

January 2016
Update

Managing California Water through Federal, State, and Local Cooperation

Working together to shape California's future





*CALIFORNIA DEPARTMENT OF WATER RESOURCES
MISSION STATEMENT*

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

Managing California Water through Federal, State, and Local Cooperation

Working together to shape California's future

California's climate and hydrology pose many challenges for water managers. Variable annual precipitation patterns, frequent floods triggered by Pacific atmospheric rivers, and prolonged droughts are all a part of the State's hydrologic cycles. We have just endured four years of drought; one of the worst in recent history, and now the forecast of a strong El Niño is upon us. Ongoing and future changes to the climate will drive rising sea levels, altered precipitation patterns, reduced snow pack in our state's largest frozen reservoir – the Sierra Nevada mountains, and other changes to California's hydrology. Every aspect of our water management system will be affected.

Water has shaped California's past and will help shape its future. Managing this water and its associated resources today and for future generations requires a strategic, integrated approach and cooperation across all levels of government.

Economic growth in California's formative years drove large-scale land-use alterations, unchecked gold mining and timber operations, and other landscape changes. In turn, growing urban and rural communities and agricultural and industrial productivity spurred development of an extensive system of reservoirs and conveyance projects unaided by our current understanding of ecological processes.

Today, California's water system supplies water to more than 38 million people and 10 million acres of irrigated agricultural lands. It delivers high-quality water to major industrial facilities that fuel the largest economy in the nation and the seventh largest in the world. A large portion of this water supply system relies on the Sacramento-San Joaquin River Delta for water conveyance.

The Delta is the largest estuary on the west coast and its aging levees and ecosystem are in a fragile state. University of California, Davis scientists say the fault that caused a Napa Valley earthquake in August 2014 could produce a temblor strong enough to cause levee failures in the Delta. During the last century, there have been 162 Delta levee failures leading to flooded islands and saline intrusion.

In addition, endangered species issues have considerably curtailed deliveries from the Delta, with consequences felt statewide. Delta pumping curtailment and four years of drought have caused drinking water wells to go dry in our poorest communities and led to significant overdraft of regional groundwater basins. A recent NASA report illustrates dramatic subsidence in some parts of our Central Valley.

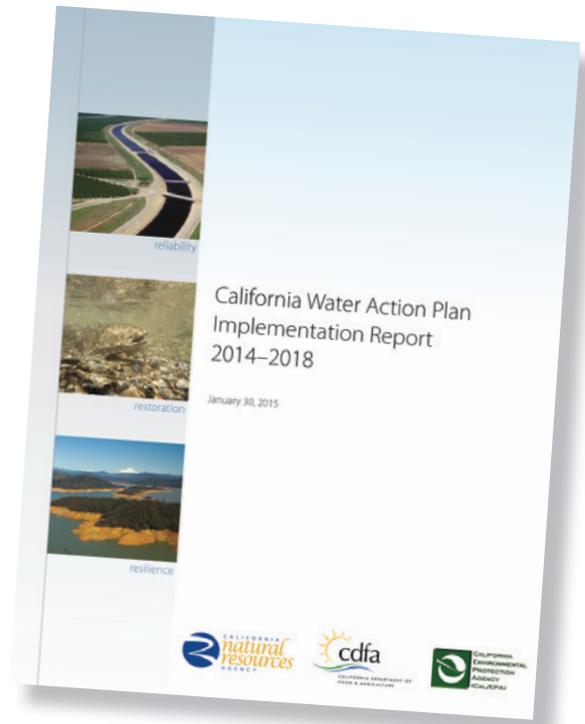


California's climate requires an extensive network of reservoirs and conveyance systems (such as the California Aqueduct, pictured) to supply water for more than 38 million people and 10 million acres of irrigated agricultural lands.

In 2013, the U.S. Army Corps of Engineers and the California Department of Water Resources prepared California's Flood Future report. The report indicates that "more than 7 million people and \$580 billion in assets are exposed to hazards of flooding in California." Flooding in a major metropolitan area will have a devastating economic impact on California and the country.

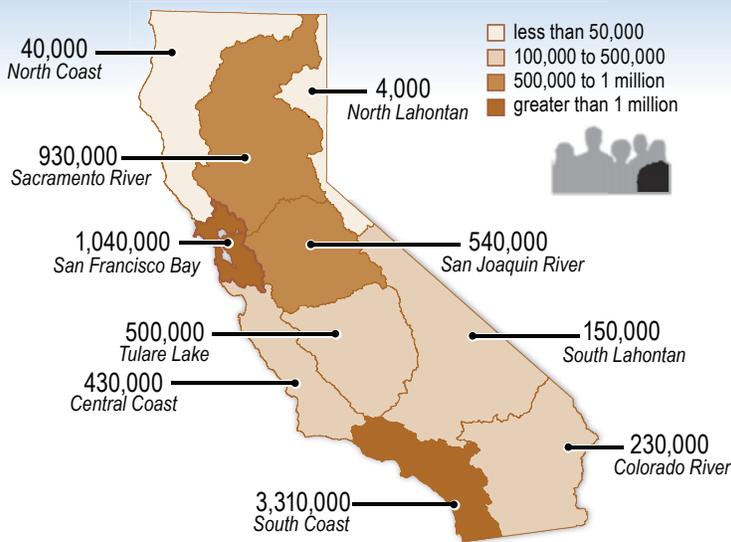
The water challenges facing our communities, our watersheds, and our economies compelled the State of California to adopt a comprehensive and practical approach to water resources management, outlined in the 2014 Governor's California Water Action Plan (Action Plan). The Action Plan states, "there is a broad agreement that the state's water management system is currently unable to satisfactorily meet both ecological and human needs, too exposed to wet and dry climate cycles and natural disasters. Solutions are complex and expensive, and they require the cooperation and sustained commitment of all Californians working together."

The Action Plan encourages implementation of multi-benefit integrated programs through cooperation among federal, State, and local governments, regional agencies, and public and private sectors. This document describes the work being done to implement the Action Plan and the investments needed to continue that work into the future.

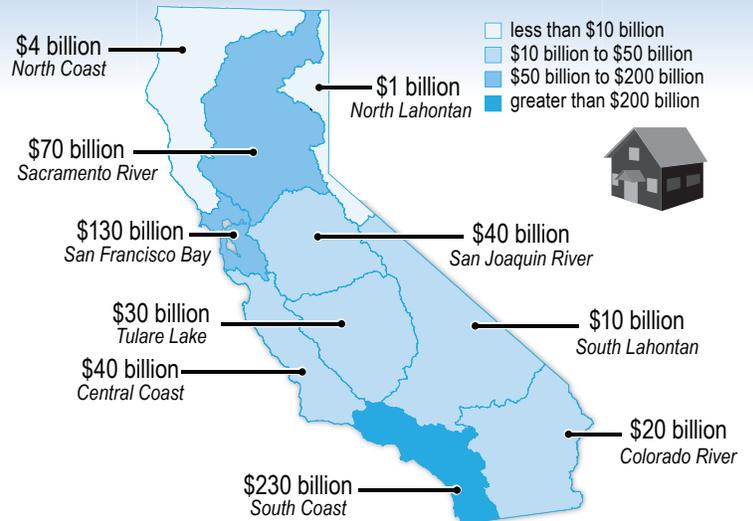


The California Water Action Plan Implementation Report 2014–2018 provides a strategy to implement the actions of the Action Plan.

Number of People in Floodplain



Number of Structures in Floodplain



California's Flood Future report documents that more than 7 million people and \$580 billion in assets are exposed to flooding hazards in California.



Ensuring Reliable Water Supply for All Californians

The challenges to ensuring reliable, clean water supplies in California have their roots in our natural climate patterns and historic water management choices spurred by economic and population growth. A large portion of the State's rainfall and runoff occurs in the northern part of California, and most water use is in our agriculturally dominated Central Valley and highly populated Southern California. In addition, most of the precipitation and runoff occur in the five-month period of December through April, while most water use is in the summer months.

To address this situation, an extensive water management network was built in the last century to store winter stormwater and convey it hundreds of miles to where and when it is needed. Two major conveyance systems, the State Water Project, operated by the State of California, and the federal Central Valley Project, operated by the U.S. Bureau of Reclamation, play a key role in delivering water to people, farms, and industry around the State. Today, these systems are less reliable. Prolonged periods of drought, reduced snowpack and river flows due to climate change, and ecosystem protection issues have considerably reduced deliveries from the State and Federal water projects in recent years.



Surface water storage facilities such as Lake Oroville (above) store winter stormwater and the State Water Project conveys it hundreds of miles to where and when it is needed.

Above: The intertie between the Governor Edmund G. Brown California Aqueduct (SWP) and the federal Delta-Mendota canal (CVP) allows for operational flexibility.

The State of California is taking two major steps to improve water supply reliability:

1. Ensure continued State Water Project deliveries to 25 million Californians and 3 million acres of agricultural lands, and protect endangered species by conveying some water around the Sacramento-San Joaquin Delta. Do this in conjunction with vital Delta ecosystem restoration.
2. Develop new, and efficiently re-operate, existing surface storage projects in conjunction with groundwater to capture storm and flood flows in a manner that increases supplies for people, farms, and industry, while maintaining flows for ecosystem health. Proposition 1, approved by California voters in November 2014, provided \$2.7 billion for such water storage projects.

To be successful, the California Department of Water Resources must work in close coordination with other State and federal agencies, and private partners.



The Knights Landing Outfall Gates Fish Barrier Project prevents salmon from entering Colusa drainage canal so they can continue migrating in the Sacramento River.



CALIFORNIA WATER FIX

RELIABLE. CLEAN. WATER.

California WaterFix is a proposal backed by the administrations of Governor Edmund G. Brown Jr. and President Barack Obama to change how we divert water from the Sacramento-San Joaquin Delta. The Delta is a source of water for two-thirds of California's population and one-third of its irrigated farmland. The plan seeks to accomplish three primary goals that have long beleaguered State and federal policymakers:

1. Allow for more natural flows in the Delta to benefit salmon, smelt, and other species.
2. Increase water supply reliability by giving the water projects that divert from the Delta more flexibility to move water without harming fish.
3. Guard the Delta water diversion point from natural disaster disruption, such as earthquake or flood.

The proposal involves construction of three new intakes, each with a maximum diversion capacity of 3,000 cubic feet per second, on the east bank of the Sacramento River in the north Delta. Each intake site would employ state-of-the-art on-bank fish screens. Two 40-foot-wide underground pipelines would carry the diverted water approximately 30 miles to the expanded Clifton Court Forebay for the existing State Water Project and Central Valley Project pumping facilities.



CALIFORNIA ECO RESTORE

A STRONGER DELTA ECOSYSTEM.

California EcoRestore is an initiative to help coordinate and advance at least 30,000 acres of critical habitat restoration in the Sacramento-San Joaquin Delta over the next four years. Driven by world-class science and guided by adaptive management, California EcoRestore will aggressively pursue habitat restoration projects with clearly defined goals, measurable objectives, and financial resources to help ensure success.

A broad range of habitat restoration projects will be pursued, including projects to address aquatic, sub-tidal, tidal, riparian, floodplain, and upland ecosystem needs.

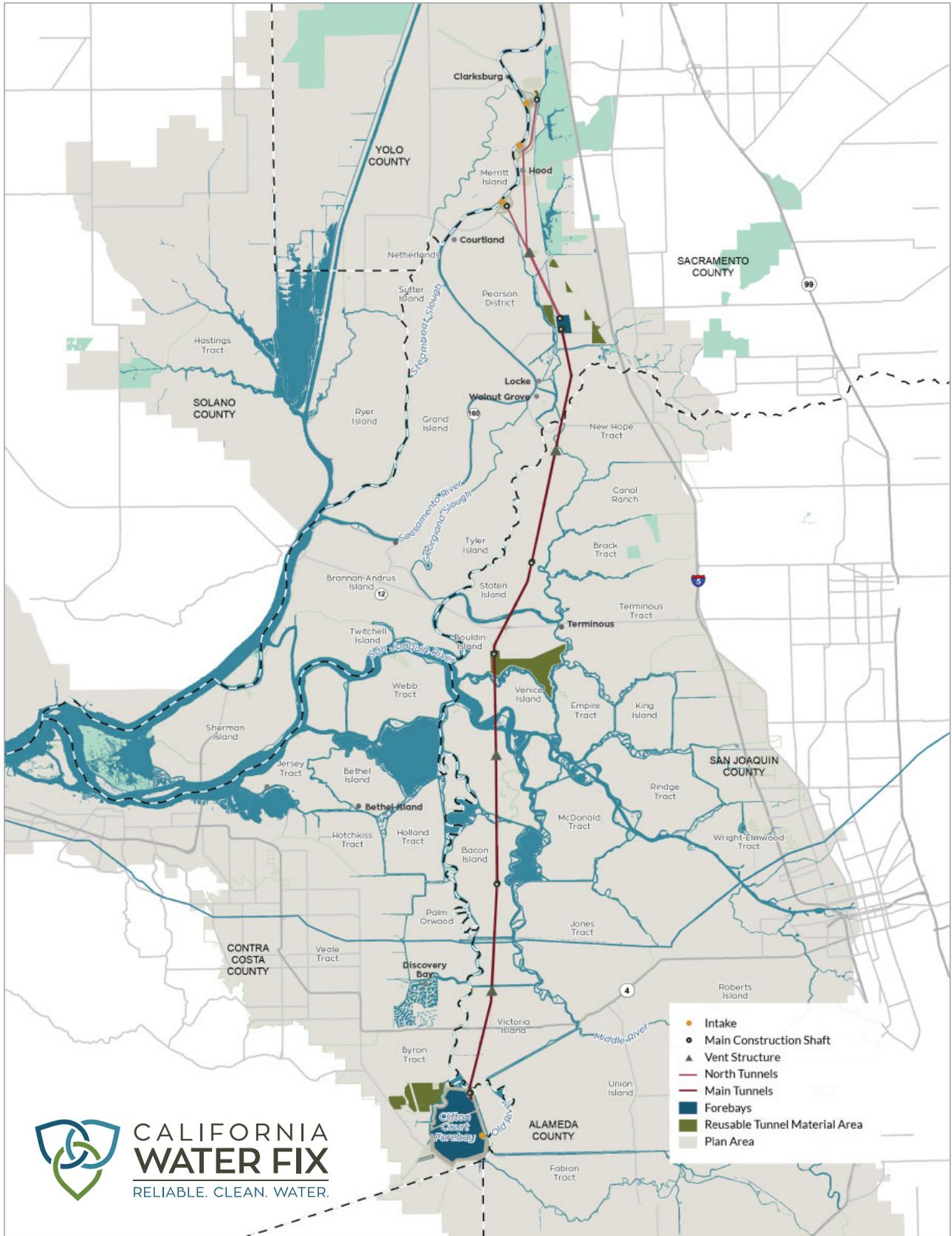
California EcoRestore's initial goal is to advance 30,000 acres of Delta habitat restoration:

- 25,000 acres associated with existing mandates for habitat restoration, pursuant to federal biological opinions. These projects will be funded exclusively by the State and federal water contractors that benefit from the projects.
- 5,000 acres of habitat enhancements.

California EcoRestore is unassociated with any habitat restoration that may be required as part of the construction and operation of new Delta water conveyance (California WaterFix).



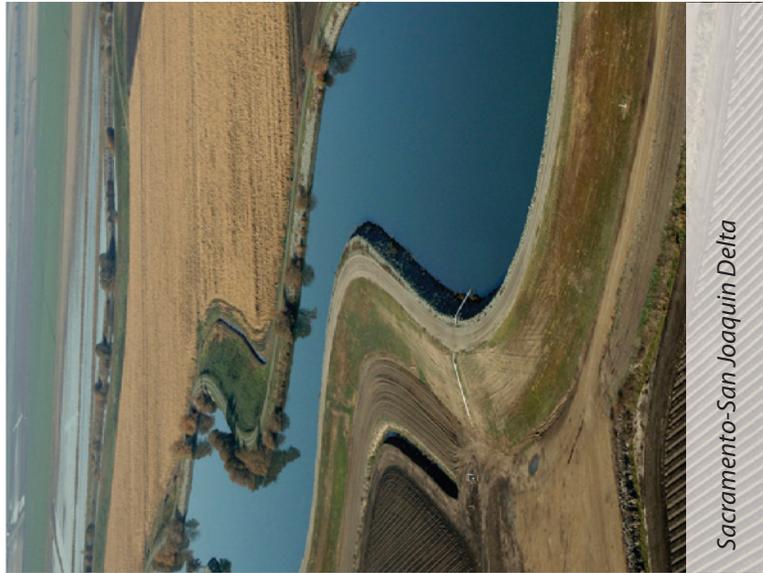
An egret and ring-billed gulls congregate on Staten Island in the Sacramento-San Joaquin River Delta.



California Water Fix project location and proposed facilities.



Friant Dam, a component of the federal Central Valley Project



Sacramento-San Joaquin Delta



Shasta Lake, the largest Central Valley Project reservoir



Building Capacity for Regional Sustainability

While California has vast infrastructure to store winter flows and deliver water hundreds of miles to where it is needed, the majority of water infrastructure and related investment is at the local and regional level. Over the past decade, the State has provided technical services and over \$990 million in financial assistance, matched over 4:1 by local agencies, to implement more than 700 regional multi-benefit projects to improve water sustainability in regions across the State.

The prolonged drought, reduction of water supply due to reduced rainfall and snowpack, and compliance with various biological opinions, coupled with increases in permanent crops and increases in urban population, have all taken a toll on regional water supply reliability and sustainability. In many areas, imbalance between water availability and demand has increased groundwater pumping and resulted in overdrafting of groundwater basins. This, in turn, has caused drinking and agricultural water wells to go dry and alarming evidence of subsidence, especially in California's Central Valley.

To provide safe drinking water to communities and to help improve regional water sustainability, the Governor issued several Executive Orders that resulted in a multi-agency drought emergency program, a more than 20% increase in statewide water conservation, and delivery of financial assistance to those communities most impacted by the four-year drought. In addition, Proposition 1, approved by California voters in November 2014, provides over \$500 million in additional grant funding to increase self-reliance at the regional level.

Above: State Geologists measure and record the water level in a groundwater well in California's Central Valley, where a recent NASA report shows evidence of land subsidence in some areas of 2 inches per month due to excessive groundwater pumping during the growing season as the State's historic drought continues.

Federal agencies continue to play a major role in California water and influence the State's ability to supply clean water to people, farms, industry, and the environment. Federal projects and regulatory programs implemented by U.S. Army Corps of Engineers, U.S. Bureau of Reclamation, U.S. Fish and Wildlife Service, National Marine Fisheries Service, and other agencies have a pronounced impact on State water supply reliability and sustainability.

The most significant piece of legislation was the State's passage of the Sustainable Groundwater Management Act in 2014. For the first time in history, the State must manage groundwater use in a sustainable manner. The landmark law requires water and land use agencies to come together in governance, and develop plans to manage groundwater – in the context of an overall regional water balance – sustainably. The State will provide financial incentives,

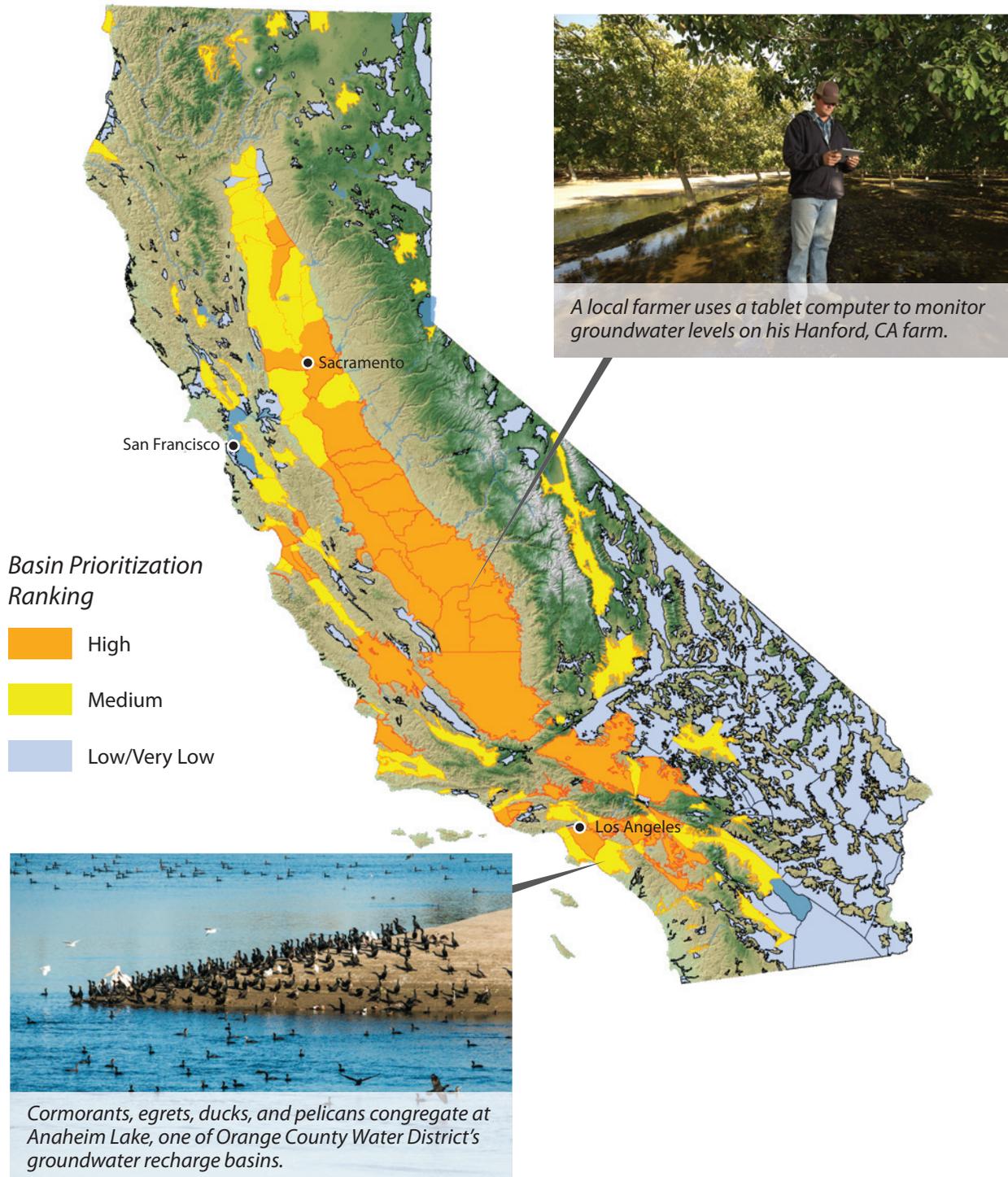
technical tools, and enforcement to ensure implementation of the legislation, but the key to success lies with the local agencies and their ability to balance regional supply and demand in a more sustainable fashion.

A key challenge is overcoming regulatory hurdles, including surface water rights and federal and State environmental regulations. Here again, close cooperation between federal, State and local stakeholders will be required for success.

Understanding California's Groundwater Basins

The State has ranked 127 of California's 515 basins/subbasins as high and medium priority based on population, reliance on groundwater for urban and agricultural uses, and impacts to groundwater. The 127 basins account for 96% of the State's annual groundwater pumping and supply 88% of the population

residing over groundwater basins. Of these, 21 basins/subbasins have been preliminarily identified as critically overdrafted, with one or more of the following undesirable impacts: seawater intrusion, land subsidence, groundwater depletion, and/or chronic lowering of groundwater levels.





Managing Floodwaters while Protecting the Ecosystem

The destruction caused by Hurricane Katrina in 2005 was a wake-up call for California. The following year, the State passed urgent flood legislation and the voters approved bonds providing over \$4 billion for improving flood management in California. This funding, matched by local and federal funding, provided much needed resources for flood risk reduction projects, particularly in urban areas.

In 2013, the State partnered with the U.S. Army Corps of Engineers to prepare California's Flood Future - Recommendations for Managing the State's Flood Risks. The report revealed that more than seven million people and \$580 billion in assets are exposed to the hazards of flooding in California; all 58 counties are at risk. This exposure to flood risk presents an unacceptable threat to public safety, infrastructure, and the State's economy. The State also adopted the Central Valley Flood Protection Plan in 2012; a comprehensive approach to reducing risk for over one million Californians protected by the State-Federally operated flood control facilities in the Central Valley. The State is taking the lead in developing basin-wide feasibility studies for these areas, in collaboration with the U.S. Army Corps of Engineers and coordination with stakeholders.

Meanwhile, U.S. Army Corps of Engineers, Sacramento District, has taken steps in developing a General Re-evaluation Report for the Sacramento River Basin, which together with the State's feasibility study, will provide a blueprint and clear direction to improve flood management for the communities in the Sacramento Valley.

The Yolo Bypass is a large flood bypass in the Sacramento Valley built during the last century. It protects the Sacramento metropolitan area communities from flooding. Located in the heart of the Pacific Flyway, the Yolo Bypass Wildlife Area's approximately 16,600

State, federal, and local agencies are working together and have taken an aggressive approach in improving flood protection while restoring the ecosystem in California; the Yolo Bypass (pictured above) Program is one example and has been helped by a recent cooperative agreement signed by the State and U.S. Army Corps of Engineers (below).

The California Department of Water Resources has worked with U.S. Army Corps of Engineers for many years to reduce flood risks in California. We have worked with the U.S. Army Corps of Engineers as a local partner in the State Subvention Program, cost-shared in urban flood risk reduction projects, Folsom Dam Modification Joint Federal Project, and many other projects.

acres is a haven for fish, waterfowl, and other wildlife, and much of the land supports rice and other agricultural uses. The State, along with the U.S. Army Corps of Engineers and other partners, has recently embarked on a comprehensive plan for the Yolo Bypass to considerably improve flood protection for the Sacramento Metropolitan area while providing for fish passage, habitat, water supply, recreation, and other benefits. Structural and ecosystem improvements planned for the bypass can enhance agricultural sustainability, water supply reliability, and

the economic health of the State. This unique opportunity will serve as a model for integrated flood management in other parts of the State.

Flood management in California is a shared responsibility among State, federal, and local agencies. Together, we have accomplished much during the last decade, but there is much to do to provide the level of flood protection that our communities deserve.



Deputy Director Bardini and Colonel Farrell sign California Department of Water Resources/U.S. Army Corps of Engineers Memorandum of Understanding in August 2015.



Taking Action to Reduce Residual Risk

Water supply reliability and effective flood emergency response are critical for maintaining California's robust economy. This has been evident during our prolonged drought, when cutbacks in State and Federal Water Project allocations in recent years forced growers to increase groundwater pumping, resulting in wells going dry and dramatic land subsidence in parts of the State. Many farming communities in the Central Valley have been hard hit. Similarly, flooding in a metropolitan area would have a devastating impact on the economic well-being of the community and the State. As noted earlier, climate change and continued population growth will only further exasperate the issues.

California is taking positive steps to reduce the residual risk impacts of extreme drought and floods. For example:

- As directed by the Action Plan and emergency drought rules, Californians have taken conservation to heart. From June to September 2015, urban areas routinely exceeded the Governor's call to reduce water use by 25% — sometimes by wide margins.
- Rebate programs for replacing turf and inefficient toilets are now in full swing, with a goal in sight of replacing 50,000 acres of turf statewide.
- The State released a new water efficient landscape ordinance this year that will be adopted by local agencies to promote more use of drought-tolerant landscapes in urban areas.
- The State has made \$33 million available in Proposition 1 grants for agricultural water use efficiency projects.
- The State has enhanced and streamlined the process for water transfers between willing sellers and buyers.
- The Governor's Drought Task Force has been meeting monthly since early 2014 and continues to tackle tough issues, such as land subsidence, in a coordinated manner.

Above: Governor Edmund G. Brown Jr. and State water leaders answer questions about the State's aggressive water conservation rules in April 2015.

- Working with local and federal agencies, the State has improved emergency response throughout California to both drought and flood.
- Financial aid has been provided to those communities hardest hit by the drought, including those without drinking water. In many cases, State assistance is complemented by federal assistance from the U.S. Bureau of Reclamation and the U.S. Department of Agriculture.

The Action Plan highlights the need for yet another important strategy to reduce risk: increasing operational and regulatory efficiency of the State's water supply and flood management systems. Actions could include re-operation of reservoirs, enhanced and coordinated operation of the State and Federal Water Projects and flood facilities, and use of programmatic regulatory approaches such as the current partnership effort on the Yolo Bypass. Such actions require early and continued federal engagement and collaboration.



Flood fighting exercises test emergency response actions that the California Department of Water Resources and local agencies would deploy to protect Delta levees from failure in the case of flood emergency.



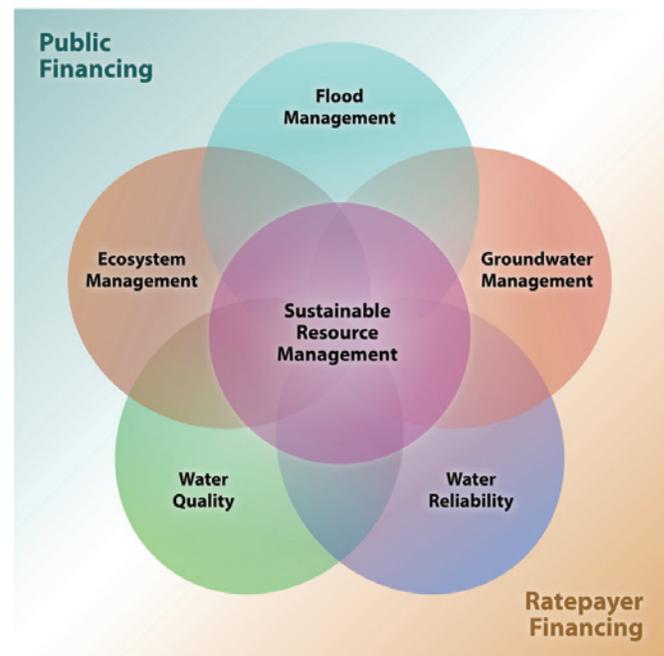
Planning Priorities and Investments for a Sustainable Future

The extraordinary drought conditions gripping California have brought challenges and hardship to communities across the State. As our water leaders say, “with crisis comes opportunity.” These conditions have revealed how past local, State, and federal investments in regionally integrated infrastructure have helped buffer many communities from the economic and societal impacts threatened by even short-term droughts. For California, the last few years have brought a renewed focus on the importance of reinvesting in our water management systems and watersheds to address the current drought challenges and prepare for future uncertainties.

The Governor’s 2014 Action Plan has been instrumental in focusing the State’s water leaders on a common set of goals and priority actions. Leveraging remaining and new Proposition 1 general obligation bond revenues with baseline budgets and other funding sources, State agencies began aligning their priorities to the Action Plan’s specific directives; however, bonds are short-term and bear interest, and despite the infusion, current investments are not keeping pace with the funding needed to attain sustainable management of the State’s water resources. Implementation of all of the work described in the Action Plan as well as other actions to improve water sustainability in California will require additional investment over the current base budget by State, local, and federal agencies.

Over the next decade, California needs \$200 billion to maintain current levels of service and water system conditions. California needs sustainable financing over the next few decades to reduce flood risk, provide reliable and clean water supplies, and restore and enhance ecosystems. The State also needs to leverage various sources of funding to achieve sustainable water management in the State.

Above: U.S. Army Corps of Engineers Commanding General Bostick and his California District Commanders visit California to see impacts of the drought first-hand in August 2015. The General engaged Senator Feinstein’s staff and State water leaders from the Governor’s Office and Office of Emergency Services, and California Department of Water Resources in discussions about shared investments and cooperative actions needed to move to more sustainable water resources management.



Continued leveraging of funding sources will help ensure a sustainable future for California.

Protecting Our Communities through Federal, State, and Local Agency Cooperation and Commitment

Unlike most rivers that can take days to reach flood stage, the American River can reach flood stage in a matter of hours. With eighteen significant flood events on the American River since 1850, Folsom Dam is critical for protecting the greater Sacramento area.

After Congressional authorization and a careful planning process, the Folsom Joint Federal Project (JFP) was initiated. The JFP will improve the ability of Folsom Dam to manage large flood events by allowing more water to be safely released in advance of a major storm event, resulting in more storage capacity remaining in the reservoir to hold back the peak inflow when it

arrives later. The new auxiliary spillway project includes a control structure to manage releases.

As part of the American River Watershed Project, the JFP will help achieve the goal of a 200-year level of flood protection for the greater Sacramento urban area, which includes approximately 400,000 people and in excess of 110,000 buildings valued at \$58 billion.

The Folsom JFP is an example of moving multi-agency cooperation to commitment on implementing projects.



The speakers, from left, Kerri Howell, Mayor of Folsom, Rep. Tom McClintock, Rep. Ami Bera, Rep. Doris Matsui, Col. Michael Farrell, Drew Lessard with the Bureau of Reclamation, Jay Punia, Central Valley Flood Protection Board Executive Officer, Mark Cowin, Director of the California Department of Water Resources and Rick Johnson, Executive Director of Sacramento Area Flood Control Agency during the celebration of the arrival of the first massive gate for Folsom Dam's auxiliary spillway on April 26, 2014.

Edmund G. Brown Jr.

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