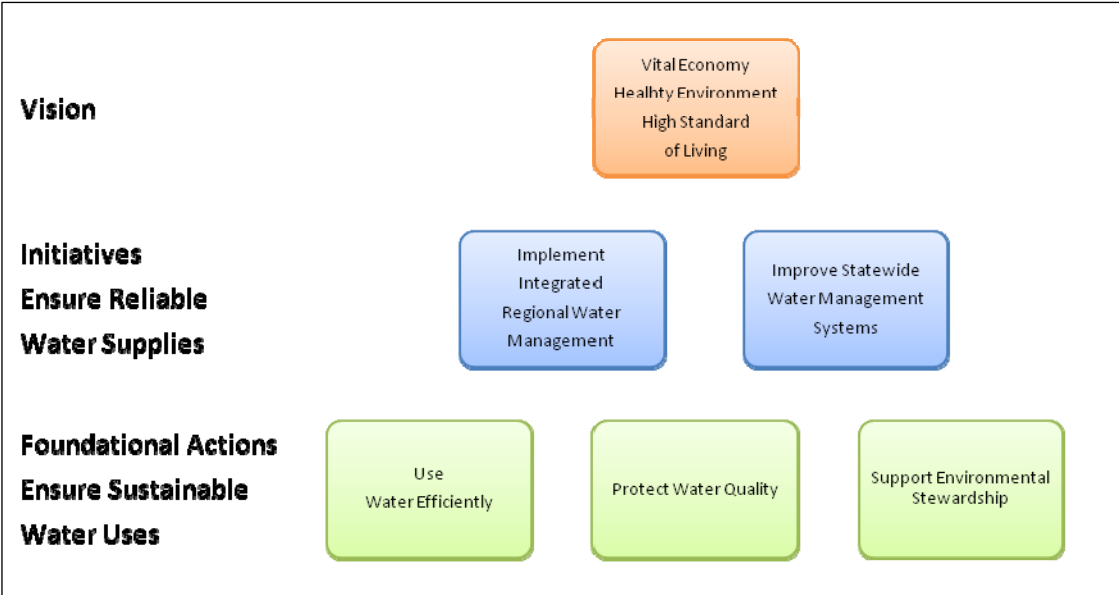


Figure 3. California Water Planning Approach
 (From - <http://www.waterplan.water.ca.gov/docs/cwpu2005/cwphighlights/highlights.pdf>)

Water Plan update 2009 further expands on and improves the planning process and principles aimed at managing California water resources in a way that provides reliable and clean water supplies for all beneficial uses today and for generations.

Vision - Desired future for California water

California has integrated, reliable and secure water resources and management systems that:

- Enhance public health, safety, and quality of life in all its communities.
- Sustain economic growth, business vitality, and agricultural productivity.
- Protect and restore California’s unique biological diversity, ecological values, and cultural heritage.

Goals - Desired outcomes over the planning horizon 2050

1. California has water supplies that are adequate, reliable, secure, affordable, sustainable, and of suitable quality for beneficial uses to protect, preserve, and enhance watersheds, communities, and environmental and agricultural resources.
2. State government supports integrated water resources planning and management through leadership, oversight, and public funding.
3. Regional and interregional partnerships play a pivotal role in California water resources planning, water management for sustainable water use and resources, and increasing regional self-sufficiency.
4. Water resource and land use planners make informed and collaborative decisions and implement integrated actions to increase water supply reliability, use water more efficiently, protect water quality, improve flood protection, promote environmental stewardship, and ensure environmental justice in light of drivers of change and catastrophic events.
5. California is prepared for climate uncertainty by developing adaptation strategies and investing in a diverse set of actions that reduce the risk and consequences posed by climate change, that make the system more resilient to change, and that increase the sustainability of water and flood management systems and the ecosystems they depend on.
6. Integrated flood management, as a part of integrated water management, increases flood protection, improves preparedness and emergency response, enhances floodplain ecosystems, and promotes sustainable flood management systems.
7. The benefits and consequences of water decisions and access to state government resources are equitable across all communities.

Mission - Purpose of the Water Plan

Updating the California Water Plan provides state, federal, tribal, regional, and local governments and organizations a continuous strategic planning forum to collaboratively:

- Recommend strategic goals, objectives, and near-term and long-term actions that would conserve, manage, develop, and sustain California's water resources and management systems.
- Prepare response plans for floods, droughts, and catastrophic events that would threaten water resources and management systems, the environment, property, and the health, welfare and livelihood of the people of California.
- Evaluate current and future water conditions, challenges, and opportunities.

Guiding Principles - Core values and philosophies / How to make decisions

1. Use a broad, stakeholder-based, long-view perspective for water management.
2. Promote management for sustainable resources on a watershed basis.
3. Increase regional drought and flood preparedness.
4. Increase regional self-sufficiency.
5. Promote regional coordination and collaboration among local governments and agencies, public and private organizations, and Tribal governments and Tribal communities.
6. Determine values for economic, environmental, and social benefits, costs, and tradeoffs to base investment decisions on sustainability indicators.
7. Incorporate future variability, uncertainties, and risk in the decision-making process.
8. Apply California's water rights laws, including the longstanding constitutional principles of reasonable use and public trust, as the foundation for public policymaking, planning, and management decisions on California water resources.
9. Promote environmental justice - the fair treatment of people of all races, cultures, and incomes.
10. Use science, best data, and local and indigenous peoples' knowledge in a transparent and documented process.

(From: http://www.waterplan.water.ca.gov/docs/cwpu2009/1208prd/B160-Highlights_FOLDOUT.pdf)

4. SCOPE OF WATER RESOURCE PLANNING

The California Water Plan provides a framework for water managers, legislators, and the public to consider options and make decisions regarding California's water future. The Plan, which is updated every five years, presents basic data and information on California's water resources including water supply evaluations and assessments of agricultural, urban, and environmental water uses to quantify the gap between water supplies and uses. The Plan also identifies and evaluates existing and proposed statewide demand management and water supply augmentation programs and projects to address the State's water needs.

The 2005 Water Plan is organized into the following 5 major volumes:

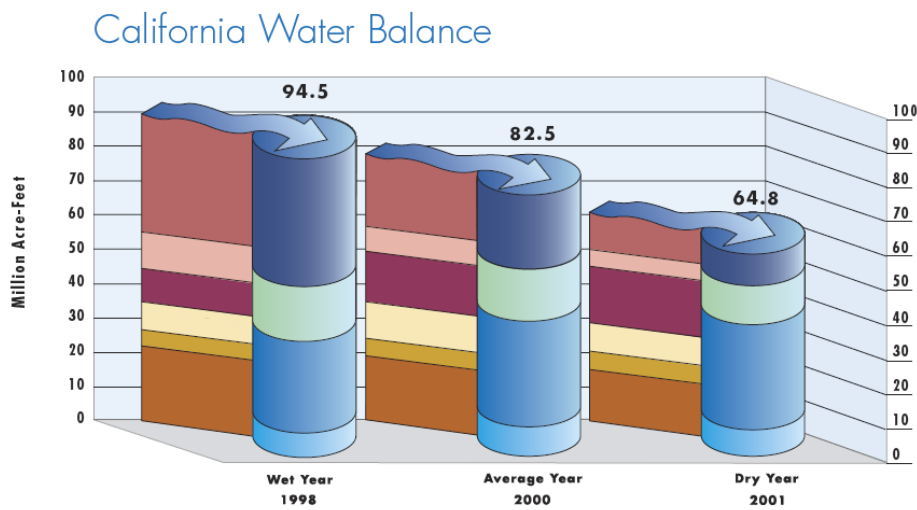
- Volume 1: Strategic Plan
- Volume 2: 25 Resource Management Strategies
- Volume 3: 12 Regional Reports
- Volume 4: Reference Guide (60+ articles)
- Volume 5: Technical Guide (Online documentation)

For additional information please see

<http://www.waterplan.water.ca.gov/docs/cwpu2005/cwphighlights/highlights.pdf>

Trends

The following figure provides a snapshot of California statewide water use.



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.

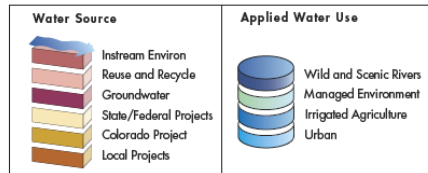


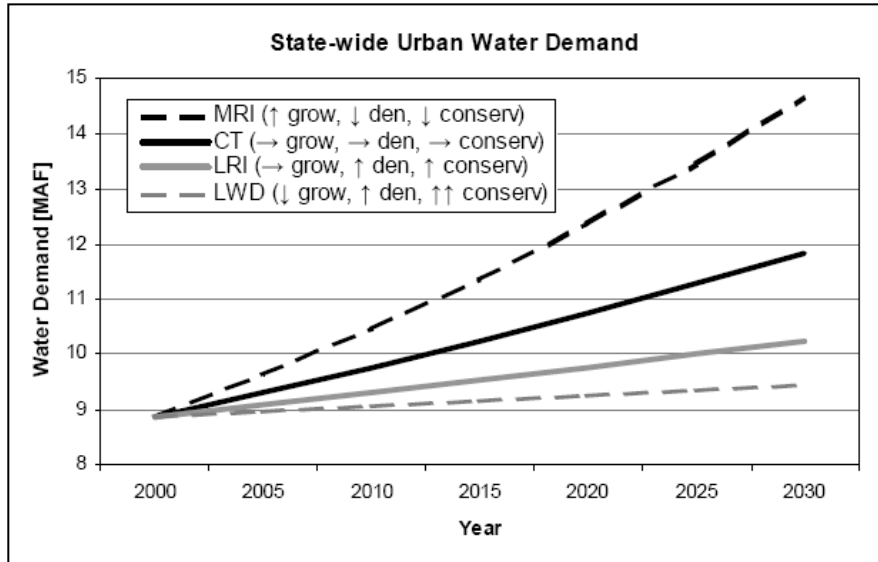
Figure from:

<http://www.waterplan.water.ca.gov/docs/cwpu2005/cwphighlights/highlights.pdf>

Demographic and Agricultural Trends

The 2005 Water Planning process initially identified four Urban demand scenarios (later reduced to three). In all four scenarios, significant statewide population growth is forecasted. Population growth from 2000 to 2030 ranges from about 10.5 million people in the Low Water Demand Scenario to over 18 million people in the More Resource Intensive scenario (the State's population in 2000 was 34.1 million). Population growth is

largest in the South and smallest in the North. Changes in employment and housing are largely proportional to population growth.



Average-year urban demand from 2000 to 2030 for each scenario: MRI - More Resource Intensive; CT - Current Trend; LRI - Lower Resource Intensive; LWD - Low Water Demand

To provide greater context for the water demand estimates the researchers included the following caveat: *In reviewing water demand changes care must be taken when interpreting the results of the water demand scenario generator. The four scenarios, by design, reflect what water demand might be (1) under specific assumptions of future water price, (2) if no additional water management strategies were implemented, and (3) under average climatic conditions. The water demand estimates presented for these scenarios can be significantly influenced by policy actions, and thus the change in water demand is not necessarily the amount of new supply required to meet future needs.*

In the agricultural sector, the irrigated crop area (ICA) decreases about 5% from 9.5 million acres in 2000 to about 9.1 million acres in 2030 in the Current Trends and Low Water demand scenarios. ICA remains constant in the Less Resource Intensive and More Resource Intensive scenarios. In all scenarios, ICA increases in the North regions and decreases in the Central and South regions. The ICA increases in the North are due to both increases in irrigated land area (consistent with the 1998 Water Plan forecast) and to greater multi-cropping.

The above information is from: Quantified Scenarios of 2030, California Water Demand. California Water Plan Update 2005. David Groves, Pardee RAND Graduate School and Scott Matyac and Tom Hawkins, DWR. Available at <http://www.waterplan.water.ca.gov/previous/cwpu2005/index.cfm>

The goal for the *California Water Plan Update* is to meet [Water Code](#) requirements, receive broad support among those participating in California’s water planning, and be a useful document for the public, water planners throughout the state, legislators and other

decision-makers. <http://www.waterplan.water.ca.gov/>. The 2009 update to the 2005 Water Plan provides a number of detailed reports and information on the planning process. Update 2009 builds on the framework and resource management strategies outlined by *California Water Plan Update 2005* which promoted two major initiatives:

- Integrated regional water management enables regions to implement strategies appropriate for their own needs and helps them become more self-sufficient.
- Improved statewide water management systems provide for upgrades to the large physical facilities, such as the State Water Project, and statewide management programs essential to the California economy.

To minimize the impacts of water management on California’s natural environment and make sure that the state continues to have the water supplies it needs, the two initiatives are supported by three foundational actions:

- Use water efficiently to get maximum utility from existing supplies.
- Protect water quality to safeguard public and environmental health and secure the state’s water supplies for their intended purposes.
- Expand environmental stewardship as part of water management responsibilities.

Update 2009 uses the same framework presented in Update 2005, but enhances the planning approach in several areas:

- Provides further acknowledgement that the Water Plan is a living document that needs to continue to evolve in future updates
- Includes improved data, analytical tools, and information management and exchange
- Includes climate change adaptation and mitigation strategies
- Integrates information and recommendations from state agency planning documents, particularly those represented on the Water Plan Steering Committee
- Includes integrated flood management
- Updates resource management strategies and regional reports
- Updates regional water balances to include eight years
- Incorporates consideration of uncertainty, risks, and resource sustainability into planning for the future to:
 - Reduce uncertainties.
 - Recognize risks to success.
 - Manage for more sustainable water supply, flood management, and ecosystem.

Incorporating the concept of resource sustainability is an ongoing process or approach that will continue to be developed in future Water Plan updates.

It is not possible to know for certain how population, water demand patterns, environmental conditions, the climate, and many other factors that affect water use and supply may change by 2050. This Water Plan update uses a range of plausible future conditions (scenarios) to help understand the implications of future conditions on water management. Each scenario includes assumptions about how 80 different factors, like

population or irrigated farmland, would describe its future. These are factors over which the water community has little control.

- **Scenario 1 – Current Trends.** For this scenario, recent trends are assumed to continue into the future. In 2050, nearly 60 million people live in California. Affordable housing has drawn families to the interior valleys. Commuters take longer trips in distance and time. In some areas where urban development and natural resources restoration has increased, irrigated crop land has decreased. The state faces lawsuits on a regular basis: from flood damages to water quality and endangered species protections. Regulation lacks a comprehensive plan, creating uncertainty for local planners and water managers.
- **Scenario 2 – Blueprint Growth.** Private, public, and governmental institutions form alliances to provide for more efficient planning and development that is less resource intensive than current conditions. Population growth is slower than currently projected—about 45 million people live here. Compact urban development has eased commuter travel. Californians embrace water and energy conservation. Conversion of agricultural land to urban development has slowed and occurs mostly for environmental restoration and flood protection. The state’s legislature has enacted several comprehensive programs to improve water quality, protect fish and wildlife, and protect communities from flooding.
- **Scenario 3 – Expansive Growth.** Future conditions are more resource intensive than existing conditions. Population growth is faster than currently projected with 70 million people living in California in 2050. Families prefer low-density housing, and many seek rural residential properties, expanding urban areas. Some water and energy conservation programs are offered but at a slower rate than trends in the early century. Irrigated crop land has decreased significantly where urban development and natural restoration have increased. Protection of water quality and endangered species is driven mostly by lawsuits, creating a patchwork of regulations.

Each scenario has different water demands. Each scenario describes a different baseline for year 2050, to which the water community would need to respond by implementing a mix of the management strategies. To eliminate groundwater overdraft statewide may require an additional 2 million acre-feet per year for each scenario. Within each scenario, water demand changes between 2005 and 2050 are different for each major water use sector (urban, agricultural, and environmental).

From <http://www.waterplan.water.ca.gov/cwpu2009/#highlights>

The California Water Plan Update 2009 follows the same organization as the 2005 Plan and is organized into five volumes:

- Volume 1: The Strategic Plan
- Volume 2: Resource Management Strategies
- Volume 3: Regional Reports
- Volume 4: Reference Guide
- Volume 5: Technical Guide

The 2009 Water Plan update provides information at the statewide and regional (12 different areas as shown in Figure 1). The Table of contents for statewide information is provided below.

California Water Plan Update 2009 Public Review Draft Chapter 1 State Summary
 Volume 3 Regional Reports

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Regional summaries (hyperlinks provided below) have been prepared for the following areas.

- [Central Coast \(CC\) Web page](#)
- Public Review Draft: [.pdf, 274 kb](#)
- [Colorado River \(CR\) Web page](#)
- Public Review Draft: [.pdf, 269 kb](#)
- [North Coast \(NC\) Web page](#)
- Public Review Draft: [.pdf, 324 kb](#)
- [North Lahontan \(NL\) Web page](#)
- Public Review Draft: [.pdf, 331 kb](#)
- [Sacramento River \(SR\) Web page](#)
- Public Review Draft: [.pdf, 181 kb](#)
- [San Francisco Bay \(SF\) Web page](#)
- Public Review Draft: [.pdf, 223 kb](#)
- San Joaquin River (SJ) Web page
- Public Review Draft: [.pdf, 252 kb](#)
- [South Coast \(SC\) Web page](#)
- Public Review Draft: [.pdf, 1.0 MB](#)

- [South Lahontan \(SL\) Web page](#)
- Public Review Draft: [.pdf, 265 kb](#)
- [Tulare Lake \(TL\) Web page](#)
- Public Review Draft: [.pdf, 550 kb](#)
- [Mountain Counties \(MC\) Web page](#)
- Public Review Draft: [.pdf, 240 kb](#)
- [Sacramento-San Joaquin Delta \(Legal Delta\) page](#)
- Public Review Draft: [.pdf, 194 kb](#)

(From - <http://www.waterplan.water.ca.gov/regions/index.cfm>)

Regional Area Plan outline

The Regional Reports are done for each of the 10 hydrologic regions, plus 2 additional areas: (1) the mountain counties area and; (2) the Sacramento – San Joaquin Delta region. Each report includes a discussion of the state of the region, key challenges; ongoing programs; and information on water supplies and uses for specific water years. The Regional Reports are also known as Volume 3 of the *California Water Plan Update*.

An example of the content included in a regional area summary is provided below.

California Water Plan Update 2009 Public Review Draft Chapter 4 Central Coast Hydrologic Region
Volume 3 Regional Reports

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(From [http://www.waterplan.water.ca.gov/docs/cwpu2009/1208prd/vol3/3_RR_CC_PRD_\(01-29-09\)LJM-mt\(clean\).pdf](http://www.waterplan.water.ca.gov/docs/cwpu2009/1208prd/vol3/3_RR_CC_PRD_(01-29-09)LJM-mt(clean).pdf))

The following summary is taken from <http://www.waterplan.water.ca.gov/cwpu2009/#highlights> and is included here to provide an overview of the trends challenges and issues facing California’s water resource future.

California is facing one of the most significant water crises in its history—one that is hitting hard because it has so many aspects. Growing population and reduced water supplies are worsening the effects of a multi-year drought. Climate change is reducing our snowpack storage and increasing floods. Court decisions and new regulations have reduced Delta water deliveries by 30 percent. Key fish species continue to decline. In some areas of the state, our ecosystems and quality of underground and surface waters

are unhealthy. The current global financial crisis will make it even more difficult to invest in solutions. We must act now to provide integrated, reliable, and secure water resources and management systems for our health, economy, and ecosystems.

Greater Drought Impacts

Today we are facing the threat of our next major drought. After a dry year in 2007, spring 2008 was the driest on record within the Sacramento River watershed, a major source of water for California's farms, cities, and ecosystems. The initial estimate of water allocation to the State Water Project made in October 2008 called for only 15 percent of contract amounts, near the lowest allocation in State Water Project history. Water reservoir levels in 2008 rivaled the low levels reached during the severe two-year drought of 1976–1977. Because of two back-to-back dry years, not even a wet winter in 2008 will end the drought.

Increasing Flood Risk

Every region of California faces flood risks – nearly 2 million people in California live within areas that can expect flooding on average of once in 100 years. This means that, on average, approximately 20,000 people per year can expect to be affected by floods. More people are moving into these floodplains and flood prone areas every day. Sacramento, the state capital, has one of the lowest levels of flood protection of any major city in the nation. Hurricane Katrina provided a vivid reminder of levee vulnerability and consequences of flooding urban areas. Before Katrina, the New Orleans levees were rated as having a 200-year level of flood protection – Sacramento's levees are rated about one-half that amount. The threat of catastrophic flooding, especially in the deep floodplains of the Central Valley and Delta, is a continuing fear.

Declining Ecosystems

The ecosystems in many areas of the state have declined – many species have been listed as threatened or endangered. Problems with watershed health, lack of suitable habitat, competition with invasive species, toxicity, and water operations contribute to the decline. One of the most obvious examples of an ecosystem on the verge of collapse is in the Sacramento-San Joaquin Delta. Salmon, delta smelt, and other species are at their lowest levels since their records have been kept, about 50 years. This decline has led to court restrictions and new regulations on Delta diversions.

Impaired Water Bodies

The quality of groundwater and surface waters varies significantly throughout the state. We need improvements in drinking water treatment, cleanup of polluted groundwater, salt management, and urban runoff management. A high priority is creating healthy watersheds to keep source water free of pollutants.

Aging Infrastructure

Conditions today are much different than when most of California’s water system was constructed; and upgrades have not kept pace with changing conditions, especially considering the growing population and the future challenges accompanying climate change. California’s flood protection system, composed of aging infrastructure with major design deficiencies, has been further weakened by lack of maintenance. State and regional budget shortfalls and a tightened credit market may delay new projects and programs.

California identifies the following future stresses on their water systems:

- *At what rate will California’s population grow into the future?*
- *What will future urban, agricultural, and ecosystem land uses be?*
- *What are the limits to California’s water supplies?*
- *How much will climate change result in rising sea level, more severe floods and droughts, and stress on the ecosystem?*
- *When will a major earthquake cause catastrophic failure of Delta levees and disrupt at least a portion of water supply to 25-million people and millions of acres of farmland?*
- *How will future regulations change how the system is operated for water supply, flood management, water quality, and ecosystem health?*
- *What other unknown challenges (endangered species listings, new health concerns for water quality, etc.) will surface?*

Finally, the development of the California Water Plan involves the use and application of a number of technical tools and models. The following table is a list of some of the key analytical tools that are employed in the development of the Water Plan.

Tool	Category	Author	Download File (type, size)
CALAG	Crop acreage and ag water use	DWR	Description (.pdf, 30 kb)
CALSIM	Water supply	DWR	Description (.pdf, 57 kb)
CALVIN	Economic optimization of water allocation	UC Davis	Description (.pdf, 168 kb)
CAWU	Evapotranspiration of applied water	DWR	Description (.pdf, 12 kb)
CU	Crop consumptive use	DWR	Description (.pdf, 36 kb)
CUP	Crop consumptive use	DWR	Description (.pdf, 185 kb)
DSM2	Hydrodynamics and water quality	DWR	Description (.pdf, 27 kb)
IMPLAN	Economics and impact analysis for planning	MIG, inc.	Description (.pdf, 21 kb)

Tool	Category	Author	Download File (type, size)
IWFM	Integrated surface water and groundwater hydrology	DWR	Description (.pdf, 293 kb)
IWRMAIN	Urban water use	CDM	Description (.pdf, 44 kb)
LAWS	Field-level water budget, Regional water supply allocation	USBR	Description (.pdf, 118 kb)
LCPSIM	Economic optimization of water management options	DWR	Description (.pdf, 157 kb)
Probabilistic Climate Projections for California	California Climate Change	CEC	Description (.pdf, 66 kb)
SIMETAW	Weather generator and evapotranspiration of applied water	DWR	Description (.pdf, 119 kb)
UPLAN	Urban land use	DWR	Description (.pdf, 24 kb)
WEAP	Water resources planning	Stockholm Environmental Institute	Description (.pdf, 88 kb)

From - <http://www.waterplan.water.ca.gov/tools/list.cfm>

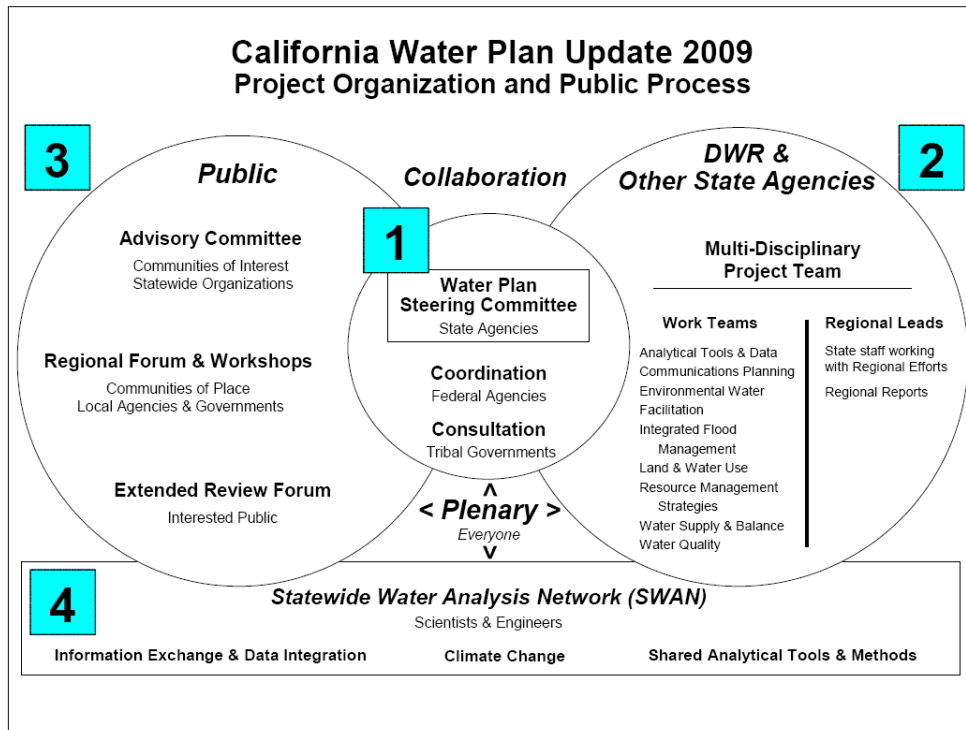
5. PARTNERSHIPS, STAKEHOLDER, AND PUBLIC INVOLVEMENT

The California Water Plan and its updates have been important sources of information for water planners since 1957. But unlike prior Water Plan updates, which were primarily products of the Department of Water Resources, Update 2009 was designed to encourage stakeholder ownership to help the Plan be viewed as the state’s Water Plan. The planning process has benefited from the first interagency California Water Plan steering committee representing 21 state government agencies with jurisdictions over different aspects of water resources and integrates companion planning documents of other state agencies. In addition, a 45-member advisory committee, expanded regional outreach, greater involvement of California Native American Tribes, and coordination with federal agencies provided broad participation in plan preparation.

Process Guide - California Water Plan Update 2009

This guide explains the project organization and public process design for preparing the California Water Plan Update 2009. It builds on the planning framework, lessons, and accomplishments of *Water Plan Update 2005*. The diagram below illustrates the process components. Three overlapping circles depict the participants, relationships, and information exchange between and among the participants, namely government agencies, tribal governments, and statewide, regional, and local stakeholders. The box beneath the circles represents the technical experts, information, and science supporting the update. Plenary meetings tie them all together. [Circle (1) Collaboration; Circle (2) California Department of Water Resources and Other State Agencies; Circle (3) Public

Box (4) Statewide Water Analysis Network (SWAN).] The activities of these groups is discussed in more detail below.



Information and figure from http://www.waterplan.water.ca.gov/docs/cwpu2009/cwp_process_guide011808v2ds.pdf

Circle 1—Collaboration

The **Collaboration Circle** shows that the Department of Water Resources (DWR) will partner with other State agencies, coordinate with federal agencies, and consult with tribal governments, to update the California Water Plan. A newly formed State agency Steering Committee will guide the update process. Working closely with a public Advisory Committee, ongoing regional water planning collaboratives, and the Statewide Water Analysis Network, the Steering Committee will ensure that the Water Plan addresses State, federal, tribal, and regional issues and initiatives, and that the Water Plan is based on sound science and current information. Facilitated by public policy mediators, representatives of member groups will seek consensus through regular participation at meetings, continuous communication, and collaborative planning.

The Water Plan Steering Committee - composed of the following State agencies, departments, boards and commissions, provides policy input, oversight, and program management. Committee members have sufficient authority to represent their agencies and allocate staff and resources to Water Plan activities as appropriate. As the committee chair, DWR is responsible for providing administrative and logistical support and for completing Water Plan Updates as required by Water Code (§10004 -- §10013).

- *Boating & Waterways*
- *Business, Transportation & Housing*
- *Cal/Environmental Protection Agency*
- *CALFED Bay-Delta Program*
- *California Energy Commission*
- *California Public Utilities Commission*
- *Conservation*
- *Fish & Game*
- *Food & Agriculture*
- *Forestry & Fire Protection*
- *Native American Heritage Commission*
- *Office of Emergency Services*
- *Office of Planning & Research*
- *Parks & Recreation*
- *Public Health*
- *Resources Agency*
- *State Lands Commission*
- *State Water Resources Control Board*
- *Water Resources*

Federal Coordination and Tribal Consultation involves the Water Plan Steering Committee seeking policy input and information for the Water Plan Update from federal agencies and tribal governments and their representatives. The Steering Committee will convey their input to Water Plan participants.

- *California Rural Indian Health Board*
- *Inter-Tribal Council of California*
- *Regional Tribal Operations Committee*
- *US Bureau of Indian Affairs*
- *US Army Corps of Engineers*
- *US Bureau of Reclamation*
- *US Department of Agriculture*
- *US Environmental Protection Agency*
- *US Fish and Wildlife Service*
- *US Forest Service*
- *US Geological Survey*
- *US National Marine Fisheries Service*
- *US Natural Resource Conservation Service*
- *Others (with role in California water)*

Circle 2—DWR and Other State Agencies

The **DWR & Other State Agencies Circle** represents the core staff responsible for developing the Water Plan Update. The Project Team consists of interdisciplinary staffs from DWR's Statewide Water Planning Branch and four District offices, other DWR divisions, and staffs from State agencies and their regional offices. The Project Team

includes a Facilitation Team to manage the public process and help different groups interact.

The Project Team comprises DWR and other State agency staffs working on the Water Plan Update. It is an interdisciplinary team that draws upon the wide range of scientific, technical, and administrative skills within DWR and partnering State agencies.

Work Teams consist of topic-specific subject matter experts from DWR and other State agencies, including their district/regional offices, as well as facilitators. Work Team Leads will convene as a group on a regular basis to plan and manage work assignments.

Regional Leads are liaisons from district/regional offices of DWR and other State agencies with regional water planning efforts. The Regional Leads will compile a directory of regional water planning initiatives and information for the Water Plan’s 12 Regional Reports.

Circle 3—Public

The **Public Circle** acknowledges DWR’s commitment to an open and transparent process that seeks participation and deliberative input from stakeholders and other public members. An evolution from Water Plan Update 2005, the Advisory Committee for the 2009 update will focus on statewide policy issues and initiatives, while regional coordination and in-depth technical discussions are delegated to other work groups.

The Advisory Committee is composed of a cross-section of diverse stakeholders. It is a consensus-seeking group of statewide organizations to represent communities of interest, including:

Business, Citizen Organizations, Energy & Water Consumer Advocates, Environment & Public Trust, Environmental Justice, Local Government & Land Use Planning, Production Agriculture, Recreation, Water Efficiency, Water Quality & Public Health, Water Suppliers - Agricultural & Urban, and Watershed & Floodplain Management

Regional Forum and Workshops will encourage regionally-based water collaborative to work closely with the Steering Committee and Advisory Committee on Integrated Regional Water Management initiatives. Numerous regional workshops are used to inform the Water Plan Update about communities of place and their regional water issues and management strategies. Annually, regional collaboratives will be invited to a Regional Forum to discuss regional issues having statewide impacts, “place-based” water issues such as data availability, lessons learned, and best management practices.

Extended Review Forum provides the opportunity for people to follow the Water Plan process without direct involvement in work activities. Extended Review Forum members will receive information updates and public meeting notices.

Public Outreach will be achieved by using a variety of communication means and involving all those participating in the Water Plan process. Within the multidisciplinary

Project Team, the Communications Planning Work Team will develop and implement a communications plan and outreach tools. Information will be available on the Water Plan Web Portal, at publicly noticed meetings and workshops, and through e-mail announcements.

(From

http://www.waterplan.water.ca.gov/docs/cwpu2009/cwp_process_guide011808v2ds.pdf)

6. PLAN IMPLEMENTATION STRATEGY

As discussed earlier, the California Water Plan provides a framework for water managers, legislators, and the public to consider options and make decisions regarding California's water future. The Plan, which is updated every five years, presents basic data and information on California's water resources including water supply evaluations and assessments of agricultural, urban, and environmental water uses to quantify the gap between water supplies and uses. The Plan also identifies and evaluates existing and proposed statewide demand management and water supply augmentation programs and projects to address the State's water needs. The California Water Plan provides state, federal, tribal, regional, and local governments and organizations a continuous strategic planning forum to collaboratively:

- Recommend strategic goals, objectives, and near-term and long-term actions that would conserve, manage, develop, and sustain California's water resources and management systems.
- Prepare response plans for floods, droughts, and catastrophic events that would threaten water resources and management systems, the environment, property, and the health, welfare and livelihood of the people of California.
- Evaluate current and future water conditions, challenges, and opportunities.

Strategies

The 2009 Plan update identifies a number of resource management strategies (i.e., projects, programs, or policies to manage water and related resources). These strategies can reduce water demand, improve operational efficiency, increase water supply, improve water quality, practice resource stewardship, and/or improve flood management.

Each region chooses an appropriate mix of resource management strategies to fit its own water management objectives, constraints and opportunities. Resource management strategies are not equally effective or practical in all regions of the state. Nor can a single strategy meet all needs in a given region – a diversified combination of strategies is required to provide flexibility needed to successfully face the uncertain future. Strategies can be implemented to produce multiple benefits. Finally, the strategies are not interchangeable since they accomplish different things and may function differently in different regions. A list of the general resource management strategies is provided below.

Resource Management Strategies	Potential Strategy Benefits								
	Provide Water Supply Benefit	Improve Drought Preparedness	Improve Water Quality	Operational Flex & Efficient	Reduce Flood Impacts	Environmental Benefits	Energy Benefits	Recreational Opportunities	Reduce GW Overdraft
Reduce Water Demand									
Agricultural Water Use Efficiency	•	•		•			•		•
Urban Water Use Efficiency	•	•	•	•		•	•		•
Improve Operational Efficiency & Transfers									
Conveyance—Delta	•	•	•	•	•	•	•	•	
Conveyance—Regional/Local <i>(under development)</i>									
System Reoperation					•				
Water Transfers	•			•	•	•			
Increase Water Supply									
Conjunctive Management & Groundwater Storage	•		•		•	•			•
Desalination – Brackish & Seawater	•	•	•	•					
Precipitation Enhancement	•			•			•		
Recycled Municipal Water	•			•			•		
Surface Storage—CALFED	•		•	•	•	•			
Surface Storage—Regional/Local	•	•	•	•	•	•	•	•	•
Improve Water Quality									
Drinking Water Treatment and Distribution			•						
Groundwater/Aquifer Remediation	•		•	•					
Matching Quality to Use			•	•					
Pollution Prevention	•		•	•		•	•	•	
Salt and Salinity Management	•		•	•		•			
Urban Runoff Management					•	•		•	•
Practice Resource Stewardship									
Agricultural Lands Stewardship	•		•	•	•	•			•
Economic Incentives (Loans, Grants, Water Pricing)	•	•	•	•	•	•	•	•	•
Ecosystem Restoration	•	•	•	•	•	•		•	•
Forest Management	•	•	•	•	•	•		•	•
Land Use Planning and Management				•	•		•		•
Recharge Area Protection	•		•		•				•
Water-dependent Recreation								•	
Watershed Management			•		•				•
Improve Flood Management									
Flood Risk Management	•	•	•	•	•	•			•
Other Resource Management Strategy <i>Objectives vary by component (see narratives in remainder of Volume 2) Strategy includes the following components:</i>									
Crop Idling for Water Transfers	•		•			•			
Dewvaporation or Atmospheric Pressure Desalination									
Fog Collection									
Irrigation Land Retirement	•		•			•			
Rainfed Agriculture			•	•					
Waterbag Transport/Storage Technology	•	•	•	•		•	•		•

Recommendations

The 2005 California Water Plan provides a series of important recommendation to guide the state through 2030. The recommendations are directed at decision-makers throughout the state (referred to as California), the executive and legislative branches of state government, and DWR and other state agencies.

1. California must invest in reliable, high quality, sustainable, and affordable water conservation, efficient water management, and development of water supplies to protect public health, and improve California's economy, environment, and standard of living.
2. State government must provide incentives and assist regional and local agencies and governments and private utilities to prepare integrated resource and drought contingency plans on a watershed basis; to diversify their regional resource management strategies; and to empower them to implement their plans.
3. State government must lead an effort with local agencies and governments to remediate the causes and effects of contaminants on surface water and groundwater quality.
4. California must maintain, rehabilitate, and improve its aging water infrastructure, especially drinking water and sewage treatment facilities, operated by state, federal, and local entities.
5. State government must continue to provide leadership for the CALFED Bay-Delta Program to ensure continued and balanced progress on greater water supply reliability, water quality, ecosystem restoration, and levee system integrity.
6. State government must lead in water planning and management activities that: (a) regions cannot accomplish on their own, (b) the state can do more efficiently, (c) involve inter-regional, inter-state, or international issues, or (d) have broad public benefits.
7. California must define and articulate the respective roles, authorities, and responsibilities of state, federal, and local agencies and governments responsible for water.
8. California must develop broad, realistic, and stable funding strategies that define the role of public investments for water and other water-related resource needs over the next quarter century.
9. State government must invest in research and development to help local agencies and governments implement promising water technologies more cost effectively.
10. State government must help predict and prepare for the effects of global climate change on our water resources and water management systems.
11. DWR and other state agencies must improve data, analytical tools, and information management and exchange needed to prepare, evaluate, and implement regional integrated resource plans and programs in cooperation with other federal, tribal, local, and research entities.
12. DWR and other state agencies must explicitly consider public trust values in the planning and allocation of water resources and protect public trust uses whenever feasible.

13. DWR and other state agencies must invite, encourage, and assist tribal government representatives to participate in statewide, regional, and local water planning processes and to access state funding for water projects.
14. DWR and other state agencies must encourage and assist representatives from disadvantaged communities and vulnerable populations, and the local agencies and private utilities serving them, to participate in statewide, regional, and local water planning processes and to get equal access to state funding for water projects.

2005 Recommendations are from:

<http://www.waterplan.water.ca.gov/docs/cwpu2005/cwphighlights/highlights.pdf>

The California Water Plan Update 2009 identifies the most pressing water management issues and challenges faced by the state and regions, and available opportunities and assets. Through the Water Plan process, California has developed recommendations in the form of policies, strategies, and approaches that will help reduce and remove impediments, and leverage resources and opportunities to help implement the Water Plan actions and achieve its goals and objectives through 2050.

These recommendations are summarized below and described in Volume 1 Chapter 2 Imperative to Act. They are directed at decision-makers and water users throughout California (referred to as *California*) and at the executive and legislative branches of state government, the Department of Water Resources and other state agencies (referred to as *state government*). **The reader must keep in mind that this summary was prepared during the public comment period for the 2009 Water Plan update and the recommendations are therefore subject to change and revision.**

1. California should implement the Water Plan's actions as the key to achieving its goals and objectives.
2. California needs a water finance plan with stable and continuous funding from an array of revenue sources for statewide and regional integrated water management. The finance plan should recognize the critical role of public-private partnerships and the principle of beneficiary pays; include alternative revenue sources; and guide investment decisions based on sustainability indicators.
3. California should manage its water resources with ecosystem health and water supply reliability and quality as equal goals, with full consideration of public trust uses whenever feasible.
4. State government should effectively lead, assist, and oversee California's water resources and flood planning and management activities that regions cannot accomplish on their own.
5. State and federal government should lead and support planning, monitoring, and scientific research to help California adapt and mitigate for climate change impacts.
6. California should improve the coordination of land use policies and practices; economic development decisions; and water, flood, and natural resource planning and management.

7. California should renovate and improve its aging water, wastewater, and flood infrastructure.
8. California should articulate and update as needed the roles, authorities, rights, and responsibilities of federal, Tribal, State, and local governments and agencies responsible for water resource and flood planning and management.
9. California should increase public understanding and awareness on the value and importance of water, water quality, and water conservation.

The recommendations are as varied as the constraints they are intended to change— institutional, legal, knowledge, information, skills/capacity, resources, funding, schedule, and public awareness. California needs to act on these recommendations to improve drought contingency planning, flood management improvements, and climate change adaptations. We need to invest the water and flood bond funds that the public has approved to implement these recommendations and realize this Water Plan.

(From - <http://www.waterplan.water.ca.gov/cwpu2009/#highlights>)
<http://www.waterplan.water.ca.gov/tools/list.cfm> planning tools table

7. OUTCOMES ASSESSMENT PROCESS

The California Water Plan has a high level and policy focus. Implementation is largely at the local and regional water provider level. State funding is utilized to encourage and help implement the policies and recommendations of the State Water Plan. The assessment of progress/implementation is more informal and there are not currently specific metrics. However, especially with recent State Water Plan updates there has been more focus on identifying the progress and status of implementation recommendations (personal communication, John Andrew, California Department of Water Resources, March 16, 2009).

8. NEEDS, CHALLENGES AND CRITICAL PRIORITIES - INTERVIEW INSIGHTS

The preceding summary (see especially the “Water Management Vision and Goals” and “Scope of Water Resource Planning” sections) provides an overview of the key water resource trends, needs and priorities facing California. A short summary of some of this information is provided below.

California’s water plan indicates that the state is facing one of the most significant water challenges in its history due to the many differing factors that are impacting water use. The following factors have been identified as significant challenges:

- Growing population
- More demands for limited water supplies
- Multi-year droughts
- Increased uncertainty associated with climate change

- Court decisions and new regulations regarding Delta water deliveries, environmental protection, and water use
- Increased risk of flood due to changing hydrology and land use
- Declining ecosystems
- Water quality concerns
- Aging infrastructure
- Seismic threats
- State budget challenges

California utilizes their comprehensive planning process to help guide the state and its stakeholders in developing solutions to meet these needs and challenges. The state indicates that the state water plan provides a strategic planning forum for multiple stakeholders to collaboratively:

- Recommend strategic goals, objectives, and near-term and long-term actions that would conserve, manage, develop, and sustain California's water resources and management systems.
- Prepare response plans for floods, droughts, and catastrophic events that would threaten water resources and management systems, the environment, property, and the health, welfare and livelihood of the people of California.
- Evaluate current and future water conditions, challenges, and opportunities.

In addition to the above factors the following observation and insights were identified in the plan summary process:

- In general California has benefited from good overall funding of state and local water agencies. However, having a more secure base/long term financing/funding would reduce uncertainties for planning and management, rather than rely up the current case-by-case approval of bond measures.
- The state could benefit from more aggressive water use reporting, local groundwater management, and more emphasis on water use efficiency & demand reduction.
- Integrated water resource planning that includes strong local input and inclusion of multiple stakeholders provides a good means to gather broad based support that reflects the realities and priorities of the community/political setting. However, it is not always possible to address all the needs of all the different interest groups. As the state looks forward it will be a challenge to improve the political/regulatory way to move projects when there are difficult tradeoffs that have to be considered.

In conclusion the 2005 California Water Plan and the 2009 Update contain a series of recommendations that can help guide the state forward in addressing its critical needs. The reader is encouraged to review these recommendations which are provided in the preceding section of this summary document.

9. REFERENCES

Much of the language and information in this summary comes directly from reports published by the California Department of Water Resources and California Natural Resources Agency.

California. Department of Water Resources. California Water Plan. Update 2005. Retrieved on February 5-6, 2009 from <http://www.waterplan.water.ca.gov/previous/cwpu2005/index.cfm>

California. Department of Water Resources. California Water Plan. Update 2009. Public Review Draft. January 2009. Retrieved on February 5-6, 2009 from <http://www.waterplan.water.ca.gov/cwpu2009/index.cfm>