Implementation Plan

Chapter photo. *Pelicans*

Contents

Tables

Boxes

Chapter 7. Implementation Plan

About this Chapter

Chapter 7 lays out the implementation plan for California Water Plan Update 2009 by presenting 13 objectives and their 115-plus related actions.

By statute the California Water Plan cannot mandate actions nor authorize spending for its recommendations. Update 2009 makes neither project-specific nor site-specific recommendations; therefore, it does not include environmental review and documentation as required by the California Environmental Quality Act. Consequently, policy-makers and lawmakers must take further action to adopt the recommendations and actions in this Water Plan and develop funding methods to help in their implementation. This underscores the need to have broad public participation and support for the Water Plan in order to have its objectives and recommendations realized.

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Implementation Plan Organization

California Water Plan Update 2009 identifies the most pressing water management issues and challenges faced by the state and regions. The Water Plan is a strategic guide toward meeting statewide and regional water challenges and leveraging opportunities. As a strategic plan, it contains a vision, mission, guiding principles, goals, objectives, related actions, and performance measures (Table 7-1 Strategic plan elements). While the objectives and related actions appear here in Chapter 7 Implementation Plan, the vision, mission, goals, and guiding principles are discussed in Chapter 2 Imperative to Act.

In addition, the Water Plan has nine crosscutting recommendations for changes needed to reduce or eliminate constraints and impediments, or to harness opportunities, to help achieve the strategic plan's vision, goals, objectives, and actions. These recommendations are directed at decision-makers throughout California, the executive and legislative branches of State government, and the Department of Water Resources (DWR) and other State agencies. The recommendations are as varied as the constraints they are intended to change—institutional, legal, knowledge, information, skills/capacity, resources, funding, schedule, public awareness, etc. For details and discussion of these Update 2009 recommendations, go to Chapter 2 Imperative to Act.

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The resource management strategy narratives in Volume 2 include recommendations on how each strategy could be implemented over the next 30 to 40 years to minimize its trade-offs and challenges, as well as how to promote additional implementation. Many of these recommendations are for State government to enact technical support to help regional groups make better decisions on the use of the strategies. The narratives do not

Table 7-1 Elements of the strategic plan

Element	Purpose
Vision	The vision statement describes the desired future for California water resources and management and serves as a foundation for water and flood planning during the planning horizon.
Mission	The mission statement describes the California Water Plan's unique purpose and its overarching reason for existence. It identifies what it should do and why, and for whom it does it.
Goals	The goals are the desired outcome of the water plan over its planning horizon. The goals are founded on the statewide vision. Meeting the goals requires coordination among State, federal, Tribal, and local governments and agencies.
Guiding Principles	The guiding principles describe the core values and philosophies that dictate how to achieve the vision, mission, and goals. In other words, the guiding principles will describe how to make decisions and do business.
Objectives	Objectives tell what we will do and why we are doing it in order to accomplish one or more goals.
Related Actions	Related actions tell how an objective will be carried out. They describe specific actions in measurable, time-based statements of intent. They emphasize the results of actions at the end of a specific time. Some related actions must be undertaken by State government or communities over which DWR has no authority. In these cases, measure and time must be part of the entities' own strategic plans.
Performance Measures	Performance measures describe what to measure and the method by which to measure in order to determine what work was performed and what results were achieved. Performance measures may be short term, intermediate, or long term and can help with accountability and to compare how well an action has met a desired goal or objective.

Related actions may be directed at specific government department and agencies. Capitalized State refers to California's State government.

include specific recommendations for funding of individual strategies since local and regional efforts will need to complete additional analysis before deciding to proceed with strategies.

Objectives and Related Actions

The objectives and related actions presented in this strategic plan are taken in part from DWR's climate change white paper as well as from companion State plans and Tribal Communication Plan.

The objectives and related actions presented in this strategic plan are taken in part from DWR's climate change white paper (Managing an Uncertain Future: Climate Change Adaptation Strategies for California's Water, October 2008) as well as from companion State plans and Tribal Communication Plan. As part of the Water Plan strategic plan, these 13 objectives will help us achieve the Water Plan goals. Meeting these 13 objectives, and planning and investing in their more than 115 related actions, will provide greater system diversity and resilience to future uncertainties and risk, and help California deal with climate conditions and other future uncertainties and risks. Numbering of the objectives and related actions is for ease of identification and does not represent priority.

Objectives and Related Actions

Many objectives derived from the Climate Change white paper were initially developed as adaptation strategies to reduce climate change impacts. Many objectives derived from companion State plans were developed to meet various resource management and communication goals. Some of the companion State plans considered in preparing the objectives and actions are listed here. (See further discussion in this volume, Chapter 3 Companion State Plans.)

- 2007 Integrated Energy Policy Report (California Energy Commission 2007)
- 2009 California Climate Adaptation Strategy (California Natural Resources Agency)
- California Department of Public Health Strategic Plan 2008-2010 (CDPH 2008)
- California Drought, An Update (DWR Apr 2008)
- California Outdoor Recreation Plan 2008: An Element of the California Outdoor Recreation Planning Program (CORP) (State Parks 2009)
- California Transportation Plan 2025 (April 2006) and 2030 (Caltrans Oct 2007)
- California Water Plan Update 2009 Draft Tribal Communication Plan (Tribal Communication Committee, Summer 2008)
- California Wildlife Action Plan (DFG 2007)
- Climate Change Scoping Plan: A Framework for Change (California Air Resources Board Dec 2008)
- Critical Water Shortage Contingency Plan (Governor's Advisory Drought Panel 2000)
- Delta Vision Committee Implementation Report (31 Dec 2008)
- Delta Vision Strategic Plan-Final (Governor's Delta Vision Blue Ribbon Task Force, Oct 2008)
- Delta Vision: Our Vision for the California Delta (Governor's Delta Vision Blue Ribbon Task Force, 19 Jan 2008)
- FloodSAFE Strategic Plan (DWR May 28, 2008 public review draft)
- General Plan Guidelines (Office of Planning and Research 2003)
- Managing an Uncertain Future; Climate Change Adaptation Strategies for California's Water (DWR Oct 2008)
- Preparing for California's Next Drought – Changes Since 1987–1992 (DWR 2000)
- Regional Water Quality Control Plans (Basin Plans) (Water Boards)
- State of California Multi-Hazard Mitigation Plan (Governor's Office of Emergency Services 2007)
- Strategic Workplan for Activities in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (State Water Boards July 2008)
- Water Action Plan (CPUC Nov 2005)
- Water Boards Strategic Plan 2008-2012 (Water Boards 2008)
- Water-Energy Climate Change Mitigation Strategies-Draft (WETCAT Mar 2008 Draft)

Objective 1 Expand Integrated Regional Water Management

Objective 1 – Expand Integrated Regional Water Management

Promote, improve, and expand Integrated Regional Water Management to create and build on partnerships that are essential for California water resources planning, sustainable watershed and floodplain management, and increasing regional self-sufficiency.

For related information, see in this volume: Chapter 2 Imperative to Act section on Integrated Water Management

The broad purpose of Integrated Regional Water Management (IRWM) is to promote a regional planning and implementation framework to comprehensively address water supply, quality, flood, and ecosystem challenges and to implement integrated solutions through a collaborative multi-partner process that includes water managers, Tribes, non-governmental organizations, State, federal, and local governments, and disadvantaged communities. Over the past decade, California has improved its understanding of the value of regional planning and made significant steps in implementing IRWM.

IRWM is a portfolio approach for determining the appropriate mix of water-related resource management strategies, water quality actions, and steps to enhance environmental stewardship. The goal is to provide long-term, reliable water supplies for all users at lowest reasonable cost and with highest possible benefits for economic development, environmental quality, and other societal objectives. Moreover, if appropriately developed and implemented, IRWM plans—in combination with other regional and watershed planning efforts for land use and transportation—can serve as the basis for broader community and regional plans for adapting to climate change impacts and increasing regional self-sufficiency.

California lies within multiple climate zones, therefore each region of the state will experience unique impacts from climate change. For some regions, improving watershed health will be the chief concern. Other areas will be affected by saltwater intrusion. In particular, regions that depend heavily upon water imports will need strategies to cope with greater uncertainty in supply. Because economic and environmental effects depend on location, climate adaptation strategies need to be regionally appropriate and preferably at a watershed scale.

California government is working to ensure funds for certain IRWM efforts. As part of the 2009 Comprehensive Water Package, Senate Bill 8 Water Diversion and Use/ Funding (from Seventh Extraordinary Session) appropriates funds from Proposition 84 for IRWM grants and expenditures for projects to reduce dependence on the Delta and to local agencies to develop or implement Natural Community Conservation Plans. The Safe, Clean, and Reliable Drinking Water Supply Act of 2010, if approved by voters, will provide $11.14 billion in funding for local, regional, and statewide programs and projects that address ecosystem and water supply issues. Of this, $1.4 billion funds would be in addition to prior funding provided by Proposition 50 and Proposition 84 and would support the existing IRWM program. Its seven funding categories are drought relief, water supply reliability, Delta sustainability, statewide water system operational improvement, conservation and watershed protection, groundwater protection and water quality, and water recycling and water conservation.

Objective 1 Expand Integrated Regional Water Management (continued)

Related Actions:

1. State government should encourage—through both financial and technical assistance—IRWM planning and implementation throughout California with greater emphasis on adapting to effects of changing climate including possible increases in drought frequency and duration and possible increases in flood events.
   - State government should promote and provide incentives to regional partnerships to move toward water and flood planning at a watershed-scale or IRWM plan-scale and to consider using watershed and groundwater basin boundaries when determining IRWM planning region boundaries.
   - State government should closely coordinate its participation in the IRWM Program, State Watershed Program, Regional Blueprint Planning Program, and other regional planning efforts to prevent duplication, leverage resources, and provide clear and consistent guidance to stakeholders.
   - State government should prioritize funding and technical assistance to support the development of IRWM plans where none exist to ensure that all regions have access to funding. State government should ensure plans are developed across the entire state to achieve the recommended planning and actions within the California Water Plan.
   - State government should acknowledge that additional assistance is warranted to IRWM plans and regions with significant rural areas and/or higher percentages of disadvantaged communities to address critical water needs and to enable them to be competitive for IRWM plan funding.
   - State government should provide incentives to encourage IRWM plans to address multiple issues and involve and provide benefits to multiple interest groups. When evaluating grant proposals, State government should award higher scores for projects that address multiple issues with a collaborative project team that includes representatives from different sectors.

2. IRWM plans must address the following objectives and issues and the plan elements listed in Box 7-1 Required Elements of Integrated Regional Water Management.
   - Protection and improvement of water supply reliability, including identification of feasible agricultural and urban water use efficiency strategies.
   - Identification and consideration of the drinking water quality of communities within the area of the plan.
   - Protection and improvement of water quality within the area of the plan, consistent with the relevant regional basin plan.
   - Identification of significant threats to groundwater resources from overdrafting.
   - Protection, restoration, and improvement of stewardship of aquatic, riparian, and watershed resources within the region.
   - Protection of groundwater resources from contamination.
   - Identification and consideration of the water-related needs of disadvantaged communities in the area within the boundaries of the plan.

Objective 1 Expand Integrated Regional Water Management (continued)

Box 7-1 Required Elements of Integrated Regional Water Management

- Consideration of all the resource management strategies identified in the California Water Plan, as updated in 2009 and future updates.
- Consideration of objectives in the appropriate regional basin plan or plans and strategies to meet applicable water quality standards.
- Description of major water-related objectives and conflicts within an IRWM planning region.
- Measurable regional objectives and criteria for developing regional project priorities.
- An integrated, collaborative, multi-benefit approach to select and design projects and programs.
- Identification and consideration of the water-related needs of disadvantaged communities in the area within the boundaries of the plan.
- Performance measures and monitoring program to demonstrate progress toward meeting regional objectives.
- A plan for implementation and financing of projects and programs.
- Consideration of greenhouse gas emissions of identified projects and programs.
- Evaluation of adaptability to climate change of water management systems in the region.
- Documentation of data and technical analyses used in the development of the plan.
- A communication process to disseminate data and information related to the development and implementation of the plan.
- A facilitation process to engage and coordinate water management projects and activities of participating local agencies and governments, local stakeholders and Tribes to avoid conflicts and take advantage of efficiencies.
- Other matters as identified by DWR.

DWR will provide financial incentives, technical assistance, and other guidance to support regions in developing and improving their IRWM plans, including standards, quantitative tools, monitoring program, and other guidance for evaluating energy intensity and resulting GHG emissions, and as well as developing adaptive responses to climate change. DWR will focus technical and financial assistance on medium and small water utilities that may lack resources to address climate change in their planning processes.

3. By 2011, all IRWM plans should include the following elements to help their region adapt to a changing climate using the IRWM partnership's best available information:
   - An assessment of the region's vulnerability to the long-term increased risk and uncertainty associated with climate change.
   - Strategies for substantial water conservation and higher use efficiency (see Objective 2).
   - Conjunctive water management strategies (see Objective 3).
   - An integrated flood management element (see Objective 6).
   - A drought contingency element that describes how entities within a region can share supplies and infrastructure during droughts and emergencies.

- Strategies for improving coordination with land use policies and planning that:
  - help restore natural processes in watersheds to increase infiltration, slow runoff, improve water quality, and augment the natural storage of water (see Objectives 5);
  - encourage Low Impact Development that reduces water demand and increases water supply reliability (see Objective 2).
- Counties and cities in general plans and other planning tools should identify areas at risk of increased wildfires and flooding and other catastrophic events due to climate change.

Objective 1 Expand Integrated Regional Water Management (continued)

Objective 2 – Use and Reuse Water More Efficiently

Use water more efficiently with significantly greater water conservation, recycling, and reuse to help meet future water demands and adapt to climate change.

For related information, see in Volume 2, Resource Management Strategies: Chapter 2 Agricultural Water Use Efficiency, Chapter 3 Urban Water Use Efficiency, and Chapter 11 Recycled Municipal Water

Urban and agricultural water use efficiency will continue to be a primary way that we meet future water demands and Update 2009 goals. To minimize the impacts of water management on California's natural environment and ensure that our state continues to meet its water demands, our cities and farms must use water more efficiently to get maximum utility from existing and future supplies. Californians have been leaders in water use efficiency measures such as conservation and recycling. However, because competition for California's limited water resources is growing, we must continue to aggressively promote and invest in water use efficiency efforts and be innovative in our pursuit of efficiency.

The California Constitution explicitly prohibits the waste and unreasonable use of the state's water. Therefore, 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. Related management strategies are noted in this and other Update 2009 objectives and described in Volume 2.

As part of the 2009 Comprehensive Water Package, Senate Bill 7 Statewide Water Conservation creates a framework for future planning and actions by urban and agricultural water supplies to reduce California's water use. SB 7[1] requires urban water agencies to reduce statewide per capita water consumption 20 percent by 2020 and make incremental progress toward this goal by reducing per capita water use by at least 10 percent on or before December 31, 2015. The bill establishes multiple pathways for urban water supplies to achieve the statewide goal in urban water use. SB 7 also requires agricultural water suppliers to measure water deliveries and adopt a pricing structure for water customers based at least in part on quantity delivered, and, where technically and economically feasible, implement additional measures to improve efficiency. It also requires agricultural water supplies to submit agricultural water management plans

1 Chaptered by Secretary of State as Chapter 4, Statutes of 2009-10 Seventh Extraordinary Session. An act to amend and repeal Section 10631.5 of, to add Part 2.55 (commencing with Section 10608) to Division 6 of, and to repeal and add Part 2.8 (commencing with Section 10800) of Division 6 of, the Water Code, relating to water.

Objective 2 Use and Reuse Water More Efficiently (continued)

beginning December 31, 2012, and include in those plans information relating to the water efficiency measures they have undertaken and are planning to undertake.

Water use efficiency must be a key part of the water portfolio of every water agency, city, county, farm, and business—as well as State and federal government agencies. Using water efficiently must be a foundational action of every water plan—one that also serves to mitigate and adapt to climate change. Further, water use efficiency and conservation reduce not only water demand but wastewater loads as well, and can reduce energy demand and greenhouse gas (GHG) emissions. Efficient water use can help communities cope with reduced water supply reliability that may be induced by climate change, thus reducing economic and environmental impacts of water scarcity.

Related actions:

1. DWR will work cooperatively with the California Urban Water Conservation Council to establish a task force that will identify best management practices to assist the commercial, industrial, and institutional sector in meeting the water conservation goal.

2. DWR, the State Water Resources Control Board (State Water Board), and other State agencies will develop a standardized water information reporting system to streamline water reporting required under the law.

3. Governor Schwarzenegger directed DWR to collaborate with the State Water Board and its nine Regional Water Quality Control Boards (Regional Boards), the California Energy Commission, the California Public Utilities Commission, the California Department of Public Health, and other agencies to implement strategies to increase regional water supply self-sufficiency and achieve a statewide 20 percent reduction in per capita urban water use by 2020.
   - Effective January 2009, all terms of water management loans and grants to an urban water supplier administered by DWR, the State Water Boards, and California Bay Delta Authority is conditioned on implementation of the water demand management measures described in Urban Water Management Plans.
   - By 2010, all Urban Water Management Plans should include provisions to implement all cost-effective, feasible, and urban best management practices established by the California Urban Water Conservation Council and should identify conservation actions for disadvantaged communities within the service area.
   - Local and regional water use efficiency programs—residential, commercial, industrial, institutional, and agricultural—should emphasize those measures that reduce both water and energy consumption, notwithstanding other water management objectives.
   - By December 31, 2010, DWR will identify and develop through a public process a method to identify per capita targets that cumulatively result in a statewide 20-percent reduction in urban daily per capita water use by

Objective 2 Use and Reuse Water More Efficiently (continued)

December 31, 2020. In developing urban daily per capita water use targets, DWR will follow the provisions set forth in SB 7 Statewide Water Conservation.
   - By 2010, local governments should initiate and pursue water conservation programs to reduce water use on existing and new landscapes. All local governments are now required by statute to adopt the State Model Water Efficient Landscape Ordinance or an ordinance that is as effective as the State model ordinance in water conservation.

4. Agricultural water agencies should fully implement Efficient Water Management Practices, in accordance with the memorandum of understanding regarding Agricultural Efficient Water Management Practices, to reduce net unit water use, improve the quality of drainage water and return flows, and to report on EWMP implementation in their agricultural water management plans.
   - DWR and other State agencies will provide technical assistance and financial incentives to agricultural water agencies and growers to increase the percentage of California agricultural lands that are irrigated with highly efficient irrigation systems and management practices.
   - Agricultural water suppliers will measure water deliveries and adopt a pricing structure for water customers based at least on quantity delivered, and where technically and economically feasible, implement additional measures to improve efficiency.
   - Beginning December 31, 2012, agricultural water suppliers will submit Agricultural Water Management Plans and include in those plans information relating to the water efficiency measures they have undertaken and are planning to undertake.
   - In 2013, 2016, and 2021, DWR will report to the Legislature the agricultural efficient water management practices being undertaken and reported in agricultural water management plans.

5. State government should authorize and fund new incentive-based programs to promote the widespread and mainstream adoption of substantial and aggressive water conservation, recycling and reuse, and related water use and reuse monitoring programs, by urban and agricultural water systems and their users. These programs should include a monitoring plan that will allow agencies to track the effectiveness of the programs and the extent to which they provide equitable benefits to disadvantaged communities.

6. Municipal recycled water may represent a relatively energy-efficient water management strategy in some areas of the state.
   - State government should provide policies and incentives to promote and accelerate the use of municipal recycled water statewide.
   - The State Water Board will (a) implement its Recycled Water Policy to encourage the use of recycled water while protecting beneficial uses of water resources and the environment, and (b) require the use of recycled water where the use of potable water would be considered a waste or an unreasonable use of water.

Objective 2 Use and Reuse Water More Efficiently (continued)

- Water and wastewater agencies should adopt policies by 2015 that promote the use of recycled water for all appropriate, cost-effective uses while protecting public health, the beneficial uses of surface water and groundwater quality and the environment.
- Local government and wastewater entities, together with local salt nutrient contributing stakeholders as identified by the Association of California Water Agencies (ACWA), the California Association of Sanitation Agencies (CASA), and the WateReuse Association (together "the Associations") together with the Regional Water Boards will increase the use of recycled water from municipal wastewater sources in a manner that implements State and federal water quality laws, prepare consistent salt/nutrient management plans for every groundwater basin/subbasin in California by 2016. These salt/nutrient management plans shall be prepared as outlined in the State Water Board's Water Quality Control Policy for Recycled Water adopted May 14, 2009.

7. All levels of government should establish policies and provide incentives to promote better urban runoff management and reuse. Urban and, where feasible, rural communities should invest in facilities to capture, store, treat and use urban storm water runoff, such as percolation to usable aquifers, underground storage beneath parks, small surface basins in drainages, or the creation of catch basins or sumps downhill of development. Depending on the source and application, captured storm water may be suitable for use without additional treatment, or it may be blended to augment local supplies. (Action also appears in Objective 9).

8. The Water Board and Regional Boards and the California Public Utility Commission will exercise their authority to require water conservation measures in permitting and other proceedings. Additional State legislation may be needed to further ensure attainment of these conservation efforts. Prior to any new measures, State government will evaluate the impacts on housing costs, including affordability to low and moderate income families and workers.

Objective 3 – Expand Conjunctive Management of Multiple Supplies

Advance and expand conjunctive management of multiple water supply sources with existing and new surface and groundwater storage to prepare for future droughts, floods, and climate change.

For related information, see in Volume 2, Resource Management Strategies: chapters 8 through 13 for strategies to increase water supplies and storage

California can prepare for future droughts, flood, and climate change, and improve water supply reliability and water quality, by taking advantage of the extensive water storage capacity of groundwater basins when managed in closer coordination with existing and new surface storage and other water supply sources when available, including but not limited to recycled municipal water, surface runoff and floodflows, urban runoff and storm water, imported water, water transfers, and desalination of brackish water and sea water.

Objective 3 – Expand Conjunctive Management of Multiple Supplies (continued)

Surface and groundwater resources must be managed much more conjunctively to meet the challenges of climate change. Additional water storage and conveyance improvements are also necessary to provide better flood management, water quality, and system reliability in response to daily and seasonal variations and uncertainties in water supply and use and to facilitate water transfers between regions.

During droughts, California has historically depended upon its groundwater. However, many aquifers are contaminated, requiring remediation if they are to be used as water banks. Moreover, groundwater resources will not be immune to climate change; in fact, historical patterns of groundwater recharge may change considerably. Because droughts may be exacerbated by climate change, more efficient groundwater basin management will be necessary to avoid additional groundwater overdraft and to take advantage of opportunities to store water underground and eliminate existing overdraft.

Better regional and system-wide water management and the reoperation of surface storage reservoirs and related infrastructure of flood and water management systems can provide many benefits in a changing climate. These include capturing higher peak flows to protect beneficial uses of water such as protecting drinking water quality, providing cold water releases for fish, preventing seawater intrusion, generating clean hydroelectricity, providing recreational opportunities in a warmer climate, and offsetting the loss of snowpack storage by facilitating increased storage of water above and below the ground.

System reoperation of existing flood and water infrastructure will require the active cooperation of many agencies, local governments, and landowners. Successful system reoperation will require that the benefits are evident to federal, Tribal, regional, and local partners. System-wide operational coordination and cooperation needs to occur in advance of responding to extreme hydrologic events that may become larger and more frequent with climate change.

Related actions:

1. By 2013, State and federal government, Tribes, and local agencies should develop conjunctive water management plans as part of their existing water planning efforts to identify strategies that can improve the coordination of local groundwater storage with State, federal, Tribal, and local surface storage and other water supply sources when available, and to facilitate re-operation of the Central Valley flood management system for multiple benefits.

2. By 2011, all Integrated Regional Water Management (IRWM) plans should identify strategies that can improve the coordination of local groundwater storage and banking with local surface storage and other water supply sources when available. The IRWM partnerships should utilize and build on their existing conjunctive water management plans. Supply sources include but are not limited to recycled municipal water, surface runoff and floodflows, urban runoff and storm water, imported water, water transfers, and desalination of brackish water and sea water.

Objective 3 Expand Conjunctive Management of Multiple Supplies (continued)

3. Streamline the State Water Resources Control Board water rights permitting process to facilitate water transfers associated with the development of statewide and basin-wide conjunctive water management strategies.

4. Local agencies should develop and implement AB 3030 Groundwater Management Plans with basin management objectives, or groundwater management plans prepared in accordance with other provisions of law, as a fundamental component of IRWM plans. Local agencies must have such groundwater management plans in order to:
   - reduce and eliminate groundwater overdraft;
   - effectively recharge and use aquifers as water banks;
   - protect and improve water quality;
   - prevent seawater intrusion of coastal aquifers caused by sea level rise;
   - monitor withdrawals and levels;
   - coordinate with other regional planning efforts to identify and pursue opportunities for interregional conjunctive management;
   - avert otherwise inevitable conflicts in water supply; and
   - provide for sustainable groundwater use.

5. Local land use agencies should adopt ordinances that protect the natural functioning of groundwater recharge areas.

6. State and local governments should increase funding incentives to protect groundwater basins from pollution or contamination, and to remediate pollution or contamination when either occurs.

7. State government should provide funding to implement monitoring, assessment, and maintenance of baseline groundwater levels, including the fractured rock hydrologeology. As the next step to achieve this, the State has enacted Senate Bill 6 Groundwater Monitoring of the 2009 Comprehensive Water Package (adds to and amends parts of Division 6 of the Water Code, specifically Part 2.11 Groundwater Monitoring). SB 6[2] requires that local agencies monitor and report the elevation of their groundwater basins to help better manage the resource during average water years and drought conditions. Specifically, this bill requires the following:
   - DWR will establish a priority schedule for monitoring groundwater basins and the review of groundwater elevation reports and make recommendations to local entities to improve the monitoring system.
   - DWR will assist local monitoring entities with compliance with this statute.
   - Local entities are allowed to determine regionally how best to set up groundwater monitoring program, crafting the program to meet their local circumstances.

2 Chaptered by Secretary of State as Chapter 1, Statutes of 2009-10 Seventh Extraordinary Session. An act to add Part 2.11 (commencing with Section 10920) to Division 6 of, and to repeal and add Section 12924 of, the Water Code, relating to groundwater.

Objective 3 Expand Conjunctive Management of Multiple Supplies (continued)

- DWR will implement groundwater monitoring programs in regions where local agencies fail to implement a monitoring program or fail to provide the required reports.
- By January 2, 2012, DWR in conjunction with public agencies will report to the Governor and Legislature findings of investigations of the state's groundwater basins that include geological and hydrological conditions and general patterns of groundwater pumping and recharge; findings will reported to the Governor and Legislature thereafter in years ending in 5 and 0.

8. In addition to the provisions required by SB 6, groundwater monitoring programs should be required to provide additional information needed to adequately characterize a groundwater basin or subbasin. State and local governments and local water management agencies should work to establish the following:
   - A water budget that quantifies the amount of water flowing into and flowing out of the basin, subbasin, aquifers or aquifers, using the groundwater monitoring data, streamflow data, and groundwater extraction data that are collected by the local agency(ies).
   - State government should require electronic submittal of monitoring data by local groundwater monitoring entities.
   - Guidelines and protocols developed by DWR for the collection and reporting of groundwater monitoring data by local water management agencies.
   - A system developed by DWR in cooperation with others for electronic reporting, storage, and retrieval of groundwater monitoring data in useful formats.

9. State government should establish a System Reoperation Task Force composed of state personnel, federal agency, and Tribal representatives, and regional and local governments, agencies, and organizations to:
   - quantify the potential costs, benefits and impacts of system reoperation for water supply reliability, flood management, conjunctive water management, hydropower, water quality, fish passage, cold-water management for fisheries, and other ecosystem needs;
   - support the update of US Army Corps of Engineers operations guidelines ("rule curves") for Central Valley reservoirs;
   - support the update of flood frequency analyses on all major rivers and streams;
   - evaluate the need to amend flow objectives;
   - expand the study of forecast-based operations for incorporation into reservoir operations guidelines;
   - include watershed level analyses that detail localized costs and benefits;
   - identify key institutional obstacles that limit system reoperation benefits;
   - communicate and promote demonstration project results to encourage broader participation in system re-operation analyses; and
   - identify dam safety issues.

Objective 3 Expand Conjunctive Management of Multiple Supplies (continued)

10. As part of completing the CALFED surface storage investigations, feasibility study reports, and associated environmental review and documentation, DWR and the US Bureau of Reclamation will:
    - Consider implementation of other strategies, including, but not limited to system reoperation and agricultural water use efficiency, recycling, desalination, conjunctive use of groundwater, conveyance, transfers and implementation of local Integrated Regional Water Management actions;
    - Consider climate change and its potential effects as it works to complete surface storage feasibility studies and environmental documentation for the North of Delta and Upper San Joaquin River Basin Storage Investigations;
    - DWR will make climate change recommendations as it works cooperatively with Contra Costa Water District on the Los Vaqueros Reservoir Expansion Investigation; and \
    - DWR will advise Reclamation on climate change considerations for Reclamation's Shasta Lake Water Resources Investigation.

Objective 4 – Protect Surface Water and Groundwater Quality

Protect and restore surface water and groundwater quality to safeguard public and environmental health and secure California's water supplies for beneficial uses.

For related information, see in Volume 2, Resource Management Strategies: chapters 14 through 19 for strategies to improve water quality

The State Water Resources Control Board and nine Regional Water Quality Control Boards (Water Boards) adopted their draft Strategic Plan Update 2008-2012 on September 2, 2008, which includes environmental, planning, and organizational priorities. The environmental and planning priority objectives and actions from the Water Boards Strategic Plan are presented below as related actions 1, 2, 3, and 4. Related actions 5 and 6 are from California Water Plan Update 2005. The objectives from the Water Boards Strategic Plan for promoting sustainable water supplies are covered in Objective 2—Use and reuse water more efficiently.

The Water Boards Strategic Plan considers climate change and other future drivers for trends. It also notes that most of the actions in its strategic plan will be implemented in a watershed framework because healthy watersheds, or drainage basins, provide clean and adequate surface water and groundwater and support healthy riparian and wetland habitat. They are essential to support the state's resources and economic future. A watershed approach is hydrologically focused, recognizes the degree to which groundwater and surface water bodies are connected physically, recognizes the linkages between water quantity and water quality, and requires a comprehensive, long-term approach to water resources management that takes system interactions into account.

State government efforts alone cannot support a comprehensive watershed protection approach. Success depends on the integration of State, federal, Tribal, and local programs, most importantly local land use decisions made by local officials, stakeholder involvement, and the actions of millions of individuals, who together can make enormous impacts.

Objective 4 Protect Surface Water and Groundwater Quality (continued)

Related Actions:

11. Implement strategies to fully protect the past, present, and probable future beneficial uses for all 2006-listed [CWA section 303(d)] water bodies by 2030.
    - Implement a statewide strategy to efficiently prepare, adopt, and implement total maximum daily loads (TMDLs), which result in water bodies meeting water quality standards, and adopt and begin implementation of TMDLs for all 2006-listed water bodies by 2019.
    - Manage urban runoff volume to reduce pollutant loadings, reduce wet weather beach postings and closures by 75 percent by 2020, eliminate dry weather beach closures and postings by 2012 and, where applicable, explore opportunities for using management techniques to promote sustainable water supplies.
    - Take appropriate enforcement actions and innovative approaches as needed to protect and restore the beneficial uses of all surface waters.

12. Improve and protect groundwater quality in high priority use basins by 2030.
    - Implement an integrated groundwater protection approach by 2012 to improve and protect groundwater in high-use basins that
        - evaluates and regulates activities that impact or have the potential to impact beneficial uses,
        - recognizes the effects of groundwater and surface water interactions on groundwater quality and quantity, and
        - encourages and facilitates local management of groundwater resources.
    - Identify strategies to ensure that communities that rely on contaminated groundwater will have a reliable drinking water supply, which may include remediation of polluted or contaminated groundwater, surface water replacement, and groundwater treatment.
    - Maintain high quality groundwater basins through application of the antidegradation directives of the State Water Board via waste discharge requirements (WDRs) and the remediation of polluted or contaminated groundwater.
    - Prepare consistent salt/nutrient management plans for every groundwater basin/subbasin in California by 2016. These salt/nutrient management plans should be prepared as outlined in the State Water Board's Water Quality Control Policy for Recycled Water adopted May 14, 2009, the purpose of which is to increase the use of recycled water from municipal wastewater sources that meets the definition in Water Code section 13050(n), in a manner that implements state and federal water quality laws.

13. Increase sustainable local water supplies available for meeting existing and future beneficial uses by 1,725,000 acre-feet per year (725,000 acre-feet per year through water recycling and 1 million acre-feet per year through water conservation), in excess of 2002 levels, by 2015, and ensure adequate flows for fish and wildlife habitat.
    - Promote implementation of best management practices, and improve compliance with requirements, for water conservation consistent with the

Objective 4 Protect Surface Water and Groundwater Quality (continued)

Strategic Workplan for Activities in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary and other relevant State and regional efforts.

- Increase the public acceptance and promote the use of recycled water and the reuse of storm water and gray water as locally available, sustainable water supplies consistent with the Climate Change Draft Scoping Plan developed pursuant to the California Global Warming Solutions Act of 2006 (AB 32) and other relevant State and regional efforts.
- Ensure that adequate stream flows are available for the protection of fish and wildlife habitat while meeting the need for diversions of water for other uses. (See Objective 5)

14. Comprehensively address water quality protection and restoration, and the relationship between water supply and water quality, and describe the connections between water quality, water quantity, and climate change, throughout California's water planning processes.
    - Prepare, as a part of the California Water Plan, a comprehensive California Water Quality Plan to help guide the State's water management activities, including protection and restoration of water quality through the integration of statewide policies and plans, regional water quality control plans (Basin Plans), and the potential effects of climate change on water quality and supply.
    - Basin Plans are consistently organized to provide a clear structure that readily conveys key elements (e.g., beneficial uses, potential impacts of climate change, water quality objectives, goals for watersheds, plans for achieving those goals, and monitoring to inform and adjust the plans) and that fully integrates other water quality control plans such as the California Ocean Plan.
    - Adopt Basin Plan amendments by collaborating in third-party initiated processes that incorporate Water Board requirements and stakeholder interests. An example is the Santa Ana Regional Water Board's Basin Plan amendment initiated with funding assistance from stakeholders as required in the State Water Board's Recycled Water Policy.

15. State government should lead an effort with local agencies and governments to remediate the causes and effects of pollution and contamination on surface water and groundwater quality. An evaluation should be completed by 2015 to inventory, evaluate, and examine the effect of contaminants on public health, ecosystem health, long-term sustainability of water resources and treatment costs, and should identify cost-effective ways and propose management strategies to improve water quality.
    - State government should work with State and federal agencies, Tribes, local Integrated Regional Water Management partnerships, and other third parties to assess, prioritize, fund, and remediate private, State, federal, and Tribal lands with abandoned mines or other mining toxin problems.

16. To safeguard water quality for all beneficial uses, State government will adopt preventive programs that integrate source water protection, pollution prevention, matching water quality to use, salt and salinity management, urban runoff management, groundwater/aquifer remediation, and water treatment and distribution.

Objective 4 Protect Surface Water and Groundwater Quality (continued)

Objective 5 – Expand Environmental Stewardship

Practice, promote, improve, and expand environmental stewardship to protect and enhance the environment by improving watershed, floodplain, and instream functions and to sustain water and flood management systems.

Reliable water supplies and resilient flood protection require environmental stewardship and sustainability to be a primary goal and foundational action for water resources management. Building adaptive capacity and system sustainability requires water and flood management projects to fundamentally incorporate maintenance and enhancement of biological diversity and natural ecosystem processes. Water supply and flood management systems are significantly more sustainable and economical when they preserve, enhance, and restore ecosystem functions. Planning and designing for ecosystem functions will help maintain resilient systems that can recover from severe natural disruptions and, in fact, allow quicker recovery with lower economic costs. Moreover, by reducing existing, non-climate stressors on the environment, ecosystems will have more capacity to adapt to new stressors and uncertainties brought by climate change.

For related information, see in Volume 2, Resource Management Strategies: Chapter 20 Agricultural Land Stewardship, Chapter 22 Ecosystem Restoration, Chapter 23 Forest Management, and Chapter 27 Watershed Management

Native riparian floodplain habitat has multiple resource, flood protection, and water supply benefits. Hydrologically connected floodplains retain and slowly release floodwater, facilitate groundwater recharge, provide seasonal aquatic and wetland habitat, support corridors of native riparian forests used as migration/movement corridors for plant and animal species related to rivers and riparian or wetland ecosystems, and create shaded riverine and terrestrial habitats. Setback levees and bypasses are approaches that can facilitate meeting these multiple benefit objectives. These objectives will also help meet AB 32 statewide mandates of greenhouse gas (GHG) emission reduction targets.

> ***Adaptive Capacity*** *is the ability of systems, organizations, and individuals to (1) adjust to actual or potential adverse changes and events, (2) take advantage of existing and emerging opportunities that support essential functions or relationships, and/or (3) cope with adverse consequences, mitigate damages, and recover from system failures. It is an indicator of how well a system will adjust to and/or recover from external changes or large perturbations (e.g., severe floods or droughts).*

> ***Resilience*** *is the capacity of resource/natural systems to adapt to and recover from changed conditions after a disturbance.*

Objective 5 Expand Environmental Stewardship (continued)

Related Actions:

1. State, federal, Tribal, regional and local governments and agencies that own and operate water management systems and flood management systems, as well as public and private organizations, should include actions in their respective land use, water, flood, and natural resource management plans that would contribute to a statewide goal to protect and re-establish native riparian floodplain corridor habitat by 2020. The combined and coordinated activities of local planning activities including Integrated Regional Water Management (IRWM), Urban Water Management Plans, Natural Community Conservation Plans, Habitat Conservation Plans as well as other water resource or riparian floodplain focused efforts should include objectives to meet these environmental stewardship goals.
   - By 2020, re-establish 1 million acres of contiguous natural riparian and floodplain habitat and its hydrologic connectivity between rivers/streams and their historical floodplains for at least 50 percent of the river miles in the regions.
   - Contribute to AB 32 GHG reduction goals related to water and flood systems operations through enhancing carbon sequestration mechanisms by re-establishing 500,000 acres of historic vegetated floodplain corridors and restoring 500,000 acres of upper watershed forests.
   - IRWM and regional flood management plans that incorporate corridor connectivity and restoration of native aquatic and terrestrial habitats to support increased biodiversity and resilience for adapting to a changing climate should receive additional credits in State government water and flood grant programs. (See objectives 1, 2, and 6)

2. State government should work with dam owners/operators, federal resource management agencies, Tribes, and other stakeholders to evaluate opportunities to introduce or reintroduce anadromous fish to upper watersheds. Re-establishing anadromous fish upstream of dams may provide flexibility in providing cold water conditions downstream, and thereby inform with system re-operation. Candidate watersheds should have sufficient habitat to support spawning and rearing of self-sustaining populations. (See Objectives 1, 3, and 6)

3. By 2015, State government should identify and prioritize for protection lands at the boundaries of the San Francisco Bay and Sacramento-San Joaquin Delta that will provide the habitat range for tidal wetlands to adapt to and shift with sea level rise. Such lands can help maintain estuarine ecosystem functions and create natural land features that act as storm buffers, protecting people and property from flood damages related to sea level rise and storm surges. (See Objectives 6 and 7)

4. By 2015, State government should prioritize and expand Delta island and Suisun Marsh subsidence reversal and land accretion projects to create equilibrium between land and estuary elevations along select Delta fringes and islands. Sediment-soil accretion is a cost-effective, natural process that can help sustain the Delta and Suisun Marsh ecosystem and protect communities from inundation, and sequester carbon. (See Objectives 6 and 7)

5. By 2030, State government will encourage, prioritize, and financially support actions to protect, enhance, and restore at least 1 million acres of upper watershed forests and meadow systems that act as natural water and snow storage. This measure not only improves water supply reliability and protects water quality, but also safeguards significant high elevation habitats and migratory corridors. (See objectives 1, 3, and 4)

Objective 5 Expand Environmental Stewardship (continued)

6. State government, including the Department of Fish and Game, should lead an effort to identify streamflows that will protect public trust uses, including fish and wildlife. This effort should include completion of studies that relate instream water flows and fish habitat and development of flow recommendations to protect sustainable fisheries.

7. State government should acknowledge where California's water comes from when deciding how state money is regionally allocated and should weigh both the needs of population centers and the upper watersheds that must meet those needs. When administering grant programs, State government should increase funding to headwaters regions including the Sierra Nevada for local projects that will benefit downstream users.

Objective 6 – Practice Integrated Flood Management

Promote and practice integrated flood management to provide multiple benefits including better emergency preparedness and response, higher flood protection, more sustainable flood and water management systems, and enhanced floodplain ecosystems.

Integrated flood management is a comprehensive approach to flood management that considers land and water resources at a watershed scale within the context of integrated water management; employs both structural and nonstructural measures to maximize the benefits of floodplains and minimize loss of life and damage to property from flooding; and recognizes the benefits to ecosystems from periodic flooding. This approach recognizes the:

- interconnection of flood management actions within broader water resources management and land use planning,
- value of coordinating across geographic and agency boundaries,
- need to evaluate opportunities and potential impacts from a system perspective,
- opportunity for multiple uses of floodplains, and
- importance of environmental stewardship and sustainability and the fundamental role of flood events to the vitality of California ecosystems.

For related information, see in this volume Chapter 2 Imperative to Act section on Integrated Flood Management and Emergency Response and also in Volume 2 Resource Management Strategies, Chapter 28 Flood Risk Management

Balancing the benefits of living in floodplains against the benefits of flooding is at the heart of integrated flood management. Flooding is a necessary characteristic of many California ecosystems. Yet floodplains are among the most valuable lands we have, providing the richest agricultural soils, desirable home sites, recreational opportunities, ready sources of water, and great ecological potential. Natural systems that evolved with

Objective 6 Practice Integrated Flood Management (continued)

floods are dependent on the periodic disturbance of flood waters to maintain the quality of the ecosystem. Floods provide renewed soils and nutrients, move plant and animals around, rearrange spatial organizations of natural communities, and convey sands, gravels, and sediments. These factors contribute to the great benefit people experience from living on floodplains while simultaneously posing risks to people.

Today in the Central Valley of California, more than 1.8 million people live behind nearly 6,000 miles of levees, with populations continuing to grow. Traditionally, Californians have altered the risk of flooding by building dams and levees that constrain floodwaters and diminish the natural benefits of floods, while providing protection to people from the harmful aspects of flooding. However, across the nation we have seen levee protection fall short of our needs. At the same time climate change may worsen the state's flood risk by producing higher peak flows, a shift toward more intense winter precipitation, and sea level rise.

The financial liability to State government of repairing our communities following a flood event is an additional concern. A collection of recent laws has refocused attention on flooding and the risks it poses. These laws require in significant areas of the state an analysis of our existing system of protection, plans for improving these systems, means of sharing financial and operational responsibilities, and a mandate to seek broad arrays of benefits from the manner in which we manage our floodplains and water systems. These laws are intended to promote a new perspective of managing floods, at least in part, for recovery from disturbance and with a greater acknowledgement of the natural cycles of flooding.

System reoperation is an important element of better integrating California's water and flood management systems. Current water resources infrastructure is already strained to meet existing, competing objectives for water supply, flood management, environmental protection, water quality, hydropower, and recreation. With a changing climate, the conflicts between competing interests will be even greater if supplies become less reliable. Because the prediction of climate change impacts will never be exact, flexibility and adaptability must be a fundamental tactic, especially with respect to water and flood system operations and management (see Objective 3).

Related Actions:

1. To facilitate coordinated operations, State and federal agencies collaboratively established a Joint Operations Center (JOC) that has served California's water supply and flood management needs. In order to successfully meet the potential threats posed by climate change, though, the capacity of the JOC should be expanded and enhanced to:
    - Improve tools and observations to better support decision-making for individual events and seasonal and inter-annual operations, including water transfers and stream gage data.
    - Improve communications and coordination during emergencies, such as floods and droughts.

Objective 6 Practice Integrated Flood Management (continued)

- Develop an operational information clearinghouse related to the major water systems in California, which would facilitate coordination with planning and research endeavors to ensure that climate change impacts related to operations are addressed.

2. Flood management systems must better utilize natural floodplain processes. Flood management should be approached from a watershed perspective. The basic physical properties of water and sediment flow, and water storage in groundwater basins and reservoirs should be evaluated considering the ecology of watersheds. Agricultural, urban, and recreational activities and regulations should be considered and planned on this basis to identify integrated water management needs and opportunities.

3. Communities in floodplains should consider the consequences of flooding and should develop, adopt, practice, and regularly evaluate formal flood emergency preparedness, response, evacuation, and recovery plans.
   - State government should assist disadvantaged communities located in floodplains to prepare for and recover from flood emergencies.

4. By January 1, 2012, DWR will collaboratively develop a multi-objective *Central Valley Flood Protection Plan* that includes actions to improve integrated flood management in the Central Valley and accounts for the expected impacts of climate change. The plan will provide strategies for greater flood protection and environmental resilience. It will address:
   - restoring the State/federal flood management system to refine definitions of floodplains and flood risks throughout the Central Valley to provide the design level of performance;
   - emergency preparedness, response, evacuation, and recovery actions;
   - expansion of the flood bypass system to reduce pressure on critical urban levees and provide for habitat, open space, recreation, and agricultural land preservation;
   - structural and nonstructural improvements to provide at least a historical 200-year level flood protection for all urban areas;
   - consideration of flood easements, zoning, set-back levees, and land acquisitions to provide greater public safety, floodplain storage, habitat, and system flexibility;
   - evaluation of dam modifications to pass potentially larger floods;
   - flood insurance requirements to address residual risk;
   - extensive, grassroots public outreach and education; and
   - integrate flood management with all aspects of water resources management and environmental stewardship.

5. DWR will complete a FloodSAFE report that identifies and characterizes significant flood risks throughout each of California's regions and documents needs and opportunities to improve integrated flood management statewide.

Objective 6 Practice Integrated Flood Management (continued)

6. Local governments should implement land use policies that consider flood risk.
   - Local land use agencies should update their General Plans in light of existing and future climate change impacts. For planning purposes, DWR recommends using a higher than historical peak reference flow.
   - Local governments should site new development where flood avoidance strategies are ensured. Flood management strategies should identify the relevant flood water elevations and describe how the public will avoid damage from this magnitude of flooding. These strategies should also account for the risks from floods of greater magnitude.
   - Local governments should utilize Low Impact Development techniques that store and infiltrate urban and storm water runoff while protecting groundwater.
   - Local governments should include flood-resistant design requirements in local building codes.

Objective 7 – Manage a Sustainable California Delta

Set as co-equal goals a healthy Delta ecosystem and a reliable water supply for California and recognize the Delta as a unique and valued community and ecosystem to promote and practice management for a sustainable California Delta.

For related information, see the Sacramento-San Joaquin Delta regional report in Volume 3

The Delta ecosystem is experiencing a steep decline. This condition, in addition to increasing seismic risk, increased added year-round water demand, court-ordered pumping reductions, and the impacts of climate change have already caused severe reductions in the Delta-dependent water supply and in the reliability of that supply. These reductions impact our economy, our food security, and our quality of life. The stakes are high, and Californians must come together now to take fundamental actions to preserve and protect the many uses of the Delta.

By executive order the Governor in 2006 launched the Delta Vision process by establishing a Blue Ribbon Task Force, a Delta Vision Committee made up of cabinet secretaries, Delta science advisors, and a stakeholder coordination group. The task force presented Delta Vision: Our Vision for the California Delta in November 2007, and a year later published the Delta Vision Strategic Plan. In December 2008, the Delta Vision Committee presented to the Governor and Legislature an implementation plan. All urged strong action to stop the continued decline of water reliability and concurrent deterioration of the Delta ecosystem. The implementation report and other Delta Vision materials are available online at http://deltavision.ca.gov/.

A multi-part water legislation package was enacted in November 2009 that includes many of the recommendations from the implementation report and other Delta Vision materials. The water package is composed of four policy bills and an $11.14 billion bond. Most significantly, the water package establishes the co-equal goals of providing

Objective 7 Manage a Sustainable California Delta (continued)

a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem.

The new laws also establish the Delta Stewardship Council and Delta Conservancy. The Delta Stewardship Council is charged with developing a Delta Plan by 2012; the council also is charged with adopting an interim plan that includes recommendations for early actions and projects.

The bond, if passed by California voters in November 2010, will fund with local cost sharing programs for Delta sustainability, water supply reliability, drought relief, improvements to the statewide water system operations, conservation and watershed protection, groundwater protection, and water recycling and water conservation.

The new laws address the issues that the Delta Vision Committee recommended as near-term actions necessary to achieve Delta sustainability and avoid catastrophe. In its implementation report, the Delta Vision Committee asserted that priorities that form the foundation for a sustainable Delta should include the following "fundamental actions":

- A new system of dual water conveyance through and around the Delta to protect municipal, agricultural, environmental, and the other beneficial uses of water.
- An investment commitment and strategy to restore and sustain a vibrant and diverse Delta ecosystem including the protection and enhancement of agricultural lands that are compatible with Plan goals.
- Additional storage to allow greater system operational flexibility that will benefit water supplies for both humans and the environment and adapt to a changing climate.
- An economic investment plan to protect and enhance unique and important characteristics of the Delta region.
- A comprehensive Delta emergency preparedness strategy and a fully integrated Delta emergency response plan.
- A plan to significantly improve and provide incentives for water conservation – through both wise use and reuse – in both urban and agricultural sectors throughout the state.
- Strong incentives for local and regional efforts to make better use of new sources of water including brackish water cleanup and seawater desalination.
- An improved governance system with reliable funding, clear authority to determine priorities and strong performance measures to ensure accountability to the new governing doctrine of the Delta: operation for the coequal goals. Completion of this fundamental action is absolutely essential to the sustained operation and maintenance of all of these recommendations.

Objective 7 Manage a Sustainable California Delta (continued)

Related Actions:

The Delta Ecosystem Must be Protected and Revitalized

Recommended actions that have authorization

1. Complete the Bay Delta Conservation Plan and associated environmental assessments by the end of 2010.

2. Update Bay-Delta regulatory flow and water quality standards to protect beneficial uses of water by 2012. Fully implement these new standards as well as the existing standards.

3. Continue funding for implementation of the CALFED Ecosystem Restoration Program (ERP), including finalization of the ERP Conservation Strategy. Complete several ecosystem projects including Dutch Slough, Mein's Landing and Hill Slough tidal restoration projects and improved habitat in the Yolo Bypass.

4. Evaluate and begin construction on Delta gates and barriers that improve water quality, water supply reliability, and ecosystem function.

5. Develop and implement streamflow recommendations throughout the annual hydrograph for tributaries to the Delta. Direct the Department of Fish and Game to develop streamflow recommendations for tributaries in the Delta watershed, as specified in Public Resources Code Section 10000 – 10005. Direct the State Water Resources Control Board (State Water Boards) to undertake appropriate proceedings to consider and implement the flows.

6. Control aquatic invasive species within the Delta. Funding the Aquatic Invasives Management Plan developed by the Department of Fish and Game, a comprehensive effort to prevent new invasions and minimize impacts from established invaders, would aid the restoration of desirable habitat.

7. Require the State Water Boards and the Department of Fish and Game to immediately expand their evaluation of potential stressors of the aquatic habitat and continue to adopt long-term programs to regulate discharges from irrigated agriculture and urban areas.

8. By 2010 begin comprehensive monitoring of Delta water quality and fish and wildlife health and by 2012 develop and implement Total Maximum Daily Load programs for the Delta and its tributary areas to eliminate water quality impairments including, but not limited to, reduction of organic and inorganic mercury entering the Delta from tributary watersheds.

Recommended actions addressed in legislation enacted in 2009

9. Large-scale habitat restoration. Identify funding and direct restoration of large areas—on the order of 100,000 acres—of interconnected habitats in coordination with flood control planning and implementation within the Delta and adjacent areas.

10. Reduce effects of non-project in-Delta diversions. Secure additional funds from the Legislature for the Department of Fish and Game to evaluate the effects of in-Delta diversions on native fishes and to make recommendations to minimize their effects while respecting their water rights.

The State's Water Supply Must be More Reliable

Recommended actions that have authorization

1. Near-term water conveyance improvements. Complete the Bay Delta Conservation Plan and associated environmental assessments by the end of 2010.

2. Water use reductions. Initiate the Governor's objective to reduce per capita urban water usage 20 percent by 2020. (Refer to Objective 2 and its related actions.)

3. Surface storage investigations. Complete CALFED surface storage feasibility studies and their environmental assessments by December 2010.

4. Financial and technical assistance. Immediately provide financial incentives and technical assistance through the Integrated Regional Water Management Plans and Local Groundwater Assistance Program to improve surface water and groundwater monitoring and data management.

Recommended actions addressed in legislation enacted in 2009

5. Long-term water conveyance improvements. Implement conveyance improvements and associated ecosystem restoration projects upon the completion of the BDCP evaluations.

6. Expand surface and groundwater storage. Complete analyses of surface storage, groundwater storage, flood control, and improved reservoir operations by 2012 and implement feasible and effective projects.

7. Water rights accountability. Enact legislation to enhance and expand the State Water Board's water rights administrative accountability. These recommendations are not intended to adversely affect the current water right priority system, including area-of-origin priorities but rather to strengthen the current administrative system. Appropriate enforcement will protect water rights.

Objective 7 Manage a Sustainable California Delta (continued)

8. Water use reporting. Ensure the sustainability of water supplies by improving water diversion and use reporting, strengthening water rights accountability, and increasing water use efficiency.

9. Integrated regional water management. Continue to improve water supply reliability by encouraging regional self-sufficiency, promoting alternative supplies, and by increasing local and regional water storage capacity.

The Delta is a Unique and Valued Place

Recommended actions that have authorization

1. Improve flood protection and emergency response. Immediately increase emergency preparedness and response in the Delta by continuing to stockpile flood response materials. Complete by 2010 a Delta-wide regional emergency response plan that achieves legally binding regional coordination between local, State, and federal agencies, and by carrying out near-term emergency preparation actions such as those recommended in the Delta Vision Strategic Plan.

2. Strengthen the Delta levee system. Continue to fund and implement levee improvement projects especially in urban areas, while also expanding the levee special projects and subvention programs until a long-term levee strategy is formulated.

3. Create a Delta National Heritage Area. Achieve federal designation for portions of the Delta as a National Heritage Area and expand the State Recreation Area network in the Delta.

4. Develop a Delta economic plan. The Delta Protection Commission is to develop a Delta economic sustainability plan by July 2011 to support increased investment in agriculture, recreation, and tourism.

Recommended actions addressed in legislation enacted in 2009

5. Establish a Delta Investment Fund to implement the economic sustainability plan.

6. Plan for appropriate land uses for at-risk areas in the Delta.

7. Long-term levee planning. Prepare a comprehensive long-term levee investment strategy that matches the level of protection provided by Delta levees to the uses of land and water enabled by those levees.

Strengthen Delta Governance and Provide Reliable Funding

Objective 7 Manage a Sustainable California Delta (continued)

Recommended actions that have authorization

1. Complete the Central Valley Flood Protection Plan.

2. Continue existing CALFED programs that support State and federal activities.

3. Continue a strong and consistent investment in science and engineering important to the Delta through a robust, well-coordinated Delta Science and Engineering Program with transparent oversight and review from a Delta Science and Engineering Board.

Recommended actions addressed in legislation in 2009

4. Establish the Delta Stewardship Council. The council will be composed of seven voting members, four appointed by the Governor and confirmed by the Senate, one appointed by the Senate Committee on Rules, one appointed by the Speaker of the Assembly, and the Chair of the Delta Protection Commission.

5. Enhance the Delta Protection Commission. The mission of the Delta Protection Commission was modified to focus its efforts in the areas of land use and economic development.

6. Establish a Delta Conservancy. The Delta Conservancy will be responsible for implementing ecosystem actions that are consistent with the Delta Plan.

7. By January 1, 2012, the Delta Stewardship Council will adopt a Delta Management Plan (Delta Plan) that will be informed by and incorporate information, actions and recommendations from Delta and Suisun planning efforts, including but not limited to:
   - Provisions of SB 1[3] Delta Governance/Delta Plan,
   - The Delta Vision Strategic Plan,
   - Delta Vision Committee's Implementation Report
   - Bay Delta Conservation Plan,
   - Suisun Marsh Management Plan,
   - Delta Protection Commission's Delta Management Plan and Economic Sustainability Plan,
   - Central Valley Flood Protection Plan,
   - State Water Boards' Delta Water Quality Control Plan,
   - CALFED Surface Storage Investigations Feasibility Study Reports, and
   - Other Delta planning studies.

3 Chaptered by Secretary of State as Chapter 5, Statutes of 2009-10 Seventh Extraordinary Session. Amends sections of the Public Resources Code and Water Code.

Objective 8 Prepare Prevention, Response, and Recovery Plans

Objective 8 – Prepare Prevention, Response, and Recovery Plans

Prepare prevention, response, and recovery plans for floods, droughts, and catastrophic events to help residents and communities, particularly disadvantaged communities, make decisions that reduce the consequences and recovery time of these events when they occur.

For related information, see Volume 4 Reference Guide articles on droughts and floods and the Drought Contingency Plan

An overall purpose of this objective is to prepare prevention response and recovery plans that coordinate the actions by state agencies, local governments, business and industry, and citizens.

The State Multi-Hazard Mitigation Plan (SHMP) is the official statement of California's statewide hazard mitigation goals, strategies, and priorities. Hazard mitigation can be defined as any action taken to reduce or eliminate long-term risk to life and property by natural and human-caused disasters. The SHMP classifies hazards into a hierarchy of primary impacts (earthquake, flood, wildfire); secondary impacts (vulnerable levees, landslides, tsunamis); climate-related hazards (drought, heat, severe storms); and other (terrorism, hazardous materials release, dam failure).

The hazards of floods and droughts have an obvious nexus to water planning. Other hazards such as earthquakes and wildfire have a less obvious nexus, but they can have impacts on and by water. As California grows, it faces the dual challenges of addressing vulnerabilities in the built and natural environment while accommodating growth and change in ways that avoid or mitigate future vulnerabilities.

Of these hazards drought differs in the timing of the impacts. The impacts of drought are typically felt first by those most reliant on annual rainfall—ranchers engaged in dry land grazing, rural residents relying on wells in low yield rock formations, or small water systems lacking a reliable source. Drought impacts increase with the length of a drought, as carryover supplies in reservoirs are depleted and water levels in groundwater basins decline. However, unlike earthquakes, fires, or floods, drought onset is slow, allowing time for water suppliers to implement preparedness and response actions to mitigate reductions in normal supplies.

Related Actions:

1. Communities in floodplains should consider the consequences of flooding and should develop, adopt, practice, and regularly evaluate formal flood emergency preparedness, response, evacuation, and recovery plans (see Objective 6).
   - State government should assist disadvantaged communities located in floodplains to prepare for and recover from flood emergencies.

2. By December 2010, the water shortage contingency plans prepared as part of Urban Water Management Plans and IRWM drought contingency plans should assume, until more accurate information is available, a 20 percent increase in the frequency and duration of future dry conditions.

Objective 8 Prepare Prevention, Response, and Recovery Plans (continued)

3. By February 2010, DWR will develop a long-term California Drought Contingency Plan (and update it on the same schedule as the California Water Plan) that includes:
   - articulation of a coordinated strategy for preparing for, responding to, and recovery from drought;
   - assessment of state drought contingency planning and preparedness;
   - description of State government's role and responsibilities for drought preparedness;
   - identification of needed improvements for drought monitoring and preparedness;
   - identification of measures to mitigate the economic, environmental, and social risks and consequences of drought events;
   - assessment of and adaptation to the impacts of drought under existing and future conditions including climate change;
   - identification of needed improvements to real-time surface water and groundwater monitoring programs;
   - identification of needed research in drought forecasting; and
   - identification of needed research of the indices and metrics for assessing the levels of drought.

4. DWR will work with the California Emergency Management Agency to develop preparedness plans to respond to other catastrophic events that would disrupt water resources and infrastructure; events like earthquakes, wildfires, chemical spills, facility malfunctions, and intentional disruption.

5. By December 2010, the California Emergency Management Agency, Governor's Office of Planning and Research, and the California Natural Resources Agency should lead an effort to update the State Emergency Plan and State Multi-Hazard Mitigation Plan to strengthen consideration of climate impacts to hazard assessment planning, implementation priorities, and emergency responses.

Objective 9 – Reduce Energy Consumption of Water Systems and Uses

Reduce the energy consumption of water and wastewater management systems by implementing the water-related strategies in AB 32 Scoping Plan to mitigate greenhouse gas emissions.

For related information, see Volume 4 Reference Guide articles on adapting water management to climate change impacts

In December 2008, the California Air Resources Board approved the Proposed AB 32 Scoping Plan, which includes six measures for reducing the energy intensity and resulting greenhouse gas (GHG) emissions of water uses and water and wastewater management systems. These six measures are presented here as related actions. Three of the measures target reducing energy requirements associated with providing and using reliable water supplies, and two measures are aimed at reducing the amount of electricity associated with conveying and treating water as well as using more renewable energy. The final measure focuses on providing stable funding for implementing these actions. Three of the measures—water use efficiency, water recycling, and urban water reuse—

Objective 9 Reduce Energy Consumption of Water Systems and Uses (continued)

are also covered in objectives 1, 2, and 4. Many of these actions also have the co-benefit of improving water supply reliability.

Although water generates approximately one-fifth of the state's electricity, water conveyance, distribution, and use also consume significant amounts of energy. Approximately one-fifth of the electricity and a third of the non-power plant, natural gas (i.e., the natural gas not in turn used to generate electricity) consumed in the state are associated with water use. According to the California Energy Commission, end use of water is the most energy-intensive portion of the water use cycle in California. In addition to the many efficiency efforts throughout the state, DWR is implementing a directive from the Governor to develop a plan to reduce per capita urban water use by 20 percent by 2020 (described in Objective 2). Many measures to increase water use efficiency and reuse can also reduce electricity demand from the water sector, and in turn, reduce GHG emissions.

Related Actions:

1. Water use efficiency reduces not only water demand but, in many instances, reduces energy demand as well, which in turn can lead to reductions in GHG emissions. (See Objective 2 for related actions).

2. Municipal recycled water may represent a relatively energy efficient water management strategy in some areas of the state (this action also appears in objectives 2 and 4).
   - Water agencies should adopt policies by 2015 that promote the use of recycled water for all appropriate, cost-effective uses while protecting public health, the beneficial uses of surface water and groundwater quality, and the environment.
   - The State Water Board will (a) implement its Recycled Water Policy to encourage the use of recycled water while protecting beneficial uses of water resources and the environment, and (b) require the use of recycled water where the use of potable water would be considered a waste or an unreasonable use of water.
   - By 2015, water and wastewater utilities should collaboratively develop water recycling plans as part of Integrated Regional Water Management plans.

3. Local agencies and governments should implement cost effective, energy efficiency measures in water system infrastructure projects.
   - Large water and wastewater utilities should conduct an assessment of their carbon footprint and consider implementation of strategies described in the AB 32 Scoping Plan to reduce GHG emissions. To take advantage of an existing framework and process for calculating their carbon footprint, these utilities should join The Climate Registry.
   - The Water-Energy Subgroup of the Governor's Climate Action Team (WETCAT) will conduct a study to assess reasonable energy efficiency and reduction targets for water and wastewater systems. Reduction in electricity

consumption could in turn reduce the GHG emission associated with this amount of electricity generation.

- The California Energy Commission, in collaboration with the WETCAT, will develop tools and protocols to evaluate, measure, and verify the energy impacts of water system and end use conservation and efficiency activities/programs.

Objective 9 Reduce Energy Consumption of Water Systems and Uses (continued)

4. Urban and, where feasible, rural communities should invest in facilities to capture, store, treat and use storm water runoff, such as percolation to usable aquifers, underground storage beneath parks, small surface basins in drainages, or the creation of catch basins or sumps downhill of development. Depending on the source and application, captured storm water may be suitable for use without additional treatment, or it may be blended or otherwise treated to augment local supplies. All levels of government should establish policies and provide incentives to promote better urban runoff management and reuse. (Action also appears in Objective 2).

5. Water and wastewater utilities should identify renewable generation projects that can be co-located with existing water system infrastructure, and where feasible begin their implementation. Examples of energy existing within water and wastewater systems include water moving through conduits, sunlight, wind, and gases emitted from decomposing organic wastes. Producing energy from these resources at water and wastewater facilities will reduce GHG emissions by offsetting the need for the facilities to consume electricity derived from natural gas and coal.
   - State government should remove impediments to implementing renewable energy projects.

6. State government will establish a public goods charge for funding investments in Integrated Regional Water Management strategies that will help mitigate and adapt to climate change.

Objective 10 – Improve Data & Analysis for Decision-making

Improve and expand monitoring, data management, and analysis to support decision-making, especially in light of uncertainties, that support Integrated Regional Water Management and flood and water resources management systems

Investment in our analytical capabilities lags far behind the growing challenges facing water managers. Significant new investment in our technical capabilities is needed to support integrated regional water planning and management and integrated flood management, to improve management of the Sacramento-San Joaquin River Delta, and to prepare for the impacts of climate change, extended droughts, and flood events. Improving communication between technical experts and decision-makers goes hand in hand with improving our technical capabilities because sound technical information is critical to making robust policy decisions.

For related information, see in this volume: Chapter 6 Integrated Data and Analysis

Objective 10 Improve Data and Analysis for Decision-making (continued)

California needs better data and analytical tools to produce useful and more integrated information on water quality, environmental objectives, economic and equity issues, surface water and groundwater interaction, and flood protection. As part of the 2009 Comprehensive Water Package, Senate Bill 6 Groundwater Monitoring requires for the first time in California's history that local agencies monitor the elevation of their groundwater basins to help better manage the resource during both average water years and drought conditions. (See objective 3 for related actions as part of SB 6.)

Related Actions:

Improve water management information

1. By 2013, a DWR-convened technical task force of State, federal, Tribal, and local water and resource managers and planners should develop a strategic plan describing specific information needs to support Integrated Regional Water Management activities and the institutional arrangements for collecting and maintaining the information. The plan should identify the range of different program needs to respond to flood and drought management, climate change, ecosystem restoration, water quality improvement, and other integrated water management objectives. Based on program needs the strategic plan should:
   - establish standards and protocols to ensure the widest utility and efficient use of resources,
   - identify the optimal location of monitoring stations,
   - prioritize long-term improvements in the monitoring network, and
   - ensure long-term maintenance and accessibility to water management information.

2. DWR will participate with the National Oceanic and Atmospheric Administration and Scripps Institute of Oceanography in implementing the Hydrometeorological Test Bed program which enhances off-shore and land measurements of weather variables.

3. State government should establish an interim range of sea level rise projections for short-term planning purposes for local, regional, and statewide projects and activities.
   - The Natural Resources Agency, in coordination with other State agencies, will convene and support a scientific panel of the National Research Council (NRC) to provide expert guidance regarding long-range sea level rise estimates and their application to specific California planning issues. These estimates should be revisited and revised regularly to reflect updated science.
   - Based upon guidance from the NRC, DWR in collaboration with other State agencies should develop long-range sea level rise scenarios and response strategies to be included in California Water Plan Update 2013.
   - As part of the ongoing California Water Plan Update process, DWR will provide revised estimates of changes to sea level, droughts, and flooding that can be

Objective 10 Improve Data and Analysis for Decision-making (continued)

expected over the subsequent 25 years (or the planning horizon for each Water Plan update).

4. In association with research institutions such as the Regional Integrated Science and Assessment centers (of National Oceanic and Atmospheric Administration), Lawrence Livermore and Berkeley National Laboratories, and the University of California:
   - State agencies should identify focused research needs to provide guidance on activities to reduce California's vulnerability to climate change.
   - The University of California should establish a system-wide Climate Change Adaptation Research Center.
   - State government should also explore partnerships with the federal government, other Western states, and research institutions on climate change adaptation.

5. State government should sponsor science-based, watershed adaptation research pilot projects to address water management and ecosystem needs. Funding for pilot projects should only be granted in those regions that have adopted Integrated Regional Water Management plans that meet DWR's plan standards and have broad stakeholder support.

Improve integration of water management information

6. By 2013 DWR will adopt Shared Vision Planning (SVP) in the California Water Plan to achieve better integration and consistency with other planning activities, to obtain consensus on quantitative deliverables, to build a common conceptual understanding of the water management system, and to improve transparency of Water Plan information. SVP integrates tried-and-true planning principles, systems modeling, and collaboration into a practical forum for making water resources management decisions.

7. By 2013 DWR will implement pilot studies in different areas of the state to explore how information can be more effectively integrated among local, regional, and statewide water planning and management activities. The initial focus of this effort will be to improve how information produced for urban water management plans can be used to more effectively support Integrated Regional Water Management plans and the California Water Plan while streamlining reporting requirements.

8. By 2011, DWR, the State Water Resources Control Board and Regional Water Boards, and other State agencies that collect water data will develop a water use measurement and reporting strategy and implementation plan. Accurate measurement of water use can facilitate better water planning and management, especially in the context of managing aquifers more sustainably, and is necessary for the development of more accurate hydrologic budgets.

9. DWR should participate in a pilot project to test the H2O, 2.0 Initiative—Adaptive Management for Water Storage and Flood Control Program. This program would

Objective 10 Improve Data and Analysis for Decision-making (continued)

establish a network of monitoring stations, use satellite imagery, and generate real-time data to inform water resource and flood management decisions.

10. In 2008, DWR completed the Integrated Water Resources Information System as a working prototype of the Water Planning Information Exchange (Water PIE). IWRIS facilitates sharing data and networking existing databases and Web sites, among State, federal, regional, and local agencies and governments and citizen monitoring efforts. This information exchange system will improve analytical capabilities and develop timely surveys of statewide land use, water use, and estimates of future implementation of resource management strategies.
    - By 2013, DWR will have an implementation and funding plan for Water PIE describing the long-term technical approach and strategy for increasing the number of linked partners.

11. By 2013, DWR will initiate a pilot project to develop a common schematic of California's water management system. Development of a common schematic will allow better integration with other analytical tools and models and sources of information on water quality, ecosystem functions, flood management, climate change and other parts of integrated water management.

12. In 2010, DWR will convene a workshop of the Statewide Water Analysis Network (SWAN) to provide advice on prioritizing technical improvements for Water Plan Update 2013, particularly to quantify future scenarios and evaluate regional water management strategies.

Objective 11 – Invest in New Water Technology

Identify and fund applied research and pilot studies on emerging water technology to make them attainable and more cost effective.

For related information, see in Volume 2 Resource Management Strategies discussions and recommendations regarding technology

State government will work with California research and academic institutions—like the California Academy of Sciences, California Council on Science and Technology, the University of California, California State University, and other universities and colleges—to identify and prioritize applied research projects leading to the commercialization of new water technologies and better scientific understanding of California's water-related systems.

Related Actions:

1. State government will work with California research and academic institutions to identify, prioritize, and begin funding applied research projects as part of a broad and diverse scientific agenda to fill gaps in knowledge about California's water resources.

2. State government will invest in pilot projects to help local agencies and governments and regional partnerships implement promising water technologies—

Objective 11 Invest in New Water Technology (continued)

to improve water use efficiency, water recycling and reuse, water supplies and quality, water and wastewater treatment, storm water capture and reuse, desalination, and others—more cost effectively with knowledge and experience specific to each region.

3. The California Energy Commission through its PIER Program (Public Interest Energy Research) will conduct research and demonstration projects that explore ways to reduce the energy intensity of the water use cycle and to better manage the energy demand of water systems.

Objective 12 – Improve Tribal Water and Natural Resources

Develop Tribal consultation, collaboration, and access to funding for water programs and projects to better sustain Tribal water and natural resources.

For related information, see Volume 4 Reference Guide articles on Tribes and Tribal Water Summit

Water Plan Update 2005 recommended that DWR and other State agencies 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. As part of Update 2009, a Tribal Communication Committee (TCC) prepared a comprehensive Tribal Communication Plan for the California Water Plan (presented in the Volume 4 Reference Guide). The Tribal Communication Plan includes definitions, goals, objectives, guiding principles, audience and venues, and a detailed implementation plan. The fifth goal of the Tribal Communication Plan calls for convening a Tribal Water Summit during Update 2009 and publishing the summit proceedings in the final Water Plan Update 2009. The summit was held in November 2009.

The 10 Tribal Communication Plan objectives are included as part of the related actions.

The Tribal Communication Committee included all California Native American Tribes in its communication planning efforts, and adopted the following definition:

California Native American Tribe *is any federally recognized California Native American Tribe or a non-federally recognized California Native American Tribe that is on the contact list maintained by the Native American Heritage Commission (NAHC).*

Related Actions:

1. Everyone involved in the California Water Plan (Water Plan) should share information with California Native American Tribes about how Tribal water issues intersect with water law, planning, and management in California. Intersections include, among other things, water rights, human life and health, fisheries management, water diversions, water storage and conveyance, flood management, water use efficiency, desalination, and climate change.

Objective 12 Improve Tribal Water and Natural Resources (continued)

2. Everyone involved in the Water Plan should share information with California Native American Tribes about how the water planning, management, and projects of State, local, and federal governments, as well as water purveyors, impact and affect California Native American Tribes.

3. Everyone involved in the Water Plan should share information with California Native American Tribes about State funding that is available for water projects, how California Native American Tribes can apply for the funding, what obstacles they may face in accessing these funds, and how they can influence future funding programs.

4. California Native American Tribes should use the Water Plan as a stepping stone to ensure their representation and genuine participation in water planning processes throughout California, including those linking water to public health, housing, economic development, and environmental justice.

5. California Native American Tribes should build a foundation of knowledge and relationships for developing their own long-term water management plans, as well as participating genuinely in regional and local water planning, including Integrated Regional Water Management plans.

6. California Native American Tribes should shape the content of the Water Plan through a variety of mechanisms, particularly the review of regional reports, resource management strategies, and other materials, and through Tribal and public meetings.

7. California Native American Tribes should build working relationships and partnerships with relevant State, local and, federal governments, and water purveyors that are based on mutual respect, fairness, honesty, responsibility, and mutual trust.

8. California Native American Tribes should educate State, local, and federal governments, and water purveyor executives and planners about the historical and ongoing relationships between California Native American Tribes and water, especially cultural and religious practices, including fishing.

9. California Native American Tribes should propose and clarify how DWR works with California Native American Tribes in State water planning efforts.

10. California Native American Tribes should build a foundation of knowledge and relationships for hosting a Tribal Water Summit in 2009 that includes the highest level of decision-makers from State, local, and federal governments, and water purveyors. DWR will place proceedings of this summit in the Water Plan's Volume 4, the Reference Guide.

11. Indigenous communities should be involved in climate change adaptation actions that will directly impact their people, waterways, cultural resources, or lands.

12. The Tribal Communication Committee, Tribal Summit Planning Team, or an equivalent Tribal forum should advise the 2013 Water Plan Steering Committee on ways to implement these related actions and the recommendations from the 2009 Tribal Water Summit, and should assist in the preparation of subsequent Tribal water summits.

Objective 12 Improve Tribal Water and Natural Resources (continued)

Objective 13 – Ensure Equitable Distribution of Benefits

Increase the participation of small and disadvantaged communities in State processes and programs to achieve fair and equitable distribution of benefits. Consider mitigation of impacts from the implementation of State government programs and policies to provide safe drinking water and wastewater treatment to all California communities and to ensure that these programs and policies address the most critical public health threats in disadvantaged communities.

For related information, see Volume 4 Reference Guide articles on Environmental Justice

Water Plan Update 2005 recommended that DWR and other State government departments and agencies should invite, 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. State policy establishes social equity and environmental justice as a State planning priority to ensure the fair treatment of people of all races, cultures, and income, in particular those having experienced significant disproportionate adverse health and environmental impacts.

To enforce the fair treatment clause, four key requirements must be met:

- Disadvantaged and disproportionately impacted communities must be identified and engaged.
- The water–related needs of these communities must be identified, and potential solutions developed and funded.
- The impact of water management decisions on these communities must be considered and mitigated.
- All State programs must be evaluated to document progress.

One of the challenges that State agencies and water systems have expressed about trying to address the needs of disadvantaged communities is simply answering the questions, Who are they? Where are they? It is not difficult to address, but agencies are often hampered by their insistence on defining communities strictly through a water lens. In some cases, local colleges and universities, or the local public health agency may already have this information assembled in a useful format that takes into account pollution sources and health indicators in addition to income and race information.

Objective 13 Ensure Equitable Distribution of Benefits (continued)

The California Water Plan can provide guidance and tools for identifying disadvantaged and environmental justice communities. It is vitally important to identify community needs. Most water, wastewater, and flood projects are not developed for these communities; yet they can impact them. An important thing to understand is that even projects that convey "general" public benefit may not benefit environmental justice or disadvantaged communities proportionally. For example, conservation programs that are heavily dependent upon toilet and washing machine rebates will have greater penetration in middle and upper class communities than they will on poorer communities that purchase less frequently and cannot afford the initial outlay for the fixture. These problems are resolved by taking community concerns into account during the project design phase in order to ensure equitable benefits.

Another concept that plays into the measurement of impacts is the cumulative effects of a project. It is understandable that water agencies would look at other water projects in determining the impact of their project, but that ignores the reality of these communities –that they live with so many stressors that one more, from any source, is one more than they can handle.

Finally, it is recommended that planners develop multi-benefit projects with consideration of affected disadvantaged communities and vulnerable populations. This is particularly true in already impacted communities. For example, if an agency is developing a flood management project, it would be prudent to look at developing the project in ways that will provide flood protection, as well as, open space, habitat, or recreation for the disadvantaged communities and vulnerable populations.

Related Actions:

1. Increase disadvantaged community participation in planning
   - DWR and the other Water Plan Steering Committee members should incorporate environmental justice issues of precautionary applications, cumulative health impact reductions, public participation, community capacity building and communication, and meaningful participation into current and future California Water Plan Update processes and other programs.
   - DWR should require that grant and loan recipients conduct outreach to disadvantaged communities and vulnerable populations and their advocates seeking their participation in water planning programs, including the California Water Plan Update and Integrated Regional Water Management plans and other local water planning processes.

2. Increase disadvantaged community access to funding
   - DWR and other State agencies should work with disadvantaged communities and vulnerable populations and their advocates to review State government funding programs and develop guidelines that make funding programs equally accessible to disadvantaged and environmental justice communities.

Objective 13 Ensure Equitable Distribution of Benefits (continued)

- DWR and other State agencies should work with disadvantaged communities and vulnerable populations and their advocates to develop a technical assistance program to provide resources, expertise, and information to disadvantaged and environmental justice communities to enable them to actively and equally participate in planning processes and access funding sources.

3. Collect and maintain data on environmental justice and disadvantaged communities
   - DWR, in coordination with the appropriate State and federal agencies, should review its current monitoring and regulatory programs to identify and address gaps in available data and monitoring programs that impact disadvantaged communities and vulnerable populations.

4. Develop Water Plan goals and objectives, in coordination with Integrated Regional Water Management partnerships, to resolve water-related public health issues in disadvantaged communities.
   - The Water Plan should include goals and objectives to ensure that all Californians have access to safe drinking water.
   - California Tribes, both recognized and unrecognized, should provide goals and objectives to protect Tribal uses of water, especially those that impact the health of Tribal members (see Objective 12).
   - DWR, the Department of Fish and Game, and other State agencies should develop statewide goals and objectives for the provision of safe fish for communities that rely on fish as part of their subsistence diet.
   - DWR, in consultation with other State agencies, including the Department of Conservation, Tribes, and community groups, should develop goals and objectives to restore and protect watersheds making use of existing community-based watershed councils and groups that are an under-utilized tool in maintaining and restoring California's water resources.

5. Assess environmental justice water-related concerns on a regional level
   - DWR and other State agencies should assess environmental justice water-related concerns on a regional level and incorporate this analysis into the Water Plan Update regional reports.
   - DWR should include provisions for environmental justice and disadvantaged communities in the guidelines for the Integrated Regional Water Management planning and grant program.

DWR should use its regional assessment, along with other applicable information such as the Department of Public Health and State Water Board's projects lists for the small community safe drinking water grant program and the small community wastewater system grant program respectively, to guide evaluation of Integrated Regional Water Management plans and whether they have met the environmental justice criteria for funding.