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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 92 related actions.

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. As a strategic plan, it contains a vision, mission, guiding principles, objectives, and related actions (Table 7-x Strategic plan elements).

Table 7-x 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. |

In addition, the Water Plan has nine 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 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. See discussion of Update 2009 recommendations in Chapter 2 Imperative to Act.

Objectives and Related Actions

The objectives and related actions presented in this Administrative Draft are taken in part from DWR's Draft Climate Change Adaptation White Paper dated October 17, 2008, as well as from companion State plans (some of which are still working drafts).

- Many objectives derived from the Climate Change Adaptation 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 other companion State plans considered in preparing the draft objectives and actions are:

- Draft Water-Energy Climate Change Mitigation Strategies (WETCAT, October 2008)
- Draft FloodSafe Strategic Plan (DWR, May 2008)
- Final Delta Vision Task Force Strategic Plan (Delta Vision, October 18, 2008)
- Water Boards Strategic Plan Update 2008-2012 (Water Boards, September 2, 2008)
- Draft Bay-Delta Strategic Work Plan (Water Boards, June 2008)
- Water Action Plan (CPUC, November, 2005)
- California Wildlife Action Plan (DFG, 2007)
- California Transportation Plan 2025 (April 2006) and 2030 (Caltrans, October 2007)
- Update 2009 Draft Tribal Communication Plan (TCC, June 17, 2008)
- Preparing for California's Next Drought – Changes Since 1987–1992 (DWR, 2000)
- Critical Water Shortage Contingency Plan, Governor's Advisory Drought Panel (2000)
- California Drought, An Update (DWR, April 2008)

As part of the Water Plan strategic plan, these 13 objectives will help us achieve the Water Plan goals (Table 7-x Water Plan Update 2009: Relationship of objectives and goal). Meeting these 13 objectives, and planning and investing in their 92 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.

PLACEHOLDER Table 2-x Water Plan Update 2009: Relationship of objectives and goals

Developing the Update 2009 Strategic Plan Elements

One of the eight key activities for Water Plan Update 2009 is:

Review and revise as needed the vision, mission, and goals of the Water Plan, and update its initiatives, recommendations, and implementation plan. This includes

- (a) reporting progress on actions associated with Update 2005's 14 recommendations,*
- (b) addressing "Parking Lot" topics from the Update 2005 Advisory Committee,*
- (c) incorporating issues and initiatives from Steering Committee members,*
- (d) updating the Water Plan stakeholder/customer survey, and*
- (e) including strategic planning for flood management.*

At its June 2007 meeting, the Water Plan Advisory Committee (AC) reviewed the strategic plan elements for Water Plan Update 2005 and offered changes. At its December 2007 meeting, the Advisory Committee discussed the initial DWR staff draft for some of the Strategic Plan Elements for Update 2009 (December 19, 2007) --- namely, the vision, mission, goals, and guiding principles. Through February 2008, a number of Advisory Committee and State-agency Steering Committee (SC) members submitted comments on the strategic plan elements that are posted on the Water Plan Comments Web page. DWR used the comments to revise the Strategic Plan Elements, and the Track Change and Clean versions of the July 1, 2008 Strategic Plan Elements were reviewed at the July 9, 2008 AC meeting. Comments from that meeting, the August 27, 2008 SC and AC briefing, and the September 17-18 Plenary Meeting were incorporated into this Administrative Draft.

Objective 1 - Promote, improve, and expand integrated regional water management to create and build on existing partnerships that are essential for California water resources planning, sustainable watershed and floodplain management, and increasing regional self-sufficiency.

Integrated Regional Water Management (IRWM) planning offers a framework for water managers to address the myriad water-related challenges and provide for future needs at the regional level. 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 demand and supply management options and water quality actions. 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.

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 a changing climate and drought and flood contingency planning.
 - State government should promote and provide incentives to regional partnerships to move towards water and flood planning at a watershed-scale and to prepare their IRWM plans using watershed and groundwater basin boundaries.
 - State government should closely coordinate the IRWM Program and State Watershed Program to prevent duplication, leverage resources, and provide clear and consistent guidance to stakeholders.
2. IRWM plans must include strategies for meeting the following objectives and issues and the plan elements listed in the box below:
 - 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 basin plan.
 - Identification of significant threats to groundwater resources and feasible strategies to avoid and reverse 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.

Box 7-x Required Integrated Regional Water Management Elements

- Description of major water-related goals, objectives, challenges, and conflicts in a region.
- Measurable regional objectives and criteria for developing regional project priorities.
- Identification and consideration of the water-related needs of disadvantaged communities in the area within the boundaries or the plan.
- Consideration of objectives in the appropriate basin plan or plans and strategies to meet applicable water quality standards.
- Evaluation of vulnerability and adaptability of water management systems in the region to climate change.
- A *facilitation plan* describing an inclusive, collaborative, integrated, multi-benefit approach and public process for the identification, selection, and design of projects and programs.
 - Consideration of all resource management strategies identified in the California Water Plan, as described in Update 2005 (Bulletin 160-2005) and future updates.
 - Consideration of greenhouse gas emissions of identified programs and projects.
- A *communication plan* with strategies to disseminate data and information about the development and implementation of the plan.
- An *implementation and financing plan* for identified projects and programs including a process to coordinate water management projects and activities of participating local agencies and local stakeholders to avoid conflicts and take advantage of efficiencies.
- A *monitoring plan* with performance measures to demonstrate progress toward meeting regional objectives.
- Publicly-accessible documentation of data, methods, and technical analyses used in developing the IRWM plan.
- Other information as identified by State government.

DWR will provide financial incentives, technical assistance, and other guidance to support regions in developing and improving their IRWM plans, including standards, quantitative tools, 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 plan* (see Objective 6).
 - A *drought contingency plan* that: (1) describes how entities within a region can share supplies and infrastructure during droughts and emergencies, and (2) assumes a 20% increase in the frequency and duration of future dry conditions, until more accurate information is available (see Objective 8).
 - 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).

Objective 2 – Use water more efficiently with significantly greater water conservation, recycling, and reuse to help meet future water demands and adapt to climate change.

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

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.

Water use efficiency must be a key part of every water agency’s water portfolio. Using water efficiently is a foundational action, one that serves to mitigate and adapt to climate change. Further, water conservation reduces 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 water shortages that may be induced by climate change, thus reducing economic and environmental impacts of water scarcity.

Related actions:

1. As directed by Governor Schwarzenegger, DWR in collaboration with the State Water Resource Control Board (Water Board) and its nine Regional Water Quality Control Boards (Regional Boards), California Energy Commission, the California Public Utilities Commission, the California Department of Public Health, and other agencies will implement strategies to increase regional water supply self-sufficiency and achieve a statewide 20 percent reduction in per capita urban water use by 2020.
 - By 2010, all Urban Water Management Plans should include provisions to implement all cost-effective, feasible, and legal urban best management practices established by the California Urban Water Conservation Council and California Energy Commission’s standard procedures for landscape equipment, 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.
2. By XXXX, agricultural water agencies should fully implement 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.
3. By XXXX, the Legislature 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.

4. Recycled municipal water may represent a relatively energy-efficient water management strategy in some regions of the state.
 - o In those regions, water and wastewater agencies should adopt policies by XXXX that promote the use of recycled water for all appropriate, cost-effective uses while protecting public health and the environment.
 - o In consultation with the Departments of Public Health and Water Resources, by XXXX the Water Board will identify opportunities to maximize water recycling through its permitting authority.
5. By XXXX, local governments should initiate and pursue water conservation programs to reduce water use on existing landscapes. All local governments are now required by statute to adopt the State Model Water Efficient Landscape Ordinance or equivalent for new development.
6. Communities should invest in facilities to capture, treat, and reuse XXXX acre-feet per year statewide of urban storm water runoff and gray water, such as underground storage beneath parks, small surface basins in drainages, domestic storm water capture systems, 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 with recycled water to augment local supplies.
7. 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.
8. The Water Board and Regional Boards and the CPUC 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 – Advance and expand conjunctive management of multiple water supply sources to prepare for future droughts and climate change.

California can prepare for future droughts and climate change, and improve water supply reliability and water quality, by taking advantage of the long-term water storage capacity of groundwater basins when managed in closer coordination with 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. Additional groundwater and surface water storage and water conveyance improvements are needed to provide flexibility to facilitate water transfers and to provide for better flood management, water quality, and system reliability, in response to daily and seasonal variations and uncertainties in water supply and use.

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 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, providing cold water releases for fish, repulsing seawater intrusion to protect drinking water quality, 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.

However, 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 XXXX, State, federal, 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 and banking with 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 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.

3. 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.
4. Local land use agencies should adopt ordinances that protect the natural functioning of groundwater recharge areas.
5. By XXXX, State and local governments should increase funding incentives by \$XXXX to protect groundwater basins from contamination, and to remediate contamination when it occurs.
6. State government should establish a System Reoperation Task Force composed of state personnel, federal agency representatives, and appropriate stakeholders 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.
7. As part of completing the CALFED surface storage investigations, DWR will incorporate system reoperation and considerations of climate change as it works with the Bureau of Reclamation (Reclamation) and local agencies to complete surface storage feasibility studies and environmental documentation for the Sites Reservoir and Upper San Joaquin River Basin Storage Investigations. DWR will also make climate change recommendations as it works cooperatively with Contra Costa Water District on the Los Vaqueros Reservoir Expansion (LVE) Investigation, and DWR will advise Reclamation on climate change matters as Reclamation continues its work on the Shasta Lake Water Resources Investigation.

Objective 4 – Protect and restore surface water and groundwater quality to safeguard public and environmental health and secure California’s water supplies for their beneficial uses.

The Water Board 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 Board’s 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 Board’s Strategic Plan for promoting sustainable water supplies are covered in Objective 2—Increase water use efficiency, recycling, and reuse to help meet growing water demands and adapt to climate change.

The Water Board’s 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, that provide clean and adequate surface water and groundwater, and support healthy riparian and wetland habitat, 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 efforts alone cannot support a comprehensive watershed protection approach. Success depends on the integration of State, federal, and local programs, most importantly local land use decisions made by local officials, stakeholder involvement, and the actions of millions of individuals, which, when taken together, can make enormous impacts.

Related Actions:

1. Implement strategies to fully support the beneficial uses for all 2006-listed 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 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 all surface waters.
2. Improve and protect groundwater quality in high use basins by 2030.
 - Implement an integrated groundwater protection approach by 2012 to improve and protect groundwater in high-use basins that (a) evaluates and regulates activities that impact or have the potential to impact beneficial uses, (b) recognizes the effects of groundwater and surface water interactions on groundwater quality and quantity, and (c) encourages and facilitates local management of groundwater resources.
 - Identify strategies to ensure that communities that rely on groundwater contaminated by anthropogenic sources will have a reliable drinking water supply, which may include surface water replacement.

- Ensure the viability of high quality groundwater basins, where appropriate, through waste discharge requirements (WDRs) and the clean-up of contamination.
3. Increase sustainable local water supplies available for meeting existing and future beneficial uses by 1,725,000 acre-feet per year, in excess of 2002 levels, by 2015, and ensure adequate flows for fish and wildlife habitat.
 - Promote implementation of best management practices, and improve compliance with requirements, for water conservation consistent with the Strategic Workplan for Activities in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary and other relevant State and regional efforts.
 - Increase the 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.
 4. 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 by 2012, and updated by 2015, 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 statewide plans and policies such as the California Ocean Plan.
 - Achieve near-term priority Basin Plan amendment needs 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 process initiated with funding assistance from stakeholders.
 5. State government should lead an effort with local agencies and governments to remediate the causes and effects of contaminants on surface water and groundwater quality. The evaluation should be completed by XXXX to inventory, evaluate, and examine the effect of contaminants on public health, long-term sustainability of water resources and treatment costs, and should identify cost-effective ways and propose management strategies to improve water quality.
 6. 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, salinity management, and water treatment and distribution.

Objective 5 – Promote, improve, and expand environmental stewardship to improve watershed and floodplain functions and 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.

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 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 system to adapt to and recover from changed conditions after a disturbance.

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 IRWMs, 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.
 - Re-establish XXXX acres of contiguous natural riparian and floodplain habitat and its hydrologic connectivity between rivers/streams and their historical floodplains for at least 50% of the river miles in the regions by 2020.
 - Contribute to AB32 greenhouse gas reduction goals related to water and flood systems operations through enhancing carbon sequestration mechanisms by re-establishing XXXX acres of historic vegetated floodplain corridors.

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, 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 XXXX, 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 XXXX, State government should prioritize and expand Delta island 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 ecosystem and protect Delta communities from inundation, and sequester carbon. (See Objectives 6 and 7)
5. State government should encourage and support actions to protect, enhance, and restore 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 6 - 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 an approach to deal with flood risk that 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.

Balancing the risks 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 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.

We have addressed this risk by building dams and levees that constrain flood waters and diminish the natural benefits of floods, while providing protection to people from the harmful aspects of flooding. More than a half-million people live behind levees in California now, with populations continuing to grow. And across the nation and the world 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 of repairing our communities following a flood is an additional concern. A collection of recent laws has refocused attention on flooding and the risks it poses. The laws require 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 leading us towards a new perspective of managing, at least in part, for recovery from disturbance and with a greater dependence on the natural cycles of flooding.

System reoperation is an important element of 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 as supplies become less reliable. Because the prediction of climate change impacts will never be perfect, flexibility must be a fundamental tactic, especially with respect to water system operations.

Related Actions:

1. In order 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.
 - Improve communications and coordination during emergencies, such as floods and droughts.
 - Develop an operational information clearinghouse related to the major water systems in California, which would facilitate coordination with planning and research groups 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 management needs and opportunities.
3. Communities in floodplains should consider the consequences of being exposed to floods 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 and accounts for the expected impacts of climate change. The plan will provide strategies for greater flood protection and environmental resilience. It will address:
 - 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 non-structural improvements to provide at least a historical 200-year level flood protection for all urban areas;
 - increased use of set-back levees, flood easements, zoning, 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. Local governments should implement land use policies that decrease flood risk.
 - Local land use agencies should update their General Plans to address increased flood risks posed by climate change. For planning purposes, DWR recommends using a higher than historical peak reference flow.
 - Local governments should site new development where flood avoidance strategies are assured. 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 runoff.
 - Local governments should include flood-resistant design requirements in local building codes.

Objective 7 – Promote and practice management for a sustainable California Delta by setting as co-equal goals a healthy Delta ecosystem and a reliable water supply for California and by recognizing the Delta as a unique and valued place.

*NOTE: The Governor’s Delta Vision Blue Ribbon Task Force concluded its work in October, adopting a Strategic Plan that proposes an integrated approach to the woes of the Sacramento-San Joaquin Delta. The plan culminates 20 months of work by the seven-member Task Force that received hundreds of comments from stakeholders and many citizens. The final Delta Vision Task Force Strategic Plan will be presented to Cabinet secretaries on the Delta Vision Committee on Oct. 27 and released in early November. The DV Committee will use the DV Task Force Vision Report and Strategic Plan to recommend actions to the Governor and Legislature by the end of 2008. Objective 7 and its related actions will be revised as needed for the Public Review Draft of Update 2009 to make it consistent with the DV Committee’s recommendations.

The Delta is in crisis, and with it, the entire state of California faces an unprecedented threat to its environment and prosperity. If the Delta continues on its current path, we face a future of continuing environmental degradation and resulting water supply restrictions. If the Delta were to fail catastrophically, the state of California would likely face an environmental and economic crisis of enormous proportions – many lives lost, tens of billions of dollars in costs, and irreparable damage to the Delta’s environment and culture.

Improving the Delta ecosystem is a legally required condition of improving the water delivery system for Californians. Neither restoring the ecosystem nor creating a reliable water supply can be achieved without the other. This is one co-equal goal.

In its Vision Report, the Delta Vision Task Force made 12 integrated and linked recommendations to chart a better future for the Delta. Those recommendations are to be carried out together. The recommendations are linked because the Delta’s challenges are linked. There can be no sustainable and reliable water supply without a healthy Delta ecosystem free of court-ordered species protection actions. At the same time, the Delta ecosystem would not remain healthy for long if the state’s economy were suffering for lack of water.

With its 12 Vision Report recommendations as a foundation, the task force premised its strategic plan on accomplishing seven broad goals. The related actions below relate to the following numbered goals:

- Goal 1: Legally acknowledge the co-equal status of restoring the Delta ecosystem and creating a more reliable water supply for California.
- Goal 2: Recognize and enhance the unique cultural, recreational, and agricultural values of the Delta as an evolving place, an action critical to achieving our co-equal goal.
- Goal 3: Restore the Delta ecosystem as the heart of a healthy estuary.
- Goal 4: Promote water conservation, efficiency, and sustainable use.
- Goal 5: Build facilities to improve the existing water conveyance system and expand statewide storage, and operate both to achieve the co-equal goal.
- Goal 6: Reduce risks to people, property, and state interests in the Delta by effective emergency preparedness, appropriate land uses, and strategic levee investments.
- Goal 7: Establish a new governance structure with the authority, responsibility, accountability, science support, and secure funding to achieve these goals.

Related Actions:

- 1.1: Make the co-equal goal the foundation of Delta and water policy-making.
- 2.1. Apply for federal designation of the Delta as a National Heritage Area and expand the State Recreation Area network in the Delta.
- 2.2. Establish market incentives and infrastructure to protect, refocus, and enhance the economic and public values of Delta agriculture.
- 2.3. Develop a regional economic plan to support increased investment in agriculture, recreation, tourism, and other resilient land uses.
- 2.4. Establish a Delta Investment Fund that provides funds for regional economic development and adaptation.
- 2.5. Adopt land use policies that enhance the Delta's unique values, and that are compatible with the public safety, levee, and infrastructure strategies of Goal 6.
- 3.1. Restore a large area of interconnected habitats—on the order of 100,000 acres—within the Delta and its watershed by 2100.
- 3.2. Establish migratory corridors for fish, birds, and other animals along selected Delta river channels.
- 3.3. Promote viable, diverse populations of native and valued species by reducing risks of fish kills and harm from invasive species.
- 3.4. Restore Delta flows and channels to support a healthy Delta estuary.
- 3.5. Improve water quality to meet drinking water, agriculture, and ecosystem long-term goals.
- 4.1. Reduce urban, residential, industrial, and agricultural water demand through improved water use efficiency and conservation, starting by achieving a statewide 20 percent per capita reduction in water use by 2020.
- 4.2: Increase reliability through diverse regional water supply portfolios.
- 5.1. Expand options for water conveyance, storage, and improved reservoir operations.
- 5.2. Integrate Central Valley flood management with water supply planning.
- 6.1. Significantly improve levels of emergency protection for people, assets, and resources.
- 6.2. Discourage inappropriate land uses in the Delta region.
- 6.3. Prepare a comprehensive long-term levee investment strategy that matches the level of protection provided by Delta levees and the uses of land and water enabled by those levees.
- 7.1. Establish a new California Delta Ecosystem and Water Council as a policy-making, planning, regulatory, and oversight body. Abolish the existing California Bay-Delta Authority, transferring needed CALFED programs to the California Delta Ecosystem and Water Council. Establish a new Delta Conservancy to implement ecosystem restoration projects, and increase the powers of the existing Delta Protection Commission
- 7.2: Require the California Delta Ecosystem and Water Plan to prepare a California Delta Ecosystem and Water Plan to ensure sustained focus and enforceability among State, federal, and local entities.
- 7.3. Finance the activities called for in the California Delta Ecosystem and Water Plan from multiple sources.
- 7.4 Optimize use of the CALFED Record of Decision and Coastal Zone Management Act to maximize participation of federal agencies in implementation of the California Delta Ecosystem and Water Plan.

Objective 8 – Prepare prevention and response plans for floods, droughts, and catastrophic events to help residents and communities make decisions that reduce the consequences of these events when they occur.

This objective and its related actions are not as far along as the others. For this draft, DWR staff used objectives and recommendations from the draft FloodSafe Strategic Plan for flood preparedness, and DWR drought reports. More information is needed from the Office of Emergency Services for other catastrophic events.

Related Actions:

1. By XXXX, all [certain size, certain vulnerability] communities should have formal flood emergency preparedness, response, and recover plans, including completion of a Delta Emergency Operations Plan by December 31, 2009. (this action also appears in Objective 6)
2. By XXXX, IRWM Plans and Urban Water Management Plans should include a drought contingency plan that assumes, until more accurate information is available, a 20% increase in the frequency and duration of future dry conditions. (this action appears in Objective 1)
3. By XXXX, DWR will develop a long-term drought preparedness plan, and updated it as needed, that includes:
 - multi-year, joint operations strategies for the State Water Project and Central Valley Project;
 - assessment of local drought contingency planning and preparedness to identify coverage, comprehensiveness, limitations, and gaps;
 - plan and sequence of actions and local assistance for dry conditions covering early and later drought stages;
 - plan for a Critical Water Shortage Reduction Marketing Program (drought bank);
 - plan for assisting small water systems owners and homeowners in rural counties;
 - identification of needed improvements to real-time surface and groundwater monitoring programs; and
 - identification of needed research in long-range weather forecasting.
4. PLACEHOLDER: Additional action(s) are needed here for preparedness planning to respond to other catastrophic events that would disrupt water resources and infrastructure like earthquakes, wildfires, chemical spills, facility malfunctions, and intentional disruption.

Objective 9 – Reduce the energy consumption of water and wastewater management systems to mitigate greenhouse gas emissions.

In October 2008, the California Air Resources Board released 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 below as related actions. Three of the measures target reducing energy requirements associated with providing reliable water supplies and two measures are aimed at reducing the amount of non-renewable electricity associated with conveying and treating water. The final measure focuses on providing stable funding for implementing these actions. The greenhouse gas emission reductions from these measures are indirectly realized through reduced energy requirements. Three of the measures—water use efficiency, water recycling, and urban water reuse—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-third of the state's electricity, water distribution and use also requires 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, the Department of Water Resources is implementing a directive from the Governor to develop a plan to reduce per capita water use by 20 percent by 2020 (described in Objective 2). Measures to increase water use efficiency and reuse will reduce electricity demand from the water sector, reducing 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. Recycled water may represent a relatively energy efficient water management strategy in some regions of the state (this action also appears in objectives 2 and 4).
 - In those regions, water agencies should adopt policies by XXXX that promote the use of recycled water for all appropriate, cost-effective uses while protecting public health and the environment.
 - In consultation with the Departments of Public Health and Water Resources, by XXXX the Water Board will identify opportunities to maximize water recycling through its permitting authority
 - By XXXX, water and wastewater utilities should collaboratively develop water recycling plans.
3. Local agencies and governments should implement cost effective, energy efficiency measures in water system infrastructure projects.
 - By XXXX, large water and wastewater utilities should conduct an assessment of their carbon footprint and consider implementation of strategies described in the Proposed 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 California Climate Action Registry.
 - By XXXX, the Water-Energy Subgroup of the Governor's Climate Action Team (WETCAT) will conduct a study to assess a reasonable energy efficiency and reduction

- targets for water and wastewater systems. Reduction in electricity consumption would in turn reduce the GHG emission associated with this amount of electricity generation.
- By XXXX, 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.
4. Urban and, where feasible, rural communities should invest in facilities to capture, treat and reuse XXXX acre-feet per year statewide of storm water runoff, such as 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 2).
 5. By XXXX, 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. By XXXX, State government will establish a public goods charge for funding investments in IRWM management strategies that will help mitigate and adapt to climate change. As noted by the Economic and Technology Advancement Advisory Committee, a public goods charge on water can be collected on water bills and then used to fund IRWM management strategies. Depending on how the fee schedule is developed, a public goods charge could generate \$100 million to \$500 million annually to invest in further efficiency improvements.

Objective 10 - Improve and expand monitoring, data management, and analysis to support decision-making in light of uncertainties that support integrated regional water management and statewide 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 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. 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.

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
 - Ensure long term maintenance and accessibility to water management information.
2. From XXXX to XXXX, DWR will participate with the National Oceanic and Atmospheric Association and Scripps Institute of Oceanography in implementing the Hydrometeorological TestBed program which enhances off-shore and land measurements of weather variables.
3. By XXXX, 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.
 - By XXXX, the Resources Agency, in coordination with State agencies, should convene and support a scientific panel of the National Research Council (NRC) to provide expert guidance regarding official 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 scientific data.
 - 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 on-going California Water Plan Update process, DWR will provide revised estimates of changes to sea level, droughts, and flooding that can be 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, Lawrence Livermore and Berkeley National Laboratories, and the University of California:
 - By XXXX 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 IRWM 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 a pilot study to explore how information can be more effectively integrated between 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 at the same time streamlining reporting requirements.
8. By 2009, DWR, the Water Boards, the Department of Public Health, and the California Bay-Delta Program should complete a feasibility study for a water use measurement database and reporting system. Information on water use is currently limited and often unreliable. 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 sound hydrologic budgets.
9. From XXXX to XXXX, DWR will participate in a pilot project to test the H2O 2.0 Initiative -- Adaptive Management for Water Storage and Flood Control Program. This program, proposed by Lieutenant Governor Garamendi, would 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 XXXX, DWR will expand the number of IWRIS partners (information providers) by XXXX and its users by XXXX.

Objective 11 - Identify and fund applied research on new water technology to help carry out water programs and better manage water systems.

State government will work with California research and academic institutions, like the California Academy of Science, California Council on Science and Technology, the University of California, 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 by XXXX as part of a broad and diverse scientific agenda to fill gaps in knowledge about California's water resources.
2. State government will invest \$XXXX per year in pilot projects to help local agencies and governments and regional partnerships implement promising water technologies to improve water use efficiency, water recycling and reuse, water supplies and quality, water and wastewater treatment, stormwater capture and reuse, desalination, and others more cost effectively with knowledge and experience specific to each region.
3. The Energy Commission through its PIER Program will invest \$XXXX per year to 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 the water system.

Objective 12 – Increase Tribal outreach, participation, and access to funding for water programs and projects to have more sustainable Tribal water and natural resources.

Water Plan Update 2005 recommended that DWR and other State agencies must invite, encourage, and assist tribal government representatives to participate in statewide, regional, and local water planning processes and to access State funding for water projects. As part of Update 2009, a Tribal Communication Committee (TCC) has prepared a comprehensive Tribal Communication Plan for the California Water Plan. The Tribal Communication Plan includes definitions, goals, objectives, guiding principles, audience and venues, and a detailed implementation plan. One of the 10 objectives 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 10 Tribal Communication Plan objectives are listed below as related actions.

California Native American Tribe - signifies all Indigenous Communities of California, including those that are federally non-recognized and federally recognized, and those with allotment lands, regardless of whether they own those lands. Additionally, because some water bodies and Tribal boundaries cross State borders, the Tribal Communication Plan includes Indigenous Communities in Oregon, Nevada, and Arizona that are impacted by water in California.

Related Actions:

1. Everyone involved in the California Water Plan (CWP) shares 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.
2. Everyone involved in the CWP shares 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 CWP shares information with California Native American Tribes about State funding that is available for water projects, how California Native American Tribes can apply for this, what obstacles they may face in accessing these funds, and how they can influence future funding programs.
4. California Native American Tribes use the CWP 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 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 shape the content of the CWP through a variety of mechanisms, particularly the review of Regional Reports, Resource Management Strategies, and other materials, and Tribal and public meetings.
7. California Native American Tribes 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 educate State, Local and Federal Government, and water purveyor executives and planners about the historical and ongoing relationships between California Native American Tribes and water, especially cultural and religious practices.
9. California Native American Tribes propose and clarify how DWR works with California Native American Tribes in State water planning efforts.
10. California Native American Tribes 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.

Objective 13 – Increase the participation of disadvantaged communities in State processes and programs to achieve equitable distribution of benefits, to consider mitigation of impacts from the implementation of State programs and policies, and to ensure that State programs and policies address the most critical public health threats in disadvantaged communities.

Water Plan Update 2005 recommended that DWR and other State agencies must 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. 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 generally pretty easily 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 effect of a project. It is understandable that water agencies would simply 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 control 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 their respective 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 DWR funding programs and develop guidelines that make funding programs equally accessible to disadvantaged and environmental justice communities.
 - 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 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.
 - DWR, DFG, 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, 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 chapters.
 - 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 their 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 their evaluation of regional plans and whether they have met the environmental justice criteria for funding.