AUG 2022

CALIFORNIA'S WATER SUPPLY STRATEGY

Adapting to a Hotter, Drier Future

CALIFORNIA ALL

CALIFORNIA NATURAL RESOURCES AGENCY

CALIFORNIA Water Boards

CalEPA California Environmental Protection Agency

cdfa CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

Introduction

Our climate has changed. We are experiencing extreme, sustained drought conditions in California and across the American West caused by hotter, drier weather. Our warming climate means that a greater share of the rain and snowfall we receive will be absorbed by dry soils, consumed by thirsty plants, and evaporated into the air. This leaves less water to meet our needs.

This is our new climate reality, and we must adapt.

During his first months in office, Governor Newsom issued an **executive order** calling on State Agencies to create a comprehensive **Water Resilience Portfolio**. The Portfolio prioritized key actions to secure California's water future. *Over the last two years we've* ***made major progress*** *that includes*: working to bring our groundwater basins into balance; updating infrastructure to move water throughout the state; restoring river systems, including the nation's largest dam removal effort on the Klamath River; and improving water management through new voluntary agreements and technology investments.

California is investing billions of dollars into these actions to secure the future of California's water supply.

Over the last three years, **state leaders have earmarked more than $8 billion to modernize water infrastructure and management**. The historic three-year, $5.2 billion investment in California water systems enacted in 2021-22 has enabled emergency drought response, improved water conservation to stretch water supplies, and enabled scores of projects by local water suppliers to become more resilient to current and future droughts. The 2022-23 budget includes an *additional* $2.8 billion for drought relief to hard-hit communities, water conservation, environmental protection for fish and wildlife, and long-term projects to permanently strengthen drought resilience.

Over the last two years, scientists and water managers have been alarmed by the accelerating impacts of the warming climate on our water supply. **We now know that hotter and drier weather could diminish our existing water supply by up to 10% by 2040**. So we are ***taking action***.

We have invested billions in securing the future of California's water supply and this focused *Water Supply Strategy* updates state priorities based on new data and accelerating climate change.

To ensure California has the water needed for generations to come, this Strategy includes:

- **Create storage space for up to 4 million acre-feet of water**, allowing us to capitalize on big storms when they do occur and store water for dry periods

- **Recycle and reuse at least 800,000 acre-feet of water per year by 2030**, enabling better and safer use of wastewater currently discharged to the ocean

- **Free up 500,000 acre-feet of water** through more efficient water use and conservation, helping make up for water lost due to climate change

- Make new water available for use by **capturing stormwater and desalinating ocean water and salty water in groundwater basins**, diversifying supplies and making the most of high flows during storm events

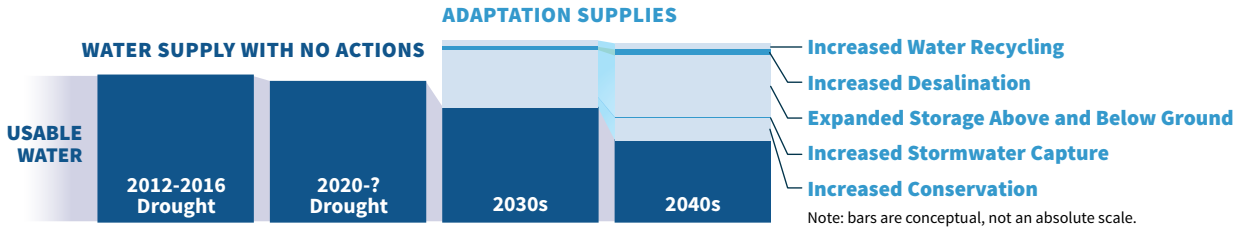
To match the pace of climate change, California must move smarter and faster to update our water systems. **The modernization of our water systems will help replenish the water California will lose due to hotter, drier weather, and generate enough water for more than 8.4 million households.**

CALIFORNIA'S WATER SUPPLY STRATEGY
Adapting to a Hotter, Drier Future

This document outlines California's strategy and priority actions to adapt and protect water supplies in an era of rising temperatures.

Over the next 20 years, California could lose 10 percent[1] of its water supplies.

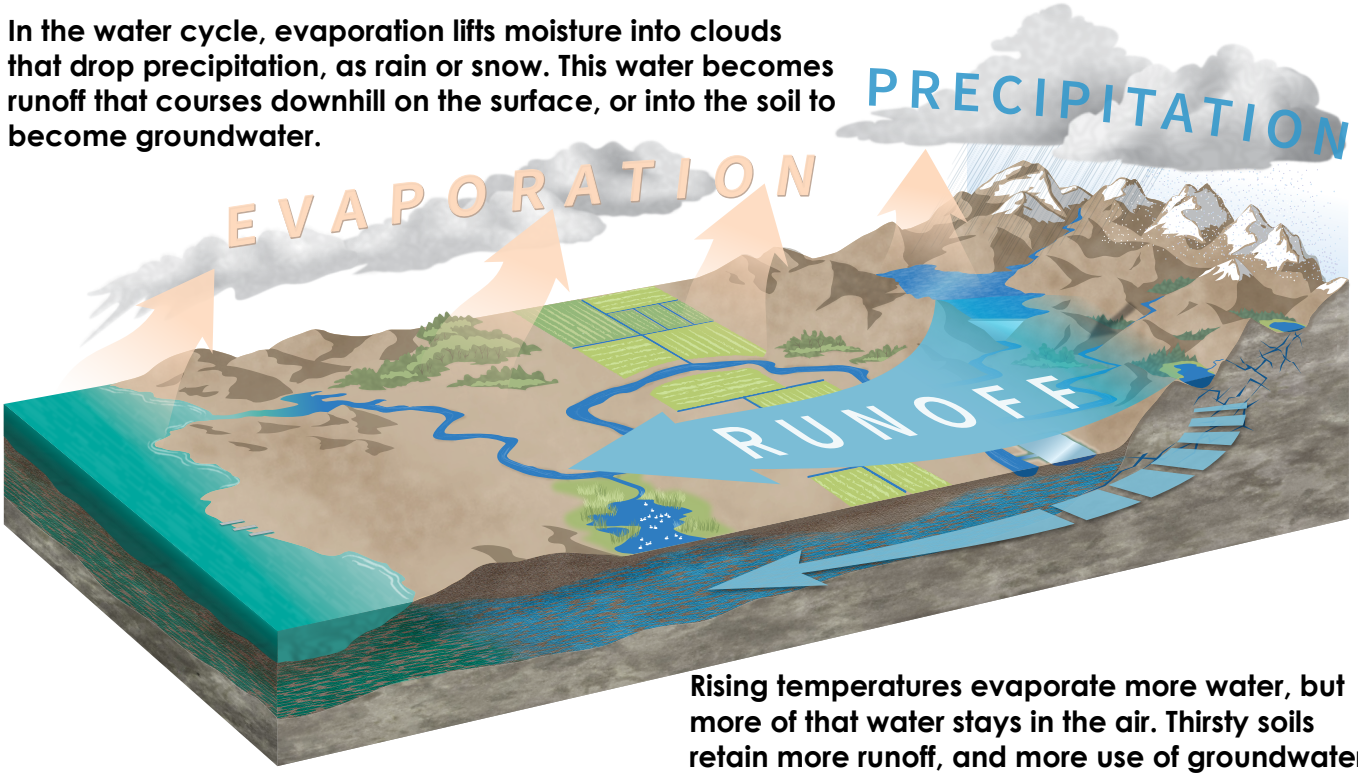
Our climate has changed, and the West continues to get hotter and drier. As it does, we will see on average less snowfall, more evaporation, and greater consumption of water by vegetation, soil, and the atmosphere itself.



In previous droughts the ratio of precipitation to evaporation to runoff has been similar. However, as temperatures rise, evaporation increases, with the consequence of a fall in runoff. As average temperatures continue to increase, the increase in evaporation will continue, with a concurrent drop in runoff.

The coming water cycle: the air claims more

In the water cycle, evaporation lifts moisture into clouds that drop precipitation, as rain or snow. This water becomes runoff that courses downhill on the surface, or into the soil to become groundwater.



Rising temperatures evaporate more water, but more of that water stays in the air. Thirsty soils retain more runoff, and more use of groundwater requires more water for recharging watertables.

[1] DWR estimates a 10% reduction in water supply by 2040. This is a planning scenario that considers increased temperatures and decreased runoff due to a thirstier atmosphere, plants, and soils. According to the California Water Plan Update, California's managed water supply ranges from 60-90 MAF per year so the effect of a drier climate results in a disappearance of about 6-9 MAF of water supply.

California's precipitation always has swung between drought and flood. Those swings are becoming more severe. Regardless of drought or flood, in this changed climate there will be less water available for people to use than there would have been in a cooler climate because of the way plants, soils, and the atmosphere use water as temperatures rise.

The volume of water used by people in California for agriculture, urban, and environmental purposes ranges from 60 million acre-feet per year to 90 million acre-feet per year. A loss of 10 percent of that volume to hotter, drier conditions could mean the disappearance of about six million acre-feet to nine million acre-feet of water supply. For comparison's sake, California's largest reservoir – Shasta – holds 4.5 million acre-feet.

Water underpins much of what we care about as Californians. To thrive and grow as a state, we will have to make up for a loss of supply. We must innovate, conserve, store, reuse, and repurpose water.

This document outlines four sets of actions the State will pursue to prepare California for its new climate reality.

These targeted actions aim to secure supplies for people, so that homes, schools, and businesses do not suffer disruptions, and the state's agricultural economy continues to thrive.

In concert with these actions, the State is working to protect fish and wildlife populations by removing stream barriers, restoring aquatic habitat, bolstering stream flows at ecologically important times, and expanding floodplains and wetlands.

The State also continues to make progress extending clean, safe drinking water to all Californians; in the last three years, the number of people impacted by failing water systems has fallen from 1.6 million to 934,000, and the state has delivered emergency drinking water assistance to 9,456 households and 150 water systems in this drought.

The actions in this strategy aim primarily to support the urban and suburban water systems that serve most Californians and to stabilize water supplies for agriculture. But benefits from these actions will extend to environmental protection and fulfillment of the right of every Californian to safe drinking water, and the State continues to advance those efforts apart from this strategy.

How California is taking action to protect community water supplies

The Water Resilience Portfolio has guided State water policy since July 2020 and will continue to do so. It is a comprehensive suite of actions that support local water resilience. However, the record-breaking temperatures and aridity of the 2012-16 drought, followed so closely by another stretch of similar conditions beginning in the winter of 2020-21, send a strong climate signal that we must heed. These new, more extreme conditions make clear that to secure water supplies, we must double down on a set of actions within the Water Resilience Portfolio, with haste.

Executing this strategy will require coordination with local, tribal, and federal partners to:

1) Develop new water through recycling and desalination.

2) Capture and save more stormwater, above ground and below ground.

3) Reduce use of water in cities and on farms.

4) Improve all water management actions with better data, forecasting, conveyance, and administration of water rights.

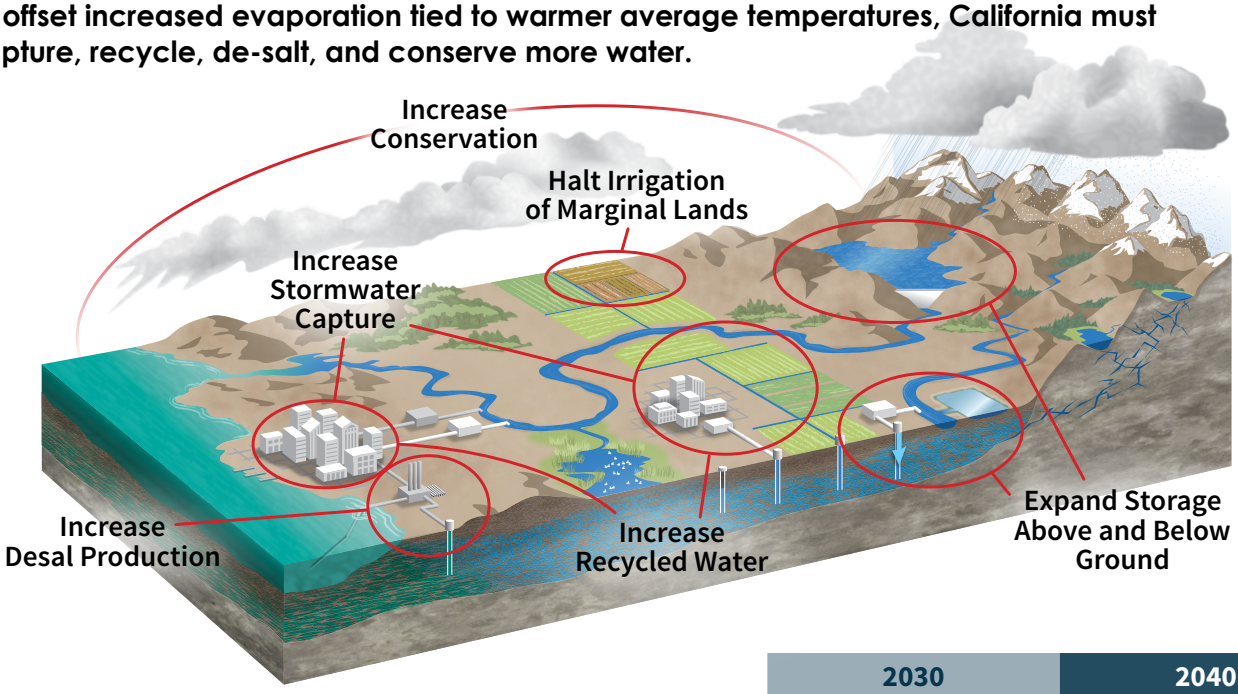
1. Develop New Water Supplies

Investments in wastewater recycling and desalination technology can help drought-proof communities.

1.1 Reuse at least 800,000 acre-feet of water per year by 2030 and 1.8 million acre-feet by 2040, with most of that additional recycling involving direct wastewater discharges that are now going to the ocean.

Closing the evaporative gap

To offset increased evaporation tied to warmer average temperatures, California must capture, recycle, de-salt, and conserve more water.



	2030		2040	
Increase Recycled Water	.8 MAF	About 5 MAF	1.8 MAF	About 7 MAF
Increase Desal Production	28,000 AF		84,000 AF	
Increase Stormwater Capture	.25 MAF		.5 MAF	
Increase Conservation	.5 MAF		.5 MAF	
SUBTOTAL FOR RECYCLED, DESAL, STORMWATER AND CONSERVATION	1.6 MAF		2.9 MAF	
Expand Storage Above and Below Ground*	3.7 MAF		4 MAF	
Total	4.8 MAF		6.9 MAF	

*Additional storage capacity does not equate to a similar volume of new water supply. MAF – million acre-feet.

Currently, recycled water offsets about nine percent of the state's water demand, about 728,000 acre-feet per year. The State Water Resources Control Board (State Water Board) has invested a total of $1.8 billion in recycled water projects statewide over the last five years that are in various stages of development. Once completed, those projects will generate an additional 124,000 acre-feet of new water supply.

Approximately 1.5 million acre-feet per year of treated wastewater is currently discharged to California's ocean waters. Not all of this can be recycled, as some water is needed to discharge brine, and wastewater in some places provides critical streamflow for fish and wildlife. But in many places, communities can tap this resource to build water supply resilience.

Current regulations enable communities to use recycled water for drinking via a reservoir or aquifer, and in 2023, the State Water Board will establish direct potable reuse regulations that allow suppliers to distribute recycled water without first putting it into a reservoir or aquifer.

Implementation Steps:

- The State will consider greater investments and leverage federal dollars where possible to build on the $3.2 billion in financing for water recycling projects that the State Water Board has provided to 94 projects since 2012. At roughly $15,000 an acre-foot, it would require a state, local, and federal investment of approximately $10 billion to achieve the 2030 goal and $27 billion to achieve the 2040 goal of recycling an additional 1.8 million acre-feet of water.
- By January 1, 2024, the State Water Board will work with local water and sanitation agencies to identify recycled water projects that hold the potential to be operational by 2030 and by no later than 2040.
- The State Water Board will formalize a process currently underway by convening a strike team to identify and resolve permitting and funding obstacles.
- The State Water Board will track the permitting and funding status of recycled water projects with a public, digital dashboard.
- The State will support local water sustainability plans that include water recycling, including (but not limited to):
  - Operation NEXT/Hyperion 2035 (City of Los Angeles)
  - Pure Water San Diego (City of San Diego)
  - Integrated Water Resources Plan and Climate Action Plan (Metropolitan Water District of Southern California)
  - Water Supply Management Program 2040 (East Bay Municipal Utility District)
- The State Water Board will act on direct potable reuse regulations by December 2023.

1.2 Expand brackish groundwater desalination production by 28,000 acre-feet per year by 2030 and 84,000 acre-feet per year by 2040 and help guide location of seawater desalination projects where they are cost effective and environmentally appropriate.

There are 14 seawater desalination plants across the state, with a combined production capacity of approximately 89,000 acre-feet per year. Some are not operating at full capacity and could be positioned to generate additional water supplies in drought, much as "peaker" power plants operate in short bursts to support electricity reliability at times of peak demand. Another 23 brackish groundwater desalination plants have a combined production capacity of 139,627 acre-feet per year. Brackish groundwater requires significantly less energy to treat than seawater.

Proposals to build desalination projects along the coast must be approved under the Coastal Act, in addition to other regulatory requirements. As California becomes hotter and drier, we must become more resourceful with the strategic opportunity that 840 miles of ocean coastline offer to build water resilience.

Implementation Steps:

- By January 1, 2024, the Department of Water Resources (DWR) and the State Water Board, in coordination with local agencies, will identify the brackish desalination projects that have the potential to be operational by 2030 and by no later than 2040. The State will consider investing in grants to local agencies for planning and building desalination projects.
- By January 1, 2024, the State Water Board will review groundwater basins impaired by salts and nutrients and determine the volume of water available for brackish groundwater desalination.
- As the State's representative on the U.S. Department of Energy's five-year, $100 million desalination innovation hub, DWR will continue to guide research investments towards technological breakthroughs that solve California desalination challenges.
- The State will help streamline and expedite permitting to provide better clarity and certainty to further desalination projects. To this end, by June 30, 2023, the State Water Board, Coastal Commission, DWR and other State entities (e.g. State Lands Commission) will develop criteria for siting of desalination facilities along the coast and recommend new standards to facilitate approval.
- Within the following year, these agencies will identify potential available mitigation sites to facilitate the expedited approval of desalination facilities. The State Water Board will consider amendments to the Desalination Policy in its Ocean Plan to streamline permits that meet the recommended siting and design standards for projects located in the identified priority areas.

2. Expand Water Storage Capacity Above and Below Ground by Four Million Acre-Feet.

While creating more space to store water in reservoirs and aquifers does not create more precipitation, and though having enough rain and snowfall to fill storage space is out of our control, we need diversion infrastructure, more places to park runoff, and the conveyance to eventually move the water to where it is needed to take advantage of fast-moving storms. Expanding storage capacity improves the ability to capture runoff

when diversions cause the least harm to the environment. Furthermore, apart from a hotter and drier climate, capturing water runoff is needed to help correct decades of over-pumping of groundwater basins.

2.1 Expand average annual groundwater recharge by at least 500,000 acre-feet.

Vast capacity to store water exists underground in California. Intentional, directed recharge of groundwater is one of the fastest, most economical, and widely available ways to harness the bounty of wet years to cope with dry years. It has the additional advantage of helping to halt or prevent land surface collapse due to over-pumping, which can damage roads, canals, and bridges. Expanding groundwater recharge requires adherence to laws, so that the environment and water users upstream and downstream are not harmed when streamflow is directed underground. With the multi-faceted suite of actions below, the State intends to help local water agencies to accelerate the pace and scale of groundwater recharge. These actions center on helping local agencies understand the best locations for recharge, analyze the impact of their recharge proposals on the environment and other water users, and expeditiously permit their projects.

Local agencies are developing groundwater recharge projects around the state. By the end of next year, the State cumulatively will have invested $350 million in local assistance for recharge projects. In planning documents, local agencies have proposed more than 340 new recharge projects that, if built, could result in as much as 2.2 million acre-feet of additional stored water in a single wet year by 2030. Until those projects are permitted, it is unclear how much water those projects will have the capacity to divert to underground storage; multiple proposals may rely on the same sources of unappropriated water. But an additional 500,000 acre-feet is a reasonable estimate of the additional average annual recharge volume that may be obtained after these projects are vetted, permitted, and constructed.

California must be ready to respond to future wet winters. Fortunately, several processes already are in place that could be used to divert water from high-flow events to underground storage. Additional outreach, education, and technical assistance will be critical for preparing diverters for a potentially wet winter so that permits can be put in place before the start of the rainy season.

Should local actions become too fragmented or inefficient to maximize recharge opportunities, the state should consider a coordinated, state-level approach to provide for orderly, efficient disbursement of rights to high winter flows.

Implementation Steps: To help achieve this target, DWR and the State Water Board will continue to provide regulatory and technical assistance to local agencies that have received State funds to ensure that groundwater recharge project proponents can successfully navigate the regulatory processes. The State will weigh the following actions. Some would require additional investments and, possibly, regulatory changes.

- **Outreach:**
  - DWR and the State Water Board will conduct a series of outreach activities to highlight temporary permitting pathways in advance of winter, to assess the status of

proposed recharge projects, and to better align state and local agencies to advance groundwater recharge. The outreach would focus on the use of an existing 180-day temporary permit process and would note that permit applications should be received no later than October 1 to be ready for diversions in January.

- By December 2022, DWR will evaluate a process whereby it files for 180-day temporary permits in certain watersheds on behalf of local agencies, in order to advance the development of the permit terms and conditions. DWR also would pay the filing fee, which could help facilitate local willingness to participate.

Technical Assistance:

- DWR will provide outreach and assistance to help connect potential diverters with State Water Board permitting staff to answer specific questions and provide information that enables effective permit applications.
- By October 2022, the State Water Board water right permitting staff will prioritize groundwater recharge permits.

- **Incentives:**
  - The State will weigh immediate and long-term incentives for recharge project applicants to pursue the State Water Board's streamlined recharge permitting pathway. Incentives could include:
  - Waiving of application costs partially or fully for a two-year period.
  - Connecting infrastructure funding to applications that use the State Water Board's streamlined underground storage permitting approach.
  - Prioritization of State funding for groundwater recharge projects that target high-flow events, which raise fewer concerns about the environment and other water right holders than projects that seek to capture water in "shoulder" seasons of spring, summer, and fall.
  - DWR will expand its watershed modeling tools to better assess water available for recharge on a watershed basis.
- **Regulatory Streamlining:**
  - The State will streamline water right permits for recharge projects receiving DWR grants or conducted under DWR's Flood-Managed Aquifer Recharge Program.
  - The State Water Board will develop permanent regulations for water availability analyses that specify methodologies, data, and alternatives for conducting such analyses.
  - The Administration will pursue legislation to revise the water right application process to deliver decisions more quickly.
- **State Administration of Potential Recharge Flows**:
  - DWR and the State Water Board will develop a mechanism to create a more consistent, economical, and equitable approach for allocation of water rights for groundwater recharge. The initial proposal would focus on the State securing all reasonably available future flood flows in the Central Valley, allowing the State to

then allocate the available water in an orderly, holistic, equitable, and integrated approach. The process would:

- Level the playing field for local agencies, especially those that lack the resources to navigate the water right process.
- Set clear water availability metrics for every potential applicant, allowing for fair comparisons among applicants.
- Address equity concerns, including, for example, the need to protect domestic wells or abate subsidence.
- Leverage other funding opportunities.
- Spur tight coordination between the State Water Board and DWR in the allocation of water rights.

2.2 Work with local proponents to complete the seven Proposition 1-supported storage projects and consider funding other viable surface storage projects.

Seven locally-driven projects are underway to increase the state's overall capacity to store water by 2.77 million acre-feet – nearly three times the capacity of Folsom Lake. The seven projects are on track to receive a combined $2.7 billion in state funding from Proposition 1, the 2014 water bond, once they meet the requirements imposed in the bond law. Four of the projects involve groundwater storage and three involve creation of a new or expanded reservoir. Two of these seven projects are likely to begin construction next year. Project proponents are working now to obtain permits, arrange financing, finalize environmental documents, and negotiate contracts with state agencies for the delivery of public benefits from the projects, including environmental flows.

Implementation Steps:

- To formalize, streamline and continue existing efforts, the California Natural Resources Agency and the California Environmental Protection Agency will establish an interagency strike team to facilitate state permitting and support completion of these projects.
- Water Commission staff will continue to monitor development of the seven Proposition 1 projects closely.
- Permit teams from the California Department of Fish and Wildlife (CDFW) and the State Water Board will continue working with applicants and with other state agencies to inform and advance the development of contracts for administration of public benefits.
- Water Commission, DWR, CDFW, and State Water Board teams will continue robust coordination. and working with applicants to draft and execute contracts for administration of public benefits.

2.3 Expand San Luis Reservoir by 135,000 acre-feet.

The federal government is proposing to expand San Luis Reservoir in Merced County to capture more winter storm runoff. In extremely wet years like 2017, San Luis fills and California misses an opportunity to capture and store even more water for use during

subsequent dry years. The project would expand the capacity of the two-million acre-foot reservoir by 130,000 acre-feet -- enough to supply nearly 400,000 homes a year. DWR is working with the U.S. Bureau of Reclamation (Reclamation) on this proposed project and sees it as an important part of a set of inter-related joint projects to benefit the Central Valley Project and State Water Project, which include upgrading the San Luis Reservoir dam for earthquake safety, modernizing conveyance of water through the Sacramento-San Joaquin Delta, and restoring capacity lost due to subsidence at major Central Valley canals.

Implementation Steps:

- In December 2019, Reclamation and DWR announced a partnership to move forward on the seismic upgrade. Reclamation and DWR celebrated the groundbreaking of the project in June 2022. Construction is expected to finish in 2028. DWR will continue to work with Reclamation to complete the seismic upgrade and expansion.

2.4 Rehabilitate dams to regain storage capacity.

As of May, 112 California dams are rated "less than satisfactory" by State dam inspectors, and the reservoirs behind 41 of those dams cannot be filled beyond a certain level in order to protect public safety. The loss of storage is about 350,000 acre-feet per year. Accelerating dam safety repairs would help local water districts regain lost storage capacity and improve public safety. While this has historically been a federal or local obligation, the Legislature and Administration enacted additional funding to support dam owners faced with costly repairs.

Implementation Steps:

- DWR will administer the $100 million in the 2022-23 budget for local dam safety projects and flood management.

2.5 Support local stormwater capture projects in cities and towns with the goal to increase annual supply capacity by at least 250,000 acre-feet by 2030 and 500,000 acre-feet by 2040.

Over the last 30 years, an average of approximately 324,000 acre-feet of stormwater a year has been captured and recharged in communities in the South Coast alone. While this value varies from year to year, during the exceptionally wet winter of 2004-05 over 900,000 acre-feet of runoff was captured and infiltrated into the local groundwater basins.

The size, cost, and feasibility of stormwater capture projects vary greatly by location. It is extremely difficult for stormwater agencies to accurately measure stormwater capture volume and to predict potential due to uncertainties with annual precipitation.

Implementation Steps:

- Through permitting and funding, the State will incentivize local agencies to develop stormwater capture projects and help offset the cost of completing these projects, including through stormwater crediting systems to encourage public-private partnerships.

- The State Water Board will hire a contractor to provide an estimate of current stormwater capture and use statewide and then re-evaluate every five years progress towards the 2030 and 2040 goals.

3. Reduce Demand

3.1 Build upon the conservation achievements of the last two decades to reduce annual water demand in towns and cities by at least half a million acre-feet by 2030.

During the 2012-2016 drought, Californians did their part to conserve water, with many taking permanent actions that continue to yield benefits; per capita residential water use statewide declined 21 percent between the years 2013 and 2016 and has remained on average 16 percent below 2013 levels as of 2020. Californians need to step up again in this current drought. The State set a target of 15 percent for statewide conservation. Californians have made progress toward that goal in the summer of 2022, but more is needed to cope with the intense drought at hand and for the long term.

California enacted laws in 2018 to set new efficiency standards for how people use water in homes and businesses in ways that make sense in each region. These standards will drive fully-efficient water use in communities and eliminate water waste, even as communities continue to grow. The 2018 legislation calls for these standards to be met by 2030. The State Water Board is on track to set those new standards, informed by extensive data collection and analysis and recommendations from DWR. The recommended standards for indoor and outdoor water use for residential, commercial, industrial, and institutional water use could save 450,000 acre-feet per year starting in 2030. This amount of water would support 1.35 million homes, and the savings would prevent urban water use from rising as much as it would otherwise as population grows and more housing is built. These new standards would not apply to individual Californians, but local water suppliers must ensure the standards are met.

Given the acute need to conserve water in a potentially fourth dry year, the State Water Board will develop emergency conservation measures that would expedite implementation of conservation in a way that is already mandated through the 2018 laws. If drought conditions persist, the new short-term requirements could take effect no later than spring 2023. The new requirements would consider the relative efficiency of each supplier. These new efficiency targets would therefore work as a bridge to take California from voluntary measures to efficiency-based, water-use budgets that account for differences in climate zones, landscape area, population, and other factors.

In addition, the Administration sponsors a robust campaign to motivate urban Californians to save water and is working to accelerate the transition of turf to landscapes that use less water. To this end, the State will partner with local agencies to convert 500 million square feet of ornamental turf by 2030, with corresponding investments in programs and policies that incentivize turf conversion. Removal of 500 million square feet of turf could generate 66,000 acre-feet of water savings each year at an estimated cost of $1 billion.

Implementation Steps:

- The State Water Board will develop short-term efficiency-based conservation targets for every urban retail water supplier based on their unique characteristics like climate zone, water demand, residential landscape area, and population. The Board will compare water suppliers' actual use to their estimated efficient use target and assign them a percent reduction, with a higher reduction target for suppliers whose actual use is further from their efficient use target.
- DWR and the State Water Board will target grants to help local water districts achieve efficiency targets, using funding recently approved by the Legislature.
- The State-run Save Our Water campaign will continue to educate Californians about the severity of the current drought and the need to make water conservation a permanent, daily practice.
- DWR will establish a grant program to support local efforts to replace ornamental turf with drought-tolerant landscaping and—where schools and parks require turf—to make turf irrigation and maintenance more efficient, with a focus on disadvantaged communities.
- The State Water Board will advance adoption of new long-term water use efficiency standards, per existing statute (2018).
  - Once DWR provides its formal recommendations, the State Water Board will begin the process for enacting the regulation to ensure the rule will be in effect by January 1, 2024.

3.2 Help stabilize groundwater supplies for all groundwater users, including a more drought-resilient agricultural economy.

California irrigated agricultural acreage declined by 1 million acres between 2002 and 2017. The approximately eight million acres of irrigated farm and ranchland will shrink by at least an estimated additional 500,000 acres to one million acres between now and 2040 as local agencies transition to groundwater use that is sustainable over coming decades. The conserved water should support a more drought-resilient agricultural economy that retains its vitality.

Implementation Steps:

The State will:

- Continue to implement the Sustainable Groundwater Management Act (SGMA) to protect communities, agriculture, and the environment against prolonged dry periods and climate change, preserving water supplies for existing and potential beneficial use.
- Support local water demand management that includes changes to cropping patterns and fallowing by building upon this year's investment of $40 million in grants to regional organizations working to reduce groundwater reliance and create local environmental and economic opportunities through land-use changes.
- Continue to support conservation and water efficiency practices by agricultural producers.
- Support flexibility in local land use decisions to protect beneficial uses and users.

- Continue direct investment and technical assistance in drought relief for agriculture with dedicated funding to assist socially disadvantaged and underserved populations.

4. Improve Forecasting, Data, and Management, including Water Rights Modernization

Crucial to achieving the water supply actions described here is a common, readily-available set of facts about water supply and use, better forecasting, and integrated use of data and technology. Water rights modernization and reform are critical to ensuring we can efficiently and effectively adapt to a changing climate.

4.1 Improve data collection and modernize forecasts for a changed climate.

Sierra snowpack provides about a third of the water people use in California, yet the existing approach to forecasting snowmelt runoff dates to the 1950s.

To account for climate change, we must simulate the physics of interactions among the atmosphere, water as rain or snow, and the land surface – and we need to do this for individual watersheds, incorporating site-specific features like slope orientation and depth of soil. This requires timely data collection.

Implementation Steps:

The State will:

- Continue to invest in the human and technical resources needed to improve predictions and forecasting for water supply planning.
- Advance a multi-agency effort to install 430 new stream gages and upgrade or re-activate 200 more across the state. These gages provide real-time surface water data for enhanced drought management and flood response.
- Work with the U.S. Army Corps of Engineers leadership to accelerate the pace at which the manuals guiding reservoir operations are updated to reflect a changed climate.

4.2 Improve the flexibility of current water systems to move water throughout the state.

California depends upon aging, damaged, or increasingly risk-prone infrastructure to transport water between different areas of the state. Modern infrastructure and tighter coordination between the state's two major water projects would expand capacity to move water when it is available.

The state and federal water projects are fed by levee-lined channels in the Sacramento-San Joaquin Delta. This Delta infrastructure faces serious threat of failure due to storm surge, sea level rise, and earthquakes that could collapse levees. Loss of this water supply for any amount of time poses significant risk to farms, businesses, and most California homes. South of the Delta, major canals have been damaged by subsidence caused by the over-pumping of groundwater, restricting the capacity to move water when it is available.

DWR proposes to modernize State Water Project (SWP) conveyance in the Delta. Had the proposed project been operational in 2021, the project could have captured and

moved an additional 236,000 acre-feet of water into San Luis Reservoir during that winter's few large storms.

Administrative hurdles also limit flexibility to move water. Every year for the last 10 years, the federal and state water projects have applied to the State Water Board for temporary flexibility in the locations where water diverted by either project may be used. These "consolidations of the authorized places of use" of the SWP and the Central Valley Project last only a year and require repetitive work by all parties involved. A permanent change to allow for consolidated place of use among the projects would make water transfers easier and lay the groundwork for discussions about future operation of the two projects.

Implementation Steps:

- DWR will advance the design of and the draft environmental impact report for the proposed Delta conveyance project, which would construct new intakes along the Sacramento River and a tunnel under the Delta to safeguard SWP deliveries and ensure that the SWP can make the most of big but infrequent storm events.
- DWR will disburse $100 million included in the 2022-23 state budget to support costs of repairing four major San Joaquin Valley canals damaged by subsidence.
- DWR and the State Water Board will chart a work plan to address the resources needed for preparation, submittal, and consideration of a joint place of use petition from the federal and state water projects.

4.3 Modernize water rights administration for equity, access, flexibility, and transparency.

The foundation of how California manages water rights dates to the Gold Rush and has not evolved in step with changing public values and management needs. The State Water Board is challenged to provide timely, useful, and meaningful information to guide state and local water management decisions, which are especially vital during periods of drought.

Other western states including Washington, Oregon, Nevada, and Idaho manage water diversions much more nimbly than California, which puts them in better position to adjust to what many call "aridification" – the transition to a drier climate. The ability to adjust diversions quickly also is crucial to protecting fish and wildlife, other water right holders, and public health. To make a century-old water right system work in this new era, the State Water Board needs accurate and timely data, modern data infrastructure, and increased capacity to halt water diversions when the flows in streams diminish. These improvements are a necessary predicate to modernize our water rights system in a manner that respects water right priorities and aligns with current public values and needs.

Implementation Steps:

The State Water Board will:

- Continue to build upon efforts started last summer with the investment of $30 million to digitize existing paper records and rebuild the state's water right data management system.

- Develop pilot projects in two or three watersheds over the next five years to collect real-time diversion data and integrate the data into the State Water Board's water rights data system, with lessons learned and outcomes used to inform statewide tools needed for administering an efficient and effective water rights system.
- Develop data and analytical tools for implementing the water right priority system for an estimated 10 to 15 watersheds.
- Support modeling staff to develop more robust supply/demand models for the Delta watershed.
- Consider adopting regulations that would allow for curtailments of water rights in years when there is not a declared drought emergency. The State currently lacks the authority in most years to implement the priority water rights system without a declared drought emergency.
- Support enforcement staff to help address illegal and unauthorized diversions during dry conditions.
- Consider regulations, legislation, and pursuing resources needed to streamline and modernize the water right system, clarify senior water rights, and establish more equitable fees.

Why target these actions?

The last three years of record-breaking drought made painfully real the hotter, drier pressures on water systems. These four major sets of actions would put to use water that would otherwise be unusable, stretch supplies with efficiency, and expand our capacity to bank water from big storms for dry times. They are designed, in other words, for a climate prone to weather whiplash.

These actions alone will not eliminate local water supply risk. The variability of rain and snow is too great, as is the uncertainty about which projects local agencies will implement. These actions aim to spur local agency adaptation to a new reality and change the way the State does business in order to better support local and regional water management efforts.

Who will carry out this strategy?

The state and federal governments each operate large water delivery systems in California, but local water districts and counties have primary responsibility for getting supplies to homes and businesses. Thousands of local and regional entities play a role in water management. Implementation of this strategy will require decisive state action. It will also require partnerships, as local agency leaders, federal partners, farmers, other business owners, and individual Californians are essential actors in carrying out this plan. To ensure successful implementation in such a decentralized system, the State must lead, set goals, provide incentives, and be prepared to exert greater authority when necessary.

The State will prioritize its funds and human resources to support local projects that satisfy state planning and permitting requirements to protect natural resources and help us

collectively reach the targets outlined above. The State will invest in forecasting and data and water right administration – including real-time tracking of water use – to improve all water management actions by state, local, federal, and private entities. The State will also ensure that California's response advances equity and takes into account communities that are most at risk from climate change and that have experienced environmental injustices.

Water affordability is key to ensuring the human right to water – established in California law -- in the face of a hotter, drier state. The State has made strides in promoting affordability through provision of low-interest loans and grants to support infrastructure and planning for water systems, and by addressing pandemic-related water debt. However, the increased investments in infrastructure necessary to meet our future water supply needs will put additional pressure on affordability. The State will identify how best to support low-income households and address community affordability of water systems. Electric and communication utilities have programs to ease cost burdens on low-income members of the community, and it is important to address this in the water utility sector in a way that is workable and sustainable from a state budget perspective.

Where local agencies fail to build water resilience, the State will exert greater regulatory authority or work with the Legislature to gain authority to do so.

Moving Smarter and Faster

Climate change uniquely affects California's regions. This document articulates statewide targets for certain water management strategies, but achieving those overarching goals requires solutions at the local level, where the opportunities and challenges of each watershed vary tremendously. To encourage collaboration across watersheds that leads to greater statewide water resilience, the State will work with stakeholders and the Legislature to create:

- A funding program that incentivizes water users to develop regional targets for recycling, desalination, storage, efficiency, and other water management strategies.
- An expedited permitting path for water projects that help regions achieve those targets.

In order to deliver the pace and scale of projects necessary to meet this unprecedented climate challenge, we must modernize regulatory structures and expand staff capacity so that State agencies can assess, permit, fund and implement projects at the pace this climate emergency warrants.

The Administration will work with the Legislature and stakeholders to pursue the following:

- A more expeditious process for completing, reviewing and finalizing California Environmental Quality Act (CEQA) reviews and Water Code proceedings for critical water infrastructure projects to build drought and flood resilience.
- A voluntary permitting process for water infrastructure projects administered by the Governor's Office of Planning and Research (OPR). State agencies would retain authority to review, identify, and address environmental impacts, but the OPR would expedite the collective permitting process. This proposed process would not be an

option for water projects already under environmental review. The Administration would work with the Legislature to determine eligibility criteria for this voluntary process.

- Legislation, where appropriate, and regulations that would allow for curtailments of water rights in years when there is not a declared drought emergency. The State currently lacks the authority in most years to implement the priority water rights system without a declared drought emergency.

The Administration will:

- Develop water availability analysis guidelines for water right applications that account for high-flow periods on fully appropriated streams and the way climate change is shifting the seasonality and intensity of runoff. Develop permanent State Water Board regulations that specify the data and methodologies to be used for conducting such analyses in order to remove the current ambiguity about regulatory requirements.
- Establish a State Water Board, DWR and the California Department of Food and Agriculture "Groundwater Recharge Coordinating Committee" to jointly implement the groundwater recharge initiatives.
- Establish programmatic permitting for projects of a similar nature (such as water recycling or habitat restoration) in order to lower costs, simplify process, and speed permit approval.
- Institutionalize early alignment and regular internal coordination across state agencies on the permitting of water supply adaptation projects.

Conclusion

The world is getting hotter. The increased heat will intensify the natural swings in California's climate and shrink water supplies. Targeted state funds and focus will support local efforts to conserve, capture, recycle, and de-salt enough water to allow California communities to prosper in a hotter, drier climate.