BAY AREA WATER SUPPLY AND CONSERVATION AGENCY
BOARD OF DIRECTORS MEETING

April 9, 2021

Correspondence and media coverage of interest between March 17, 2021 and April 7, 2021

Correspondence

From: Nicole Sandkulla, BAWSCA CEO/General Manager
To: Sophie Maxwell, SFPUC President of the Commission
Date: April 6, 2021
Subject: BAWSCA Comments on Proposed 2021 Revised Baseline of the Final SFPUC Water Enterprise Capital Improvement Program

From: Restore Hetch Hetchy
To: Sophie Maxwell, SFPUC Commission President
Date: April 2, 2021
Subject The San Francisco Regional Water System and groundwater banking

From: Los Vaqueros Reservoir Expansion Project – Monthly Report
Date: March 29, 2021

From: Advanced Quantitative Precipitation Information (AQPI)
To: Members of the Bay Area Delegation
Date: March 31, 2021
Subject: Request for support of additional funding in FY 2022 for the National Oceanic and Atmospheric Administration's Office of Atmospheric Research Weather and Air Chemistry Research account to support Advanced Quantitative Precipitation Information system.

Media Coverage

Drought/Water Supply Conditions

Date: April 7, 2021
Source: Center for Western Weather and Water Extremes
Article: CW3E End of Winter Summary: Water Year 2021 Characterized By Persistent Dry Weather And Worsening Drought in California

Date: April 2, 2021
Source: Los Angeles Times
Article: Drought is back. But Southern California faces less pain than Northern California

Date: April 1, 2021
Source: KPBS
Article: California Snowpack Below Normal With Wet Season Ending

Date: April 1, 2021
Source: SFGate
Article: California's reservoirs at 50% of capacity as drought looms

Date: April 1, 2021
Source: Valley Water News
Article: Valley Water Continues To Call For Voluntary Conservation As Drought Conditions Worsen

Drought/Water Supply Conditions, cont'd.:

Date: April 1, 2021
Source: Environmental Defense Fund
Article: California is facing another drought, but I'm still hopeful. Here are 3 reasons why

Date: March 31, 2021
Source: Associated Press
Article: On tap in California: Another drought for years after last

Date: March 17, 2021
Source: Bay Area News Group
Article: Drought: Santa Clara Valley Water District asks public to step up water conservation

Water Policy:

Date: April 5, 2021
Source: Delta Stewardship Council
Editorial: Complexities: Thinking about the San Francisco Estuary during the 2021 Bay-Delta Science Conference

Date: April 4, 2021
Source: Modesto Bee
Editorial: Are CA Water Wars About To Boil?

Date: April 1, 2021
Source: National Review
Editorial: Reform California's Water Policies

Date: March 31, 2021
Source: CalMatters
Editorial: With San Francisco Fay on life support, Newsom withholds the cure

Date: March 26, 2021
Source: Western Water Notebook
Article: California Weighs Changes For New Water Rights Permits In Response To A Warmer And Drier Climate

Date: March 24, 3031
Source: Half Moon Bay Review
Article: Water war continues to affect salmon run

Water Infrastructure:

Date: April 6, 2021
Source: Maven Meetings
Article: Ca. Water Commission: Ensuring The Reliability Of The State Water Project. Part 1: Strategic Priorities and Programs

Date: April 5, 2021
Source: New York Times
Article: How California Stands to Benefit From the $2.2 Trillion Infrastructure Proposal

Water Infrastructure, cont'd.:

Date: April 5, 2021
Source: ABC 7 News
Article: Vice President Kamala Harris, Governor Gavin Newsom visit Bay Area water facility

Date: March 31, 2021
Source: Pacific Institute
Article: Biden Infrastructure Plan: Water Components

Date: March 26, 2021
Source: Water & Waste Digest
Article: Industry Associations Applaud Congressional Committees For Passage Of Water Infrastructure Bills

Water Quality:

Date: April 2, 2021
Source: Phys.org
Article: Microplastics are affecting melt rates of snow and ice

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Bay Area Water Supply & Conservation Agency

April 6, 2021

The Hon. Sophie Maxwell, President
San Francisco Public Utilities Commission
525 Golden Gate Avenue, 13th Floor
San Francisco, CA 94102

SUBJECT: BAWSCA Comments on Proposed 2021 Revised Baseline of the Final SFPUC Water Enterprise Capital Improvement Program

Dear President Maxwell,

BAWSCA has completed a review of SFPUC's Proposed 2021 Revised Baseline of the final SFPUC Water Enterprise Capital Improvement Program (Baseline Report), dated March 16, 2021. The ability to review and comment on the Baseline Report in advance of the Commission's adoption of the new baseline is appreciated. This letter presents BAWSCA's findings and recommendations based on our review. We hope the Commission will consider them as part of its action.

BAWSCA's findings and recommendations pertain only to the regional water projects in the Baseline Report.

Findings

1. All the projects in the Baseline Report are shown in the adopted FY 21-30 CIP Budget.
2. There are no major funding surprises in the Baseline Report.
3. Several project schedule priorities have been revised significantly in the proposed 2021 baseline as compared with the prior 2018 baseline. Of the 12 new projects in the 2021 baseline, 3 project completion schedules have been advanced forward by 2 to 7 years, and 3 project schedules have been delayed by 4 to 6 years. For example, the Pre-stressed Concrete Cylinder Pipe Repair Project ($54.8M) is scheduled to be completed 7 years earlier than shown in the adopted FY 21-30 CIP Budget.
4. The new baseline will be adopted about 1 year after the FY 21-30 budget was approved. This delay has resulted in CIP Quarterly Reports that have been significantly out of sync with SFPUC's adopted budget for one year.
5. The proposed 2021 baseline includes 12 more projects and extends project activity over a longer timeframe than previously included in the 2018 baseline.
6. The amount of budget allocated to current and future baseline projects necessarily impacts the remainder of the funding available for CIP work efforts not covered in the baseline, specifically those small projects (less than $5M) which are not included in the rebaselining.
7. The project delivery costs for the Water Enterprise (WE) are summarized in Section 3 of the Baseline Report. The WE project delivery costs are projected at about 45.4% (ranging from about 42.5% in Water Treatment to about 50.7% in Watersheds and Lands). This remains high compared to the industry norm of 35% to 40% depending on project complexity.

Recommendations

1. Moving forward, new baseline reports should be produced within 6 months following the adoption of a new 10-year CIP to allow for more accurate quarterly reporting for use by the Commission, BAWSCA, and the water customers.
2. The SFPUC should reconsider its ability to perform the added workload reflected in the Baseline Report and review what further actions need to be taken or resources added to achieve the identified critical results given the issues the SFPUC has reported regarding ongoing issues with staff and consultant resource availability for managing the current 2018 baseline projects.
3. The budget proposed for the projects included in the Baseline Report may limit the funding available to perform projects that have a cost of less than $5M, including monies available for rehabilitation and replacement. It is recommended that SFPUC address any funding shortfall for that important work as part of its development of the next 10-year CIP update that is anticipated for adoption in February 2022.
4. To enable better tracking and reporting, program management costs should be broken out separately in future quarterly reports, similar to the procedure used in the reports produced for the Water System Improvements Program.

BAWSCA finds its collaboration with the SFPUC staff to be highly informative and productive. We continue to seek this engagement and believe BAWSCA's input has proved valuable to the SFPUC.

BAWSCA respectfully asks the Commission to consider BAWSCA's findings and recommendations as part of its action on the Baseline Report.

Sincerely,

Nicole Sandkulla
CEO and General Manager

NS/TF/le

cc: SFPUC Commission
M. Carlin, SFPUC Acting General Manager
K. How, SFPUC Assistant General Manager, Infrastructure
S. Ritchie, SFPUC Assistant General Manager, Water Enterprise
K. Miller, SFPUC Director, Water Capital Programs
BAWSCA Board of Directors
BAWSCA Water Management Representatives
A. Schutte, Hanson Bridgett

RESTORE HETCH HETCHY

Yosemite National Park

April 2, 2021

Sophie Maxwell, Chair
San Francisco Public Utilities Commission
Via email

Re: The San Francisco Regional Water System and groundwater banking

Dear Chair Maxwell:

Restore Hetch Hetchy thanks the San Francisco Public Utilities Commission for the well-organized presentation and discussion of water demands and supply options on March 26. We commend the Commission for the essential services it provides, especially that of reliably delivering water supply to San Francisco and other Bay Area communities. It's in the broader public interest, of course, to provide a reliable supply with minimal impact to the natural world.

Restore Hetch Hetchy commends the Commission for working with stakeholders to develop a plan to restore healthy fisheries on the lower Tuolumne River. We take no position, however, on the various proposals which have been presented to date.

Restore Hetch Hetchy's environmental priority lies upriver in Yosemite National Park. We believe the Commission should prioritize relinquishing the use of Hetch Hetchy as a reservoir, restoring it as the iconic valley it once was, and returning Hetch Hetchy Valley to Yosemite National Park and the American people. We encourage the Commission to prepare for the day when Hetch Hetchy Reservoir no longer stores water as part of San Francisco's Regional Water system.

3286 Adeline St. Suite 7
Berkeley, California 94703
510.893.3400

The discussion on March 26 touched on groundwater banking. There is much to add to this important opportunity. After all, over the past several decades, groundwater banking has been the most successful way for California's urban agencies to augment supplies. Table 1 includes a list of selected groundwater banking projects, implemented over the past three decades, which total 2,592,000 acre-feet – more than 7 times to volume of Hetch Hetchy Reservoir. When operated conjunctively with surface reservoirs, groundwater banking can provide equivalent water supply benefits.

Table 1: Selected Groundwater Banks Serving Urban Water Agencies in California

Urban Agency	Banking Partner	Volume (acre-feet)
Valley Water (Santa Clara Valley Water District)	Semitroplc Water Storage District	350,000
San Diego County Water Authority	Semitropic Water Storage District	45,000
Metropolitan Water District of Southern California	Semitropic Water Storage District	350,000
Alameda County Water District	Semitropic Water Storage District	150,000
Zone 7 Water District	Semitropic Water Storage District	65,000
City of Tracy	Semitropic Water Storage District	10,500
Metropolitan Water District of Southern California	Arvin Edison	350,000
Irvine Ranch Water District	Rosedale Rio Bravo - Strand Ranch	50,000
Metropolitan Water District of Southern California	Antelope Valley – East Kern	280,000
Metropolitan Water District of Southern California	Kern Delta	250,000
Metropolitan Water District of Southern California	Mojave	380,000
Metropolitan Water District of Southern California	Within Service Territory	252,000
San Francisco Public Utilities Commission	Within Service Territory	60,000
Total		2,592,000

Most of the projects included in Table 1 involve groundwater supplies stored in Kern County. For several reasons, Kern is an especially good place to bank groundwater. The aquifers have been depleted so there is room for recharge. The high gravel content of the soil readily accommodates recharge at low cost. Farms are comparatively large, so fewer separate interests need to come to agreement. Finally, Kern County is bisected by the California Aqueduct, which serves California's largest cities.

San Francisco's Regional Water System is not served by the California Aqueduct, but by its own pipelines which cross Stanislaus County. The soil type and groundwater depletion in Stanislaus County may not be as universally conducive to groundwater banking as Kern County, but a plethora of opportunities exist – as are indicated by the Groundwater Sustainability Plans being developed by the county's Groundwater Sustainability Agencies.

The greatest challenge to developing successful groundwater banking arrangements in Stanislaus County does not involve physical barriers or limitations. Rather, the farms in Stanislaus County are relatively small, making it more challenging for San Francisco to successfully negotiate a mutually beneficial agreement with landowners. California's Sustainable Groundwater Management Act requires local communities to work together, however, so it might be easier for parties to come to agreement with San Francisco than it has been in the past.

The San Francisco Public Utilities Commission already has experience with groundwater banking - in its own service area. The Regional Groundwater Storage and Recovery project, initiated in 2014 with Daly City, San Bruno and the California Water Service Company, encourages those agencies to rely on surface water in wet years so groundwater can be recharged. During dry years and especially in droughts, groundwater will then be available to supplement other supplies. This is a good project. By using the same approach to working with community interests in Stanislaus County, water supply benefits at a much greater scale are possible.

Restore Hetch Hetchy strongly recommends that the San Francisco Public Utilities Commission pursue groundwater banking as a means to improve environmental conditions while providing a reliable water supply for its customers.

Please do not hesitate to contact me if you would like to discuss this matter further.

Sincerely,

Spreck Rosekrans
Executive Director

Cc: Michael Carlin, Acting General Manager
Nicole Sandkulla, General Manager and CEO, BAWSCA
Tom Zigterman, Chair, BAWSCA

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LOS VAQUEROS RESERVOIR EXPANSION PROJECT

MARCH 29, 2021

UPCOMING ACTIVITIES

March 30 – Joint Meeting with Legal & Finance Workgroups

April 13 & 20 – Technical Review Board meetings (50% Dam Design)

April 26 – Design Workshop (50% Dam Design and Cost Estimate)

April 29 – Cost Allocation Workshop

UPCOMING LAP BOARD COORDINATION

April 5 – Valley Water Storage Committee

ADDITIONAL PROJECT INFO

https://www.ccwater.com/lvstudies

https://www.usbr.gov/mp/vaqueros/

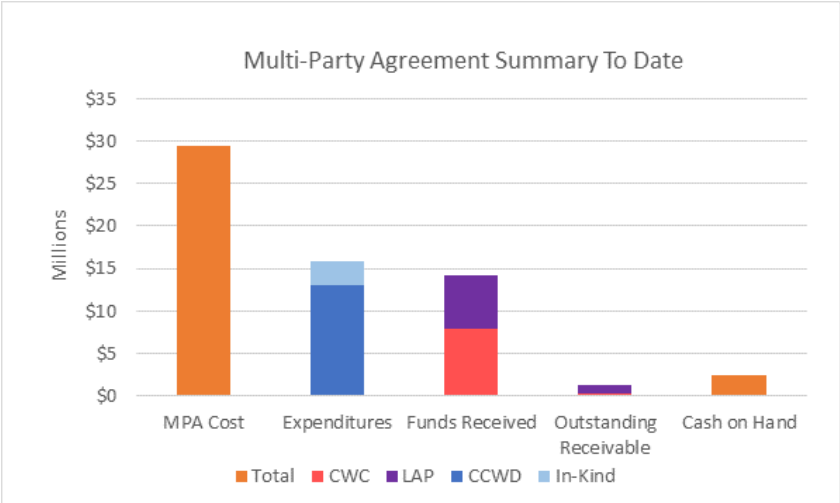
https://cwc.ca.gov/Water-Storage/WSIP-Project-Review-Portal/All-Projects/Los-Vaqueros-Reservoir-Expansion-Project

MONTHLY REPORT

FUNDING

Thank you to the Local Agency Partners (LAPs) for their assistance in the Washington DC virtual meetings held March 1 - 12. We are anticipating that several members of Congress will sign on to a funding support letter prepared by Congressman Mike Thompson. The total Federal funding request includes the remainder of the authorized full federal share of 25 percent of the total project cost (approximately $211 million). The support letter encourages the Department of Interior to include a significant portion of this funding in the FY2022 WIIN Act work plan.

The following chart provides an overview of the Multi-party Agreement (MPA) expenditures through February 28, 2021. The in-kind services, funds received, outstanding receivable, and cash on hand are shown through March 17, 2021. The third MPA invoice was sent to the LAPs earlier this month and is reflected in the outstanding receivables.



JPA FORMATION

The Legal Work Group met on March 25th to continue to work on refining the terms of the JPA Agreement. The target date for completion of the JPA Agreement is Spring 2021. CCWD has scheduled Board approval of the JPA Agreement on April 7. The first JPA Board meeting will be held within 60 days of JPA formation.

CCWD AND EBMUD USAGE FEES

Version 5.0 of the proforma financial model was released February 20th. Partners provided comments on the model and Clean Energy Capital and CCWD are developing written responses.

A Cost Allocation Workshop was scheduled on April 29 for the Finance Workgroup and other interested LAP staff.

CCWD executed the letter of intent (LOI) on March 19 and transmitted to the LAPs for signature. LAP execution of the LOI is requested prior to, or concurrent with, LAP execution of the JPA Agreement. Several LAPs have completed execution of the LOI.

PERMITTING

Reclamation has initiated consultation with the State Historic Preservation Officer as required under Section 106 of the National Historic Preservation Act. Reclamation has also completed the final review of the terrestrial Biological Assessment (BA) and has started review of the aquatic BA. California Department of Fish and Wildlife (CDFW) is continuing its review of a pre-formal draft of the Incidental Take Permit application. The CDFW Lake and Streambed Alteration Agreement application package is under development. U.S. Army Corps of Engineers (USACE) and Central Valley Regional Water Quality Control Board (CVRWQCB) have begun permit package reviews. The Draft Wetland Mitigation Plan and Restoration and Revegetation Plan, required by the USACE and CVRWQCB, is being developed. CCWD is continuing discussions with the State Water Resources Control Board in preparation for modifications to CCWD's Los Vaqueros water rights as needed for future Phase 2 LVE operations.

OTHER AGREEMENTS

CCWD continues to coordinate with the California Department of Water Resources (DWR) and Reclamation. On March 12th a modeling and operations workshop was held with CCWD, DWR, and Reclamation. A draft operations plan is being developed and may serve as the foundation for the coordinated operations agreement(s).

On March 18 EBMUD and CCWD executed the Backstop MOU for the potential provision of alternative conveyance through EBMUD facilities when the reservoir will be unavailable during dam construction.

DESIGN

The District held meetings with DWR staff to continue coordination on the Turn-in to the California Aqueduct at Bethany Reservoir, which will include preparation of a Pump-In Proposal to identify water quality implications and long-term water quality monitoring for the facility. Coordination with regional agencies

progressed, including meetings with Contra Costa Transportation Authority to consider adjustments to the Transfer-Bethany Pipeline and planned highway alignments to avoid conflicts. A meeting was held with East Bay Regional Park District and East Contra Costa County Habitat Conservancy to review the pipeline alignment evaluation.

A draft Pumping Plant No. 1 (PP1) Replacement preliminary design report is currently under review, which summarizes key design criteria, decisions, facility layout, construction approach, schedule, and construction cost estimate update. A meeting was held with adjacent landowners to discuss options for disposal of groundwater during construction. Reclamation continues to review the draft assistance agreement for final design funding.

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March 31, 2021

Dear Members of the Bay Area Delegation:

On behalf of our coalition of California water management agencies, we respectfully request that you support the inclusion of additional funding in Fiscal Year 2022 for the National Oceanic and Atmospheric Administration's (NOAA) Office of Atmospheric Research (OAR) Weather and Air Chemistry Research account to support a critical new weather forecasting system known as the Advanced Quantitative Precipitation Information (AQPI) system. Funding this program at $28.2 million over 5 years, starting at $4.8 million for Fiscal Year 2022 to implement AQPI Phase 2, will enable better forecasting of extreme storm events to help San Francisco Bay Area communities prepare for flooding and droughts.

When big atmospheric river storms hit California, current weather forecasting technology does not provide the detailed information needed to inform emergency response and enhance reservoir flood operations, flood protection, and combined sewer-stormwater systems. Standard weather radars, originally designed for low topographical areas on the east coast and the great plains, are often unable to give an accurate picture of what is happening just above the complex landscape of California's coastal mountain ranges, where precipitation can be heaviest.

NOAA funds other demonstration programs like the VORTEX-SE that addresses tornado forecasting. In the Bay Area, there is a unique regional issue similar to VORTEX-SE, and AQPI is necessary for the success and growth of the region because existing technology is outdated and better forecasting is needed for public safety, and because advanced warning of storms can help to minimize economic costs. Currently, over 90% of flood damages in California are due to atmospheric rivers.

The State of California has already supported Phase 1 of the AQPI system with nearly $20 million in state funding. Phase 1 is anticipated to be completed in 2022, after five years of development including the installation of five new radar units throughout the Bay Area. We are working closely with UC San Diego's Scripps Institution of Oceanography to ensure that the AQPI system will include tools specifically designed to translate the new data and improved forecasting that it generates, which can then be used by on-the-ground emergency and water managers to support mitigation of risk and damage caused by extreme storm events.
This 5-year funding request for Phase 2 provides a viable plan to operate the system, demonstrate its value, and enhance its performance based on feedback and direction from the

local, regional, state, and national agencies it supports and depends upon. Phase 2 includes management, outreach, communication, operations, maintenance, and research advancing the science of precipitation, streamflow, and coastal flood forecasting to improve AQPI and better meet stakeholder needs. Lessons learned in the Bay Area from this program will have application to other west-coast flood-prone urban and surrounding communities. Phase 2 would allow additional scanning radars and low-cost vertically pointing radars to be added to the AQPI observational network, as well as at least one regional precipitation forecast model, customized to California and the Bay area.

AQPI is necessary for the safety of the Bay Area's 7.76 million residents. Accurate and timely precipitation information is critical for making decisions regarding public safety, infrastructure operations, and resource allocations. Improved precipitation monitoring and prediction in the San Francisco Bay region can enhance public safety through early warning and storm tracking when hazardous weather events come onshore. Having early warnings can help to minimize economic costs. Advanced notice of these extreme weather events can help to plan for and minimize damage and associated costs of recovery.

We appreciate your support of this request.

Sincerely,

Robert Shaver
General Manager
Alameda County Water District

Nicole Sandkulla
Chief Executive Officer/General Manager
Bay Area Water Supply & Conservation Agency

John A. Coleman
Chief Executive Officer
Bay Planning Coalition

Supervisor Diane Burgis
Chair, Board of Supervisors
County of Contra Costa

Rosemarie R. Gaglione
Director of Public Works
County of Marin

Jacqueline Zipkin
General Manager
East Bay Dischargers Authority

Clifford C. Chan
General Manager
East Bay Municipal Utility District

Chuck Weir
General Manager
Livermore-Amador Valley Water Management Agency

Jason Warner
General Manager
Oro Loma Sanitary District

Mark Strudley
Flood Control Program Manager
Santa Cruz County Department of Public Works

Grant Davis
General Manager
Sonoma Water

Michael P. Carlin
Acting General Manager,
San Francisco Public Utilities Commission

Rick L. Callender, Esq.
Chief Executive Officer
Santa Clara Valley Water District

cc:

Senator Dianne Feinstein
Senator Padilla
Speaker Pelosi
Rep. Anna Eshoo
Rep. Zoe Lofgren
Rep. Jackie Speier
Rep. Ro Khanna
Rep. Eric Swalwell
Rep. Barbara Lee
Rep. Mark DeSaulnier
Rep. Jared Huffman
Rep. Mike Thompson
Rep. Jerry McNerney
Rep. Josh Harder
Rep. John Garamendi

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CW3E END OF WINTER SUMMARY: WATER YEAR 2021 CHARACTERIZED BY PERSISTENT DRY WEATHER AND WORSENING DROUGHT IN CALIFORNIA

Center for Western Weather and Water Extremes | April 7, 2021

"Total precipitation has been well below normal throughout much of California during water year (WY) 2021. In some regions, drier than normal conditions extend back to the start of WY 2020. Drought has expanded and intensified across the state, and current water storage levels are below normal in many reservoirs. Below-normal snowpack in the Sierra Nevada may limit water resource availability as summer approaches. The abnormally dry conditions were driven by a lack of landfalling atmospheric rivers (ARs) and persistent ridging/blocking over the Northeast Pacific Ocean. Drought is expected to continue through spring 2021, thereby increasing the threat of significant wildfire activity in summer 2021."

Dive into the details from the Center for Western Water and Weather Extremes here: CW3E End of Winter Summary: Water Year 2021 Characterized by Persistent Dry Weather and Worsening Drought in California

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Drought is back. But Southern California faces less pain than Northern California
Los Angeles Times | April 2, 2021 | Bettina Boxall

Sean de Guzman, chief of snow surveys for the California Department of Water Resources measures snowpack at Phillips Station near Echo Summit in February. (Rich Pedroncelli /Associated Press)

Drought is returning to California as a second, consecutive parched winter draws to a close in the usually wet north, leaving the state's major reservoirs half empty.

But this latest period of prolonged dryness will probably play out very differently across this vast state.

In Northern California, areas dependent on local supplies, such as Sonoma County, could be the hardest-hit. Central Valley growers have been told of steep cuts to upcoming water deliveries. Environmentalists too are warning of grave harm to native fish.

Yet, hundreds of miles to the south, the Metropolitan Water District of Southern California reports record amounts of reserves — enough to carry the state's most populous region through this year and even next.

Memories of unprecedented water-use restrictions in cities and towns, dry country wells and shriveled croplands linger from California's punishing 2012-16 drought.

Officials say the lessons of those withering years have left the state in a somewhat better position to deal with its inevitable dry periods, and Gov. Gavin Newsom is not expected to declare a statewide drought emergency this year.

“We don’t see ourselves in that position in terms of supply,” said Department of Water Resources Director Karla Nemeth. “If it’s dry next year, then maybe it’s a different story.”

Southern California is a case in point.

Lake Oroville, the big Sacramento Valley reservoir that helps supply the urban Southland, is only 41% full and the Metropolitan Water District can expect a mere 5% of full deliveries from the north this year.

But the agency has more water than ever stored in regional reservoirs and groundwater banks.

“We’re not contemplating any difficulty in meeting deliveries,” said Brad Coffey, water resources manager for the MWD, which imports supplies from the Colorado River and Northern California.

Los Angeles, which is partially supplied by the MWD, is similarly confident that it will have no problem meeting local demand. “We’re not in any shortage,” said Delon Kwan, assistant director of water resources for the L.A. Department of Water and Power.

L.A.'s water use has declined to 1970s levels, despite the fact that California’s biggest city has nearly 1 million more residents than it did then. Restrictions on landscape watering have been in place for a decade, and the city continues to offer conservation rebates for water-efficient appliances and lawn removal.

Across the state, overall urban water use remains 16% less than it was in 2013.

“We see an enduring conservation and efficiency from the last drought,” said E. Joaquin Esquivel, chairman of the State Water Resources Control Board. “We changed fundamentally our water use on the urban side.”

System improvements have been made in small rural communities that ran out of water when their wells dried up during the last drought.

Though agriculture is expected to once again turn to groundwater to make up for sharp cuts in federal irrigation deliveries, officials are hoping to avert a repeat of the last drought, when growers rushed to drill new wells and ramped up pumping so much that parts of the intensely farmed San Joaquin Valley sank several feet.

“I don’t fully expect the same scenario to play out,” said state Natural Resources Secretary Wade Crowfoot. “It was more of a free-for-all” before passage of a 2014 state law that requires

groundwater users to stop chronic overpumping of the enormous Central Valley aquifer by 2040.

“My sense is that there’s a strong understanding among local water agencies that they now have a responsibility to achieve sustainability,” he added.

But environmentalists and the commercial salmon industry worry that this year will be a repeat of 2014-15, when low flows in the Sacramento River pushed water temperatures to lethally warm levels for salmon eggs, virtually wiping out two years of reproduction for endangered winter-run Chinook.

“Good for Metropolitan — they’ve got record storage,” said Barry Nelson of Western Water Strategies. “But the ecosystem and the fishing industry are cratering.”

Precipitation is only about half of average in key northern and central Sierra Nevada watersheds and 39% of average in the southern range. The statewide snowpack that helps fill reservoirs is well below average — 59% on Thursday — but not nearly as grim as 2014, when it was 33%, or the record low of 5% in 2015.

With Shasta Lake, the biggest reservoir in the federal Central Valley Project system, 53% full, the Bureau of Reclamation is significantly cutting supplies to many farmers in the San Joaquin Valley.

Growers on the west side of the valley are slated to get only 5% of their contract amounts, and even those deliveries have been temporarily frozen. On the east side, Millerton Lake deliveries have been reduced to 20% of contracted amounts.

But the cuts will be far less for irrigation districts with the oldest diversion rights on the Sacramento and San Joaquin rivers. Those senior rights holders can expect 75% of their contract amounts, which comes out to a total of 2.2 million acre-feet — more than four times what Los Angeles uses in a year.

Those huge contracts, which the bureau signed when the Central Valley Project dammed the Sacramento and San Joaquin, have long been attacked by the environmental community.

In a March 12 letter to the state water board, environmental groups complained that releases from Shasta Lake for senior rights holders will deplete the reservoir of cold water needed later in the year to maintain salmon-friendly temperatures on the Sacramento River.

They also point out that meager precipitation is not the only reason Oroville, the State Water Project’s principal reservoir, is so low.

In 2018, the state and federal water projects amended a 30-year-old agreement that spelled out how they would coordinate operations to meet water quality and environmental standards in the Sacramento-San Joaquin Delta, a distribution hub for both projects.

Because Shasta's capacity is considerably greater than Oroville's, the original pact called for Shasta to provide the bulk of the releases necessary to meet delta standards. The 2018 agreement shifted some of the federal obligations to the state.

Especially in dry years, the state now has to release more water from Oroville to flow through the delta and out to sea than previously required. That has resulted in a corresponding reduction in state deliveries from the delta and an increase in federal deliveries.

The Water Resources Department did not provide numbers for this year. But in 2018, the agency estimated the new formula would reduce state deliveries by an average of 100,000 acre-feet a year, with that number increasing to 200,000 acre-feet in very dry years.

Nemeth acknowledged that the new operating terms have played a role in Oroville's steep drop. But she attributed most of the decline to what she called "catastrophically dry" conditions in the Feather River watershed that feeds Oroville.

She also defended the 2018 deal, saying that in wet years it allows the state project to slightly increase delta exports to the MWD and other customers.

"It's a trade-off," said Doug Obegi, an environmental attorney with the Natural Resources Defense Council. "It's not solving the problem that they've contracted more water than can be sustainably delivered."

Two years ago, Shasta and Oroville were nearly full, thanks to 2019, the nation's second-wettest year on record; and 2017, the wettest year on record in the northern Sierra.

That the levels of California's two biggest reservoirs fell so quickly is another reminder of the effects of climate change, which is accentuating the swings from drought to flood that California has always experienced.

"Are we adapting enough? No," Esquivel said. "We need to adapt further and faster and more. And we know that it takes dollars and resources to accomplish that work. It's not any one thing. It's investing in infrastructure … in water systems that will receive the brunt of the climate crisis."

# # #

California Snowpack Below Normal With Wet Season Ending
KPBS | April 1, 2021 | Associated Press

Above: Sean de Guzman, chief of snow surveys for the California Department of Water Resources, checks the depth of the snow pack during the fourth snow survey of the season at Phillips Station near Echo Summit, Calif., Thursday, April 1, 2021.

The water content of California's Sierra Nevada snowpack was measured at 59% of the April 1 average, when it historically is at its peak, the state's chief of snow surveys and water supply forecasting said Thursday.

The unsurprising result follows the second consecutive dry winter and comes amid indicators that California is entering another drought just a few years after a five-year dry spell.

Overall, the state has received only about 50% of average precipitation in the current water year and its major reservoirs are only about half full, said Sean de Guzman of the Department of Water Resources.

"It's currently tied for the third-driest year on record," de Guzman said during a briefing at Phillips Station in the Sierra Nevada, where manual measurements have been made since 1941. The Sierra-wide measurement is made by sensors at 260 locations.

The snowpack normally supplies about 30% of California's water. How much of the current snowpack ends up in reservoirs remains to be seen.

De Guzman said the latest runoff forecasts around 58% of average, slightly under last year's number.

"As the snowpack starts to melt the big unknowns are how dry are the soils beneath the snowpack and how much water will absorb into those soils before running off into our rivers and streams," de Guzman said. "The next few weeks are just really critical to watch to see how much of that snowmelt will enter into our reservoirs."

De Guzman said it was somewhat of an anomaly for the state to have received more snow than rain, a result of colder storms.

The snow that did fall favored the northern and central Sierra over the southern end of the range, which runs for hundreds of miles along the California-Nevada state line.

At Phillips Station, de Guzman measured a snow depth of 49.5 inches (1.26 meters) and a snow water content of 21 inches (53 centimeters) which translates to 83% of average for the location.

During the 2012-2016 drought, then-Gov. Jerry Brown watched as a measuring device was placed in a snowless field of grass at Phillips Station and took the drastic step of ordering a 25% reduction in water use.

While the Department of Water Resources characterizes the current year as "critically" dry, California is better positioned than it was back then.

"Even though we have drought-like conditions, Californians as a whole have actually been conserving a lot more water compared to where we were before 2012 when the previous drought started," de Guzman said. "A lot of the public has continued their effort which is a great sign and we need to keep continuing to do that."

The season's final snow survey will be conducted on April 29.

# # #

California's reservoirs at 50% of capacity as drought looms
SFGate | April 1, 2021 | Amy Graff

A Feb. 4, 2021, drone view shows Bidwell Canyon Marina at Lake Oroville with the water level recorded at 700.99 feet, with a reservoir storage of 1,262,203 acre-feet. Lake Oroville in Butte County is a reservoir formed by the Oroville Dam impounding the Feather River. Andrew Innerarity/California Department of Water Resources

After two back-to-back winters marked by abnormally dry conditions, California is once again facing a water supply shortage.

The state's largest 154 reservoirs are at 50% of overall capacity, the California Department of Water Resources said. Lake Shasta, the largest water reserve, is at 65% of its historical average and 53% of capacity. The severity of dry conditions is particularly apparent in the Feather River watershed where Lake Oroville is at 53% of historical average and 41% of capacity.

The start of April marks an important time in California as it's the end of the rainy season and state officials begin to assess two of the main water sources — reservoirs and the snowpack — and forecast how much can be allocated to farms and municipalities. The department already

warned 40,000 water rights holders they will probably only get 5% of the amount they requested.

Reservoir water levels are dipping down to alarming levels as winter rainfall failed to replenish stores. Officials measure seasonal rainfall totals using the "water year," running from October to September, and the 2020-2021 water year is on track to be the third-driest in recorded history.

The Sierra Nevada snowpack is one of California's most important water sources and provides about 30% of the yearly fresh water supply for California.

This year's snowpack tells a complicated story. The southern Sierra remains well below average for both rain and snow, while the northern and central section, stretching from the Cascades to Mammoth, is at 70% of average for snow and 50% of average for rain. This region saw fewer storms than normal but they were cold and brought more snow than rain, the Department of Water Resources said.

The California Department of Water Resources conducted a snow survey at Phillips Station on April 1. The manual survey recorded 49.5 inches of snow depth and a snow-water equivalent of 21 inches, which is 83% of average for this location. DWR

California state officials trudged through the snow for a survey at Echo Summit on Thursday to assess the snowpack. It's a ritual that happens every year, as April 1 is typically when California’s snowpack is the deepest and has the highest snow-water equivalent. The April

results are a key indicator for the state's water supply over the rest of the year; as the snow melts in spring and summer, the runoff replenishes reservoirs.

Measurements are taken in the same location at Phillips Station near Sierra-at-Tahoe, and this year, the Department of Water Resources measured a snow depth of 49 inches and a snow-water equivalent of 21 inches, which is 83% of average for this location.

While the Phillips Station reading is from a single point, the more telling number is the sum total of measurements taken from the department's electronic snow survey stations throughout the Sierra. Today's reading indicated that statewide the snowpack’s snow-water equivalent is 16.5 inches, or 59% of average for the date.

“While there is some snow on the ground today at Phillips Station, there is no doubt California is in a critically dry year. State agencies, water suppliers and Californians are more prepared than ever to adapt to dry conditions and meet the challenges that may be ahead,” said Karla Nemeth, director of the Department of Water Resources. “With climate change impacting how precipitation falls in California, ongoing water efficiency and long-term efforts like recycling water, capturing stormwater, and planting water-friendly landscapes are essential to securing California’s water future.”

Does this all mean California is in a drought?

Chris Orrock, a spokesperson for the department, said Gov. Gavin Newsom has not declared an official drought emergency, directing state officials to prepare for water shortages. "We have not heard the governor is planning to," Orrock said.

But while the state may not officially be in a drought, many experts are starting to use the term.

“We’re looking at the second dry year in a row. In California, that pretty much means we have a drought,” said Jay Lund, a civil and environmental engineering professor at UC Davis, told the Associated Press.

# # #

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VALLEY WATER CONTINUES TO CALL FOR VOLUNTARY CONSERVATION AS DROUGHT CONDITIONS WORSEN

Valley Water News | April 1, 2021 |

Image of snowy mountain landscape a few miles from Philips Station
In March 2021, mountain peaks are covered with snow near the Phillips Station meadow, where the California Department of Water Resources conducted a snow survey in the Sierra Nevada Mountains. The April 1 statewide snowpack is 59% of average. Andrew Innerarity / California Department of Water Resources

Although a few storms in March delivered some rain and snow across California, the Golden State experienced a mostly dry winter season. The result: most of Santa Clara County and nearly all of California are in a drought, according to the U.S. Drought Monitor.

Snowpack in the Sierra Nevada measured at 59% of average on April 1, according to the California Dept. of Water Resources. Locally, rain totals in our county this season are at about 50% of normal and storage levels at our reservoirs are at 26% of average. Also, the amount of imported water that Valley Water will receive this year was drastically reduced.

Despite these challenges, Santa Clara County's water supply outlook appears adequate for the remainder of the year. We anticipate sufficient supplies to meet demands in 2021. Our current groundwater levels are good, and we are maximizing our withdrawals of water from the Semitropic Groundwater Storage Bank near Bakersfield. Valley Water is also actively working to purchase additional water supplies to help meet demands.

But as we look to the future, we can't just sit back and hope for rain and snow next winter. We need to prepare today in case these drought conditions worsen.

That's why it's crucial Valley Water continues to invest in conservation programs and our aging infrastructure, including pipelines, water treatment plants and the retrofitting of Anderson Dam in Morgan Hill. We also need to make smart investments to secure water supplies for the future, such as expanding our county's use of recycled and purified water.

The Valley Water Board of Directors continues to call for a 20% voluntary reduction in water use compared to 2013, which we implemented during the last historic drought. In the previous seven years, water use in Santa Clara County was down by about 21% compared to 2013. Water saved today is water that's available in the future.

"We must all do our part and conserve water," Valley Water Board Chair Tony Estremera said. "We believe that conservation is a way of life here in Santa Clara County."

The Board of Directors is scheduled to receive an update from Valley Water staff on the water supply outlook at its board meeting on April 27, at which time the Board of Directors could consider changes to the existing policy of a 20% voluntary water conservation effort in Santa Clara County.

Valley Water offers a wide-ranging conservation program to help residents and businesses save water and money. You can learn more about our robust programs by visiting watersavings.org.

Why the snowpack is important

More than half of Santa Clara County's water supply comes from hundreds of miles away – first as snow or rain in the Sierra Nevada range of northern and eastern California, then as water in rivers that flow into the Sacramento-San Joaquin River Delta.

Often called "imported water," it is brought into the county through the complex infrastructure of the State Water Project, the federal Central Valley Project, and San Francisco's Hetch Hetchy system.

The April 1 snowpack survey is a key indicator for planning statewide summer water supplies because it's typically when the snowpack is at its deepest with the most water content. Snow in the Sierra Nevada melts and is captured in reservoirs across the state.

The below-average snowpack levels and rain this winter, combined with the dry soil conditions that reduced runoff into key reservoirs, resulted in a decrease in State Water Project and Central Valley Project supplies. At the beginning of 2021, Valley Water's State Water Project allocation was 10%, but that was reduced to just 5% in March, providing only 5,000 acre-feet of water. Valley Water's Central Valley Project supply has also been slightly reduced.

Semitropic Groundwater Storage Bank

In years when there's a large Sierra snowpack, such as the 2016-17 and 17-18 water years, our local reservoirs are often at capacity. There are times when our share of available imported water from the Central Valley Project and State Water Project is more than we need and more than we can store in San Luis Reservoir in Merced County, locally in Anderson and Calero reservoirs or in our local groundwater aquifer.

When that occurs, we can send that surplus water down the California Aqueduct to a groundwater basin near Bakersfield in Kern County. Valley Water's portion of that Semitropic Groundwater Storage Bank is 350,000 acre-feet. Currently, Valley Water's storage in the Semitropic Bank is over 333,000 acre-feet, or 95% of capacity. Valley Water plans to withdraw about 30,000 acre-feet from this bank to supplement our county's water supply this year.

Anderson Reservoir

This past fall, Valley Water lowered the water levels in Anderson Reservoir as part of our effort to strengthen the existing dam so it can safely withstand a large earthquake. The project will keep the public safe and, once finished, allow Valley Water to store water in Anderson Reservoir. While this vital work is done, we will have to rely more on imported water over the next ten years during construction at Anderson Dam.

# # #

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California is facing another drought, but I'm still hopeful. Here are 3 reasons why.
Environmental Defense Fund | April 1, 2021 | Ann Hayden

It's a daunting time to be working on water in California.

The Sierra snowpack measurement came in today at 59% of average statewide, making this the second dry winter in a row. The drought conditions led state and federal officials to announce last week painful water cuts for farmers and for municipal water systems that are already sending requests to customers to conserve water.

It's disheartening to envision farmers again trying to make do with very limited supplies; salmon stranded in warm, dwindling rivers; and cities facing water cutbacks while wondering if the next wildfire will erupt in their neighborhood.

Meanwhile, the importance of clean water to wash our hands has taken on a whole new level of importance with the COVID-19 pandemic, yet nearly 1 million Californians still lack access to clean and affordable drinking water.

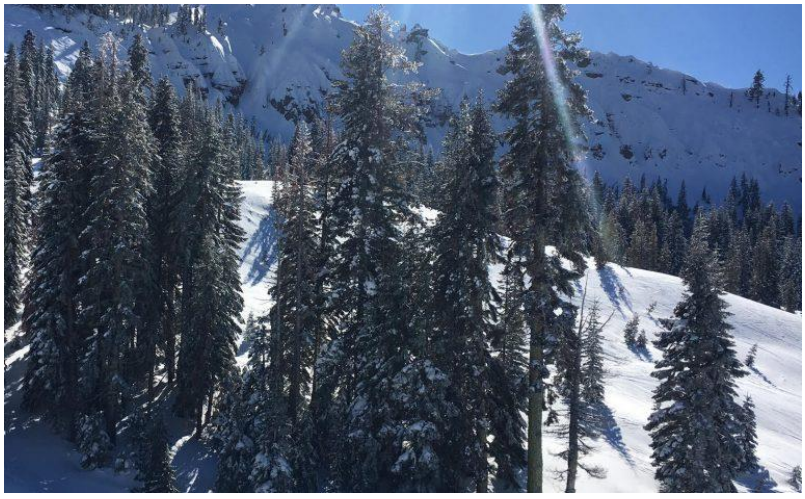
With this bleak picture, you can reasonably ask, "What's there to be hopeful about?" Here are three things that give me hope about our water future.

1. We are making progress to guarantee safe water for all.

Water leaders are really beginning to understand how to address this erratic and unpredictable water supply situation. We have the know-how to manage our water supplies through difficult droughts — if we follow the science, deploy new tools and work together.

Clearly, making sure all Californians have access to clean water should remain the top priority. Fortunately, the state made recent progress to address this by approving a new Safe and Affordable Drinking Water Fund. The state is now working on an assessment that will outline how much more funding is needed to ensure everyone in California has safe and reliable water.

When this report comes out, we need an all-hands-on-deck effort from the state and federal government to fill the funding gap and finally fix this problem. The good news is that California's latest cap-and-trade auction that directs money to the drinking water fund performed well last month, and the state is on track to have a $19 billion budget surplus this fiscal year.



On average, the snowpack supplies about 30 percent of California's water needs as it melts. With the snowpack measuring below average for two years in a row, farmers and cities are bracing for water cutbacks.

2. New tools and technologies are coming online to help manage water.

On top of available funding, new tools are coming online to help manage water supplies and develop durable, pragmatic solutions to our water challenges.

This summer, an online platform called OpenET will launch, making much-needed data on the amount of water consumed by crops and other vegetation widely accessible and cost-effective to farmers for the first time.

As regional water managers implement California's Sustainable Groundwater Management Act (SGMA), OpenET will help them create more accurate water budgets and design effective water trading programs and other tools. It will also help farmers refine irrigation practices and improve their bottom line.

OpenET is already providing data to another tool I'm especially excited about: the open-source accounting and trading platform that EDF co-developed with the Rosedale-Rio Bravo Water Storage District. Conceived in response to SGMA, the platform will help the district and its landowners track water use like an online bank account and eventually trade water.

Combined, OpenET and the accounting and trading platform have the potential to build a better understanding of local water dynamics and enable water managers and landowners to respond with the right local solutions.

Tools like OpenET may prove useful later this year when California crosses another important milestone on the long road toward groundwater sustainability: The state will be releasing reviews of groundwater sustainability plans and will tell groundwater sustainability agencies where more work remains.

3. A new era of cooperation has arrived.

Finally, we have a new federal administration that wants to collaboratively solve problems with California leaders on a number of issues, including water, which Gov. Gavin Newsom has already demonstrated is a high priority.

While it's anxiety-inducing to be facing yet another drought in California, we are now in a better position to make data-driven decisions, deploy the necessary tools and work together to build a more resilient water future.

# # #

On tap in California: Another drought four years after last
Associated Press | March 31, 2021 | Brian Melley

In this Oct. 30, 2014, file photo, houseboats float in the drought-lowered waters of Oroville Lake near Oroville, Calif. California's hopes for a wet "March miracle" did not materialize and a dousing of April 2021 showers may as well be a mirage at this point. The state appears in the midst of another drought only a few years after a punishing 5-year dry spell dried up rural wells, killed endangered salmon, idled farm fields and helped fuel the most deadly and destructive wildfires in modern state history. (AP Photo/Rich Pedroncelli, File)

LOS ANGELES (AP) — California's hopes for a wet "March miracle" did not materialize and a dousing of April showers may as well be a mirage at this point.

The state appears in the midst of another drought only a few years after a punishing 5-year dry spell dried up rural wells, killed endangered salmon, idled farm fields and helped fuel the most deadly and destructive wildfires in modern state history.

"We're looking at the second dry year in a row. In California that pretty much means we have a drought," said Jay Lund, a civil and environmental engineering professor at the University of California, Davis.

In fact, the entire West is gripped in what scientists consider a "megadrought" that started in 1999 and has been interrupted by only occasional years with above-average precipitation. In California, the heaviest rain and snow comes in the winter months, but not this year — about 90% of the state already is experiencing drought conditions, according to the U.S. Drought Monitor.

Much of California's water comes from mountain snow in the Sierra Nevada that melts during the spring and summer and feeds rivers and streams that in turn fill reservoirs. The Sierra snowpack traditionally holds its peak water content on April 1 and the state will take a survey Thursday to determine the level. Last month, a survey showed just 60% of the average.

Four years ago, when then-Gov. Jerry Brown officially declared an end to a statewide drought emergency, he said conservation should continue, warning "the next drought could be around the corner."

It's arrival will mean different things depending on where people live.

The 2012-2016 drought required some sacrifice from everyone as Brown ordered a 25% reduction in water use. Residents took shorter showers, flushed less frequently and let their cars get dirty. Many homeowners replaced their lawns with artificial grass or desert succulents.

Such restrictions are less likely this time around because municipal supplies are in better shape and water use has not returned to previous levels, said Caitrin Chappelle of the Public Policy Institute of California. The Metropolitan Water District, which sells water to public agencies serving about half the state's 40 million residents, has a record high water supply.

But efforts to restore depleted groundwater aquifers or keep river flows high and water temperatures low enough for the winter-run Chinook salmon that almost went extinct on the Sacramento River during the drought, are not as far along.

"The time in between the end of the last drought and, possibly, the beginning of this next one isn't that long," Chappelle said. "They have started doing a better job of planning for it, it's just whether or not they've had enough time to prepare before the emergency hits again."

The Sierra snowpack provides about 30% of California's water and the Department of Water Resources measurement is key to forecasting how much can be allocated to farms and municipalities under a complex system of water rights laws that spell out what each user is entitled. The department already warned 40,000 water rights holders they will probably only get 5% of the amount they requested.

"Guys are in a really tough spot when they don't know what water's going to be available until the planting season, which is now," said Danny Merkley of the California Farm Bureau Federation.

With less water to draw from rivers and the state's intricate network of canals and aqueducts, farmers fallowed hundreds of thousands of additional acres.

Growers will likely do the same thing again, idling low-value row crops such as tomatoes, lettuce or onions, to commit their precious groundwater to high-value permanent crops like almonds, pistachios and wine grapes, Merkley said.

Tapping those wells could have ramifications for their neighbors. During the last drought, agribusiness was blamed for over-pumping groundwater, causing the land to sink and wells in some poor rural communities to go dry.

Lawmakers for the first time decided to regulate groundwater and require plans in the next two decades to stop over-pumping from aquifers. But groundwater levels have not fully recovered from the last drought with another looming.

In Tombstone Territory, an unincorporated area surrounded by orchards outside Fresno, three-quarters of the 50 homes lost their well water during the last drought, said Amanda Monaco of the Leadership Counsel For Justice & Accountability. Many residents are farmworkers who can't afford the $20,000 required to dig a deeper well.

"If we're headed back into a drought that means potential devastation for communities that we work with," Monaco said. "They're terrified that kind of thing could happen again."

Ray Cano was one of the first Tombstone residents to lose his well water in 2015.

"It started spitting air and then nothing came out of it," Cano said.

His next door neighbor ran a hose over while Cano had his pump replaced and lowered deeper in the well. Cano returned the favor later that year when the neighbor's well dried up.

Even now that their wells are working, the water quality is so poor that residents are provided 50 gallons (190 litres) of drinking water a month under a grant.

With less snow and temperatures warming due to climate change, another bad fire season is likely on the way, said Daniel Swain, a climate scientist at the University of California, Los Angeles.

The state largely escaped fire devastation during the previous drought, but has suffered terribly since, after 100 million trees died and vegetation remained dry as a result of the drought. Since 2015, the state has experienced the largest, most destructive and deadliest fires in recorded state history;

Lund found that the drought caused about $10 billion in damages statewide, without direct loss of life. But the wildfires after caused a record of over $55 billion in direct property losses and 175 direct deaths, with possibly many other deaths and economic impacts due to weeks of widespread air pollution from smoke.

"The interesting thing about these other drought impacts is they happened after the drought ended," Lund said. "

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Drought: Santa Clara Valley Water District asks public to step up water conservation
Largest water provider in Silicon Valley stops short of mandatory water restrictions
Bay Area News Group | March 17, 2021 | Paul Rogers

LOS GATOS, CALIFORNIA – MARCH 16: Pat Steele, left, and her husband, John Steele, of Santa Cruz visit Lexington Reservoir, which is just 31% full, on Tuesday, March 16, 2021, near Los Gatos, Calif. (Dai Sugano/Bay Area News Group)

In the latest sign that California is entering a new drought, Silicon Valley's largest water provider on Tuesday asked the public to step up water conservation efforts.

"We have no idea how long it will last or how bad it might get," said Tony Estremera, chairman of the board of the Santa Clara Valley Water District. "Clearly we can't just sit back and wait for more rain."

The district, a government agency based in San Jose that serves 2 million people, stopped short of announcing immediate mandatory water restrictions, like asking cities and private water companies who buy its water to implement odd-even lawn watering days for their customers, or to impose rates that set a penalty for residential water use above a certain level. Both practices were among the tools used in Santa Clara County and across the Bay Area and California during the last drought, a historic emergency that stretched from 2012 to 2016.

Instead, the district took the approach Tuesday that many other large water agencies around the Bay Area have embraced so far after two dry winters in a row: asking the public for more conservation, but not yet cracking down to get it. A decision on whether to move toward tougher measures will likely be made by May, Santa Clara Valley officials said.

“We’re hoping you will continue to conserve,” said Aaron Baker, the chief of the district’s water utility. “If as we move forward, we see we need to call for additional restrictions or mandatory conservation, we will be making those decisions shortly. But at this time please continue your voluntary conservation.”

Baker said the decision will be made based on how much people conserve and how much extra water the district is able to buy from other parts of the state to boost its supplies.

Some critics said the agency should do more.

“They don’t want to make people conserve as much because they want to sell water,” said Katja Irvin, co-chair of the water committee of the Sierra Club’s Loma Prieta chapter, based in Palo Alto.

Irvin said the district should step up ads on radio, billboards and other media emphasizing the new drought. Katja said the district should boost funding for its conservation efforts, which include paying people to replace lawns with drought-tolerant plants, and offering rebates for water-efficient appliances.

The district’s 10 reservoirs on Tuesday were 16% full. The Sierra Nevada snowpack was 61% of normal. And rainfall this winter in most Bay Area cities is only at about 40% of the historic average.

“The reservoirs are low,” Irvin said. “If there’s another one or two years of drought we are in big trouble. We won’t be able to get water from somewhere else because everybody else will also want it.”

In 2015, during the peak of the last drought, the district asked its retail providers in Santa Clara County for a 30% reduction in water use compared with 2013 — and got 27%. Former Gov. Jerry Brown also set mandatory conservation targets for cities. Both moves led to higher water rates, “water cops” knocking on doors of people overwatering landscaping, restaurants ordered not to serve glasses of water and other restrictions.

After the drought ended in 2017, with massive atmospheric river storms drenching California, the spillway at Oroville Dam in Butte County failing, and major flooding in downtown San Jose causing $100 million in damage, the water district asked the public to continue conserving water voluntarily, at levels 20% below 2013. The public met that target through 2019, and last year reduced consumption slightly less, by 16%.

Other Bay Area water agencies say they are not yet considering specific targets for mandatory or voluntary water reductions. The Contra Costa Water District, which serves 500,000 people, says it has ample supply, with its largest reservoir, Los Vaqueros, 80% full.

“We think we’re in a good spot,” said Jennifer Allen, a spokeswoman for the district. “Obviously it could change. We’re being very mindful of what’s happening. We feel we have enough to meet our customers’ demand, but as always there’s no room for wasting water.”

The East Bay Municipal Utility District, which serves 1.4 million people in Alameda and Contra Costa counties, will decide in late April whether to set targets, based on how much more rainfall comes, said district spokeswoman Andrea Pook.

“We ask our East Bay community to be smart about how they use water,” Pook said, “and to stay tuned for more information in the coming weeks as we finalize our water supply outlook for the year. Our customers have done an amazing job over the past decades reducing their water use.”

The Santa Clara Valley Water District has a bigger challenge than most of its Bay Area counterparts. Anderson Reservoir, near Morgan Hill, the district’s largest, was ordered to be drained last year by federal regulators who were concerned that its 70-year-old dam could collapse in a major earthquake. That reservoir, which holds more water than all of the district’s other nine reservoirs combined, will remain empty for the next 10 years until a $576 million project to rebuild its 240-foot earthen dam is completed.

Until then, the district plans to rely on pumping local groundwater, which normally makes up about half its supply. It also plans to continue to import water from the state and federal governments from the Sacramento-San Joaquin River Delta. And it will draw more from underground supplies it has banked at the Semitropic Water Storage District in Kern County, while also boosting recycled water. And it has increased its budget to buy water on the open market from $5.4 million last year to $17.8 million this year, while also asking residents for more conservation.

Santa Clara Valley Water District crews have finished draining nearly all of the water from Anderson Reservoir, leaving it just 3% full as part of a $576 million earthquake repair job. (Santa Clara Valley Water District)

“We want to get everybody aware and prepared,” Baker said.

LOS GATOS, CALIFORNIA – MARCH 16: Lexington Reservoir, which is just 31% full, is photographed on Tuesday, March 16, 2021, near Los Gatos, Calif. (Dai Sugano/Bay Area News Group)

# # #

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Complexities: Thinking about the San Francisco Estuary during the 2021 Bay-Delta Science Conference

Delta Stewardship Council | April 5, 2021 | Dr. Steven Culberson, Interagency Ecological Program Lead Scientist

In anticipation of this week's Bay-Delta Science Conference, I thought it would be useful to consider some of what it takes to understand a complex ecosystem like an estuary and to encourage everyone working in the San Francisco Estuary – scientists, policymakers, and local stakeholders – to continue shifting our ecosystem management focus from the simple to the complex. I'll explain why in a moment.

Here are four suggestions for improving ecosystem management in the San Francisco Bay-Delta:

1. Embrace complexity as an attribute of ecosystems.
2. Support and require ongoing conversations about the limits of monitoring science and the need to make difficult policy decisions in the absence of complete information.
3. Understand the value of lost resources and invest appropriately in the preservation of resources before they are lost.
4. Prioritize information and learning as much as the desire to solve a particular problem, and internalize the notion that learning, like evolution, never ends.

Ecology is not an exact science, and outcomes are far from what is expected traditionally from scientific disciplines like chemistry or physics. We don't have sufficient resources to turn the Estuary into a sophisticated outdoor laboratory to facilitate our understanding. We typically don't study the ecosystem; more often, we look at one or two dissected parts and try to imagine what an integrated, holistic management system would look like, all while focusing on only one or two driving factors. When the system doesn't respond favorably to our limited and targeted tinkering, we lament that the problem is wicked.

What if we rejected the premise that there's a simple relationship between fish and water? What could we expect to find in the ecosystem? We are already fully aware that organisms that persist in

complicated environments tend to have many ways to survive depending on what conditions they encounter in a specific season, day, or moment. At any point in time, organisms may be exposed to a different set of stressors, which require behavioral or other biological responses to mitigate. Persistence – survival – is not the product of lasting through a particular event or short-lived condition; it is the product of a long chain of survived events: night and day, for weeks, months, years, and generations. Wouldn't a better recovery strategy have available as many opportunities as possible for species to find a way to survive; shouldn't we provide multiple – many – options for the organisms to chance upon as they travel through the Estuary?

We need to become comfortable making resource management decisions with an understanding that the Estuary is dynamic and complicated. We must find ways to take protective steps in the absence of complete information. Our human understanding of what other organisms need is limited. Our ability to collect information from murky, convoluted aquatic environments is limited, labor-intensive, and enables only the briefest glimpse into what estuarine organisms experience. Remember, the ecosystem was working well before we made large-scale changes. Simplification to enable human control may result in the elimination of many of the very ecosystem services that we value so highly.

Biology and ecology are messy; nature (via natural selection) has shown that it takes generations to evolve strategies for persistence in a variable environment. But, given time and genetic raw material, life does indeed find a way. I think our real task is to understand how nature solves its own problems and to see if we can provide the conditions under which organisms (given time and genetic raw materials) can seek their own solutions.

As an alternative to our usual way of doing business, I suggest that we try to understand ecosystems on their own terms when we contemplate managing them and that we become more explicit and accepting of human conceptual limitations to evaluating our actions. Ecosystem management is complex, and isn't that a wonderful human challenge, perhaps the most human challenge of all, to understand and to adapt, rather than to control?

# # #

About the Author
Dr. Steven Culberson is the Lead Scientist for the Interagency Ecological Program (IEP), a nine agency consortium of State and federal partners who coordinate and share responsibility for monitoring and interpreting environmental data from the San Francisco Estuary. His position at the Delta Stewardship Council and the Delta Science Program supports an independent, scientific perspective that any of the IEP agency partners can access, while pursuing mandated and associated environmental monitoring and data interpretation.

Steven has worked for 30 years in California ecological and management systems and holds a Ph.D. in ecology from the University of California, Davis. His professional focus has ranged from subsistence aquaculture to systems thinking and simulations to science communication and the management/science interface in pursuit of natural resource management. A graduate of Oberlin College in Ohio, Steve dabbles in fitness, poetry, Italian food, and relaxing at home with his wife Mary and their three feline roommates.

ARE CA WATER WARS ABOUT TO BOIL?
Modesto Bee | April 4, 2021 | Garth Stapley

Not counting long and ugly court battles, the two most likely solutions to California water wars are voluntary agreements or involuntary edicts.

Our Modesto Bee Editorial Board long has favored voluntary agreements, or compromises negotiated mainly between local irrigation districts (representing our farmers) and state and federal officials.

The other side, chiefly represented by environmental and fishing interests, would prefer that the California State Water Board simply take huge amounts of water from our Stanislaus, Tuolumne and Merced rivers, mostly to benefit fish — what could be called involuntary edicts. It's an insult to our ancestors who sacrificed to build mountain reservoirs and canals, turning this valley into one of the most fertile agricultural regions in the world.

You haven't heard much during the three years that things have been mostly on hold. But recently, columns and essays reflecting environmental interests have begun popping up in blogs, publications and opinion pages with more frequency than usual.

Reading between the lines, Assemblyman Adam Gray sees a torpedo.

"These folks are suggesting we should abandon the (ongoing) voluntary agreements, is the message I'm reading in their own words," said Gray, whose district stretches through Stanislaus and Merced counties. "To see them go on a PR campaign against the voluntary agreements suggests an agreement is close, and their intent in blowing that up."

On Thursday, an environmental advocacy group approached me with questions about submitting essays. They are welcome to use our opinion pages to advance the public debate, of course — as are office holders, farmers and water agencies like the Modesto and Turlock irrigation districts. Let's have a full and fruitful discussion.

I hope the assemblyman is right, that voluntary agreements finally could be around the corner. Despite enormous pressure from the environmental lobby, Gov. Gavin Newsom and his predecessor, Jerry Brown — Democrats, both — stand behind these negotiations. They represent the best chance at all sides getting something, rather than one side getting everything, and the other, nothing.

A voluntary agreement is always better than an involuntary edict.

# # #

Garth Stapley is The Modesto Bee's Opinions page editor. Before this assignment, he worked 25 years as a Bee reporter, covering local government agencies and the high-profile murder case of Scott and Laci Peterson.

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Reform California's Water Policies
National Review | April 1, 2021 | Steven Greenhut

Drought-stricken farm land near the Salton Sea and the town of Calipatria in Calif., May 31, 2015 (Mike Blake/Reuters)

They have left the state unable to cope with droughts

As California emerged from a historically tough five-year drought in 2017, then-governor Jerry Brown signed two new laws that required local water agencies to limit water use to 55 gallons per person per day, with water-use allotments dropping to 50 gallons by 2030. Despite some misreporting to the contrary, these limits on individuals were not enforceable.

Instead, the state imposed fines on districts that failed to meet the new targets. It was pretty clear what direction the state was taking: Since then, California has gone all in for extreme conservation measures that could eventually lead to rationing as water-use allotments drop. Unless something changes, it may be only a matter of time before such policies lead to personal restrictions on lawn-watering, car-washing, and even showering.

While Brown surely was right that California needed to address its water shortages even in non-drought years, he was wrong to suggest that the solution is more of these government mandates for conservation among urban and commercial water-users. We all felt relief when the rains started that year, but the respite was short-lived — and it punted the debate to another day.

That day is fast approaching. As of early March, federal-government data show that 99.3 percent of the state is abnormally dry, with 90.9 percent facing moderate drought, 58.6 percent in severe drought, and 29.5 percent in extreme drought. The 2020–21 winter rainy season was a disappointment, and with that short season ending, we're left with insufficient Sierra Nevada snowpack and low reservoir levels.

State policy-makers will soon turn their attention away from the coronavirus, the unemployment scandal ($31 billion in fraudulent payments to scammers, as legitimate recipients waited for their checks), and a likely gubernatorial-recall campaign to focus once again on water issues. Unfortunately, Governor Gavin Newsom is even less likely than Brown to approve the projects that could address our recurring shortages.

Before we turn to those projects, let's float some basic water-use numbers. Around 50 percent of the state's available water flows unimpeded to the Pacific Ocean. Agriculture uses 40 percent and urban users (commercial and residential) account for the final 10 percent. State officials fixate on eking out additional savings from residences, which use only 5.7 percent of available water resources.

"If all the savings from water rationing amounted to 20 percent of our residential water use, then that equals about 0.5 million acre-feet, which is about 10 percent of the water used to irrigate alfalfa," wrote the pseudonymous Scott Alexander in his blog, Slate Star Codex. He argued that the state could buy out alfalfa farmers to achieve the gains it's trying to get out of urban users, adding, "I realize that paying people subsidies to misuse water to grow unprofitable crops, and then offering them counter-subsidies to not take your first set of subsidies, is to say the least a very creative way to spend government money — but the point is it is better than what we're doing now." It's a reminder of the incoherent mess that is modern California water policy.

Many agricultural subsidies are a vestige from the past, when the agricultural industry was more powerful than it is today. These days, the environmentalist lobby is in the driver's seat — and it sees conservation and rationing as ends in themselves. The state hasn't built significant water infrastructure since the 1970s, when the population was half its current 40 million.

In 1919, when California's population was 3.35 million, it faced a similar problem. That year, the California State Irrigation Association distributed a water-infrastructure blueprint by Colonel Robert Bradford Marshall, a geographer, who wrote, "The people of California, indifferent to the bountiful gifts that Nature has given them, sit idly by waiting for rain, indefinitely postponing irrigation, and allowing every year millions and millions of dollars in water to pour unused into the sea."

In the ensuing years, the state and federal governments, through the State Water Project and the federal Central Valley Project, built a remarkable system of dams, reservoirs, and canals, which provide the water that sustains the current population and turned the Central Valley into one of the world's most productive agricultural regions. These projects also eliminated massive

and routine floods. California used to fund water projects appropriately, via revenue bonds paid by end users.

California water policy has devolved largely into an insane battle over fish habitats. Fish populations are important, but flushing more water down the rivers isn't doing much to revive their still-declining numbers. During the last drought, I covered a contentious meeting at the Oakdale Irrigation District, in the Sierra Nevada foothills east of the San Joaquin Valley city of Modesto, where officials were draining two reservoirs to help a handful of hatchery-raised steelhead trout. "Now we have sizable communities that eventually might open the spigots and have no water," I wrote, "to help a fish so common I had it for dinner this week."

How did we reach this place? State and federal bureaucrats have been implementing inflexible rules, which are the result of legislation and court decisions. Today's environmental groups operate as litigation machines. They fight almost every proposal to expand the state's water resources — from slightly boosting the height of existing dams to building reservoir projects that have been in the planning stages for decades.

In my book Winning the Water Wars, I detail how California can meet its water needs. The state can promote abundance through targeted infrastructure improvements, water recycling, desalination, public–private water projects (such as the Cadiz Water Project, which would tap an aquifer the size of Rhode Island), and better water-pricing so that water can more easily be bought and sold.

Most proposals run up against the usual cast of bureaucratic and environmental characters. The environmental movement and its friends in state government are using water policy as a means to achieve broader goals. For instance, the California Coastal Commission, which advocates slow growth, for years has delayed the approval of a Huntington Beach desalination plant at a shuttered energy facility over worries about the impact on — get this — plankton. A concern about depleting a small amount of drifting whale food in the massive Pacific Ocean seems like a red herring to stop the plant.

Despite years of inaction, California can still avoid taking draconian steps. It needs to do what previous generations have done: Tap new water resources and build sufficient infrastructure to capture and store water during rainy years so that it has enough during dry ones. It needs to plan, rather than live at the mercy of Mother Nature.

In 1987, former Democratic governor Pat Brown recalled his approach toward the state's water shortages. "If we had not built the Oroville Dam, the Edmund G. Brown Aqueduct and the San Luis Reservoir, California would be facing a tremendous water shortage," he wrote. It's a straightforward idea that used to be widely shared even by environmentalists.

"Californians have only to see to it that the forests on which the regular and manageable flood of the rivers depend[s] are preserved, that storage reservoirs are made at the foot of the range and all the bounty of the mountains may be put to use," wrote John Muir, the Sierra Club founder.

The problem isn't a lack of rain but a lack of political will to assure that Californians have enough water that there's no need for rationing.

# # #

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With San Francisco Bay on life support, Newsom withholds the cure
CalMatters | March 31, 2021 | Jon Rosenfield, Guest Commentary

South San Francisco Bay Area. Photo via iStock
IN SUMMARY

San Francisco Bay's life support systems are unravelling quickly, and a wealth of science indicates that unsustainable water diversions are driving this estuary's demise.

Yet, with another drought looming, federal and state water managers still plan to divert large amounts of water to their contractors and drain upstream reservoirs this summer. Meanwhile, the state's most powerful water districts are preparing yet another proposal to maintain excessive water diversions for the long-term.

By delaying reforms that the law requires and that science indicates are necessary, Gov. Gavin Newsom encourages wasteful water practices that jeopardize the Bay and make the state's water future precarious. Will Newsom act to protect San Francisco Bay and put the state on a more sustainable path before it's too late?

Numerous signs indicate that unchecked water diversions are choking the Bay. Toxic algae blooms proliferate in the polluted trickle of water that enters the Delta from the San Joaquin River – in a dry year like this, 90% of that river's winter-spring runoff is diverted by industrial agriculture and cities like San Francisco.

Six of the Bay's native fish species are officially endangered, as are orcas that feed on dwindling Central Valley salmon; the once ubiquitous delta smelt could become extinct in the

wild this year. And, regulators will cut the ocean salmon fishery again this year because Central Valley rivers are not producing enough young fish.

Californians should ask why San Francisco Bay's native species continue to slide toward extinction. And why some Central Valley's rivers have been reduced to toxic drains for agribusiness. After all, multiple federal and state laws require protection of imperiled species, fisheries and water quality.

Over the past four years, then-President Donald Trump's ridiculous claims about California water presented new threats to the people and wildlife that depend on San Francisco Bay. Recent reporting revealed how the Trump administration's pandering to corporate benefactors steamrolled the expertise of federal biologists, and allowed industrial agriculture and cities to further plunder Central Valley rivers before they reached San Francisco Bay.

But now that Trump is gone, who should Californians blame for the ongoing neglect of the West Coast's largest inland estuary and its watershed? For more than a decade, the governor's office has rebuffed calls for the State Water Resources Control Board – which is charged with protecting the public's water and fisheries – to improve water quality standards. Since 2010, the water board has repeatedly documented the need for more flow to reach the Bay from its Central Valley watershed – in a typical year, more than half of that water is diverted under current rules.

The water board is required to review its water quality standards every three years to ensure that they protect the public's interests. In 2018, it took a first step toward overhauling standards that dated to 1995. But additional necessary protections were never completed, and even the new, partial update has not been implemented.

Newsom has blocked the water board's adoption of science-based standards, hoping instead to entice water districts to contribute only what they are willing to part with voluntarily. His lieutenants argue that the water purveyors will delay implementation of any plan that isn't their own. For example, when the state sued over Trump's endangered species plan, large water districts abandoned negotiations because they saw the feeble new federal requirements as the basis for their voluntary offer. Undeterred, Newsom's team has pursued talks, even expressing their desire to settle claims over Trump's fraudulent plan.

For years, required updates to the state's water quality requirements have been held hostage to one voluntary proposal after another; drought planning has also taken a back seat to discussions of voluntary agreements. These talks led nowhere, even as diversions continued, fish populations plummeted and water quality became increasingly toxic. Now the water districts are cobbling together a new offer. And Newsom seems eager to talk.

California doesn't need endless talk about illusory deals. It's time for the State Water Resources Control Board to adopt a comprehensive, science-based plan to restore San Francisco Bay. Such a plan will force realistic discussions about sustainable water use in our drought prone

state – and it might even lead to creative solutions. But first Newsom must stop kicking California's water problems down the road and let the water board do its job.

# # #

Jon Rosenfield has also written about water agreements and the need to set new objectives and protections for the Delta.

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CALIFORNIA WEIGHS CHANGES FOR NEW WATER RIGHTS PERMITS IN RESPONSE TO A WARMER AND DRIER CLIMATE

WESTERN WATER NOTEBOOK: STATE WATER BOARD REPORT RECOMMENDS ALIGNING NEW WATER RIGHTS TO AN UPENDED HYDROLOGY

Western Water | March 26, 2021 | Gary Pitzer

As California's seasons become warmer and drier, state officials are pondering whether the water rights permitting system needs revising to better reflect the reality of climate change's effect on the timing and volume of the state's water supply.

The American River in Sacramento in 2014 shows the effects of the 2012-2016 drought. Climate change is expected to result in more frequent and intense droughts and floods.

The American River in Sacramento in 2014 shows the effects of the 2012-2016 drought. Climate change is expected to result in more frequent and intense droughts and floods. (Source: California Department of Water Resources)

A report by the State Water Resources Control Board recommends that new water rights permits be tailored to California's increasingly volatile hydrology and be adaptable enough to ensure water exists to meet an applicant's demand. And it warns that the increasingly whiplash nature of California's changing climate could require existing rights holders to curtail diversions more often and in more watersheds — or open opportunities to grab more water in climate-induced floods.

"California's climate is changing rapidly, and historic data are no longer a reliable guide to future conditions," according to the report, Recommendations for an Effective Water Rights Response to Climate Change. "The uncertainty lies only in the magnitude of warming, but not in whether warming will occur."

The report says climate change will bring increased frequency and intensity of extreme weather events, such as atmospheric rivers and drought, prolonged fire seasons with larger fires, heat waves, floods, rising sea level and storm surges. Already, the state is experiencing a second consecutive dry year, prompting worries about drought. "The wet season will bring wetter conditions during a shorter period, whereas the dry season will become longer and drier," the report said.

The State Water Board report catalogues 12 recommendations — inserting climate-change data into new permits, expanding the stream-gauge network to improve data and refining the means to manage existing water rights to ensure sufficient water is available to meet existing demands. At the same time, the report says, the State Water Board should build on its existing efforts to allow diverters to capture climate-driven flood flows for underground storage.

Because floods and the magnitude of the peak flows are expected to increase under many climate change projections, “there may be greater opportunity to divert flood and high flows during the winter to underground storage,” the report said. The State Water Board could build on the flood planning data used by the Department of Water Resources to help inform water availability analyses and to spell out conditions for the resulting water right permits for floodwater capture.

“Water rights can either be something that helps us adapt and create resiliency … or it can really hinder us.”
~Joaquin Esquivel, State Water Resources Control Board Chair

“The recommendations are a menu of options,” said Jelena Hartman, senior environmental scientist with the State Water Board and chief author of the report. The goal, she said, was to “clearly communicate what the water rights issues are and what we can do.”

The result of a 2017 State Water Board resolution detailing its comprehensive response to climate change, the report could be the first step toward a retooled permitting system for new water rights applications. (The Board has averaged about a dozen newly issued permits per year, mostly for small diverters, since 2010.) The State Water Board is seeking public comments on the report through March 31.

And while the report does not call for reopening existing permits, it does sound a warning for those permit holders: With droughts projected to become longer and more severe, the State Water Board may need to curtail water diversions more often and in more watersheds.

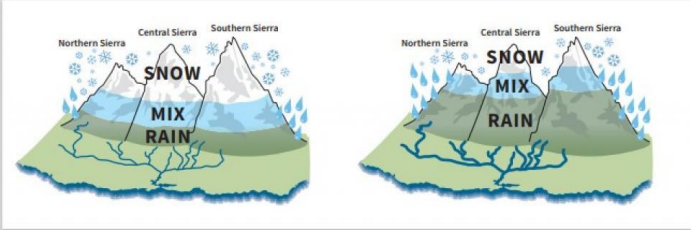
Time to ‘Reset Expectations’?

During a March 18 webinar on the report, Erik Ekdahl, the State Water Board’s deputy director for the Division of Water Rights, said it may be time to “reset expectations” regarding curtailments for water use permits, given that curtailments have only been implemented by the state in 1976-1977 and 2014-2015.

“That’s not an overuse of curtailments,” he said. “If anything, it’s an underuse. We may need to look at curtailment more frequently.”

Some water users fear the report could be the beginning of a move to restrict their access.

“To the extent climate change is incorporated into water rights administration, it should be to respond to a changing hydrology in a manner that is protective of existing users … and not to turn back the clock on



Climate change is expected to move the snow line in Sierra Nevada watersheds higher, which will likely change the timing and volume of winter and spring runoff. (Source: California Department of Water Resources)

water rights or to service new ambitions for instream flows that aren't in the law," said Chris Scheuring, senior counsel with the California Farm Bureau Federation.

The report notes that many of California's existing water rights are based on stream gauge data drawn during a relatively wet period (since about 1955). Although California has had some of its most severe droughts on record since the 1970s, annual flow on many streams is highly variable due to California's Mediterranean climate. Fluctuations in year-to-year precipitation are greater than any state in the nation, ranging from as little as 50 percent to more than 200 percent of long-term averages.

If climate conditions swing drier overall, the report says, it will be difficult for those existing water right holders to divert their permitted volume. Expanding the network of stream and precipitation gauges will be critical, the report says, to improving the accuracy of water availability analyses.

But the report's focus is on new water rights applicants and the need to weave climate change data into their permits to provide a clear description of projected water availability. "We take the long view in asking if there is sufficient water available for a new appropriation," Hartman said.

State Water Board leaders said the water rights response is part of the umbrella of actions needed to confront climate change.

"Water rights can either be something that helps us adapt and create resiliency … or it can really hinder us," Chair Joaquin Esquivel said at the Board's Feb. 16 meeting where the report was presented.

Writing Climate Change into New Permits

The fingerprints of climate change are increasingly evident in California's seasonal weather. Extreme conditions are on the upswing. Peak runoff, which fuels the state's water supply, has shifted a month earlier during the 20th century. The four years between 2014 and 2017 were especially warm, with 2014 the warmest on record. Annual average temperatures in California are projected to rise significantly by the end of the century.

"We are already experiencing the impacts of climate change," said Amanda Montgomery, environmental program manager with the State Water Board. The continuous warming creates an "unambiguous trend" toward less snow, she said, and shifts in snowpack and runoff are relevant for water management and water rights.

Jennifer Harder, a water rights expert who teaches at the University of Pacific's McGeorge School of Law in Sacramento, said integrating climate change considerations into water rights permits is good policy that aligns with the State Water Board's mission of ensuring the highest and most beneficial use of water.

"It's beyond dispute that the changes in precipitation and temperature patterns resulting from climate change will affect water availability," she said.

Kimberly Burr, a Sonoma County environmental attorney and member of the North Coast Stream Flow Coalition, told the State Water Board at the Feb. 16 meeting that knowledge about the effects of climate change on water is sufficient enough to be incorporated into new water rights permits. It's an important issue, she said, because the state must ensure adequate flows exist to protect endangered species, vulnerable communities and public needs under the public trust doctrine.

"There is a finite amount of water and we have to prepare for the worst and move forward with great caution," she said.

A Challenging Water Rights System

Water rights in California are based on a permitting system that includes several specifics, such as season and point of diversion and who can continue taking water when there is not enough to supply all needs. Getting a water right permit can take from several months for a temporary permit to several years for a permanent right.

In deciding whether to issue permits, the State Water Board considers the features and needs of the proposed project, all existing and pending rights, and the necessary instream flows to meet water quality standards and protect fish and wildlife.

The priority of a water right is particularly important during a drought, when some water right holders may be required to stop diverting water according to the priority of their water right. Suspension of right is done through curtailments of the user's ability to divert water.

If the State Water Board implemented the recommendations in the water rights and climate change report, critics say, it would add another component in a system that aims to meet the demand for additional water. Already, local groundwater agencies are lining up to get access to available water sources for aquifer recharge and groundwater banking so they can comply with the state's Sustainable Groundwater Management Act.

Some question whether putting the report's recommendations into action would possibly hinder the permitting process.

"The concern I have is we have quite a big backlog already and it's already challenging to get through the system," said State Water Board Vice Chair Dorene D'Adamo, who serves as its agriculture member. "How do we incorporate all of this and still be nimble and move with deliberate speed?"

Incorporating a climate change response into new water rights permits would be complicated, but necessary, State Water Board member Tam Doduc said.

Striving For Complete Data

Adding climate change data to water rights permits applications is problematic because of questions about the precision of existing data and the degree to which it can be localized.

“Current climate change models have disparate findings, and many are calibrated for a global scale but not regional areas,” Lauren Bernadett, regulatory advocate with the Association of California Water Agencies, told the Board. “The recommendations insert significant uncertainty for any person or agency applying for a permit.”

A State Water Board report on adapting water rights permits to address climate change impacts says the state needs to improve its system of stream and precipitation gauges to better track climate change impacts on water availability. (Source: California Department of Water Resources)

Harder, the law professor, said good data is critical for determining water availability, but perfect data to achieve absolute certainty is unattainable. “There are many different facets of water management and it requires us to give careful thought into how we make decisions in the face of the data we have, knowing it will never be perfect and always be changing” she said.

Better streamflow data is crucial to knowing whether the water exists to support new permits. The report notes that the low number of gauges, particularly on the smaller stream systems in California, means there is often not enough information to accurately characterize hydrologic variability over years or decades. That significantly limits the ability to reliably estimate water availability.

The report says the state may need to rethink how it estimates water availability. It added that one way to improve accuracy may be temporary installation of portable stream gauges at requested diversion points.

Moving From Theoretical To Practical

Addressing how to respond to climate change in water rights permitting would be a substantial undertaking, particularly given the existing array of complex and controversial matters on the State Water Board’s agenda.

“We don’t have all the details yet and this won’t be an easy task. Too often we focus on our water quality activities because water rights are too difficult.”
~Tam Doduc, State Water Board member

“We don’t have all the details yet and this won’t be an easy task,” Doduc said. “Too often we focus on our water quality activities because water rights are too difficult.”

Said Esquivel: “There is a lot of work to be done and it can seem overwhelming. But there is a lot of great groundwork and a commitment to making sure the water rights system is going to adapt and be here for us when we need it most.”

The State Water Board already has broad authority under existing law to take on climate change in water rights permits should it decide to do so, said Harder, with McGeorge Law School.

“What the board is trying to do,” she said, “is snap those tools together in a new way and polish up the edges.”

However the issue proceeds, Harder said, the state should recognize that water resources are best understood by the local agencies that have the most pertinent information about them.

“We need to approach this as a partnership as opposed to looking at it through the lens of … state power vs. local power,” she said. “There is an important role for both here.”

# # #

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Water war continues to affect salmon run
Half Moon Bay Review | March 24, 2021 | Vanessa Ochavillo and August Howell

The upcoming salmon season doesn't look promising for recreational and commercial fishermen on the Coastside. But environmentalists from the Central Valley are hoping to change that in the future by easing the movement of salmon between the Pacific Ocean and inland rivers.

One of those rivers is the Tuolumne River. Its stewards at the Tuolumne River Trust are sounding the alarm over the river's health and say that committing more water to this distant river will help the salmon populations more than 100 miles away in places like Coastside fisheries.

Last week, the Tuolumne River Trust won support for its cause from the San Mateo County Harbor District and the Half Moon Bay Seafood Marketing Association, which represents Half Moon Bay commercial fishers.

Peter Drekmeier, policy director of the Tuolumne River Trust, said by talking with local agencies he is hoping to revive support for implementing the controversial Bay Delta Water Quality Control Plan. The plan by the California State Water Resources Control Board was passed in 2018 but, shortly after, faced lawsuits, including by water supplier, the San Francisco Public Utilities Commission.

The Bay-Delta plan requires that the Tuolumne River receive more water than it has historically. Specifically, the plan sets a new minimum of 40 percent of what's called unimpaired flow. Flow has averaged 12 percent in the recent past.

Critics of the plan say increasing the flow in the Tuolumne River comes at the expense of filling up reservoirs to the desired amounts for suppliers like SFPUC, which provides water for customers in places including Half Moon Bay, El Granada, Miramar and Princeton.

Drekmeier said the SFPUC's reservoirs are filled using plans of a "worst case scenario" drought of eight years and calls that projection excessive.

Steve Ritchie, SFPUC assistant general manager for water, said the agency stands by its use of an eight-year drought plan. He said the state used to tell water districts to use a three-year drought to plan and that it recommended an increase to five years during the last drought. He suspects that number will go up again.

"We think it's prudent to use a long drought to plan," Ritchie said.

Ritchie said there was a limited window for the SFPUC to protest the Bay-Delta plan and called the agency's lawsuit "protective." He said a much more productive alternative would be for the state and other agencies to finalize an in-progress "voluntary agreement," which emphasizes stronger habitat restoration measures for the next 15 years.

Those discussions for an alternative have been stalled for months but Drekmeier called the voluntary agreement “inferior” to the Delta Plan and wants the SFPUC and the Bay Area Water Supply and Conservation Agency to withdraw their lawsuit.

“Some people are holding out hope that the process isn’t dead, but signs are at least that it’s on life support,” Drekmeier said of the voluntary agreement discussions. “Meanwhile, months slip by and we’re not seeing improvements.”

The conditions of the Sacramento-San Joaquin Delta Estuary have contributed to the endangerment of the coho and chinook salmon species.

Pacific Fishery Management Council, which determines when salmon fisheries can be open, is looking at a much shortened commercial season this year: 78, 94 or 104 days as opposed to last year’s 167 days.

Robin Ehlke, who oversees salmon fishery management for the council, said there are a host of environmental factors that contribute to the abundance of salmon in any given year. The agency’s focus is the number of salmon. And, this year, it’s looking low.

Salmon was a top-earner for fishermen at Pillar Point Harbor, according to the Half Moon Bay Seafood Marketing Association in a letter supporting the Bay-Delta plan. But fishermen have reported smaller landings in recent years: salmon brought in over $38 million worth of catch between 1998 and 2008 but less than $15 million from 2010 and 2019.

“If the continued loss of salmon seasons isn’t turned around, we will see more losses of commercial fishing businesses in our port and others,” says the Half Moon Bay Seafood Marketing Association’s letter.

The Harbor District board of commissioners passed a resolution supporting the Bay-Delta plan.

# # #

CA WATER COMMISSION: ENSURING THE RELIABILITY OF THE STATE WATER PROJECT, PART 1: STRATEGIC PRIORITIES AND PROGRAMS

Maven Meetings | April 6, 2021 |

One of the California Water Commission's statutory responsibilities is to conduct an annual review of the construction and operation of the State Water Project and make a report on its findings to the Department of Water Resources and the Legislature, with any recommendations it may have. Having just finished the 2020 State Water Project review, the Commission has launched its 2021 State Water Project review with a theme focused on creating a resilient State Water Project by addressing climate change and aging infrastructure to provide multiple benefits for California. The goal of this year's briefings is to deepen the Commission and the public's awareness of how the State Water Project serves California and the challenges the State Water Project faces.

At the California Water Commission's March meeting, Commissioners heard a series of presentations on the State Water Project which will be covered in two parts. In part one, Karla Nemeth, the Director of the Department of Water Resources, discussed the Department's overall plans for the State Water Project for the upcoming year. Next, Ted Craddock, Deputy Director for the State Water Project, then discussed the strategic priorities and initiatives that the Department is doing to ensure the reliability of the State Water Project. In part two, which will be posted tomorrow, John Andrew, Assistant Deputy Director, gave a presentation on the climate change vulnerability for the State Water Project. Lastly, Behzad Soltanzadeh, Chief of Utility Operations, discussed the Department's efforts to address issues related to aging infrastructure.

DIRECTOR NEMETH LAYS OUT THE PLAN AND VISION FOR THE STATE WATER PROJECT

Director Karla Nemeth began by expressing her appreciation for the Water Commission's role in oversight of the State Water Project. "One of the things I think is important about the Commission's role is that we really are at a historic moment of change throughout California when it comes to infrastructure, and the State Water Project itself has really served California very well these past many decades," she said. "But we need to ask ourselves collectively, how do we prepare the State Water Project to not only deal with aging infrastructure but how do we prepare ourselves to use it to do more and meet the challenges of the 21st century?"

The State Water Project provides water supplies for 27 million Californians and about 750,000 acres of farmland, as well as important flood control and recreational benefits. The State Water Project also supplies water in ways intended to support fish and wildlife habitat protection, such as temperature control, functions she noted that will become increasingly challenging in the future as the state experiences and responds to climate change.

Among the 27 million Californians served by the State Water Project, about 6 million are in underrepresented communities. The State Water Project itself is the fourth largest power generator as well as the largest power user in California. Director Nemeth noted that this was

important when the state experienced grid stabilization issues last summer, as the State Water Project played a crucial role in helping California get through those crunch times at the end of the day.

Like a lot of industries and sectors, Director Nemeth said the Department and the State Water Project have redoubled efforts to focus on the equity of programs and services; this includes better outreach to traditionally underrepresented communities to make sure their needs are understood and taken into account in the Department's planning processes.

Aging infrastructure and workforce

The State Water Project is over 60 years old. With climate change and aging infrastructure, the Department is aware of the elevated risk, she said. It requires intensive maintenance and innovative technologies in thinking about how to deliver a high level of service that can respond to risks associated with infrastructure and climate change.

There is also the issue of the aging workforce. Many folks who have been with the Department for a long time and have acquired a lot of knowledge are nearing retirement age. In response, the Department has been developing a secession plan to transfer that knowledge to the incoming group of leaders.

The Department is pursuing about 150 new positions to help with the work needed to maintain the State Water Project's reliability. The Department has also hired a Chief Financial Officer for the State Water Project, which Director Nemeth said speaks to the desire to be as transparent as possible with the State Water Project contractors. Anticipating a lot of new investment in the State Water Project, they want to make sure their approaches to rate structures are financially sound, she said.

The Department has hired someone who will head up the climate change efforts within the State Water Project. She noted that John Andrew runs the climate change program for the entire Department, so having one staff person within the State Water Project itself will help meet those challenges.

Creative solutions

Director Nemeth then turned to the ways in which the State Water Project is innovating.

> **Grid stabilization**: The Department has been working with Cal-ISO to ensure that the State Water Project is operated in a manner that can help ease up on the electrical grid during times of heavy use in the late hours of the day. They are also generating more power up at Oroville at Hyatt and Thermalito to put onto the grid. They are now working on front-end planning with Cal-ISO and other big power generators in the state.
>
> **Forecast Informed Reservoir Operations**: The Department has been working to implement Forecast Informed Reservoir Operations, which is a way to utilize recent

advancements in weather forecasting technology to align water supply with the flood protection benefits of the facilities. "The added flexibility also enables us to do more things for the environment as needed," said Director Nemeth. "One of the biggest challenges is the rigidity of the system, in terms of how we can provide water at the right volume and timing that helps support native fish and wildlife species. So any flexibility that's gleaned from more precise Forecast Informed Reservoir Operations is going to help us system-wide with all of the objectives that we're managing to."

Improved water transfer process: The Department has made significant improvements to the water transfer process. A new contract amendment for the State Water Project was recently adopted that allows for long-term transfers of Table A water supplies among state contractors. "That kind of flexibility is going to be really important for the future and an important tool that the State Water Project can bring to the table, particularly as it relates to sustainable groundwater management," said Director Nemeth.

Habitat restoration: The Department has a focus on habitat restoration, particularly relative to reactivation of floodplains. The Department is partners in the Yolo Bypass Fishery Enhancement Project, but they are also looking at projects upstream. "How we manage floodwaters and how we allow for State Water Project waters to go up on those floodplains and return into the system and create this new habitat is going to be important for the State Water Project to balance across multiple needs," Director Nemeth said.

Climate action

The Department has been focused on reinvesting in the State Water Project, so it's ready for the challenges presented by climate change. This includes developing their renewable portfolio and hiring a climate action coordinator.

It also includes conducting a near-term rehabilitation and long-term feasibility study for subsidence-related damage to the California Aqueduct. Addressing subsidence on the Aqueduct is essential because the damage from subsidence reduces the ability to move water during the above average and wet water years.

"We were able to do move water in 2017, which was a huge water year and a big drought buster," said Director Nemeth. "We know that kind of water year is right around the corner, and we want to make sure that the California Aqueduct is ready to handle those kinds of high flow events, which is hugely important for our drought management in California."

Discussion highlights

Commissioner Dan Curtin acknowledged that climate change is reducing the snowpack, and SGMA is being implemented, so is the state moving ahead on groundwater capture through new conveyances systems to capture that runoff? And what about desal?

Director Karla Nemeth acknowledged that as a utility, they need to ensure they are reinvesting in the system so it is reliable. One of the biggest needs with the SWP contractors and their member agencies is, how do all these pieces fit together?

"There's been a lot of conversation about how 'it's an all-of-the-above strategy, and I think we all understand that intuitively, for a whole bunch of reasons," she said. "Water reliability is different in different parts of the state. Coastal communities have access to the ocean water desal."

"In my mind, there are two tasks," she continued. "One is, you know, how do we start to articulate how reinvestment in the State Water Project fits with on a more granular level with local water supply plans? And two, we all have a growing sense of water affordability is a significant issue … we know we have some significant equity issues within our communities. When we have these broad or intense economic disparities, we know that the affordability of water rates is different for different Californians. And so in my mind, what I think we need to be doing is putting the whole package together as water leaders."

"The State Water Project needs to do its job to lay out the things that we need to do to make this water supply source more reliable from a gray infrastructure perspective, but also from a perspective of how it relates to operating during more extreme events and capturing the extremes," she continued. "A lot of our work is annual averaging that affects how we do long term planning, but we do have to open up that kind of aperture on long term planning to accommodate these extreme scenarios and think about what's a reasonable approach for project investment that accommodates those scenarios, and how does that work better with other local investments that we need water agencies to be making?"

Director Nemeth said the report by the PPIC on urban-ag partnerships relating to the Central Valley and the urban areas within the State Water Project was interesting. Still, reinvestment in the State Water Project needs to happen to make those projects effective.

"That is interesting and important integrated thinking," she said. "The more that we can have these conversations in these transparent public settings, I think the better off we'll be because the system is complicated. The State Water Project is a big part of it; it was constructed in an era where we had a different ethos. But water fundamentally is really managed at the local level in California. So it's incumbent upon all of us to generate that picture of water resilience where the State Water Project and investments connect to all these other water supply choices, and water quality choices that we know need to be made at the local level."

STATE WATER PROJECT PRIORITIES AND INITIATIVES

Ted Craddock, Deputy Director of the California State Water Project, then discussed the specific strategic priorities and programs that the Department is implementing to ensure the reliability of the State Water Project.

As an organization, it's essential to lay out a strategic plan with a vision and mission, Mr. Craddock began. The Department has an overall strategic plan in which one of the key guiding

principles is to secure the State Water Project for future generations. This strategic plan gives them a focus; additionally, there is a complimentary strategic plan for the State Water Project.

"The mission we're working towards here at our organization is the safely supplied quality water to the people and environment of California," he said. "It is our succinct way of saying our mission, but it helps to ensure our team is working towards a common goal. Then we've identified as a collective team, the importance of working together as one team to ensure we're being good stewards of the system, keeping it operable, and then also building partnerships. In our strategic plan, that is a theme that we build on, besides our priorities."

The Department is working to support the Governor's Water Resilience Portfolio; this includes working on Delta conveyance, looking at subsidence impacts along the California Aqueduct as well as the impacts on other water systems, and making it easier for water contractors to do transfers and exchanges and utilize the State Water Project infrastructure as part of their overall water supply reliability at a regional perspective.

The Department is taking a holistic look at the State Water Project system from a risk perspective and set up a risk-informed planning system to ensure that limited financial resources are being spent wisely to maintain and improve system reliability. The Department is also working on Forecast Informed Reservoir Operations for the State Water Project at Lake Oroville and Lake del Valle. The Department has a partnership with the Army Corps of Engineers, Scripps Institute, and water agencies focused on the cutting edge of understanding the atmospheric rivers and how advanced forecasting can improve water resources management with the State Water Project.

Challenges to the continued operation of the State Water Project

Mr. Craddock presented a list of the challenges to the State Water Project's continued operation. Aging infrastructure is a challenge, as well as the affordability of reinvesting in the system. The current estimate is that $10 billion in reinvestment in the system is needed over the next 20 years. The Department is developing a 20-year capital investment plan that identifies the specific investments necessary so that the State Water Project contractors, who are responsible for paying for those costs, can plan for the eventual future financial needs of the system.

Mr. Craddock noted that our understanding of natural hazards such as earthquakes has improved over the years. So there are a series of seismic reassessments and retrofits being done throughout the system.

As the population has grown in the state, the reliance upon the State Water Project has likewise increased. As a result, the periods of time when maintenance activities can occur have become smaller, so planning when that work will happen is critical. The Department just held its annual maintenance planning workshop with representatives of the State Water Project contractors to layout the maintenance plan for the upcoming year.

Workforce and safety initiatives

There are several succession planning and workforce initiatives underway within the State Water Project. There is an initiative called the One Team initiative, which is focused on ensuring the management team for the State Water Project understands the important roles that each of the functional areas does to get the work done, and how everyone works together for the common mission. There is also a succession planning element included to ensure an exchange of knowledge from senior leaders to the more junior managers.

They have asked the eight operating divisions on the State Water Project to put together succession plans specific to their divisions. These plans will include strategies, such as rotating staff in different positions and providing opportunities to overlap responsibilities to ensure transfer of knowledge. Mr. Craddock said they have an additional focus on new engagement with the industry and our colleagues in the university system.

The Department is also going through an organizational review called the Baldrige approach, an assessment and benchmarking review of the Department to identify areas for further improvement moving forward.

There is a proposal to add new positions to the State Water Project workforce to implement the Department's asset management programs. *"Over the last five to seven years, we've developed an asset management program," he said. "We're now transitioning from the strategy, policy phase to implementation, and we need the people to implement asset management and then what's associated with that as a maintenance management system, which will have a greater focus on preventative maintenance."*

There is a continued focus on workforce safety, the safety of the public, and emergency preparedness. Mr. Craddock said these areas that require very close attention. They are operating a 'no-fail utility and things do happen, so it's important to be prepared.

Subsidence on the aqueduct

Addressing subsidence along the California aqueduct is a major focus area. A team has been established to start planning the work. They are currently in the feasibility study phase. There is a two-phase approach to addressing the problem: a near-term five-year plan for immediate improvements and a 10-15 year plan for the significant capital investments.

"What's happened is in the San Joaquin Valley is that subsidence has occurred over many decades, but was exacerbated during the last drought period with a loss of the Aqueduct's conveyance capacity on the order of 20% in some areas," said Mr. Craddock. "The Aqueduct pools have a volume of water that allows us to use that water as a buffer as we move flow through the system. We now have to operate the Aqueduct at higher levels closer to the top of the concrete liner. The loss of the buffer has taken away some of our ability to operate the Aqueduct in a flexible way with our pumping plants throughout the system."

About half of the subsided Aqueduct portion is within the joint state-federal facilities, so they are working with Reclamation and other federal partners to determine how best to leverage State Water Project funding with federal funding to complete the needed work on the California Aqueduct over the next decade.

Water supply contracts

The Department just executed a contract amendment with many of the State Water Project contractors that include water management tools that provide greater flexibility for water transfers amongst the State Water Project contractors by providing a mechanism for multi-year transfers, which was not in the previous contracts. This is intended to provide greater ability for state contractors to manage their water supplies over a more extended period.

The Department is currently working to extend the current contracts, set to expire in 2035, through 2085. They are currently going through a court validation process with the water supply contract extensions and expect those to be in place in 2024. They will also be transitioning to a simpler billing process for their water contractors.

Environmental activities

Mr. Craddock said that operating the system in an environmentally responsible way is very important and part of the State Water Project's mission statement. So the Department is working on fishery improvement projects on the Feather River and around Lake Oroville, implementing the biological opinions for Delta operations, and investing in science, monitoring, and reporting.

There are numerous projects in the Delta to help threatened and endangered species related to shallow water habitat and in fish passage, like the Yolo Bypass project. The scientific work of monitoring and sampling that the Department does is very important for the system and knowledge of delta water quality.

Discussion highlights

Commissioner Fern Steiner noted that many agencies are looking to develop local supplies, some of which are expensive, such as desal and recycled water. "You're going to have to invest in this aging infrastructure, which is, of course, a fixed asset and will have to be paid for as these agencies roll off. I know that all of our agencies in the south face the issue of how to pay for these fixed assets as everyone rolls off and develops these local projects? Usually, they're developed by the larger agencies who can afford them, so the smaller agencies are left with the problem of paying for the fixed assets. So in the extension of the contracts to 2085, is that issue being addressed in advance rather than as you're building?"

"That was one of the drivers for getting out ahead on the extension of the contracts, because we are in that period where the current repayment period is getting shorter and shorter under the existing contracts," said Mr. Craddock. "So it's extremely important that we transition over to the new contracts that we're targeting for 2024, to provide that mechanism to spread out payments

over a longer period. The way our State Water Project finances are set up, there are some balloon payments at the end of the current contract term. Under the new contracts, that goes away, which provides more of the consistent revenue requirements, what we're currently working on. Our 20-year forecast is to put that together in a way that considers the affordability concerns for the agencies we're delivering water to. We envision that will be partnered with the State Water contractors to ensure we're doing it in a way that is an incremental increase that's planned over time that folks can plan for because we understand the concerns you're mentioning, Commissioner."

# # #

How California Stands to Benefit From the $2.2 Trillion Infrastructure Proposal
Monday: If the plan passes, the state will have big plans for the federal money.
New York Times | April 5, 2021 | Shawn Hubler

President Biden speaking about his infrastructure plan last week. Anna Moneymaker for The New York Times

Good morning.

“This is a game changer,” Gov. Gavin Newsom exulted last week during a news conference. “We are very, very enthusiastic.”

Was he talking about his recent coronavirus vaccination? The latest poll in the recall campaign?

No, he was reveling in news from what has long been California’s sweet spot — infrastructure, baby.

Perhaps more than any other part of the country, California stands to benefit from the $2.2 trillion proposal introduced last week by President Biden. As our colleague Jim Tankersley and others reported (and detailed for The Upshot and “The Daily”), the sweeping plan would inject huge sums of money into wider roads, faster internet, high-speed trains, charging stations for electric cars, airport terminals, upgraded water pipes and much more.

If it passes — a big if — the state that conjured Los Angeles out of the chaparral and the nation's agribusiness capital out of the swamps of the Central Valley will have big plans for the federal money.

The infusion is being seen not only as the path to a long-overdue upgrade of the freeways, dams and aqueducts that have long been California's hallmark but also as a way to scale up and export the state's ambitious climate policies.

Take, for example, the bill's implications for the port of Los Angeles and Long Beach, which together handle about 40 percent of the container cargo that comes into the United States.

The diesel trucks that carry goods from the docks to mega-warehouses many miles inland have long been a target in a state where worsening wildfires have become a year-round reminder of the peril of global warming. Port trucks spew so much pollution on their way out of Long Beach on the 710 Freeway that "Asthma Alley" is the route's nickname.

The federal infrastructure bill would underwrite not only clean trucks, but also tens of thousands of heavy-duty charging stations between the ports and the mega-warehouses inland where their goods are delivered. Perhaps more important, it would put the weight of the federal government behind California's ongoing struggle to persuade shipping companies from other nations and states to lower the emissions from their port equipment.

Matt Petersen, who heads the nonprofit Los Angeles Cleantech Incubator and leads a regional project to significantly lower greenhouse gas emissions from Los Angeles traffic, said last week that if he could pick just one project to fund from the Biden bill, it would be to accelerate the replacement of those aging port trucks.

"That would be it," he said, "in terms of the biggest overall impact."

The bill would speed up California's push to curtail carbon emissions in other ways as well.

Cars: California has been weaning itself from fossil fuels for decades. The state requires utilities to use increasing amounts of wind and solar power each year, and last year Mr. Newsom issued an executive order requiring that all new cars sold in the state be zero-emission vehicles by 2035.

The Biden plan would supercharge that effort with federal incentives to drive zero-emission vehicles rather than gas guzzlers and fund the build-out of tens of thousands of charging stations to make electric cars more convenient to drive.

Buses: The state's transit agencies are moving toward replacing all diesel-fueled buses within the next two decades. The Biden bill would replace 50,000 diesel public transit vehicles and 20 percent of school buses with vehicles that run on alternative fuel.

That would not only cut down on emissions in the state, but also support the state's clean tech sector. At least four alternative fuel bus manufacturers are based in California, as are companies such as Silicon Valley's Zum, which is replacing Bay Area school buses with a fleet of electric buses.

Rail: The package as proposed would provide $80 billion for rail projects in California. The state's embattled high-speed rail project, passed by voters in 2008 but politically shunned in recent years as too expensive, is unlikely to score a windfall, but other projects could benefit, according to a Los Angeles Times analysis.

Among them: high-speed electrification of the rail system between Anaheim and Burbank; construction of a 1.3-mile tunnel to extend passenger rail into downtown San Francisco; and shortening the ride from Los Angeles to San Diego by straightening that rail line.

The San Francisco Chronicle reports that the plan also could increase the capacity of BART, the Bay Area's transit system, extending it to San Jose and Santa Clara and perhaps connecting high-speed rail to the region. Amtrak also wants to create 30 new routes with the proposed funding, including between Los Angeles and Las Vegas, and to add more trains between San Diego and Los Angeles.

Water: Rural communities throughout the state contend with contaminated drinking water, particularly in the Central Valley. The state has struggled with the cost of cleanup for years. The Biden bill has $66 billion to address water systems nationally.

Broadband: In the state that gave rise to Silicon Valley, more than a quarter of public school students still lack reliable internet access — an issue laid bare during the past year as schools shifted to remote instruction during the pandemic. The bill would spend $100 billion nationally on high-speed broadband.

In-home care: The bill also includes $400 billion to expand access to caregiving for people who are older and disabled, and to improve pay and benefits for caregivers. California is projected to have a higher proportion of residents over 65 than Florida within the next decade.

# # #

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Vice President Kamala Harris, Governor Gavin Newsom visit Bay Area water facility
ABC 7 News | April 5, 2021 | Amy Hollyfield and Lyanne Melendez

Vice President Kamala Harris is returning to her hometown of Oakland Monday for the first time since taking office. She will be joined by California Gov. Gavin Newsom to take a tour of a facility to highlight the benefits of the American Jobs Plan.

OAKLAND, Calif. (KGO) -- Vice President Kamala Harris returned to her hometown of Oakland Monday for the first time since taking office.

Harris was joined by Governor Gavin Newsom on a tour of a water treatment facility to highlight the benefits of the American Jobs Plan, which proposes investing $111 billion in the nation's water infrastructure. Harris and President Joe Biden say the plan would help ensure access to clean drinking water and create jobs.

Harris touched down in Oakland at 9:45 a.m. before going to the water treatment plant. She arrived from Los Angeles, where she spent the Easter holiday, and was greeted by Lt. Gov. Eleni Kounalakis, Sen. Alex Padilla and Rep. Barbara Lee.

At the facility, Harris and Newsom met with water plant workers who underwent an apprenticeship program. The vice president said such programs would serve as a model for the rest of the country under the proposed American Jobs Plan.

"This facility and this group have really been doing work that is a model for the country," Harris said.

The plan wouldn't just upgrade infrastructure, but also create jobs and focus on equity, Harris said. The Biden-Harris administration is proposing an upgrade to 100% of the country's lead water pipes, she said.

"Drinking lead will kill our children -- literally," Harris said.

Vice President Harris then met with small business owners at Red Door Catering company in Oakland which, last September, received government funding and was able to stay afloat.

Harris came to listen while promising to provide more financial support for small businesses located in underserved communities.

"And sometimes you can just look and tell when people are telling you the truth and they are going to keep their word and I really fell hopeful and I believe things are going to get better," said Reign Free, Owner of Red Door Catering.

After returning to Los Angeles Monday evening, the vice president heads to Chicago on Tuesday to focus on vaccine equity.

When Harris arrives in Chicago, it will be her first official visit to that city. She will be greeted by Mayor Lori Lightfoot. In a tweet the mayor said that she and the vice president shared a common goal which is to focus on vaccine equity and getting to those hardest hit communities.

Harris was born in Oakland and kicked off her presidential campaign there in January 2019.

She began her career as a prosecutor in the Alameda County District Attorney's Office.

# # #

Biden Infrastructure Plan: Water Components
Pacific Institute | March 31, 2021 | Peter Gleick and Cora Kammeyer

Earlier today, President Biden announced the first components of his proposed $2 trillion national infrastructure plan to rebuild failing, aging, and outdated water, energy, transportation, and communications systems. While the current information provides only the broadest outlines of his proposals, and the details will have to be worked out in specific legislation to be debated in Congress, it is clearly the most ambitious plan to have been put forward in many years.

One key component, and the one of particular interest to the community the Pacific Institute works with, is the set of proposals focused on U.S. water problems. In September 2020, the Pacific Institute released a set of water-related recommendations for the new administration.

Among the most important of these recommendations are the need to deliver clean, affordable drinking water to everyone in the U.S., with a focus on removing 100% of remaining lead pipes and service lines; implementing new standards to protect drinking water from currently unregulated pollutants; preparing for the increasingly dangerous consequences of extreme weather and climate disasters; and improving access to safe water in underserved communities, including on Tribal lands.

The Biden Plan addresses several of the priorities laid out in the Pacific Institute's set of recommendations. The Plan dedicates $111 billion to water infrastructure investments, and includes specific actions on water as detailed below:

- Calls for the elimination of all lead pipes and service lines and requests $45 billion for this purpose, to be funded through the EPA's Drinking Water State Revolving Loan Fund and grants through the Water Infrastructure Improvements for the Nation Act (WIIN).
- Provides funding to address western drought impacts with a focus on water efficiency and recycling investments, Tribal water settlements, and dam safety.
- Seeks $10 billion to monitor and remediate new drinking water contaminants (PFAS – per- and polyfluoroalkyl substances) and invest in small rural water systems.
- Requests $56 billion in grants and loans to states, Tribes, territories, and underserved communities to upgrade and modernize America's aging drinking water, wastewater, and stormwater systems, tackle new contaminants, and support clean water infrastructure across rural America.
- Seeks investments in protection from sea-level rise, hurricanes, and severe weather events.
- Seeks investments to protect and restore nature-based infrastructure like forests, wetlands, watersheds, coasts, and oceans.
- Invests $16 billion to plug oil and gas wells that contaminate water, air, and local communities and provides jobs to restore old and abandoned mines.

Other details will certainly emerge once legislation is proposed and debated in Congress. We also note that many of our recommendations to address national water problems are not financial, but require regulatory or other actions, such as modernizing the National Flood Insurance Program, integrating climate risks into all federal water management plans, restoring and expanding access to science- and water-related expertise in federal agencies, addressing international security risks associated with water, and developing new standards to protect U.S. waters from unregulated contaminants. We look forward to seeing how the Biden Administration takes up the broader fight of solving the nation's water challenges.

# # #

Industry Associations Applaud Congressional Committees For Passage Of Water Infrastructure Bills

Water & Waste Digest | March 26, 2021 | Christina Tuser and Bob Corssen

National Association of Clean Water Agencies (NACWA), WateReuse Association and Water Environment Federation (WEF) released statements of support for the passage of the Senate Environmental and Public Works Water Funding Bill. Similar support was share for the U.S. House infrastructure bill in the Transportation and Infrastructure Committee.

The Senate Environment and Public Works (EPW) Committee unanimously passed the Drinking Water and Wastewater Infrastructure ACT (DWWIA) of 2021 Mar. 24, 2021.

The passage of this bill in the Senate EPW follows a hearing last week during which industry stakeholders shared the importance of reauthorizations of funding programs to the water and wastewater sectors.

The bill would reauthorize and significantly increase the amount of federal assistance made available to states and communities through the Drinking Water State Revolving Fund (DWSRF) and the Clean Water State Revolving Fund (CWSRF) programs.

According to the bill's language, the DWSRF would start its reauthorization at $2.4 billion in 2022 and gradually increase annually to $3.25 billion for fiscal years 2025 and 2026. The CWSRF would follow the exact same reauthorization pattern for funding annually. Ultimately, this amounts to $14.7 billion for both programs.

Additionally, DWWIA also references the Water Infrastructure Finance and Innovation Act (WIFIA), and provides funding of $50 million annually through fiscal year 2026, and it would also resurrect the EPA Lead Reduction Grant program with $100 million annually through fiscal year 2026. The lead reduction program would be a welcome funding source for utilities seeking to comply with the Lead & Copper Rule Revision, which is expected to be effective at the end of 2021.

Industry associations including NACWA, WateReuse Association and WEF released statements of support for the passage of the bill.

According to WEF, additional reauthorizations and changes include:

- The Clean Water State Revolving Fund would get $14.65 billion over the next 5 years and allow a greater percentage of loans to be forgiven or other favorable loan terms
- The Water Infrastructure Finance and Innovation Act would require only one ratings agency opinion letter, instead of two
- The U.S. EPA Sewer Overflow & Stormwater Reuse Municipal Grant Program would get $1.4 billion over the next 5 years.
- The Alternative Source Water Pilot Program would receive $125 million over the next 5 years.

In a letter of support from the WEF Board of Trustees, including President Lynn Broaddus, the trustees congratulated "the Committee on putting forth a bill that will advance many of the water

infrastructure funding and policy priorities our members have been advocating for over the years," citing provisions of the bill including but not limited to: Sections 210, 204, 211, 217, 202.

NACWA also shared vocal support for the Senate EPW Committee passage of the bill.

"NACWA applauds the Senate EPW Committee for unanimously passing the Drinking Water and Wastewater Infrastructure ACT of 2021," said Adam Krantz, chief executive officer of NACWA in the NACWA statement. "The Clean Water State Revolving Fund is an integral part of how municipal public water utilities pay for much-needed capital investments and we are grateful to the Senate Committee for the increase of $14.5 billion over five years."

According to the WateReuse Association, the legislation contains a number of WateReuse Association policy priorities, including: reauthorization of the Alternative Water Source Grants Pilot Program and the creation of an Interagency Working Group on Water Reuse to create a more formal structure for engaging external stakeholders on matters related to water recycling.

"The WateReuse Association applauds EPW Chairman Carper, Ranking Member Capito, and members of the Committee for developing strong, bipartisan legislation to improve our nation's water recycling infrastructure," said Patricia Sinicropi, executive director of the WateReuse Association in the association's press release. "The Drinking Water and Wastewater Infrastructure Act of 2021 provides tools and investments to help communities address complex and evolving challenges through the adoption of water reuse."

According to WEF, the DWWIA bill is expected to be considered on the Senate floor in April.

Additionally, bipartisan legislation was introduced in the U.S. House of Representatives, which would authorize $50 billion in direct infrastructure investment over the next five years. This bill aims to address America's crumbling wastewater infrastructure and local water quality challenges, according to The House Committee on Transportation and Infrastructure.

Some of the provisions included in that bill that are supported by NACWA include:

- Directing U.S. EPA to assess low-income water needs around the country and authorization of a pilot program to develop and implement programs to assist low-income households in maintaining access to affordable and reliable clean water services.
- Establishment of a new Clean Water Infrastructure Resiliency and Sustainability Program authorized at $225 million over five years.
- Authorization of a U.S. EPA study that examines the state of existing and potential future technologies – key components of the bipartisan Advanced Research Projects Agency – Water.
- Authorization of $5 million for U.S. EPA to complete an updated Clean Watersheds Needs Survey
- Authorization of a U.S. EPA pilot program to assist with 15 public clean water utility projects to create or improve waste-to-energy systems

Should both bills pass their respective chambers, the Senate and House will need to negotiate the goal of a final agreement. Once passed by Congress, the water infrastructure package will be eligible to be included in the expected major infrastructure package later on in 2021.

President Joe Biden is also expected to announce his multi-trillion dollar infrastructure package in the coming weeks. The total cost for this bill is estimated to range from $2 trillion to $4 trillion.

# # #

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Microplastics are affecting melt rates of snow and ice

Phys.org | April 2, 2021 | Evan Lim, Earth Institute at Columbia University

Microplastics, pieces of plastic 5mm or less in size. Credit: chesbayprogram/CC

Microplastics have reached the farthest corners of the Earth, including remote fjords and even the Mariana Trench, one of the deepest parts of the ocean. Recently, yet another distant area of our planet has been found to contain these pollutants: glaciers and ice sheets. An Eos article published in March examines how microplastics create changes in these icy ecosystems, and underscores the importance of properly distinguishing them from another form of pollution in snow, black carbon.

In addition to the large plastic waste, such as water bottles and milk jugs, that ends up on remote beaches, many pieces of plastic get broken down into smaller and smaller pieces by ocean waters and wind. These tiny particles are microplastics, minute pieces of plastic that were either broken down over time or were small to begin with, such as fibers from clothing or beads in face washes.

How do microplastics find their way in and onto snow to begin with? Peter Deneen, a writer at Watershed Progressive who is not affiliated with the article, explained, "Most often microplastics end up in snow via airborne deposition. Microplastics…tend to be lighter than dust particles and become airborne more easily…These particles, due to their shape, can remain airborne and gain enough altitude to circulate with large-scale weather and be transported [to] faraway

places." Jing Ming, one of the authors of the article, emphasized that airborne travel is one of the reasons why microplastics are so prevalent.

The article highlights the distinction between microplastics and black carbon, another form of pollution which also collects on snow. Black carbon particles come from the combustion of fossil fuels by humans as well as from natural sources such as forest fires. Because of their dark color, black carbon particles absorb sunlight and heat the surfaces they land on. When they are deposited on snow and ice, they increase melt rates. As a result of this melting, the planet's bright, reflective surfaces decrease in area. And as a result of that decrease, even more sunlight is absorbed by the surface, resulting in greater warming.

Currently, almost all studies of black carbon ignore the co-presence of microplastics in snow, which also have an effect on melt rates. Ming explained, "Microplastics depositing in snow will last hundreds of years or even longer. They can absorb solar radiation and reduce surface albedo given they are not completely transparent but with colour." The authors emphasize that it is not just the colored microplastics which absorb sunlight and heat up, but more translucent plastics as well. Translucent plastics, which ordinarily would not absorb light, can wear, break down, or become scratched; all of these processes increase their absorption levels.

As current measurements and instruments do not account for the presence of microplastics, their effect on melt rates can mistakenly be attributed to black carbon. Ming explained that, as a result, "the forcing of black carbon in snow may need to be reassessed owing to the coexistence of microplastics." In other words, the measured effect of black carbon on snow melt may be considerably different from the actual effect, due to the neglected presence of microplastics.

In order to begin sorting out the different impacts of microplastics and black carbon, the article suggests three simple changes. The first is to use glass bottles to collect field samples in order to avoid plastic contamination. The second is to filter melted snow samples in order to separate microplastic particles. And the third is to centrifuge (spin at a high speed) samples to separate microplastic particles, as they generally have a lower density than black carbon particles. Ming emphasized that "we should quickly set up a protocol to measure microplastics in snow, differentiate microplastics from black carbon and separate their individual roles in affecting snow."

Deneen highlighted another important consideration of microplastics in snow. "The thing about microplastics on snow/ice is that snow/ice are not what we would call a 'microplastics sink,'" explained Deneen, who is a former GlacierHub editor. "Snow and ice melts and as it does, those particles are transported through a variety of ecosystems, contaminating riparian habitat, estuarian, and eventually marine." As they reach these ecosystems, whether through snow melt or otherwise, microplastics pick up chemical contaminants and can disturb many forms of life: animals can ingest them, harming not only themselves, but also humans who eat them. Smaller invertebrates will consume microplastics, then be consumed by fish, and the plastic makes its way up the food chain until it arrives on a plate.

Many hands will be needed to tackle the broader issue of microplastic pollution. "We need people, companies, and governments working at it from all sides to find alternative materials and shift the culture that has come to depend upon [plastics]," said Deneen. He strongly emphasized the need for sufficient and substantial policy that imposes limits on plastic production and use, and that aims to clean up the already damaged terrains.

Microplastics affect an extremely wide range of ecosystems. As demonstrated by their presence in snow, microplastics affect each ecosystem in distinct ways, depending on the context and existence of other factors, such as black carbon. Understanding these differences is crucial to responding to the microplastics crisis. Battling plastics means addressing pollution not only in oceans and beaches, but on high mountain glaciers as well.

# # #