# 2025 Annual Review

## of the construction and operation of the

# State Water Project

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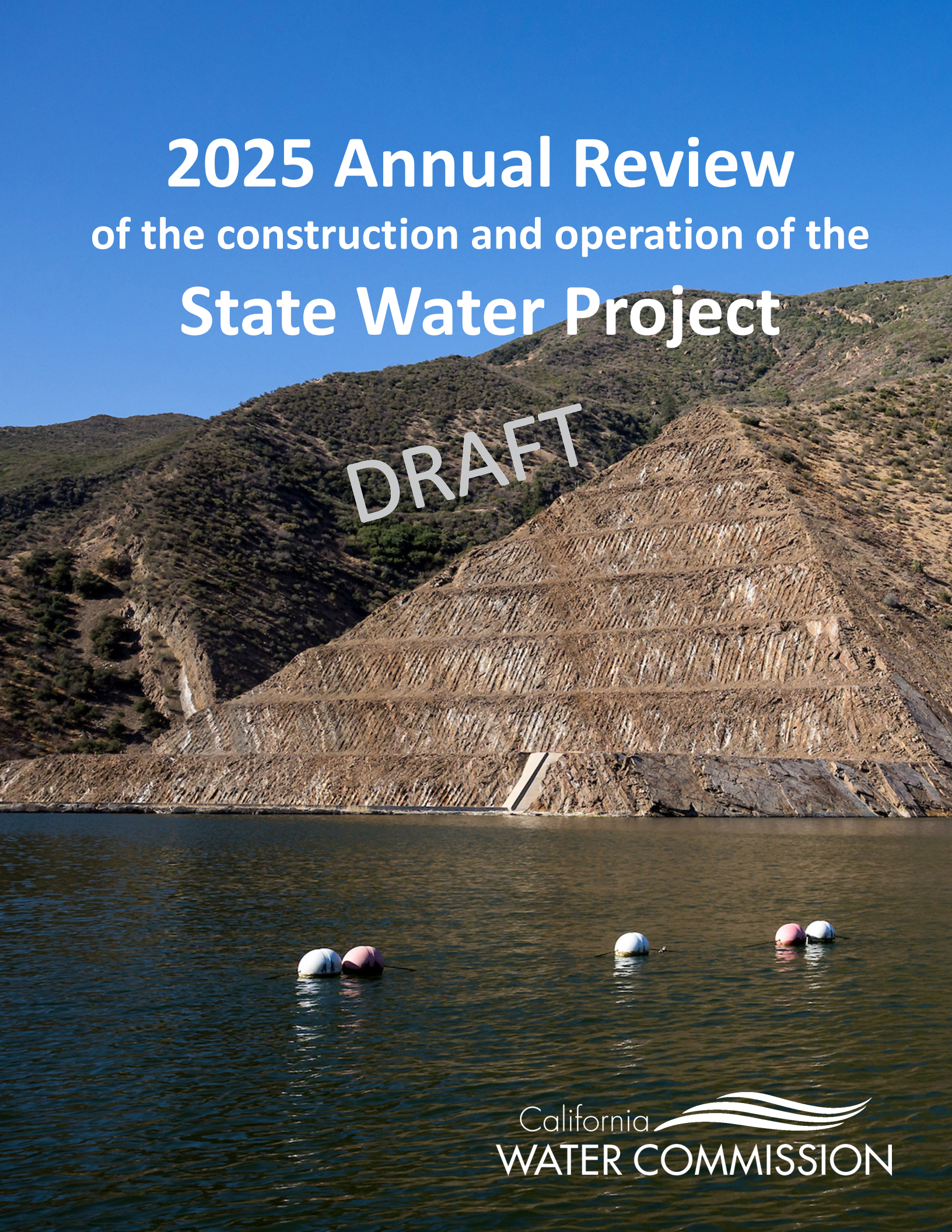

California
WATER COMMISSION

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*On the cover: Pyramid Lake, a reservoir in Los Angeles County is formed by Pyramid Dam on Piru Creek near Castaic, California. Photo by Xavier Mascareñas/DWR*

## 2025 CALIFORNIA WATER COMMISSION

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## INTRODUCTION

The State Water Project (SWP) is the nation's largest state-built, multi-purpose water project that is paid for by its beneficiaries – primarily the water agencies that it serves. Planned, constructed, and operated by the Department of Water Resources (DWR) – in coordination with the federal United States Bureau of Reclamation's (USBR) Central Valley Project (CVP) – the SWP remains one of the most affordable and cost-effective sources of water in the state. The SWP is considered an engineering marvel that has helped fuel California's population boom and economic prosperity since its initial construction in the 1960s. The SWP is a no-fail system. Its continued operation through weather extremes such as flooding and drought is essential to the viability of California.

The SWP consists of 36 water storage facilities and 705 miles of rivers, pipelines, and canals that supply water to 27 million people and irrigate 750,000 acres of farmland. In addition to its primary purpose of supplying water, the SWP also provides flood protection, offers recreational opportunities such as boating and hiking, and generates hydroelectric power. Strategic planning by DWR balances environmental considerations with water management, while navigating external challenges, such as climate change and aging infrastructure, and internal efforts, such as safety and workforce development.

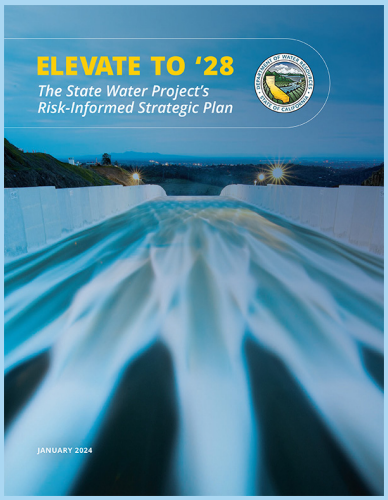
One of the main roles of the California Water Commission (Commission) is to serve as a public forum for discussing water management issues in California. The Commission uses this forum, in part, to provide additional transparency around the operations of the SWP. Water Code section 165 requires the Commission to conduct an annual review of the progress of the construction and operation of the SWP and to provide that report to the Legislature. The Commission's annual report of the SWP gives an update on DWR's progress on implementing the prior year's findings, summarizes the year's SWP presentations, and provides findings and future recommendations.

## California Water Commission

The nine-member California Water Commission uses its public forum to explore water management issues from diverse perspectives to advise State decision-makers on equitable ways to improve water policy, planning, and management in response to California's changing hydrology. For more information regarding the California Water Commission, visit cwc.ca.gov.

In 2024, the theme of the State Water Project presentations and the Commission's Annual Review and Recommendations was "Elevate to 28", the State Water Project's Strategic Plan. In 2025, the presentations focused on the "Past, Present, and Future of the State Water Project". In 2025, SWP made a total of 14 presentations to the Commission, four of which provided updates on current SWP operations. These presentations help the public stay informed of DWR's efforts and provide the basis of the findings and recommendations that the Commission makes to DWR and the Legislature regarding SWP operations and construction activities in 2025.

## Elevate to '28




The SWP's strategic plan, "Elevate to '28", details SWP's mission, vision, and purpose; the core values that guide its work; and the goals and objectives it sets out to achieve. Elevate to '28 supports the goals of DWR's strategic plan and defines cross-divisional activities through initiatives to meet the strategic needs of DWR and the SWP.

**Elevate to 28 contains five key goals:**

1. Advance an industry-leading safety culture.
2. Be the employer of choice.
3. Accelerate adaptation and strengthen resiliency for a changing climate.
4. Promote awareness of the State Water Project's significance.
5. Optimize infrastructure, financial integrity, and operations.

- The SWP mission is to sustainably 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.
- The SWP vision is to be the most reliable, sustainable, and resilient water provider for the people and environment of California, now and for future generations.
- The SWP purpose is to operate the SWP as one team to provide safe, reliable, and affordable water for the well-being and prosperity of California.

## PROGRESS ON 2024 RECOMMENDATIONS

In 2024, the Commission made six recommendations to DWR for SWP operations. Progress was made in all six throughout 2025.

| 2024 RECOMMENDATIONS | PROGRESS ON RECOMMENDATIONS |
|---|---|
| Maintain open and transparent communication with the Commission; State, local, and federal agencies; Tribes, interested parties; and the public as they prepare the SWP for water year 2025. | DWR maintained open and transparent communication with the Commission, giving 14 presentations on various topics throughout 2025, and worked with federal agencies on joint-operated facilities. |
| Implement a workforce strategy plan to attract and retain skilled replacements, as one-third of the water sector workforce approaches retirement. | DWR began development of a Risk Informed Workforce Strategy that is scheduled to be implemented in 2026. |
| Move boldly and swiftly to incorporate natural and innovative infrastructure solutions to address challenges associated with climate change, including completion of the Climate Adaptation Plan, and the implementation of interim action projects to mitigate subsidence in the California Aqueduct. | DWR released the State Water Project Adaptation Strategy, which examines how a combination of strategies can help the SWP maintain reliable water deliveries despite hotter temperatures, more extreme storms, more severe droughts, and higher sea levels.<br><br>DWR added an addendum to the 2024 Delivery Capability Report (DCR), which provides information to water managers to help them prepare for future water supply conditions, and analyzes how ongoing subsidence will impact the operation of the SWP. |
| Accelerate operational changes that allow the SWP to better address extreme hydrology, such as Forecast-Informed Reservoir Operations (FIRO), sub-seasonal ridging forecasts, snow surveys, and downstream river stage forecast models. | DWR continues to invest in research and development efforts such as FIRO, which uses the best available science to optimize and inform its reservoir operations. In 2025, DWR coordinated early releases of water prior to strong atmospheric rivers to create additional reservoir capacity to manage incoming inflows. DWR coordinated with numerous inter-agency partners on this critical public safety initiative at two locations: Lake Oroville and New Bullards Bar. |
| Work in conjunction with State Water Project Contractors and other water users to capture excess stormwaters and runoff to refill reservoirs and recharge groundwater basins. | The SWP's Adaptation Strategy increases the ability of public water agencies to save and store water during wetter times to address acute water shortages during droughts, and plan for the projected changes in the future water supply reliability. Recent efforts include consideration of local and regional storage, replumbing for local and regional flexibility, water recycling, conservation and efficiency projects, and long-term transfers or exchange agreements that enable individual public water agencies to secure a future with reliable water supplies. |
| When briefing the Commission, include high-level information on the topic, explain its importance and what it is meant to achieve, and how it relates to other priorities of the administration and/or DWR's Strategic Plan. | DWR's presentations in 2025 were insightful, informative, and covered topics that were relevant to not only the Commission, but to a wide array of interested parties throughout the state. The presentations were followed by public comments from the State Water Contractors, a local farmer, and a water district executive. |

# State Water Project Facilities


Public Affairs Office 11/7/2018


Vince Arrant/DWR

In this photo from 1960, California Governor Edmund G. Brown addresses the Southwest Water Council from his office in downtown Sacramento about the future construction of the State Water Project. The project would stretch from the Sierra Nevada Mountains in Plumas County to the flatlands of Riverside County in Southern California. Today, it conveys water through more than 20 pumping plants and 30 storage facilities (lakes and reservoirs), five hydroelectric power plants, and 705-plus miles of aqueducts and pipelines.

## PAST: CREATING AND CONSTRUCTING THE STATE WATER PROJECT

Ten-thousand years prior to European influences, an estimated 300,000 indigenous people lived amongst unimpeded rivers and streams that flowed through and into expansive ecosystems across all of California. The Sacramento-San Joaquin Delta (Delta) – today a critical hub for California's water supplies – was a lot larger pre-European contact. In the late 1700s, Spanish settlers arrived, built missions alongside rivers and streams, and began to divert water for human use. Human migration into California was slow until 1849, when the Gold Rush changed the area overnight, growing the population by 100,000 within the year.

Seasonal flooding was an issue. The great flood of 1862 had a devastating effect on California, which put Sacramento under 10 feet of water. In 1878, the first state engineer, William Ham Hall, concluded the Central Valley should be developed in a systematic manner, with integrated flood control systems featuring levees, weirs, and bypasses. Though his plan was not implemented at the time, it is the first concept of flood control management that inspired the system we see today.

DWR FILE PHOTO

In this photo from 1970, construction takes place on the large-diameter discharge lines from the Wind Gap Pumping Plant in Kern County. Today, the iconic lines are visible from Interstate 5 and the State Water Project pumping plant is located on the California Aqueduct downstream from Teerink Pumping Plant. Construction took place from 1966 to 1973 and was renamed the Ira J. Chrisman Wind Gap Pumping Plant in April 1986, for the former member of the California Water Commission (1960-1976), mayor of Visalia (1954-1955), and Tulare County rancher.

Before 1930, water development planning and infrastructure construction were primarily performed at the local level. An example of the State supporting local projects for water management was the passage of the Wright Act of 1887. This State law allowed communities and farmers to create irrigation districts to pool resources together and build infrastructure for water resource management needs. These water management projects were designed and built without the benefit of a statewide framework to provide guidance and coordination.

In 1921, the California Legislature authorized a statewide water resource investigation. Years of detailed research led by State Engineer Edward Hyatt resulted in the State Water Plan (1930) and the Central Valley Project Act. Voters approved the project, but, by 1933, during the Great Depression, the bonds became unmarketable. To help move water management forward, the federal government authorized the USBR to construct and operate the CVP. It was the first water infrastructure project to move water north to south through the Delta.

Between 1940 and 1955, the state's population doubled. In 1951, State Engineer Arthur Edmonston presented to the Legislature the Feather River Project, a precursor to the SWP, which proposed a multi-purpose dam and reservoir on the Feather River that included water transport facilities to the San Francisco Bay Area, San Joaquin Valley, and Southern California.


DWR FILE PHOTO

In this photo from 1960, DWR Director Harvey O. Banks, left, and California Department of Agriculture Director William E. Warne, look at a DWR water development system map, which highlights the State Water Project. Warne was appointed by Governor Edmund G. Brown and served as DWR director from 1961 to 1967 and the first Resources Agency secretary from 1961-1963. Warne managed DWR during its peak construction of the State Water Project.

## State Water Project Construction Completion

**1962:** South Bay Aqueduct immediately began delivering water to the South Bay.

**1967:** Upper Feather River Watershed lakes, North Bay aqueduct.

**1968:** Lake Oroville and Dam, still the tallest dam in the nation.

**1973:** Edmonston pumping plant, which pumps water almost 2,000 feet in elevation over the Tehachapi mountains.

**1998:** Coastal Branch, which brought water to the Central Coast.

On Christmas Day 1955, a levee along the Feather River broke, inundating Sutter County in and around Yuba City with water and contributed to the loss of many lives and significant damages to properties. In response, the Legislature created the Department of Water Resources in 1956. This was a consolidation of 52 business functions across different state agencies.

In 1957, the Legislature authorized DWR emergency appropriations of $25 million to start construction of the SWP and continued with annual appropriations until the proper funding mechanisms were in place.

In 1959, the Legislature adopted the California Water Resources Development Bond Act, known and cited as the Burns-Porter Act. The Legislature submitted the bond act to voters for approval. Led by the then Governor Pat Brown, Californians approved the issuance of $1.75 billion in general obligation bonds to assist in the financing of the immediate construction of the SWP.

Today, the SWP is the largest state-built and operated storage and water conveyance system in the nation. SWP facilities support the multi-purposes of water supply, flood protection, environmental protection, hydropower generation, and recreation.

Built nearly 60 years ago, the SWP has seen some significant changes since initial construction. A changing climate, aging infrastructure, updated construction standards, subsidence impacts, and environmental needs are all constraining the SWP's ability to sustain its value.

# PRESENT: MANAGING SWP OPERATIONS, MAINTENANCE, AND CONSTRUCTION

## EMPLOYEE SAFETY METRICS AND DATA COLLECTION

For the SWP, safety is a core value, not a priority: priorities change, but core values do not. Advancing a safety driven culture not only safeguards the well-being of personnel and facilities but also enables the safe delivery of water and power across California. Prioritizing safety at every level of SWP operations reinforces its commitment to deliver reliable service. The continuous improvement plan for overall health and safety at DWR highlights the enhancements and improvements made over the past 15 years that showcase DWR's commitment to enhancing the safety culture among its employees.

The program's success is monitored at both the program and executive levels. At the program level, performance is measured using a series of metrics, including reportable and recordable incidents, avoidable and non-avoidable vehicular accidents, safety audits conducted at SWP work locations, and the completion of action items identified during those audits. The performance indicators include an employee-level validation of the safety program's performance to ensure employee comprehension and use of the safety program.

At the executive level, annual risk assessments are conducted at all SWP work locations to validate the overall effectiveness of the SWP safety program and its measures. Since the program's inception in 2011, DWR has reduced workplace safety incidents by at least five percent annually.

2025 safety targets were to complete the same number of, if not more, safety audits, and to bring down the number of injury incidents and vehicle accidents. These are tracked through the Total Recordable Incident Rates (TRIR) and Days Away, Restricted, Transferred (DART). The table below shows DWR Operations & Maintenance (O&M) year-to-date DART and TRIR numbers compared to other government and private utilities, with the goal of being in line with the private utilities.

| Comparison | 2023 | | 2024 | | 2025 | |
|---|---|---|---|---|---|---|
| | DART[1] | TRIR[2] | DART[1] | TRIR[2] | DART[3] | TRIR[3] |
| Government Utilities | 2.9 | 4.9 | 1.4 | 2.1 | | |
| Private Utilities | 1.1 | 1.5 | 1.1 | 1.5 | | |
| DWR O&M | 2.8 | 4 | 1.5 | 2.5 | 2.54 | 4.32 |

[1] Recordable injuries resulting in medical restrictions for every 200,000 hours worked.

[2] All recordable/reportable incidents including hearing loss, fatalities, skin disorder, chronic exposures which may not be a DART incident for every 200,000 hours worked.

[3] 2025 Government and Private Utility DART and TRIR numbers will not be updated by the Bureau of Labor Statistics until the second quarter of 2026.

## STATE WATER PROJECT WATER DELIVERIES

**Table A Water:** Table A Water is an allocation of SWP water that DWR makes available for delivery to an SWP Contractor during a calendar year. The Table A water allocation is typically a percentage of a contracted maximum amount of Table A water (in Table A of Article 6), which an SWP Contractor may request from DWR for that year. The maximum Table A amounts also form the basis for a substantial portion of the payments SWP Contractors pay to DWR under their long-term water supply contracts.

**Article 56 Carryover Water:** An SWP Contractor can elect to store (carryover) its Table A water and non-SWP water in SWP conservation facilities for delivery in a subsequent year or years.

**Article 21 Interruptible Water:** Interruptible Water is SWP water available as determined by DWR that is not needed for fulfilling SWP Contractors' annual Table A water deliveries or for meeting SWP operational requirements. Interruptible Water is typically available on a short-term basis during wetter conditions and may be delivered to an SWP Contractor upon request. Interruptible Water is supplied in addition to other SWP water types.

**Flexible Storage Withdrawal Water:** Three SWP Contractors participating in the repayment of capital cost of Castaic Lake and Lake Perris have a contractual right under Article 54 of the water supply contracts to borrow a limited amount of SWP water from those lakes in excess of their other SWP supplies. The borrowed water must be replenished by the SWP Contractor to the SWP within five years using approved SWP or non-SWP water.

**Advanced Table A Water:** Three North of Delta SWP Contractors have a contractual right under Article 45 of their water supply contracts to borrow a limited amount of Table A water in excess of their other SWP supplies. The borrowed water must be replenished by the SWP Contractor to the SWP within five years unless water in Lake Oroville reaches certain levels, which resets the Advanced Table A balance to zero.

**Human Health & Safety:** A special allocation of SWP water under Article 18(a) of the water supply contracts to meet SWP Contractors' minimum demands for domestic supply, fire protection or sanitation (human health and safety needs). This allocation is subject to justification, DWR's approval, and multiple use restrictions, and is generally considered only during severe drought conditions.

**Non-SWP deliveries:** Under Article 55 of the water supply contracts, SWP Contractors may request delivery through the SWP facilities for water they acquire from non-SWP sources. Also, DWR may allow non-SWP Contractors (e.g., Central Valley Project contractors) to convey non-SWP water through the SWP facilities, subject to available capacity and payment of costs.

## SWP WATER DELIVERIES, POWER GENERATION, AND USE

The SWP delivered 2,130,703 acre-feet of water in Water Year 2025. Every year, SWP Contractors receive an "allocation" of water, which is a percent of the total amount of SWP water allowable per their contract terms with DWR. The initial allocation to SWP Contractors was five percent on December 1, 2024, then increased to 15 percent in late December, 20 percent in January 2025, 35 percent in February, 40 percent in March, with a final allocation of 50 percent in April. Allocations are tracked monthly, with adjustments made as needed, driven by the hydrology forecast, planned storage and exports, Delta water quality and flow requirements, SWP Contractor demands, and CVP operations. The contractors' allocations were based on their maximum Table A amount, which equals 4,172,786 acre-feet for all 29 SWP Contractors combined. During 2025, SWP facilities generated 3,840 gigawatt hours (GWh) of energy. During the same period, the SWP used 5,870 GWh of energy. In general, SWP power usage increases with SWP water deliveries.

## 2025 PLANNING AND OPERATIONS

The SWP is operated in real time, adjusting the rate of releases from water storage facilities and the rate of exports from the Delta to meet water supply and downstream flow and water quality requirements. Many factors influence this real-time decision making. The SWP's objectives are to deliver water to meet minimum health and safety needs, preserve upstream storage for future dry year and drought protection, meet regulatory requirements, deliver water based on priority, and maximize diversion to storage and delivery of water supply.

Water Year 2025, which began on October 1, 2024, started with storage in Lake Oroville, SWP's largest water storage facility, at 98 percent of the historical average for that date. DWR reduced releases to preserve storage for future requirements. The SWP Contractors were able to carryover more than 800,000 acre-feet of storage in San Luis Reservoir, which helped shore up their supplies in the event of a dry year ahead.

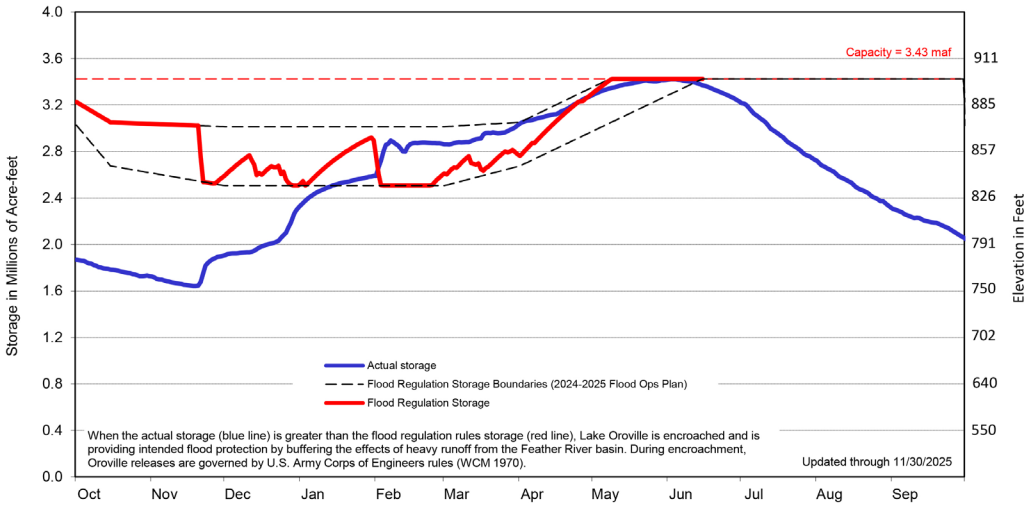
As of February 10, Lake Oroville was at 135 percent of historical average for that date. DWR took advantage of the Storm Flex Provision in the Incidental Take Permit (ITP), which allowed the SWP to increase pumping levels and capture 16,000 acre-feet of storm runoff during a one-week period. DWR also increased releases from the Feather River beginning in late January to balance flood control, storage conservation, and downstream water supply needs. Flood control releases continued through April, before the refill period began.

Export operations during winter and spring are adjusted to capture storm flows in accordance with State and federal Endangered Species Act (ESA) operating permits, and to put that storage into San Luis Reservoir to meet future demands. From December 2024 to June 2025, State and federal ESA operating permits limited water exports through the Delta for fishery purposes, ensuring adequate

## Summary of SWP water deliveries, energy generation, and usage[1]

| Year | Water Delivered (acre-feet) | Allocation | Power Generated (GWh/year) | Power Used | Net Power Acquired (GWh/year) |
|---|---|---|---|---|---|
| 2000 | 3,584,667 | 90% | 6,832 | 8,518 | 1,686 |
| 2001 | 2,042,118 | 39% | 4,588 | 6,358 | 1,770 |
| 2002 | 2,850,215 | 70% | 5,631 | 8,191 | 2,560 |
| 2003 | 3,167,604 | 90% | 6,117 | 8,862 | 2,845 |
| 2004 | 3,119,578 | 65% | 6,887 | 9,661 | 2,774 |
| 2005 | 3,627,004 | 90% | 5,661 | 8,282 | 2,621 |
| 2006 | 3,691,568 | 100% | 7,515 | 9,109 | 1,594 |
| 2007 | 2,996,629 | 60% | 6,410 | 9,276 | 2,866 |
| 2008 | 1,950,968 | 35% | 4,100 | 5,701 | 1,601 |
| 2009 | 1,933,735 | 40% | 4,255 | 5,438 | 1,183 |
| 2010 | 2,660,960 | 50% | 4,368 | 7,184 | 2,816 |
| 2011 | 3,596,749 | 80% | 5,258 | 8,583 | 3,325 |
| 2012 | 2,848,082 | 65% | 4,810 | 7,404 | 2,594 |
| 2013 | 2,107,572 | 35% | 3,679 | 5,721 | 2,042 |
| 2014 | 1,079,839 | 5% | 1,426 | 2,780 | 1,354 |
| 2015 | 1,375,536 | 20% | 1,699 | 3,483 | 1,784 |
| 2016 | 2,299,679 | 60% | 3,535 | 6,598 | 3,063 |
| 2017 | 3,732,527 | 85% | 5,011 | 9,652 | 4,641 |
| 2018 | 1,984,723 | 35% | 2,933 | 5,723 | 2,790 |
| 2019 | 3,049,485 | 75% | 4,842 | 7,662 | 2,820 |
| 2020 | 1,457,500 | 20% | 2,484 | 3,877 | 1,393 |
| 2021 | 1,160,082 | 5% | 1,371 | 2,771 | 1,400 |
| 2022 | 1,267,989 | 5% | 1,891 | 2,434 | 543 |
| 2023 | 3,415,279 | 100% | 3,809 | 8,226 | 4,417 |
| 2024 | 1,987, 597 | 40% | 4,076 | 5,550 | 1,474 |
| 2025 | 2,130,703 | 50% | 3,840 | 5,870 | 2,030 |

[1] Source: Department of Water Resources' State Water Project Analysis Office. (In addition to Table A water, reported deliveries include Article 56 carryover water, Article 21 interruptible water, Flexible Storage withdrawal water, Advanced Table A water, Human Health & Safety water, and other non-SWP deliveries.)




- **Water Year 2025** began with storage in Lake Oroville at 98 percent of the historical average.
- **February:** storage in Lake Oroville increased by 277,000 acre-feet over the month, ending the month at 129% of historical average.
- **March:** storage increased by 162,000 acre-feet, ending the month at 121% of historical average, 88% of total capacity.
- **April:** storage increased by 238,000 acre-feet, ending the month at 120% of historical average, 96% of total capacity.
- **June:** storage reached its peak for the year, 3.42 million acre-feet on June 4, and ended the month at 120% of historical average, 94% of total capacity.
- **October:** to begin the new Water Year, Lake Oroville was at 107% of historical average.

conditions for protected fish species. DWR works in close coordination with USBR, California Department of Fish and Wildlife (CDFW), National Marine Fisheries Service, and United States Fish and Wildlife Service on Delta operations. They also meet twice a month with the SWP Contractors on water supply planning and operations.

In June, because the Water Year was classified as above normal, DWR began tidal operation of the Suisun Marsh Salinity Control Gates (SMSCG) for 60 days, in compliance with its ITP. With tidal operation of the SMSCG, the gates are opened during the outgoing tide to allow fresh water into Suisun Marsh and closed during incoming tide to keep higher salinity water out of the Marsh. Suisun Bay is the largest brackish water wetland on the West Coast, where salt water from San Francisco Bay meets fresh water from the Sacramento-San Joaquin Delta. The Marsh provides a unique habitat that is essential for sensitive, endemic species that are not found elsewhere in the state. Tidal operation of the SMSCG is one of the mechanisms DWR uses to ensure the water quality is fresh enough to promote waterfowl habitat.

Lake Oroville began July at 120 percent of the historical average. Total storage continued to decrease throughout the rest of the Water Year. July through September were primary months for moving stored water from Oroville to support exports from the Delta, and to manage temperatures in the Feather River, essential for the survival of Chinook salmon. Because of the Above Normal Water Year classification, there were additional actions implemented to improve habitat for the endangered Delta smelt, a fish endemic to the Delta.

By October 1, precipitation statewide for Water Year 2025 was about average. However, there was a notable disparity in the amount of precipitation in the northern and southern watersheds, with the Sacramento Valley classified as above normal, and the San Joaquin Valley classified as below normal. The majority of precipitation came from storms in late November/early December 2024, and again in late January/early February 2025. Peak storage at Oroville (3.42 million acre-feet) was reached on June 4.

## Long-Term Operations Incidental Take Permit

Under the California Endangered Species Act (CESA), DWR is required to obtain an Incidental Take Permit (ITP) to minimize, avoid, and fully mitigate impacts to threatened or endangered species that may result from SWP operations. An ITP allows a permittee to take a CESA-listed species if such taking is incidental to, and not the purpose of, carrying out an otherwise lawful activity. In November 2024, CDFW issued an ITP to DWR that allows for the taking of five CESA-listed fish species at the SWP's Harvey O. Banks Pumping Plant in the South Delta: spring-run salmon, winter-run salmon, Delta smelt, longfin smelt, and white sturgeon. The ITP requires DWR to manage the water it exports through the Delta and to the San Joaquin Valley and Southern California carefully, adapting operations to minimize impacts to five listed species when they are present in the system. This new set of operational rules provide species protection for listed species while generating water supply reliability.

Working with CDFW, DWR has designed a robust science and monitoring program to help provide real-time information for managing take of listed species at the SWP pumps. In addition, the ITP invested in the construction of a non-physical barrier at Georgiana Slough that is intended to keep migrating juvenile salmon in the Sacramento River, rather than the interior Delta where they are subject to take at the pumps. Initial studies show the migration barrier has been approximately 85% effective in keeping salmon moving down the Sacramento River. DWR is also using newly developed state-of-the-art DNA tools to confirm species identification within hours of collection at the SWP fish screening facility. Real-time exports are modified based on these genetic tests that determine listed salmon runs from non-listed salmon runs. Other conservation measures include salmonids protection during multi-year droughts, investments in science to advance salmon forecasting tools for real-time management, and a longfin smelt culture program.

## ANNUAL BUDGET AND COST PLANNING

The SWP has long-term, legally binding contracts with the 29 local public water agencies, known as the SWP Contractors. The SWP operates as an enterprise fund for the State, charging external users, as opposed to government entities, and its debt is backed solely by the SWP Contractor charges.

The 29 SWP Contractors are responsible for the reimbursable costs of operating the SWP, which includes water supply and power, water storage, water conveyance, operations and maintenance (O&M), and regulatory compliance, which in total amounts to more than 95 percent of the SWP's revenue. Non-reimbursable costs – or those not covered by SWP Contractors – include the cost-sharing portion of joint-use facilities with the CVP, and flood control purposes. Recreation, and fish and wildlife enhancement, are paid for by other means, such as through annual State General Fund appropriations, but in recent years the SWP Contractors have covered any shortfall in funding.

### Major SWP Programs

SWP's $1.2 billion annual revenue supports more than 100 programs, including:

- Strategic Plan & Strategic Risk Management
- SWP Operations Planning/Model Development
- Long-Term Operations Biological Opinion and Incidental Take Permit Compliance
- Federal Energy Regulatory Commission (FERC) Relicensing
- Power Planning and Contracts
- Financial Management Enhancement Program
- Strategic Asset Management
- California Aqueduct Subsidence Program

Capital improvements to the SWP are financed through the issuance of water system revenue bonds. Full repayment of these bond funds is being made by SWP Contractors, rather than by California taxpayers.

The 2025 SWP budget is $1.128 billion. $720 million of that is the expense of O&M. $408 million is for planned capital projects expenditures. Power is a variable cost and is planned separately and depends on dynamic power markets, hydrology, and water delivery. For example, in 2024 the net cost of power was $188.5 million.

DWR continues operating the SWP with stable revenues provided by the SWP Contractors. DWR requires that all program expenditures are managed within the annual budget. Federal funding challenges impact capital planning for the SWP-CVP joint-use facilities. DWR is actively working with its federal partners on navigating those challenges.

The SWP costs are increasing. Despite pressures on the affordability of the SWP from climate change, infrastructure needs, and regulatory requirements, the SWP is considered the most economical water source in California. Currently, total SWP assets are reported in its financial statement at approximately $9.3 billion, benefiting California's people and environment. Continued investment to maintain and enhance the SWP is critical to California's economy.


PHOTO COURTESY DWR

Foundation work takes place for a 400,000-gallon water storage tank as part of the fire safety modernization project at the Dos Amigos Pumping Plant in Merced County.

## Top Capital Projects in 2025-2026 Planning*

- San Luis Field Division Fire Safety Modernization - $66.9M
- Perris Dam Remediation Project, Emergency Release Facilities - $57.4M
- Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project (Big Notch) - $41.6M
- Oroville River Valve Outlet System - $33.7M
- Sisk Dam Remediation Construction - $29.5M
- Subsidence and Groundwater Monitoring - $26.4M
- Oroville Dam 13.8KV Feeder Line and Fiber Optic Cable Replacement - $22.4M
- Joint-Operation Center Relocation Project Construction - $18.3M
- Oroville Emergency Response – Site Restoration - $17.9M

* State Water Plan planning is on calendar year basis. Total planned capital expenditure is $408 million for 2025 and $356 million for 2026 (planning completed December 2024). Capital expenditure is typically around one third of the total operation expenditure (excluding power).

PHOTO COURTESY DWR

Installation of a radial gate on the California Aqueduct. Check structures control the water level and flow by raising and lowering the radial gates.

## 2025 SWP CONSTRUCTION PROJECTS

One of the largest expenses for the SWP is construction and maintenance of their facilities. These facilities ensure adequate water supplies are available under various hydrologic and legal conditions while maintaining operational flexibility. The system is aging and there is a lot of work that takes place to optimize performance. Key construction activities undertaken in the past year to manage and maintain the SWP occurred across its entire length and included all major facility types – dams, canals, pipelines, and pumping and generating plants. The four examples that follow are a sampling of the more than 26 active projects and programs in 2025 that contribute to the no-fail operation of the SWP.

### Replacement of Radial Gates and Check Structures 3, 4, 6, and 9

Check structures control the water level and flow on the California Aqueduct by raising and lowering the radial gates. Located south of Sacramento, these gates and structures are near each other, so they were consolidated under a single contract. Some need repairs based on their condition, others need to be completely replaced. Once they reach a certain level of deterioration it is more feasible to replace the entire gate.


Shasta Lake
Sacramento River
Lake Oroville
Feather River
River Valve Outlet System Rehabilitation
North Bay Aqueduct
Temporary Rock Barriers at Middle River, Old River, and Grant Line Canal
South Bay Aqueduct
Replacement of Radial Gates, Check Structures 3, 4, 6, and 9
Fire Safety Modernization - Gianelli Pumping-Generating Plant, SLFD O&M Center, Dos Amigos Pumping Plant, Coalinga O&M Center
San Joaquin River
California Aqueduct
Coastal Branch
West Branch
East Branch
East Branch Extension
Pyramid Dam and Lake Modernization Program
Castaic Dam and Lake Modernization Program

ANDREW NIXON/DWR

Large valves are transported on a barge up the Diversion Pool to Oroville Dam. DWR is updating Oroville Dam's River Valve Outlet System (RVOS) to ensure the ability to discharge cold water to the Feather River to maintain water temperatures necessary for fish health, especially during periods of drought.

## Eight Construction contracts completed in 2025

**Total amount: $64 million**

- River Valve Outlet System Rehabilitation, Oroville Dam Diversion Tunnel No. 2
- Temporary Rock Barriers, Middle River, Old River, and Grant Line Canal
- Electric vehicle charging station infrastructure
- Abandoned pipes and conduits removal, Sacramento River
- Canal improvements, Palermo Canal
- Roofing replacement, Edmonston Pumping Plant
- Roofing replacement, Operations and Maintenance Center surveillance unit and vehicle storage buildings
- Chipps Island Phase 2B north parcel interim management and levee repairs

### River Valve Outlet System Rehabilitation - Oroville Dam Diversion Tunnel No. 2

This is a diversion tunnel underneath the Oroville Dam. In the original construction of the Oroville Dam, the diversion tunnels allowed the water to go by as the dam was built up. Diversion Tunnel 2 was also used to allow water to pass through the dam (low-level outlet) during the initial filling of the reservoir. It went unused until 20 years ago when cold water requirements in the river required them to re-engage and use the low-level outlet on a routine basis.

PHOTO COURTESY DWR

A temporary rock barriers is being installed on the Grant Line Canal. Rock barriers prevent salinity from going upstream, allowing higher water levels so agriculture can pull water safely.

Because of the added use, there was a need to maintain and update the two upstream valves. Since there is no way to isolate them from the high-pressure water flow from the dam, two new valves were added on the downstream side, and a much-reduced section of a thrust wall that carries the load of all the water pressure (650-feet water elevation) was put in. More than two million pounds of force is carried through the thrust wall.

## Fire Safety Modernization

Fire safety modernization is currently underway at the Gianelli Pumping-Generating Plant, San Luis Field Division Operations and Maintenance Center, Dos Amigos Pumping Plant, and Coalinga Operations and Maintenance Center. When these facilities were first put into operation the fire safety was not as in-depth as it is now. The modernization project includes much needed updates including the installation of water tanks and an emergency egress.

## Temporary Rock Barriers

Rock barriers are installed on a frequent basis around the Delta for water quality control. They prevent salinity from going upstream, allowing higher water levels upstream so agriculture can pull water safely. Large-diameter rip rap forms much of the barrier. Culverts allow for regulated water control. They are installed and removed annually so they are not in place during flood season. Current rock barriers being installed are on the Middle River, Old River, and Grant Line Canal.

## Pyramid Dam Modernization Program

Pyramid Dam and Lake provide regulatory storage for the Castaic Powerplant, serve as an afterbay for the William E. Warne Powerplant, and emergency storage for SWP deliveries. Constructed between 1969 and 1973, Pyramid Dam is a 400-foot-high, zoned earth and rockfill dam, with a 1,090-foot crest length, and impounds 169,090 acre-feet of water. The Angeles Tunnel conveys water to and from Pyramid Lake to Castaic Powerplant for power generation. Operation of the

XAVIER MASCAREÑAS/DWR

Pyramid Lake and Dam. Pyramid Lake, a reservoir located in Los Angeles County, is formed by Pyramid Dam on Piru Creek near Castaic, California.

lake is governed by the pump-back operations, which involves pumping water from a lower reservoir to an upper reservoir, typically for hydroelectric or water management purposes. The lake level depends on whether the Los Angeles Water and Power Department is pumping or generating.

Initiated in 2018, the Pyramid Dam Modernization program evaluates facility performance and original design in consideration of current seismic and hydrologic loadings (the understanding of faults and ground motions). It also considers modern standards and analysis methodologies, which are far more robust than what they had in the 1960s, when the dam was built.

**Key milestones accomplished to date include:**

- Between 2018 and 2021, DWR completed detailed inspections, invasive coring, and structural analysis of the spillway chute.
- In 2019, DWR established winter operations for Pyramid Lake to reduce the likelihood of using the emergency spillway while studies are underway to understand its erodibility.
- In 2020, DWR completed the Level 2 semi-quantitative risk analysis for Pyramid Dam.
- In 2020, DWR completed a geotechnical investigation of the emergency spillway, including the installation of piezometers. The investigation helped inform a Phase 1 erodibility analysis completed in 2022. A more sophisticated Phase 2 erodibility analysis will be completed in 2026.
- In 2022, DWR completed the investigation of the Palomas segment of the San Gabriel fault to better understand potential ground motions. The fault segment is located about three kilometers from Pyramid Dam.

KEN JAMES/DWR

Castaic Lake in Los Angeles County is part of the West Branch of the State Water Project and is created by the Castaic Dam on Castaic Creek.

- In 2022, DWR completed a structural analysis of the low-level outlet's intake tower and Angeles Tunnel intake tower with current earthquake ground motions.
- In 2025, DWR completed the Pyramid Dam Safety Assessment, which leveraged the investigations and studies performed over the past few years to examine, evaluate, and prioritize potential vulnerabilities to the facility, and identify potential risk reductions measures that DWR may consider implementing as part of its overall risk management of SWP infrastructure.

Consistent with modern dam safety best practices and the regulatory requirements of the Federal Energy Regulatory Commission (FERC), which has regulatory oversight of Pyramid Dam, DWR uses risk-informed decision-making to inform the need for and prioritization of studies and future improvements to the dam. It is anticipated that future modifications of Pyramid Dam would include gated spillway seismic retrofits, emergency spillway erosion protection, and outlet works/valve seismic retrofits.

## Castaic Dam Modernization Program

Castaic Lake and the 425-foot-high zoned earthen embankment dam are the terminus of the West Branch of the California Aqueduct. Constructed between 1966 and 1974, the 320,000-acre-foot capacity lake provides water supply for more than five million Californians, as well as regulatory and emergency storage. Recreation is managed by the Los Angeles County Department of Parks and Recreation.

The Castaic Dam Modernization program was initiated in 2018 to evaluate facility performance and design by considering current seismic and hydrologic loadings, modern standards, and analysis methodologies. Consistent with its

other modernization programs, DWR's SWP uses risk-informed decision-making to inform the need for and prioritization of studies and future improvements. Focused studies include instrumentation upgrades, seismic loading on the high and low towers and left abutment, and how much movement is left in terms of expansion on the spillway due to its expanding clay bedrock foundation.

**Key milestones to date included the following:**

- In 2019, DWR established winter operations for Castaic Lake to reduce the likelihood of using the spillway while studies are underway to understand the rate and distribution of the uplift of concrete panels, and deflections to the spillway walls driven by the expansive foundation rock.
- Between 2019 and 2024, DWR performed a geotechnical investigation, installed additional dam safety instrumentation, and performed stability analyses for the left abutment area of the dam which experienced instability during construction of the dam.
- Between 2020 and 2022, DWR completed a geotechnical investigation and installed dam safety instrumentation within the spillway to better understand the geologic conditions and distribution and rate of deflections caused by the underlying expansive rock foundation. Uplift and deflections to the spillway have been monitored since its construction and appears to be driven by the slow penetration of groundwater into the expansive clay bedrock foundation. The new instrumentation will better inform alternatives and designs for the spillway's rehabilitation.
- In 2021, DWR completed the Level 2 semi-quantitative risk analysis for Castaic Dam.
- In 2021, DWR completed retrofits of the Tower Bridge which included the addition of carbon-fiber reinforcement to bridge piers to improve seismic performance. This required advanced communication and planning with local partners and the community due to the reservoir drawdown needed to complete construction.
- In 2024, DWR completed the Castaic Dam Safety Assessment, which leveraged the investigations and studies performed in prior years to examine, evaluate, and prioritize potential vulnerabilities to the facility and identify potential risk reductions measures that DWR may consider implementing as part of its overall risk management of the SWP.
- In 2025, the SWP advanced the design of a debris containment risk reduction measure for the low-level outlet works which would increase the post-earthquake reliability of the outlet works. DWR plans to finalize the design in 2026 with construction spanning 2027 and 2028.
- In 2025, DWR developed plans for the replacement of aging dam safety instrumentation, with installation planned for 2026 and 2027.

It is anticipated that future modifications of Castaic Dam would include outlet tower debris mitigation, instrumentation upgrades, and spillway rehabilitation.

# FUTURE: PREPARING FOR UNCERTAINTY

NINA SHOCKEY/DWR

A view of newly installed equipment from the California Department of Water Resources' Sustainable Groundwater Management Office to enhance the monitoring and understanding of land subsidence in California. The newly installed GPS station and remote sensing calibration equipment are firmly anchored into the ground to ensure precise positioning and detect vertical movement of the Earth's surface.

## CLIMATE ADAPTATION STRATEGIES

In August 2025, DWR released a new report, State Water Project Adaptation Strategy, that examines how a combination of strategies can help the SWP maintain reliable water deliveries to 27 million Californians despite hotter temperatures, more extreme storms, more severe droughts, and higher sea levels. This first-ever report details more than a dozen different actions DWR is already taking or evaluating.

If there is not a continued investment in the system, and if subsidence is not addressed, there will be a steep decline in delivery capability over the next 20 years. If the only actions taken are to address subsidence and maintain the system, there will be a decline in the ability to operate because of the changing hydrology due to climate change. If new features are added, such as Forecast Informed Reservoir Operations (FIRO) and the Delta Conveyance Project (DCP), as well as new storage, that set of actions will help improve the system's yield even with the effects of climate change.

Currently the SWP's average annual delivery capability is approximately 2.19 million acre-feet/year. By 2043 the combined actions could help the SWP exceed current delivery capability by 200,000 acre-feet/year. By 2085 the combined

### Key Takeaways of the Climate Adaptation Strategy

- Continued maintenance and restoration of SWP infrastructure is the highest priority.
- On its own, the Delta Conveyance Project (DCP) is the single most effective strategy to adapt to a changing climate and maintain water supply reliability. It also amplifies the effectiveness of other strategies.
- FIRO is a safe, effective, and low-cost strategy. It should be implemented as soon as possible in coordination with United States Army Corps of Engineers (USACE) approvals.
- Additional South-of-Delta water storage is also a promising strategy. Additional storage, especially when paired with the DCP, can help improve drought resilience.
- DWR should continue to pursue adaptation strategies like water supply forecast improvements and Feather River watershed management. These may be difficult to value, but likely will deliver real benefits and foster future adaptations.
- Each strategy responds to different climate stressors such as increasing drought frequency, more extreme precipitation, earlier runoff, and sea level rise, and a combination of responses is needed.
- Implementation of a portfolio of strategies brings greater adaptation than the sum of individual strategies.

actions could help the SWP maintain delivery capability close to current levels.

The Climate Adaptation Strategy describes 17 strategies that the SWP is pursuing to address anticipated effects of climate change. It quantitatively evaluates five of these to show how they would be expected to change the future of SWP reliability, enhance resilience, increase flexibility and efficiency, minimize risks, and ensure the sustainability of the system.

The plan concludes that, while climate change will alter the state's hydrology leading to less water for delivery, and subsidence in the California Aqueduct will reduce the SWP's ability to deliver water, a portfolio of actions can offset much of the decline.

## DELIVERY CAPABILITY REPORT ADDENDUM: IMPACTS OF SUBSIDENCE

The Delivery Capability Report (DCR) is used widely both within and outside the SWP for water supply planning. The information in these reports is a key component of the drought planning done by the SWP and is fundamental to the drought planning done by the Public Water Agencies that receive SWP and Central Valley Project water. This year, DWR issued an addendum to the report that also analyzes how ongoing subsidence will impact the operation of the SWP.

It predicts what the effects of climate change will be 20 years from now, how that will change the ability to move water through the system, and what will happen if we do not take actions to address subsidence.

In 2025, there was a three percent reduction in the ability to move water due to subsidence. Twenty years out, this report outlines that there could be an 18 to 87 percent reduction, which is profoundly significant. The DCR explains why interim projects to address subsidence are necessary, but a comprehensive project in the future is also vital for future conveyance. Through the Sustainable Groundwater Management Act (SGMA), DWR is working with Groundwater Sustainability Agencies to stabilize subsidence.

## FORECAST-INFORMED RESERVOIR OPERATIONS

DWR, along with federal and local water agencies, has developed a Forecast Informed Reservoir Operations (FIRO) program. This program leverages recent advancements in scientific forecasting of atmospheric rivers (AR) to anticipate and manage large storm events while maximizing opportunities to increase water supply. FIRO is one of the ways DWR is optimizing its operations to proactively respond to some of the greatest risks and opportunities posed by a changing climate and extreme weather.

DWR, in coordination with U.C. San Diego Scripps Institution of Oceanography Center for Western Weather and Water Extremes (CW3E), USACE, Yuba Water Agency, and the National Weather Service are working on this critical initiative at two locations: Lake Oroville and New Bullards Bar. Starting in 2019, the agencies participated in a five-year effort through the development of the Yuba-Feather FIRO Steering Committee to assess the viability of FIRO in the Yuba Feather watershed. The Final Viability Report was posted on the Scripps website in Spring 2025.

Research has found that AR type storms produce essentially all the flooding in California, and about 50 percent of annual rain. The number, size, and strength of ARs annually make or break the Water Year in the West. In northern California, 85 percent of the variance in annual precipitation is due to the variance in the five percent of the wettest days each year, which are almost all AR events.

**How FIRO works:**

FIRO leverages improved forecasting tools into the operational decision making.

FIRO assesses the possibility of giving the reservoir operator more flexibility to keep a little more water in the reservoir after a storm, in case there is not another storm coming. If there is a big storm coming, they can let more water go.

This  creates additional reservoir capacity to manage incoming inflows. Additionally, there is potential to improve water supply reliability and increase hydropower generation, both valuable assets.


ANDREW NIXON/DWR

Leaders from the USACE, Sonoma Water, University of California San Diego's Scripps Institution of Oceanography and DWR pose for a photo after they commemorated the signing of a new water control manual for Coyote Valley Dam and Lake Mendocino. The revised manual redefines the operating rules around flood control schedules for the first time in the dam's 66-year history by incorporating the principles of modern-day forecast-informed reservoir operations, or FIRO, to enhance the facility's dual mission of flood risk management and water supply security.

AR reconnaissance over the Pacific Ocean improves forecasting abilities of anticipated rain, snow, and flooding on the west coast of the United States. AR reconnaissance combines data collection by aircraft with specialized ocean and satellite observations, and research on weather models, and.

At Lake Mendocino, in Northern California, reservoir operators use FIRO and AR forecasts to support operations in both drought and flood years. In Water Year 2025, more than 10,000 acre-feet of additional water was stored, meaning more water for the summer.

The USACE is evaluating the use of FIRO in all new Water Control Manual (WCM) updates. The WCM contains specifications for storage and releases from reservoirs and outlines policies and data protocols for flood risk management operations and drought contingency operations. This opens the door for California to explore implementing FIRO broadly as an adaptation strategy to climate change. It is one of many tools the State and its federal and local agency partners are using to reduce the risk of flooding and improve water supply in wet years as California adapts to a hotter, drier future.

DWR meets regularly with the USACE to coordinate flood operations and to balance flood risk reduction operations and water supply conservation within the rules of the WCM. In Water Year 2025, with extensive coordination with USACE water managers, DWR made controlled water releases from Lake Oroville to maintain the required flood space.

# 2025 FINDINGS AND RECOMMENDATIONS

## 2025 FINDINGS

The Commission finds that, in 2025, DWR:

- Operated the SWP to provide water supply to meet minimum health and safety needs, meet environmental needs to protect endangered species, conserve water storage to meet future critical needs, provide downstream flood risk reduction, and deliver water based on priority or water rights. (see pages 11-14)

- Responded to the annual precipitation and snowpack conditions, capturing and storing stormwaters, and increasing storage in its reservoirs. (see pages 11-14)

- Showed a commitment to enhancing the safety culture among its employees by making use of safety metrics and data collection to identify trends and reduce injuries, illnesses, and unsafe conditions. (see page 9)

- Used the best available science to optimize and inform its operations. (see pages 24-27)

- Made efforts to minimize, avoid, and fully mitigate impacts to threatened or endangered species that may result from SWP operations. (see page 14)

- Improved long-term project planning to anticipate and adapt to climate change, infrastructure needs, and regulatory requirements. (see pages 24-27)

- Apprised the Commission of its financial goals, SWP budget, and cost projections, indicating that its 2025 approved SWP budget was $1.128 billion, including operations and capital costs. (see page 15)

- Informed the Commission about key construction activities undertaken in the past year to manage and maintain the SWP, including the replacement of several radial gates and check structures, the rehabilitation of Oroville Dam's river valve outlet system, and modernization programs at Pyramid and Castaic Lakes. (see pages 18-23)

## 2025 RECOMMENDATIONS

The Commission recommends that DWR:

- In recognition of the pressing water management challenges subsidence presents, work closely with other government agencies and private entities to mitigate subsidence on the California Aqueduct that reduces operating flexibility and capacity.

- Explore the alignment of additional financial mechanisms and funding sources, like beneficiary pay models, to support the long-term operation, maintenance, and resilience of the SWP, especially in lean fiscal years.


COURTESY/CALIFORNIA WATER COMMISSION

The California water Commission held their November meeting at Pyramid Lake in Southern California, followed by a tour of Castaic Dam and Lake.

- Support ecosystem functions and the protection of listed species through water management that adheres to environmental regulations.

- Inform the Commission of current construction activities and long-term plans for aging infrastructure repair.

- Inform the Commission of efforts to advance the SWP Adaptation Strategy, including the overall importance of the Delta Conveyance Project.

## CONTINUING RECOMMENDATIONS

The Commission recommends that DWR continue to:

- Reduce its carbon footprint and make the SWP's power portfolio 100 percent renewable and carbon neutral by December 2035. (2023 Annual Review)

- Move boldly and swiftly to incorporate natural and innovative infrastructure solutions to address challenges associated with climate change, including implementation of the Climate Adaptation Plan, and the completion of interim action projects to mitigate subsidence in the California Aqueduct. (2024 Annual Review)

- Accelerate operational changes that allow the SWP to better address extreme hydrology, such as Forecast-Informed Reservoir Operations, sub-seasonal ridging forecasts, snow surveys, and downstream river stage forecast models. (2024 Annual Review)

- Work in conjunction with State Water Project Contractors and other water users to capture excess stormwaters and runoff to refill reservoirs and recharge groundwater basins. (2024 Annual Review)

## CONCLUSION

This document fulfills the Commission's requirement to review the progress of the construction and operation of the SWP. The Commission has determined that DWR is working to maintain the operations of the SWP, preparing for and responding to climate extremes, and maintaining operational flexibility so that the SWP continues to benefit California. The Commission requests that DWR continue to keep the Commission informed of operations and construction activities in 2026. These findings and recommendations will be presented to DWR and the Legislature.

California
WATER COMMISSION

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