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California Water Action Plan Implementation Report **2015 Summary of Accomplishments**

January 13, 2016



This report was prepared by the California Natural Resources Agency in coordination with the California Environmental Protection Agency and the California Department of Food and Agriculture for the fiscal and appropriate policy committees of each house of the California Legislature, and for the public.

This report is available in electronic form:
http://resources.ca.gov/california_water_action_plan.

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Acronyms and Abbreviations

AB	Assembly Bill
Act	Sustainable Groundwater Management Act
Action Plan	California Water Action Plan
af	acre-feet
Cal OES	California Governor's Office of Emergency Services
CDFA	California Department of Food and Agriculture
CDFW	California Department of Fish and Wildlife
CNRA	California Natural Resources Agency
Conservancy	Sacramento-San Joaquin Delta Conservancy
CVFPB	Central Valley Flood Protection Board
CWC	California Water Commission
Delta	Sacramento-San Joaquin Delta
DSC	Delta Stewardship Council
DWR	California Department of Water Resources
GSA	groundwater sustainability agency
IRWM	integrated regional water management
Office	Office of Sustainable Water Solutions
Proposition 1	Water Quality, Supply, and Infrastructure Improvement Act of 2014
SB	Senate Bill
SCC	California State Coastal Conservancy
USACE	U.S. Army Corps of Engineers
Water Board	State Water Resources Control Board
WCB	California Wildlife Conservation Board
WISP	Water Storage Investment Program

Note: In this report, California Native American Tribes refers to federally recognized and non-federally recognized tribes within the state.

Introduction: 2015 — A Watershed Year

The close of 2015 and start of the New Year mark the end of a tremendous 12 months. California endured a fourth consecutive year of extraordinary drought, the worst in over a century. Central Valley communities saw drinking water wells dry up and agricultural lands subside. Coastal streams that salmon and steelhead depend on dwindled without rain. Agricultural communities were severely stressed. And cities and towns across the state made hard decisions aimed at boosting water conservation efforts and developing new sources of supply.

What made 2015 an extraordinary year had little to do with the standard reactions often born of challenging years, such as heightened political wrangling; frenzied debate over large, new funding measures; high-profile lawsuits; and economy-versus-ecology rhetoric. In 2015, California took a stand against the status quo, making big strides toward a dramatically different — and stronger — future for us all. The Brown Administration — working closely with the Legislature, State agencies, federal and local agencies, California Native American Tribes, environmental advocates, and other partners — implemented dozens of actions that are collectively moving the state from reaction to thoughtful response; from defense to offense; from a patchwork of independent activities to collaborative, cohesive strategies. These actions all are guided in some way by the [California Water Action Plan](#) (Action Plan).

Released by Governor Edmund G. Brown Jr. in January, 2014, the Action Plan is a roadmap for the first five years of the state's journey toward sustainable water management. The plan includes 10 primary actions and dozens of supporting sub-actions, ranging in focus from drought preparedness and response to improved groundwater management, flood protection, and sustainable financing. The 10 primary actions are designed to help achieve three overarching goals — reliability, restoration, and resilience. Led by the California Natural Resources Agency (CNRA), the California Environmental Protection Agency, and California Department of Food and Agriculture (CDFA), the effort to implement the Action Plan is collaborative and inclusive, involving a broad array of affected State entities; federal, local, and tribal partners; and the public.

This report highlights a number of efforts undertaken by the Brown Administration and its partners throughout 2015. It includes a narrative summary (organized according to the 10 actions), a timeline-based overview of some of the year's key successes, and a graphical representation of efforts still to come. Appendix A includes the timeline of highlights from 2014 for continuity.

In support of Governor Brown's 2016–2017 proposed State Budget, and as a means of keeping the Action Plan as relevant and useful as possible, modest updates to the Action Plan are being released in tandem with this report. This Administration will continue to implement the Action Plan over the next several years. Guided by the Action Plan, the hard work of realizing the three overarching goals will continue, with the intention that the plan will be updated and used for guidance by future administrations and their partners.

Responding to the fourth year of extraordinary drought and myriad associated challenges to the state's people, environment, economy, and way of life, California made great strides in 2015 toward a more sustainable future by advancing implementation of the 2014 California Water Action Plan. Most notable perhaps was the promising start of State-regional cooperation to understand, govern, and regulate California's threatened groundwater resources.



January

Proposed Budget Funds Water Priorities

Governor proposes 2015-16 State Budget, which includes funding for such Action Plan priorities as continued drought response. **(All Actions)**

Local Groundwater Agencies Get Help

DWR offers facilitation services to assist local efforts in forming new groundwater governance entities. **(Actions 2, 6)**



Drought Plan Protects Water Supplies and Fish

State/Federal Water Projects and Fish and Wildlife Agencies propose operational adjustments to protect water supplies and fisheries **(Actions 4, 5, 9)**

March

Governor Signs \$1B Drought Legislative Package

Working with the Legislature, Governor signs \$1B emergency drought legislation. **(Action 5)**

Regulations Issued to Protect Salmon

Water Board adopts emergency regulations to protect fisheries. **(Actions 4, 5)**

State Takes Urgent Conservation Action

Water Board makes urgent changes in water rights to conserve municipal water supplies and protect fish. **(Actions 1, 2, 4, 5, 7)**

Sierra Nevada Watershed Management Effort Begins

Sierra Nevada Conservancy and U.S. Forest Service launch new integrated watershed management program. **(Actions 4, 5, 6, 7, 8)**

May

Emergency Barrier Protects Delta Water Quality

DWR installs barrier to protect Delta water quality from ocean salinity intrusion caused by drought (barrier later removed in November 2015). **(Action 5)**

State Invests in Water & Carbon Savings

DWR awards \$28M for projects that save 270,000 acre-feet of water and reduce 199,000 metric tons of greenhouse gases. **(Actions 1, 2)**

Delta Committee Adopts Science Actions

DSC's Delta Plan Interagency Implementation Committee adopts high-impact science actions to improve Delta management. **(Actions 3, 9)**

Streamlined Guidelines and Drinking Water Funds Announced

Water Board announces streamlined guidelines and \$19M to address emergency drinking water needs. **(Actions 5, 7, 9)**

February

Survey Shows Water Storage Potential

CWC conducts statewide survey to develop inventory of water storage projects that may seek Water Storage Investment Program funding. **(Action 6)**

State Provides Emergency Drinking Water Funding

Water Board announces availability of \$2.1M in emergency drinking water funds for 15 projects in drought-stricken communities. **(Actions 2, 5, 7)**

New Technology Used to Monitor Fish

DWR uses improved camera system to monitor Delta Smelt to reduce fish entrainment. **(Action 3)**

April

Governor Restricts Statewide Water Use

Executive order requires 25% urban water-use reduction statewide. The regulations were adopted by the Water Board in May. **(Actions 1, 5)**

Governor Announces CA EcoRestore and CA WaterFix

State and federal leaders unveil updated plans to achieve Delta ecosystem restoration and water supply reliability. **(Actions 3, 4, 9)**



State Funds Boost Rural Flood Protection

DWR invests \$9M in levee patrol road repair to improve emergency response capabilities for rural flood protection. **(Action 8)**

June

President Obama Announces Federal Drought Assistance for California

President Obama responds to the state's drought crisis with \$18M to provide jobs for CA workers dislocated by the drought. **(Action 5)**

Adopted State Budget Funds Water Priorities

Legislature approves and Governor signs 2015-16 Budget with \$2B for CA Water Action Plan implementation. **(All Actions)**

State Hosts Prop 1 Tribal Government Consultation

CWC, CDFW, DWR, and Water Board sponsor a 2-day Tribal Government Consultation on Prop 1 funding opportunities. **(All Actions)**

Safe Drinking Water Plan Released

Water Board publishes *Safe Drinking Water Plan for California*, a strategy to ensure safe drinking water for all Californians. **(Action 7)**

State Funds Habitat/Carbon Sequestration

CDFW provides \$21M for projects to restore 2,400 acres of Delta/coastal wetlands and mountain meadows. **(Actions 3, 4)**

Climate Report Reveals New Data

DWR releases *California Climate Science and Data Report*, highlighting challenges and opportunities for adaptation. **(Actions 1, 2, 5, 8)**

Guidebook Assists Agricultural Water Suppliers

DWR publishes guidebook to assist agricultural water suppliers affected by drought. **(Actions 1, 5)**

July

Flood Conservation Strategy Released

DWR publishes draft Conservation Strategy to support ecosystem restoration; an essential part of the 2017 Central Valley Flood Protection Plan. (Actions 4, 8)

Landscape Irrigation Ordinance Strengthened

CWC adopts DWR's revised Landscape Ordinance, requiring more efficient landscape irrigation systems statewide. (Actions 1, 5)

Summit Showcases Technology-Drought Nexus

The Governor's Office, Imagine H2O, and ACWA sponsor a summit to discuss how to leverage technology to build a drought-resilient California. (Actions 1, 2, 5)

Drought-Stricken Community Gets Water

Water Board approves \$0.5M to bring safe drinking water to Central Valley community of 1500 people. (Actions 5, 7)

September

Partnership Forms to Advance Flood and Habitat Protection

CNRA convenes federal, State, and local agencies to coordinate Yolo Bypass flood protection and habitat restoration. (Actions 4, 8)

State Incentivizes Water Efficiency on Farms

CDFA selects 100 projects totaling \$9.4M to implement efficient on-farm irrigation systems. (Action 1)

Scientists Publish Delta Challenges Report

Four former DSC scientists author the *Delta Challenges Report*, laying out the perils of status-quo Delta water supply and ecosystem management. (Action 3)

State Hosts Drought Workshops

DWR completes more than 100 drought-related workshops in local communities statewide. (Actions 1, 5)

November

Governor Acts to Protect Fish and Bolster Drought Response

Governor issues executive orders directing CDFW, DWR, and other agencies to bolster the State's drought response efforts. (Actions 1, 5)

Historic Dam Removal Benefits Salmon

State Coastal Conservancy and partners demolish San Clemente Dam, allowing threatened Steelhead to access 25 miles of historic spawning habitat. (Actions 4, 8)

State Readies for "El Niño"

CalOES establishes storm-ready Web portal; DWR finalizes Delta Flood Emergency Plan and completes inspections of 1600 miles of levees. (Actions 3, 8, 9)

Input on Climate Adaptation Plan Sought

CNRA publishes draft *Safeguarding California: Implementation Action Plans* to improve CA's response to a changing climate. (Actions 1-9)

Ag Water Efficiency Grant Funding Announced

CDFA announces \$16M for investment in systems to reduce water/energy use. (Actions 1, 5)

August

State Hosts Chief Army Engineer for Drought and Flood Project Tour

Governor's Office, Senator Feinstein's Office, DWR, and CalOES host top USACE commanders for CA drought tour. Completion of Folsom Dam auxiliary spillway also highlighted. (Actions 5, 6, 8, 9)



NASA Casts Light on State's Groundwater Crisis

Supported by DWR, NASA publishes report revealing areas of the state affected by subsidence resulting from excessive pumping of groundwater. (Actions 5, 6)

Rebates Incent Urban Water Conservation

DWR provides \$40M in Prop 1 funding for turf removal and replacement of inefficient toilets. (Actions 1, 5)

Prop 1 Drinking Water Grant Guidelines Approved

Water Board releases guidelines for providing \$260M grant funding for drinking water infrastructure projects. (Actions 5, 7)

October

Salton Sea Legislation Signed

Working with the Legislature, Governor signs various bills to protect Salton Sea, boost water conservation, strengthen groundwater management, and improve water quality. (Actions 1, 4, 5, 6, 7)

Prop 1E Funding Set to Lower Flood Risk

DWR awards \$246M for 7 urban flood projects and recommends \$15.3M for critical levee repairs by local agencies. (Actions 2, 4, 8)

More Prop 1 Grants Announced

DWR announces availability of Prop 1 grant funding: \$31M for ag. water agencies and \$10M for counties with stressed groundwater basins. (Actions 1, 6)

December

Grants Benefit Wildlife and Watersheds

CDFW receives Prop 1 grant applications for ecosystem and watershed protection. Est'd \$31.4M total awards planned for early 2016. (Actions 3, 4)

Regions Set to Receive Grants for Integrated Projects

DWR approves \$232M for award in early 2016 to 26 regions (incl. \$50M benefiting disadvantaged communities) for integrated, watershed based projects. (Actions 1-9)

Delta Restoration Projects Advance

CDFW, DWR, CVFPB, and others coordinate on funding and permitting of the Knights Landing Outfall Gates project to improve fish passage in the Delta. (Actions 4, 8)



Key Action Plan Activities in 2015

Action 1 — Make Conservation a California Way of Life

On April 1, 2015, in the fourth year of California's historic drought, Governor Edmund G. Brown Jr. issued Executive Order B-29-15 to save water, increase enforcement against the wasting of water resources, and streamline the government's response to drought. The order required the State Water Resources Control Board (Water Board) to establish a mandatory conservation program that reduces urban water use by 25 percent. Californians stepped up to the challenge. From June to November 2015, urban areas have exceeded the 25% goal — many areas by wide margins. During this period, urban areas cut their water use by a cumulative 26.3 percent, which equates to 328.9 billion gallons of water, or enough to supply five million people for a year. Likewise, through landowner partnerships with State and federal officials, many farmers have voluntarily cut back on water use in critically affected parts of the state. Also, the California Department of Water Resources (DWR) provided \$10 million for the CalConserve loan program, offering low-interest loans to local urban water agencies implementing water conservation programs.

The conservation successes in 2015 were achieved with the help of the State's [Save Our Water Campaign](#), which saw an infusion of funding from the State Budget in the past two years in response to the drought. By the spring of 2015, the statewide campaign had reached Californians through radio (English/Spanish), social media, outdoor billboard advertising, direct consumer outreach, and outreach through businesses and other partnerships. As directed by the Governor, a large portion of the budget was allocated to the 2015 summer media campaign, targeting key markets in Northern, Central, and Southern California.

Use of funding authorized by Proposition 1 (the Water Quality, Supply, and Infrastructure Improvement Act of 2014) was accelerated in 2015 by the Legislature and the Administration to complement local resources. As a result, rebate programs for replacing turf and old, inefficient toilets are now in full swing, with a goal in sight of replacing 50 million square feet of turf statewide. The emphasis of the program is to reach Californians in the most drought-stricken, disadvantaged communities.



The State's aggressive turf replacement program offers property owners \$2 per square foot to remove water-intensive turf with drought-tolerant, low water use landscaping more conducive to our dry California climate. This program, along with programs offered by local water suppliers, will help meet the Governor's target of removing 50 million square feet of turf statewide, thereby saving water and reducing carbon emissions associated with the treatment and delivery of potable water.

The State released a new water-efficient landscape ordinance, to be adopted by local agencies by the end of 2015. The ordinance is intended to promote expanded use of drought-tolerant landscapes in urban areas. In addition, Senate Bill (SB) 555, passed by the Legislature and signed by the Governor, requires urban retail water suppliers to submit validated water-loss audit reports to DWR. To assist with compliance, DWR published an updated guidebook for urban water management plans, which includes guidance for water-loss auditing. The Water Board will soon develop performance standards for volume of water loss.

Spurred by the Governor's April 1st executive order, the State expanded its assistance to agricultural water users to incent water use efficiency. DWR strengthened agricultural water management planning requirements and made \$33 million in grants available for agricultural water-use efficiency projects. Also, DWR announced availability of financial assistance for preparation of agricultural water management plans — as required by the executive order — for smaller agricultural water suppliers. The California Department of Food and Agriculture's (CDFA's) State Water Efficiency and Enhancement Program awarded \$6.15 million from Assembly Bill (AB) 32's Greenhouse Gas Reduction Funds for 71 projects, to implement on-farm irrigation systems that use less water and energy and reduce greenhouse gases. The same program awarded a total of \$9.38 million for 100 projects later in the year. To date, the program has led to an estimated 24,500 acre-feet in water savings and 51,000 metric tons of carbon dioxide equivalent greenhouse-gas reductions per year.

In partnership with the University of California, the California Urban Water Conservation Council, the U.S.D.A. Natural Resources Conservation Service, and other organizations, DWR delivered over 100 workshops and various guidance documents during the year to provide technical assistance on urban water conservation, agricultural drought management strategies and efficient water management practices, and targeted education on specific commodities and crops.

Action 2 — Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government

The most significant State achievements in 2015, with regard to building regional capacity and self-reliance, included initiation of the Sustainable Groundwater Management Program (discussed in Action 6), accelerated delivery of financial and technical-assistance incentive programs to regions, and progress made on preparing for and adapting to climate change.

Sustainable Groundwater Management Depends on Regional Water Balance

In January 2015, the State launched implementation of the Sustainable Groundwater Management Act. The landmark law requires water and land-use agencies to cooperate and develop plans to sustainably manage groundwater, in the context of an overall regional water balance. The State's role is to provide financial/technical assistance and enforcement, but the key to success lies with the local agencies and their willingness to balance regional water supplies and demands in a more sustainable manner. See Action 6 for details of 2015 groundwater management achievements.

During the year, as directed by the Administration, DWR and the Water Board accelerated availability and award of general obligation bond grants to local communities to build regional capacity and self-reliance, as well as to service the numerous local grants awarded over the previous decade.

In 2015, DWR finalized awards totaling \$232 million for integrated, multi-benefit projects throughout the state. The funding will support 26 regions to implement over 130 projects, with total costs in excess of \$1 billion. Nearly \$50 million of the \$232 million will go to disadvantaged communities in 26 regions. With these awards, to be announced in early 2016, Proposition 84 funds for integrated water management are now fully expended, clearing the way for Proposition 1 funding to commence.

Through \$257 million in grants and low-interest loans, the Water Board financed water recycling projects throughout the state in 2015. This was a tenfold increase in volume from two years earlier; moreover, these projects will save an estimated 600,000 acre-feet during their lifetimes. The Water Board achieved this increase in part by aggressively lowering the interest rate to just 1 percent for water recycling projects. The Water Board's Proposition 1 funding for water recycling has already started to roll out the door, with \$85 million committed this year and more in the pipeline for 2016.

Building on 2014's streamlining of recycled water regulations for outdoor use and groundwater recharge, the Water Board convened an expert panel to help formulate new regulations for surface water augmentation with recycled water and produce a report on the feasibility of direct potable reuse. Both the regulations and the report will be finalized in 2016. The Water Board also adopted uniform criteria for desalination facilities that balance protection of the marine environment with the use of ocean water as a supplement to traditional water supplies. In addition, the Water Board issued regulatory decisions to incent stormwater capture in urban areas and approved its Storm Water Resource Plan Guidelines to aid local agencies in meeting legislative requirements on Proposition 1 grants for stormwater projects.



An excellent example of a regional program jointly sponsored by State and federal governments is the Sierra Nevada Conservancy's Watershed Improvement Program. This comprehensive program is integrating fire management, watershed stewardship, water supply reliability, habitat restoration, and local economic development across the Sierra Nevada, the major source of California's water supply, providing 15 million acre-feet of annual storage in non-drought years. Sierra Nevada Conservancy was allocated Prop 1 funding for these types of projects.

Among the strategies identified by Governor Brown in his April 2015 executive order, which established a new interim statewide greenhouse-gas emission reduction target, is carbon sequestration in natural and working lands. The Brown Administration recognized the importance of soil health in the 2015–2016 proposed State Budget by highlighting that “as the leading agricultural state in the nation, it is important for California’s soils to be sustainable and resilient to climate change.” California’s Healthy Soils Initiative is a collaboration of State agencies and departments, led by CDFA, to promote the development of healthy soils. A combination of innovative farm and land management practices contribute to building adequate soil organic matter that can more effectively retain water, increase carbon sequestration, and reduce overall greenhouse gases.

In 2015, DWR, in partnership with the Water Education Foundation and other stakeholders, hosted a conference — Integrated Regional Water Management 2.0: The Next Generation. Attendees discussed making integrated regional water management (IRWM) even stronger, specifically by aligning and integrating IRWM with groundwater sustainability planning, to realize the full potential of the IRWM approach. Culminating several years of stakeholder engagement, the strategic plan for the future of IRWM in California is due for release in 2016. Conference attendees received an early draft of the plan's recommended strategies.

DWR awarded \$28 million to 22 entities in regions across the state, for projects estimated to deliver lifetime water savings of 270,000 acre-feet and reduce greenhouse gases by 199,000 metric tons. Funds for this new water-energy grant program came from the State's Greenhouse Gas Reduction Fund. Another round of funding has been approved for 2016.

At the Paris climate talks in December, Governor Brown demonstrated California's national and international leadership in climate change by showcasing many of the State's efforts. For example, in response to the Governor's directive, the CNRA published the [Safeguarding California: Reducing Climate Risk](#), to describe how the State will prepare for and adapt to the catastrophic effects of climate change, including extended droughts and wildfires, rising sea levels, and increasingly extreme weather and ensuing floods.

In June, DWR published the most up-to-date information on climate science and associated recommendations in the report, [California Climate Science and Data for Water Resources Management](#). Continued work in 2016 and beyond will address projected impacts on water supply and flood control systems, including identification of potential system redesign alternatives and other adaptation responses to climate change. The State continued to assist regions and other stakeholders in preparing for, and adapting to, climate change. For example, DWR partnered with the California Landscape Conservation Cooperative to host a training workshop for more than 70 natural resource managers seeking to work with tribes on appropriate use of traditional ecological knowledge. Such knowledge, learned and passed down by indigenous people, can help us better prepare and respond to future changes.

Action 3 — Achieve the Coequal Goals for the Delta

April brought a turning point in the future of the Sacramento-San Joaquin Delta (Delta). Governor Brown, flanked by officials from the White House and State and federal agencies, announced two revised strategies for achieving the coequal goals of Delta water-supply reliability and ecosystem restoration: California WaterFix and California EcoRestore.

Once fully implemented, [California WaterFix](#) will reduce conflicts with endangered fish species by addressing the current pattern of reverse flows in the Delta. The project will increase water-supply operational flexibility by adding a second point of diversion to the current system.

[California EcoRestore](#) is the State's five-year commitment to restoring at least 30,000 acres of Delta habitat. The successful completion of the Knights Landing Outfall Gates Fish Barrier Project is a prime example of EcoRestore's value. State agencies worked closely with Reclamation District 108 to ensure this project's completion in 2015, just in time to prevent the stranding of wayward and endangered winter-run Chinook salmon on their journey up the Sacramento River. DWR, the California Department of Fish and Wildlife (CDFW), and other State agencies are actively pursuing more than 20 additional EcoRestore restoration projects throughout the Delta region.



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

The Sacramento-San Joaquin Delta Conservancy (Conservancy) accelerated its efforts to contribute toward Delta restoration and local community sustainability. In December, the Conservancy finalized its Proposition 1 grant-solicitation package and is planning to award \$9 million for restoration projects in early 2016. The Conservancy also began sponsoring two regionally led habitat restoration planning efforts (Cache Slough and North East Delta). These regional plans will help guide future Proposition 1 funding decisions, as well as assist local agencies and others with related decision-making.

Neither the sources of current challenges nor their remedies are found exclusively within the Delta's boundaries. Recognizing this, the Administration and the Legislature provided funding and positions for the Water Board to accelerate the development of the Bay-Delta Water Quality Control Plan, a long-term regulatory program to improve Delta water quality and aquatic ecosystems. To help support the implementation of the Water Quality Control Plan, the CDFW and CNRA began working with partners to develop voluntary settlement agreements on several key tributaries of the Sacramento and San Joaquin rivers.

The Delta Plan, adopted by the Delta Stewardship Council (DSC) in 2013, will help support these and other State and local actions affecting the Delta through the use of best available science and adaptive management. Overall, 75 of the 118 Delta management actions recommended by DSC's plan are underway. To date, 20 have been completed.

Action 4 — Protect and Restore Important Ecosystems

In 2015, State, federal, and local partners helped return a threatened fish to its historic spawning grounds. They did it by tearing down a 100-foot-tall dam. In November, California State Coastal Conservancy (SCC) officials and others celebrated the largest dam removal in California's history, an accomplishment of enormous ecological and symbolic value. With the removal of the defunct San Clemente Dam, the project has opened up 25 miles of habitat critical to the recovery of South-Central California Coast steelhead and has restored more natural flows to the Carmel River. Over time, it also will restore natural beach sand deposition patterns for the fragile coastal ecology. This project epitomizes the vision articulated in *Action 4 — Protect and Restore Important Ecosystems*.



The landmark removal of the San Clemente Dam on the Carmel River has opened up access to over 25 miles of spawning and rearing habitat for endangered steelhead trout, and also is expected to benefit the California red-legged frog, another species listed as threatened.

Other restoration efforts unfolded across California in 2015. The Governor signed Salton Sea legislation and kick-started a renewed drive toward project implementation. He formed the Salton Sea Task Force to identify actions needed to protect regional air quality and ecosystem health at the sea. He also appointed a new Assistant Secretary to oversee coordination with State, federal, tribal, and local stakeholders in the effort to identify early-action projects and develop a long-term management plan for the Salton Sea.

Over a dozen State agencies updated or created new restoration grant programs funded by Proposition 1. These public funding programs will leverage the financial and technical expertise of local agencies, the nonprofit sector, and others to maximize restoration outcomes in every corner of the state.

California continued investing in the Lake Tahoe watershed, with State investments totaling over \$650 million since 1997. Many Tahoe-focused public agencies and nonprofit groups are actively pursuing additional funding from various Proposition 1 restoration programs.

With funding from the California Wildlife Conservation Board, California Department of Transportation, SCC, DWR, and other partners, the Sonoma Land Trust and Ducks Unlimited restored 1,000 acres of San Francisco Bay tideland habitat by breaching a decades-old levee. The Sears Point Wetland Restoration Project is a landscape-scale effort that proves the effectiveness of diverse and dedicated coalitions.

The San Joaquin River Restoration Program continued to make progress with essential multi-benefit flood protection and ecosystem restoration projects. During 2015, 12 design alternatives for fish passage were completed and 33 miles of river levees were inspected and evaluated. Work will continue in 2016, pending approval of the State Budget.

The Sierra Nevada Conservancy entered into formal partnership with the U.S. Forest Service to create the Sierra Nevada Watershed Improvement Program, an integrated approach to watershed restoration, wildfire management, air quality, and economic sustainability.

Innovation was a hallmark of restoration efforts. The CDFW invested tens of millions of dollars from the Greenhouse Gas Reduction Fund in various coastal, Delta, and mountain-habitat restoration projects that also sequester carbon dioxide, the primary driver of global climate change. This program and others like it will take advantage of the capacity of healthy, restored ecosystems to accumulate and store atmospheric carbon.

In 2015, DWR continued work on construction of the 50-acre Sherman Island flood-scour-site stabilization and associated habitat enhancements, as well as on

the final design and permit application for construction of 1,100 acres of Dutch Slough tidal habitat and related habitat restoration. DWR also proceeded with the design and scoping of a 140-acre habitat mitigation and enhancement site involving Delta levees on Twitchell Island.

Consistent with the principle of “One Delta, One Science” and the call for integrated science in the Delta, which is highlighted in the Delta Science Plan, DSC’s Science Program invested in a strategic set of actions and research. Those actions and research efforts included “big data” management, improved integrated modeling, management of invasive aquatic weeds, and ecological responses to the emergency drought barrier (see Action 5). Additionally, several of the multi-agency–endorsed Delta Plan Interagency Implementation Committee’s High-Impact Science Actions were initiated in 2015. These critical science investigations are designed to inform future management decisions in the Delta.

The Water Board and the CDFW moved ahead with a program to enhance flows in five stream systems to support critical habitat for anadromous fish. The five streams are Mark West Creek (Russian River tributary), Mill Creek (Sacramento River tributary), Shasta River, South Fork Eel River, and Ventura River. With the effects of the drought falling disproportionately on the State’s fisheries, the Water Board also took emergency action, as recommended by the CDFW, to provide minimal flows in key tributaries to prevent possible extirpation of several important species.

Action 5 — Manage and Prepare for Dry Periods

Drought gripped California for a fourth consecutive year in 2015, resulting in the drying up of 2,200 groundwater wells that supply water to at least 9,000 residents. The drought also had major impacts on productivity and jobs in the state’s agricultural sector. One U.C. Davis study estimated a net water-supply loss of 2.5 million acre-feet during the year, as well as \$2.7 billion in statewide economic losses and 18,600 lost jobs (Howitt et al. 2015). More than 4,700 wildfires left land charred and vulnerable to erosion and mudslides.

With funding from the CDFA, the U.C. Davis Center for Watershed Sciences conducted a study of the impacts of the drought on farmers and ranchers in 2015. The study found that the drought is responsible for the greatest water loss ever seen in California agriculture, with river water for Central Valley farms reduced by roughly one-third. Central Valley unemployment and the number of fallowed acres also increased significantly.

In March, facing another year of extremely dry conditions, the Legislature approved and the Governor signed a \$1 billion emergency drought package to help communities cope with California’s devastating drought. In April, the Governor announced actions that would save water, increase enforcement to prevent wasteful water use, streamline the State’s drought response, and invest in new technologies that would make California more drought resilient. In response, the Water Board issued water-right curtailment orders for the Sacramento-San Joaquin and Delta watersheds and the Scott River, the Antelope, and the Deer Creek watersheds. In addition, DWR installed, and later removed, a salinity drought barrier to successfully stop the encroachment of ocean saline waters into the Delta.



The State installed a salinity drought barrier to stop the encroachment of saline waters into the Sacramento-San Joaquin Delta due to the lack of freshwater flows.

Victims of the state’s historic four-year drought include small towns in California’s Central Valley where drinking water wells have gone dry. Since September, 2014, the California Governor’s Office of Emergency Services (Cal OES) has provided more than \$8 million dollars to local governments for emergency deliveries

of potable water supplies. Additional funding was committed to emergency food, housing, and utility assistance, as well as to water conservation and infrastructure projects. These efforts provided millions of dollars to water agencies around the state to deliver water, drill wells, run pipe, and make infrastructure improvements. In many cases, State assistance was complemented by federal assistance from the U.S. Bureau of Reclamation and the U.S. Department of Agriculture, local cost-sharing, volunteer support, and aggressive conservation actions by Californians.

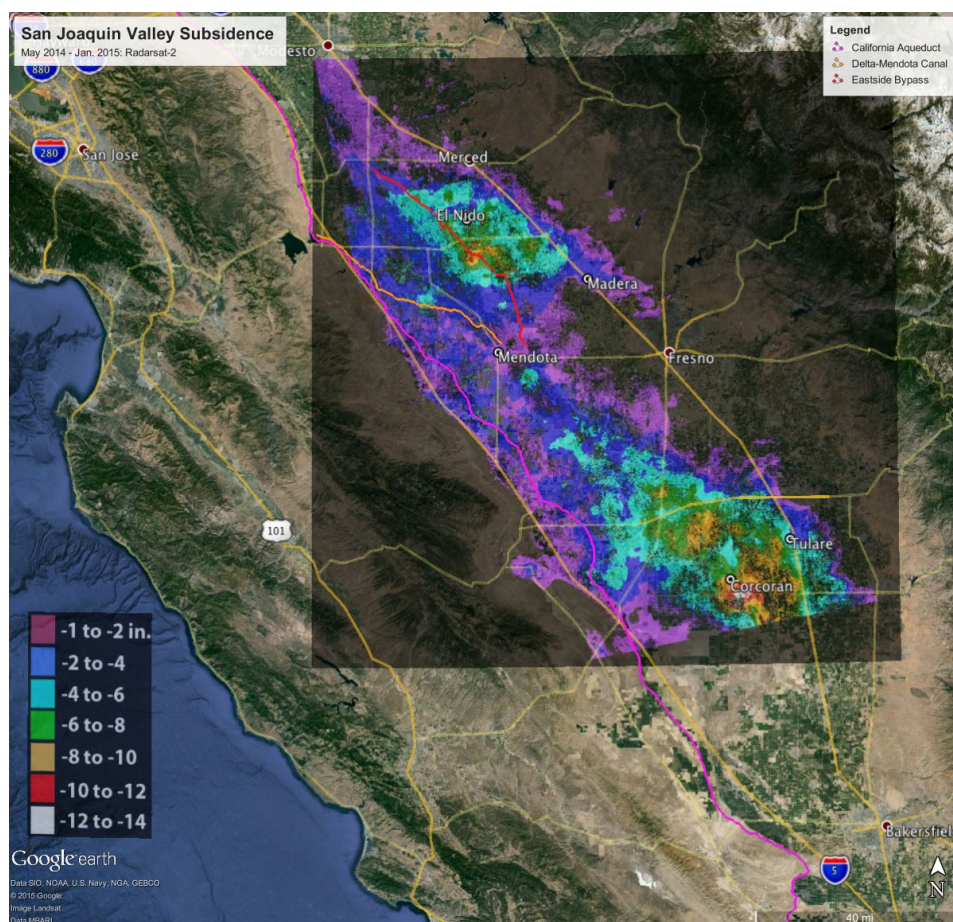
The State Drought Task Force, established in 2013 by the Governor's Office, continued to meet monthly throughout 2015 to tackle tough issues in a coordinated manner. Perhaps the most notable cooperative achievement was the collaborative response to the National Aeronautics and Space Administration report (NASA 2015) on land subsidence released in the fall. That report reveals land subsidence occurring at an alarming rate, as much as 2 inches per month in some areas of the Central Valley.

The subsidence is caused by excessive groundwater pumping that occurred after cuts were mandated in surface water allocations. Subsidence is threatening vital infrastructure, including major water supply systems, flood control levees, transportation networks, and gas and electrical utilities. The members of the Drought Task Force traveled to and met with affected Central Valley communities, listened to their needs, and created an initial list of strategies for addressing the crisis.

The Drought Task Force also initiated a monthly statewide tribal government consultation on drought issues for California Native American Tribes. The monthly meetings were held throughout 2014 and 2015 and included the participation of federal partners, such as the Bureau of Indian Affairs, Indian Health Service, U.S. Department of Agriculture, U.S. Coastal Guard, and National Guard.

Tribal concerns regarding drought impacts were elevated to the Drought Task Force, including cultural resources exposed by low and receding water levels; impacts on natural resources and fisheries; bark beetle infestation on forestry land; and illegal marijuana plantation operations on tribal lands, which siphon surface water from important tributaries and waterways.

These and other drought-related accomplishments and publications can be found on the State's California [Drought website](#).



A report released by NASA Fall 2015 shows alarming rates of land subsidence due to excessive groundwater pumping during times of drought. The Central Valley has been hardest hit.

Action 6 — Expand Water Storage Capacity and Improve Groundwater Management

The Action Plan calls for a multi-faceted approach to improving the resiliency of water supply systems in California. In addition to conveyance solutions discussed in Action 3, Action 6 calls for financial support of water storage and conjunctive management, and sustainable groundwater management and cleanup of the state’s contaminated groundwater reservoirs.

Proposition 1 dedicated \$2.7 billion for investments in water storage projects and designated the California Water Commission (CWC) as the agency responsible for appropriately allocating these funds. The CWC, through its [Water Storage Investment Program](#) (WSIP), will fund the public benefits of these projects. Eligible projects also must provide measurable benefits to the Delta ecosystem or its tributaries.

In April 2015, the CWC convened a Stakeholder Advisory Committee to provide technical and policy input as they developed the new program. The committee of 31 seasoned water experts and stakeholders provided perspectives representing a broad spectrum of California interests during their meetings, which concluded in October. During the year, the CWC conducted an inventory of more than 100 potential storage projects throughout the state. At their December meeting, the CWC directed staff to begin the formal Office of Administrative Law rulemaking process for the WSIP regulations.

In 2015, the State launched implementation of the Sustainable Groundwater Management Act (Act), a package of laws passed in 2014 that aims to protect the groundwater basins that provide a critical source of water supplies to many Californians in dry years. This landmark law requires landowners, water agencies, and land-use authorities to come together in governance and develop plans to sustainably manage groundwater, in the context of an overall regional water balance. The State’s role is to provide the financial incentives and technical tools, as well as enforcement needed, to ensure implementation of the legislation. The key to success, however, lies with the local agencies and their willingness to balance regional supply and demand in a more sustainable manner.

A host of achievements were realized during 2015 to implement the historic groundwater legislation.

- The State established Web pages to provide transparency and easy access to information, such as an [interactive groundwater map](#) and an interactive map conveying [groundwater well data](#).
- AB 1390 and SB 226 will allow the State to integrate and streamline the groundwater adjudication process for basins subject to the Act, and thus bring greater clarity to implementation actions.
- SB 13 amends and clarifies numerous California Water Code sections of the Act. DWR hosted an SB 13 webinar for local agencies in November to explain changes to the law.
- DWR convened a number of advisory groups (e.g., California Native American Tribes, environmental groups, and counties) to help establish a common understanding of complex issues associated with forming groundwater sustainability agencies (GSAs), revising groundwater basin boundaries, and developing groundwater sustainability plans. Input received during these sessions is informing the development of regulations. Although the Act states that tribal participation is not mandatory, realizing the goal of full local participation of stakeholders, including California Native American Tribes, will ensure successful groundwater management statewide.
- Numerous agencies proactively notified DWR of their intent to become GSAs. This information is now publicly accessible on DWR’s [Sustainable Groundwater Management](#) Web page.
- In August, DWR released a preliminary list of 21 groundwater basins and subbasins that have been significantly overdrafted by excessive pumping and thus fall under the earliest deadlines required by the Act.
- In October, the CWC approved DWR’s proposed Basin Boundary Regulation, and the regulation went into effect on November 16. Local agencies now have the opportunity to request a modification to their basin boundaries, with all information publicly accessible on the Web.

Following establishment of governance and basin boundaries, the next important step for local GSAs is to develop groundwater sustainability plans. DWR is working on new regulations — set to be established in mid-2016 — to describe what constitutes an adequate plan. In preparing for this regulation, and to assist the local agencies, DWR hosted advisory group meetings with stakeholders and published various discussion papers.

Farmers have stepped up and begun on-farm flood flow capture and recharge projects in some areas of the state. During dormant periods, agricultural lands have the potential to serve as percolation basins for groundwater recharge. In the summer of 2015, scientists at University of California Cooperative Extension released a report identifying 3.6 million acres of farmland suitable for groundwater recharge.

Action 7 — Provide Safe Water for All Communities

In 2015, the Water Board published the *Safe Drinking Water Plan for California*, which assesses the overall quality of the state's drinking water, identifies specific water-quality problems, reveals the known and potential health risks associated with drinking water contamination in California, and recommends strategies to improve drinking water quality. The Administration continued to work with local governments, communities, and water agencies to help develop innovative strategies for addressing governance, technical assistance, capital improvements, and ongoing operations and maintenance costs involved in bringing public water systems in small disadvantaged communities into compliance with State and federal regulations. Legislation signed by the Governor authorizes the Water Board to require a public water system — under certain conditions — to consolidate with a failing water system, when doing so would be best for small communities.

In March, pursuant to AB 92, the Office of Sustainable Water Solutions (Office) was established within the Water Board. The Office was created to provide sustainable drinking water and wastewater treatment solutions and financial and technical assistance, particularly to small disadvantaged communities.

In August 2015, the Water Board released Proposition 1 funding guidelines addressing \$260 million for drinking-water infrastructure improvements. Those funds are now available with a continuous application process, along with low-interest loans through the Infrastructure State Revolving Fund Loan Program.

Responding to the Governor's November executive order, the Water Board took an additional step in December when it adopted a resolution authorizing the allocation of \$5 million in Cleanup and Abatement Account funds to help residents on private wells and small water systems who are facing immediate drought-related water shortages.

The Water Board continued to assist communities affected by the drought by supplying \$29 million in grant funding for well replacement and rehabilitation, interties, extension of service, consolidation of water systems, and delivery of hauled and bottled water.



Potable water being delivered to homes whose wells have run dry in East Porterville, California, July 2015.

Action 8 — Increase Flood Protection

California is vulnerable to extreme changes in weather and hydrology. In the midst of a fourth year of devastating drought, the state faces the prospect of intense storms and flooding triggered by El Niño weather patterns (Pacific Ocean warming). Already, at the start of the 2015–2016 wet season, Southern California hillsides produced torrential mudslides that buried a section of Interstate 5 and damaged a segment of the California Aqueduct.

Public awareness and preparedness are essential to minimizing flood damage. The State’s flood-preparedness campaign kicked off in October, with statewide media stories and tours for officials from the Joint Flood Operations Center in Sacramento. To generate more widespread awareness and augment existing online resources, Cal OES established a new flood-ready website, titled [California Storm Ready](#). In the months leading up to October, DWR completed inspections of 1,600 miles of state-owned levees and finalized the Delta Flood Emergency Management Plan.

In response to unprecedented demand, DWR trained more than 1,000 public agency staff statewide on sandbagging and other flood-fight methods through December. Similarly, over 700 flood emergency managers attended DWR’s 12 regional Preseason Flood Meetings, to review emergency procedures and enhance agency coordination. By December, DWR increased strategically pre-positioned flood-fight materials in warehouses and pre-loaded containers to 25 locations throughout the state — 10 sites more than in previous years. Having these materials strategically pre-positioned prior to a flood event allows DWR to promptly support local response.

During 2015, DWR made available \$343 million of the Proposition 1E funding for 13 urban and non-urban local flood-risk-reduction projects and feasibility studies to reduce flood risk in areas protected by state-owned flood infrastructure. In all, the projects are estimated to provide better protection for 600,000 people and more than \$1 billion in assets.

DWR also awarded \$5 million in Proposition 84 funding to 20 local agencies statewide to improve flood emergency response. The funding will help agencies update or develop flood safety plans, conduct Standard Emergency Management System/National Incident Management System training, conduct exercises, purchase flood-fighting supplies and equipment, and upgrade computerized flooding alert systems.

History has demonstrated the vulnerability of the aging levees in the Delta and the tremendous damage that can ensue when levees fail, including damage to water supply systems. During 2015, the DSC published an issue paper describing flood risks, levee conditions, and the status of State funding programs, and developed a computer-assisted decision support tool to evaluate potential levee investments. An independent mid-course science review of the project found the proposed methodology and planning tool “to have worthwhile potential in assisting the decision-making of investment priorities for levees” and concluded that both will be informative to the overall effort to recommend State investments for Delta levees.

The Yolo Bypass, authorized by Congress in 1917, protects residents of the Sacramento metropolitan area, local industry, a major state transportation hub, and the State Capitol from flooding. Located in the heart of the Pacific Flyway, the Yolo Bypass Wildlife Area’s approximately 16,600 acres are a haven for fish, waterfowl, and other wildlife, and much of the land supports rice and other agricultural uses. During 2015, the CNRA convened State, federal, and local partners to embark on implementation of a comprehensive plan for the Yolo Bypass. The plan’s purpose is to considerably improve flood protection for the Sacramento region while providing for fish passage, habitat, water supply, recreation, and other benefits. Structural and ecosystem improvements planned for the bypass will preserve or 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.

Action 9 — Increase Operational and Regulatory Efficiency

Action 9 calls for increased coordination among agencies to improve operational and regulatory efficiency, including improved coordination of State Bay-Delta actions. The Delta Plan Interagency Implementation Committee, comprised of 17 high-level State and federal agency representatives, met twice in 2015 to hear reports on work affecting the Delta, including implementation of the multi-benefit Yolo Bypass improvements and the Delta Science Program. Notably, the committee endorsed 15 High-Impact Science Actions to support improved Delta management. Already, funds from the fiscal year 2015–2016 budget and Proposition 1 are being committed to support this important research.

During the year, the CNRA, the U.S. Department of the Interior, and the National Marine Fisheries Service requested an unbiased assessment of the Delta's future under status-quo management. The call was answered by four former Delta Science Program lead scientists who participated in the Delta Challenges Workshop in the spring and subsequently authored the report *Challenges Facing the Sacramento-San Joaquin Delta: Complex, Chaotic, or Simply Cantankerous?* (Luoma et al. 2015). This report takes information spread across diverse publications and presents it in a concise, readable fashion for members of Congress, legislators, and the public.

The report details challenges facing the Bay-Delta system within the context of the physical, water supply, water quality, ecological, and institutional complexity of the Delta. It also illustrates how this complexity makes it impossible to address challenges individually.

The four scientists confirm that current management of the Delta is unsustainable and demonstrate how the current drought highlights the limitations of traditional approaches that consider solutions in isolation. The report underscores the importance of multi-institutional science as a means of addressing future uncertainty in the Delta, which will likely be exacerbated by climate change and sea level rise. The authors express optimism that “California has the tools and the intellectual resources to manage the multiple

dimensions of the problem and thereby achieve the state's twin goals of a reliable water supply and an ecologically diverse Delta ecosystem.”

In 2015, State and federal water management and regulatory agencies attempted to use these existing tools and capabilities to flexibly manage, in real-time, the State's water systems to provide water for people, agriculture, and fish. Given the severity of the drought, success was limited; however, the experience of working together and exchanging information in a timely and transparent manner will ensure a more effective, coordinated response during future dry periods.

Action 10 — Identify Sustainable and Integrated Financing Opportunities

The Action Plan has been instrumental in focusing California water agencies and stakeholders on a common set of goals and priority actions to achieve more sustainable management of the state's water resources. But implementation of all work described in the Action Plan will require additional investment over the current base budget by State, local, and federal agencies. As securing additional funding becomes more challenging, careful prioritization of State's investment in water management actions and leveraging of various sources of funding become critical.

Proposition 1 authorized \$7.545 billion in general obligation bonds to fund ecosystems and watershed protection and restoration; water supply infrastructure projects, including surface and groundwater storage; and drinking water protection. As shown in the table below, the Administration and Legislature worked together to ensure that a good portion of Proposition 1 funding was committed during the 2015–2016 fiscal year to myriad actions, including those identified in the Action Plan.

During 2015, the CNRA enhanced its [Bond Accountability](#) website, which provides easy public access to Proposition 1 grant resources, including State agency contact information. In addition, as called for by Proposition 1, the CNRA provided consistency reviews for all State agency funding-solicitation packages, and worked with DWR and the Water Board to hold a tribal consultation workshop in the fall.

Proposition 1 Chapters	Allocation \$7,545,000	Committed \$4,857,809	Balance \$2,687,191
Clean, Safe and Reliable Drinking Water	\$520,000	\$469,183	\$50,817
Protecting Rivers, Lakes, Streams, Coastal Waters and Watersheds	\$1,495,000	\$173,026	\$1,321,974
Regional Water Security, Climate, and Drought Preparedness	\$810,000	\$232,450	\$577,550
Statewide Water System Operational Improvement and Drought Preparedness	\$2,700,000	\$2,646,000	\$54,000
Water Recycling	\$725,000	\$342,250	\$382,750
Groundwater Sustainability	\$900,000	\$844,000	\$56,000
Flood Management	\$395,000	\$0	\$395,000
Statewide Bond Costs	\$0	\$150,900	(\$150,900)

Note: All dollar amounts are in thousands.

Source: Adapted from California Natural Resources Agency 2015

Despite the infusion of bonds and federal revolving loan funds over the last decade, current investments are not keeping pace with the funding needed to attain sustainable management of the state’s water resources. Today, we have the opportunity to continue pivoting from our historic pattern of reactionary damage control toward sustained and strategic planning and response to California’s water management needs. Making that leap will require agencies to continue their efforts to align programs in the pursuit of common outcomes; commit to planning and managing in an integrated fashion; and cultivate stable, reliable sources of funding.

Pending State Budget approval, the 2018 update to the California Water Plan will include — for the first time — specific outcomes and metrics to track water management performance, tools to inform policy and decision-making, prioritized near-term investment needs, and recommended options for sustainable financing. Throughout 2016, DWR will engage State, federal, tribal, and local agencies and stakeholders in the development of Update 2018.

Other Work to Support Action Plan Implementation

Implementing the Action Plan requires agency cooperation and commitment to achieve sustainable outcomes; oversight to track and report on outcomes achieved; and a significant investment of resources, existing and new. Good progress has been made during the last two years in each of those areas, but much remains to be done. If California is to secure the path toward reliability, restoration, and resilience, the Legislature and the public must continue to support State services foundational to the success of the Action Plan. Such services include the collection and analysis of water data and decision-support tools to inform policy and future investment priorities.

Figure 2 presents a projected schedule of activities and agency roles for the five-year term of the Action Plan, with the intention that the momentum will continue and work will proceed beyond the current Administration to future State leadership.

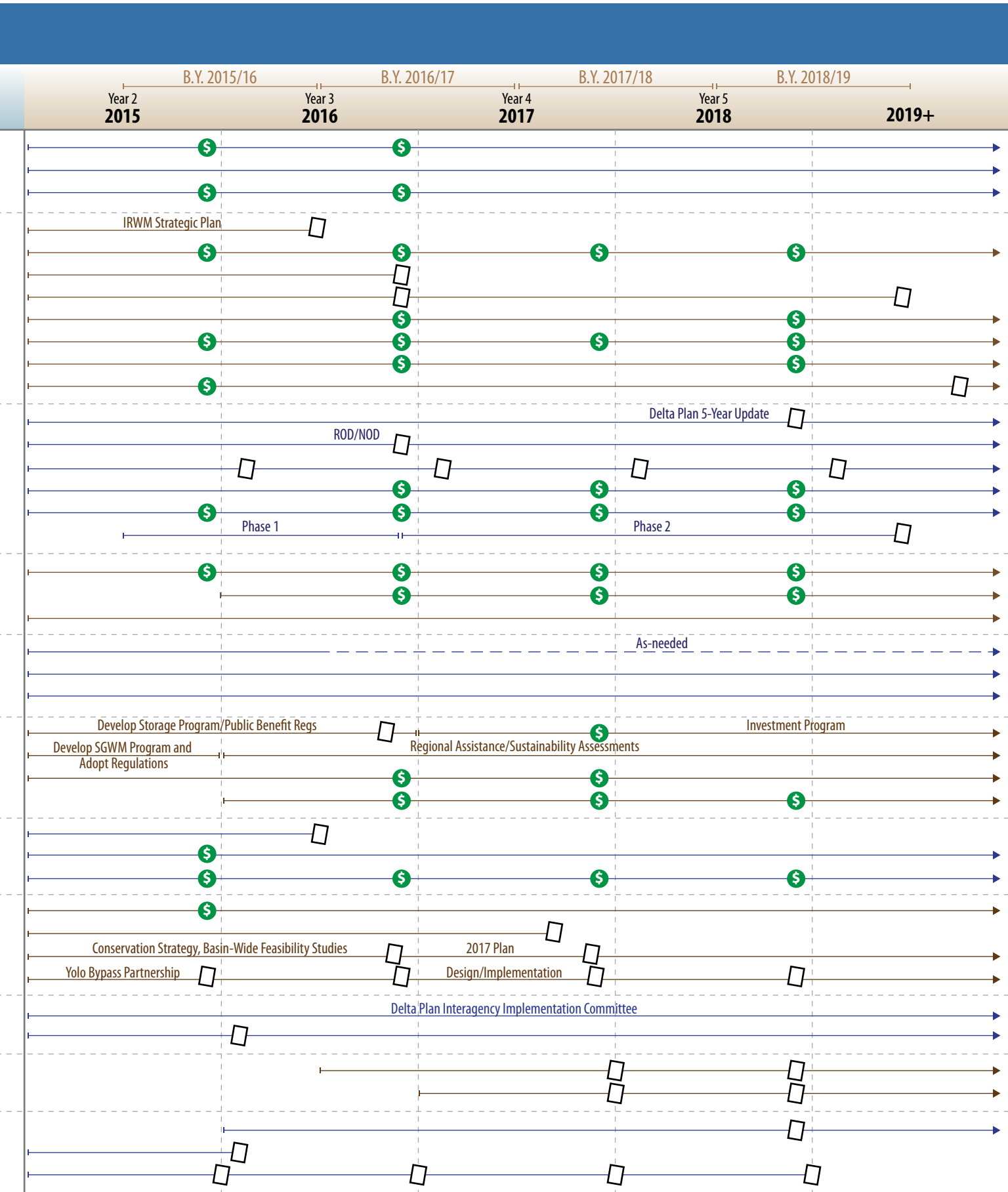
Actions	Agency	Activity
1. Make conservation a California way of life	DWR DWR, DSC DWR, CDFA, CEC	Prop 50/Prop 1 Urban and Agriculture Local Assistance "Save Our Water" Campaign, Delta Science Seminars Water and Energy Grants
2. Increase regional self-reliance and integrated water management across all levels of government	DWR DWR OPR Water Board Water Board Water Board DWR DWR	IRWM Enhancement Recommendations Prop 84/Prop 1 IRWM Local/DAC Assistance Land Use/Water Management Recommendations Recycled Water Regulations Prop 1 Stormwater Local Assistance Prop 1 Water Recycling Technologies Prop 1 Desalination Grants Prop 204 Drainage Reuse
3. Achieve the co-equal goals for the Delta	DSC DWR CNRA CDFW, DC, DWR DSC Water Board	Delta Plan California WaterFix California EcoRestore Prop 1 Delta Watershed Restoration Projects Implement High Impact Delta Science Actions, Others Bay-Delta Water Quality Control Plan Update
4. Protect and restore important ecosystems	CDFW, DWR, WCB, others CNRA DWR, CDFW	Prop 1 Grant Projects Prop 1 State Obligations Habitat Restoration San Joaquin River Restoration
5. Manage and prepare for dry periods	DWR DWR, CalOES, Water Board, others DWR, USBR	Critical Water Shortage Preparedness/Information Management Assist Communities In Need SWP/CVP Operation/Water Transfer Management
6. Expand water storage capacity and improve groundwater management	CWC, Water Board, CDFW, DWR DWR, Water Board DWR Water Board	Prop 1 Water Storage Investment Program Sustainable Groundwater Management Prop 1 Sustainable Groundwater Planning Prop 1 Groundwater Contamination Clean-up Grants
7. Provide safe water for all communities	Water Board Water Board Water Board	Safe Drinking Water Plan for California Prop 1 Wastewater Treatment Projects Prop 1 Drinking Water/Small Community Grant Program
8. Increase flood protection	DWR DSC/DWR DWR, CVFPB CNRA, DWR, CDFW, others	Flood System Improvements (Small Communities, Systemwide) Delta Levee Investment Strategy Central Valley Flood Protection Plan 2017 Integrated Yolo Bypass Project
9. Increase operational and regulatory efficiency	DSC, 17 agencies DWR, DSC, CDFW, others	Bay-Delta Activities Coordination State/Federal System Operations Improvements
10. Identify sustainable and integrated financing opportunities	DWR, others DWR, others	Investment Strategy Finance Plan
Other Work to Support Action Plan Implementation	DWR CNRA, CalEPA, CDFA CNRA, CalEPA, CDFA	Statewide Water Planning/CA Water Plan Updates Update to the CA Water Action Plan Action Plan Implementation Management/Reporting

Agency Acronyms

CalEPA– California Environmental Protection Agency
CalOES– California Office of Emergency Services
CDFA– California Department of Food and Agriculture
CDFW– California Department of Fish and Wildlife

CNRA– California Natural Resources Agency
CEC–California Energy Commission
CVFPB– Central Valley Flood Protection Board
CWC– California Water Commission
DC– Delta Conservancy

DSC– Delta Stewardship Council
DWR– California Department of Water Resources
OPR– Governor's Office of Planning and Research
Water Board– State Water Resources Control Board
WCB– California Wildlife Conservation Board



grant awards
 deliverables

Note: This is an estimated schedule for informational purposes with selected major/representative ongoing and planned activities shown. It is subject to change based on 2016 Budget Act, Prop 1 appropriations and other Legislative directives.

Endnotes

California Natural Resources Agency. 2015. Bond Accountability: Proposition 1 Overview. [Web page.]

Viewed online at: <http://bondaccountability.resources.ca.gov/p1.aspx>.

Howitt RE, J Medellín-Azuara, D MacEwan, JR Lund, and DA Sumner. 2015. *Preliminary Analysis: 2015 Drought Economic Impact Study*. Davis (CA): U.C. Davis Center for Watershed Sciences. 9 pp.

Luoma, SN, CN Dahm, M Healey, JN Moore. 2015. "Challenges Facing the Sacramento-San Joaquin Delta: Complex, Chaotic, or Simply Cantankerous?" *San Francisco Estuary and Watershed Science*, 13(3). Viewed online at: <http://escholarship.org/uc/item/3nd0r71d>.

National Aeronautics and Space Administration (NASA). 2015. *Progress Report: Subsidence in the Central Valley, California*. Prepared for the California Department of Water Resources by Tom B. Farr, Cathleen Jones, and Zhen Liu of NASA's Jet Propulsion Laboratory, Pasadena, CA. Viewed online at: http://www.water.ca.gov/groundwater/docs/NASA_REPORT.pdf.

Appendix A

2014 Highlights

January

Governor Releases Water Action Plan

Governor releases *California Water Action Plan*, following coordination with state agencies, tribes and public

Governor Takes Action on Drought

Governor issues drought emergency declaration and proposes 2014/15 State budget that includes funding for Action Plan implementation, including drought response (**Actions 1-5**)

Drought Forum Raises Awareness

CDFA sponsors forum to discuss drought information needs and ways to improve preparedness (**Action 5**)

Adjusted Operations Save Water

Upon petition by DWR & BOR, State Water Board issues order to allow adjusted operation of the State and Federal Projects to save water for critical needs (**Actions 5, 9**)

Integrated Projects Receive Grants

DWR awards \$153M to 20 regions to support 138 integrated multi-benefit projects (**Actions 2, 5**)

March

Emergency Legislation Helps Drought-Stricken Communities

Governor and Legislature collaborate on accelerated drought relief and Action Plan implementation package (SB 103/104; over \$687M). State agencies quickly responded by working with the American Red Cross and community organizations to deliver water to those in need (**Actions 1, 2, 5, 7**)



Low Interest Loans for Water Recycling

State Water Board makes available \$800M in low-interest loan funds to increase water recycling and provide alternative drought-proof supply for communities (**Actions 1, 2, 5, 7**)

May

Save Our Water Month

Governor proclaims May to be *Save Our Water Month* and State Intensifies public campaign with TV/radio ads and planned State Fair Exhibits (**Actions 1, 5**)

Work Begins to Prioritize Delta Levee Investments

DSC releases concept paper and establishes inter-agency funding agreements to prioritize State investments in Delta levees, consistent with the Delta Plan (**Actions 3, 8**)

State Coordinates Voluntary Actions in Key Watersheds

State Water Board adopts emergency fish flow regulations to maintain minimum flows in 3 Sacramento River tributaries, and coordinates with CDFW to develop voluntary cooperative agreements with landowners to achieve minimum flows (**Action 4**)

Emergency Funding for Drinking Water Systems

State Water Board issues the first grants to aid communities with drinking water systems impacted by drought. By summer's end, over \$13 M was granted (**Actions 2, 5, 7**)

February

State Closes Rivers to Fishing

The CA Fish & Game Commission takes unprecedented emergency action to close waters to fishing to protect native fish from low water flows in waterways significantly impacted by drought (**Actions 4, 5**)



State Addresses Fisheries Crisis

CDFW begins coordinating with federal agencies and commercial fishing industry, leading to State-led trucking of 30M fish to the SF Bay (**Actions 4, 5, 9**)

April

Governor Orders Redoubling of Drought Efforts

Governor issues Executive Order to redouble state response to drought. Aims to increase water management flexibility for state/local water managers and regulatory entities and provide conservation incentives (**Actions 1, 5**)

State Publishes Groundwater Shortages Report

DWR publishes report identifying groundwater basins in the state with potential groundwater shortages and gaps in groundwater monitoring (**Actions 5, 6, 7**)

June

Final State Budget Funds Action Plan and Drought Relief

Final 2014/15 State Budget provides an additional \$100M+ in funding priorities for the Action Plan and helps lay solid fiscal foundation for implementing near-term actions, including money for water supply assessments, local technical assistance, water rights enforcement, and fish habitat restoration (**Actions 1, 2, 4, 5**)

Delta Communities Receive Flood Emergency Response Funds

DWR awards \$5M in grants to flood control agencies in the Delta to prepare for flood emergencies (**Action 8**)

State Prioritizes Groundwater Basins

DWR releases statewide ranking of 515 groundwater basins in the state collectively producing greater than 90% of California's annual groundwater; 127 basins ranked high and medium priority (orange/yellow on map) (**Action 6**)

State Eases Path to Recycled Water Use

State Water Board adopted a new General Order allowing the regional boards to streamline the permitting of recycled water uses, including agricultural and landscape irrigation, dust control, and some industrial processes (**Actions 2, 9**)

July

State Consolidates Water Quality Programs

Effective July 1, Drinking Water Program is relocated from CDPH to State Water Board; consolidating major water quality programs within the Board allows State to better manage/protect water resources and ensure safe drinking water for Californians **(Actions 2, 7, 9)**

State Adopts Emergency Conservation Regulation

State Water Board approves emergency regulation to ensure urban water agencies and their customers increase water conservation or face possible fines/other enforcement **(Actions 1, 5)**

New Grant Program will Restore Wetlands and Reduce Carbon

CDFW releases grant solicitation for wetland restoration projects to be awarded in 2015; projects will sequester greenhouse gas/carbon, restore critical wildlife habitats, and aid water supply objectives **(Action 4)**

September

Water Year 2014 ends as California's 4th driest

Landmark Groundwater Legislation Passes

The Legislature passes, and the Governor signs, historic groundwater policy reform that paves the way for sustainable groundwater management across the state. Emphasis is on local control, coordinated basin management, and limited but effective state involvement **(Action 6)**



Families without Drinking Water Get Relief

Governor issues order making funding available through the California Disaster Assistance Act to provide water for drinking and sanitation to households currently without running water **(Actions 5, 7)**

November

Voters Approve Water Bond (Proposition 1)

An unprecedented 64% of California voters approve a \$7.5 billion water bond, designed to help implement the Action Plan's broad range of actions

Agency Coordination Promotes Efficiency on Delta Solutions

Delta Stewardship Council (DSC) convenes the second Delta Plan Interagency Coordinating Committee meeting, focusing on advancing Delta science, cross-agency collaboration, and Action Plan implementation **(Actions 3, 4)**

State Publishes Report on Drought Impacts to Groundwater

DWR publishes report identifying areas where drought has significantly impacted groundwater resources **(Actions 5, 6, 7)**

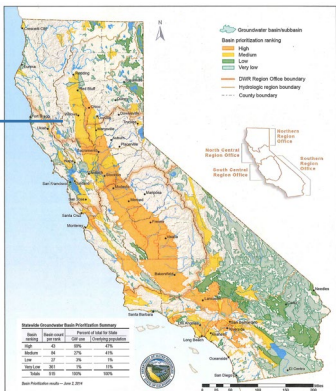
August

Grants Promote Water Desalination

DWR awards a total of \$8.7M in grants to eight water desalination projects throughout the state focusing on construction, research, feasibility and/or demonstration **(Actions 1, 2, 5)**

Legislature Approves New Water Bond

The Legislature and the Governor negotiate and approve AB 1471 (Rendon), a \$7.5 billion water bond slated for the November Ballot **(Actions 1-8)**



October

State Publishes California Water Plan Update

DWR, on behalf of the State, publishes the 2013 update of the *California Water Plan* (Bulletin 160), continuing the legacy that began with the 1957 Bulletin 3- California Water Plan. This update includes vital information on the State's water conditions, including groundwater and flooding **(All actions)**

Grants Aid California Farmers

CDFA awards \$3.6M in Greenhouse Gas Reduction funds for 93 projects to implement on-farm irrigation systems that use less water and energy and reduce greenhouse gas **(Actions 1, 5)**

Expedited Grants Increase Regional Self Reliance

DWR announces \$221M in grants to regions (incl. disadvantaged communities) to implement over 100 near-term drought relief projects, leveraging more than \$3 local per \$1 state funds. Shortest grant process in history of IRWM program **(Actions 2, 5)**

December

Grant Program Encourages Water-Energy Efficiency

DWR receives 96 applications requesting \$142M in Greenhouse Gas Reduction Funds for the 2014 Water-Energy Grant Program, well in excess of the \$19M available. Awards will be made in 2015 **(Actions 1, 2, 5)**

State Continues Collaboration with Tribes

California Tribes and state resource agencies finish a year of monthly consultation and coordination meetings about drought response, conservation programs, and impacts on cultural resources **(Actions 2, 5)**

Useful Web Links

California Climate Science and Data for Water Resources Management (PDF):

http://www.water.ca.gov/climatechange/docs/CA_Climate_Science_and_Data_Final_Release_June_2015.pdf

California Drought: <http://ca.gov/drought/>

California EcoRestore: <http://resources.ca.gov/ecorestore/>

California Natural Resources Agency, Bond Accountability: <http://bondaccountability.resources.ca.gov/>

California Storm Ready: <http://storms.ca.gov/>

California Water Action Plan: http://resources.ca.gov/california_water_action_plan/

California WaterFix: <http://www.californiawaterfix.com/>

DWR Interactive Groundwater Map: <https://gis.water.ca.gov/app/boundaries/>

DWR Interactive Map, Groundwater Well Data: <https://gis.water.ca.gov/app/gicima/>

DWR Sustainable Groundwater Management: <http://www.water.ca.gov/groundwater/sgm/>

Safeguarding California: Reducing Climate Risk (PDF): <http://resources.ca.gov/climate/safeguarding/>

Save our Water: <http://saveourwater.com/>

State Water Resources Control Board, Division of Drinking Water:

http://www.waterboards.ca.gov/drinking_water/programs/index.shtml

Water Storage Investment Program: <https://cwc.ca.gov/Pages/PublicBenefits1.aspx>



