

**BAY AREA WATER SUPPLY AND CONSERVATION AGENCY
BOARD POLICY COMMITTEE MEETING**

July 12, 2019

Correspondence and media coverage of interest between June 27, 2019 and July 9, 2019

Correspondence

Date: July 1, 2019
From: Secretaries Jared Blumenfeld and Wade Crowfoot
To: VA Plenary Participants
Re: Voluntary Agreements Progress Report

Media Coverage

Water Management:

Date: July 9, 2019
Source: San Francisco Chronicle
Article: PG&E's planned power shutdowns could choke off vital water supplies

Date: July 8, 2019
Source: AgNetWest
Article: Optimism for Adopting Voluntary Approach to California's Water Goals

Date: July 8, 2019
Source: Sierra Sun Times
Article: Conservation Coalition Outlines Goals for Governor Newsom's "Water Portfolio" Plan

Date: July 7, 2019
Source: Bakersfield.com
Article: Market-based program would encourage farmers to buy, sell local groundwater

Date: July 7, 2019
Source: Cal Matters
Article: California needs Sites Reservoir, Here's why

Date: June 27, 2019
Source: Los Angeles Times
Article: California was warned about climate change 30 years ago. Not it's feeling the effects

Date: June 27, 2019
Source: US Bureau of Reclamation
Material: Press Release: Bureau of Reclamation releases funding opportunity for water reclamation and reuse research studies

Date: June 27, 2019
Source: US Bureau of Reclamation
Material: Press Release: Reclamation makes funding available for applied science grant projects to inform water management decisions

Water Policy:

Date: July 10, 2019
Source: Los Angeles Times
Article: California Senate approves Newsom bill to protect utilities from wildfire costs

Date: July 8, 2019
Source: San Francisco Chronicle
Article: California's big PG&E wildfire bill: What you need to know

Date: July 8, 2019
Source: KTLA 5
Article: State Senate Passes Bill to Create California Wildfire Fund

Date: July 6, 2019
Source: Ventura County Star
Article: Wildfire panel recommends extending safeguards to water agencies

Date: July 6, 2019
Source: Daily Republic
Article: California lawmakers race to pass wildfire legislation by July 12

Date: June 27, 2019
Source: California Water News Daily
Article: Continuation of Drought Legislation Sought by Bipartisan Western Senators

Dam Safety:

Date: July 9, 2019
Source: Yale Environment360
Article: In an Era of Extreme Weather, Concerns Grow Over Dam Safety

MEMORANDUM

To: VA Plenary Participants
From: Secretaries Jared Blumenfeld and Wade Crowfoot
Re: Voluntary Agreements Progress Report
Date: July 1, 2019

This memo provides a status report on our agencies' development of voluntary agreements (VAs) with water users, non-governmental conservation organizations and federal agencies. The VAs intend to implement updated water quality objectives for the Sacramento and San Joaquin Rivers and their tributaries, as well as the Sacramento-San Joaquin Bay-Delta, through a broad set of tools. The memo outlines progress to date and describes work in the coming months to complete and evaluate these agreements. This memo is intended to be shared with any and all stakeholders who are interested in following the development of the VAs.

State agencies and VAs participants have yet to decide whether this effort will culminate in a single proposed voluntary agreement or multiple agreements. In this document we refer to this proposal in the plural as voluntary agreements (VAs) for consistency; this is not intended to suggest a predetermination as to the final format.

Overview

Since Governor Newsom took office in January, we have helped to lead an effort to advance and evaluate the initial VAs framework presented to the State Water Resources Control Board (State Water Board) in December 2018. The VAs are being developed as an alternative mechanism to provide reasonable protection of native fish, wildlife and other beneficial uses as required by law and identified in the State Water Board's update to the Bay-Delta Water Quality Control Plan (Bay-Delta Plan).

The VAs seek to improve conditions for native fish and wildlife through targeted river flows and a suite of habitat-enhancing projects including floodplain inundation and physical improvement of spawning and rearing areas. The VAs aim to achieve these improvements while also balancing the needs of other beneficial uses identified in the Bay-Delta Plan, including municipal, domestic and agricultural water supplies, recreation, and navigation.

The VAs reflect a collaborative approach to water resources management and native fish and wildlife protection. Over the past six months, support for this effort has been reflected in extensive collaboration over hundreds of hours among the State Team,

Bureau of Reclamation and an array of stakeholders, including dozens of public water agencies and environmental conservation groups.

Our collective effort has involved clarifying the details of complex, interconnected 15-year agreements among dozens of parties to manage flows and restore habitat in the Sacramento and San Joaquin river systems, their tributaries and the Bay-Delta. The proposed VAs are currently being evaluated by the California Natural Resources Agency (CNRA), the California Environmental Protection Agency (CalEPA), the State Water Board, the Department of Water Resources (DWR) and the Department of Fish and Wildlife (DFW) (known collectively as the “State Team”) to determine whether they can provide reasonable protection for beneficial uses of Bay-Delta waters as required by law.

It is important to note that many environmental conservation groups participating in the process have raised concerns regarding the adequacy of the VAs flow and non-flow assets to achieve required outcomes. At the same time, many water users have expressed concerns about the prospect of being asked to contribute more assets beyond what was outlined in VAs presented to the State Water Board in December 2018.

On March 1, the Directors of DWR and DFW submitted two documents to the State Water Board:

1. An updated Project Description for the VAs that provided more detailed information about the assets being offered in the agreements, including water flows, funding, accelerated implementation of habitat improvements, and a science based decision-making process to manage flows.
2. A Planning Agreement to guide further work needed to complete the VA proposals. The Planning Agreement set a target date of June 30, 2019, to resolve several outstanding legal and policy questions regarding the proposed VAs and to further refine certain elements of the project description.

Status of the Voluntary Agreements

We are pleased to report substantial progress since March 1 to further develop and evaluate the VAs. Work has advanced through three primary work groups, each composed of representatives from the State Team, the Bureau of Reclamation, water agencies and environmental groups:

1. The **Assets to Outcomes Work Group** is identifying how the water flows, habitat and funding provided through the VAs—known as “assets”—could result in measurable, achievable outcomes that will reasonably protect native fish species and other beneficial uses. The goal of this work group is to provide the State Water Board with information necessary to determine whether the VAs' assets will result in providing reasonable protection of the beneficial uses as required by law.

2. The **Governance, Science and Adaptive Management Work Group** is structuring a decision-making process that would govern implementation of the VAs to adaptively manage the water flows and habitat provided by the VAs. This group is designing a science program to track and report outcomes of the various assets and provide scientific information to support effective adaptive management. This collaborative decision-making approach utilizing real-time scientific monitoring could significantly improve our state's environmental management of these river systems.
3. The **Policy Work Group** is addressing critical path legal and policy questions, such as enforceability of the VAs' terms and appropriate amendments or updates to the Bay-Delta Plan that remain to be resolved. This work group has received extensive support from a Legal Work Group that drafted the Planning Agreement submitted March 1.

The work of each of these three groups is guided by a Plenary meeting of all groups participating in the VAs, which takes place every three weeks and is led by the Secretaries. Detailed below is the specific progress made in each work group, as well as outstanding work yet to be completed.

Assets to Outcomes Work Group

Since March 1, this work group has completed an enormous amount of work. First, it has clarified the complicated details regarding the water flows and habitat projects proposed by participating water agencies in each tributary; this clarification is essential for the State Team to analyze the VAs.

The work group has also discussed the methodology that will be used to analyze these assets and the outcomes they can be anticipated to produce, as well as an approach to comparing the outcomes generated by the VAs assets to the outcomes generated by the unimpaired flows proposed by the State Water Board staff.

Extensive discussion has taken place about how to analyze the water flow assets in the state's current analytical models, including CalSIM, SacWAM, and WSE.¹ The State Water Board released a preliminary baseline run for SacWAM and held a webinar to review the latest version of the model. DWR and the State Water Board have been working together to assure an understanding of potential differences between CalSIM and SacWAM representation of flow assets, and towards a comparison of baseline runs. These baseline runs are nearly completed, and substantial progress has been made on modeling the VAs and unimpaired flows.² Once completed, this work will make it possible to analyze and compare the modeled results of the flow assets in each of the

¹ CalSIM, which is a DWR model, and SacWAM and WSE, which are State Water Board models, all assess the effects of hydrologic changes in the Sacramento and San Joaquin River systems.

² These models are based on a monthly time step; other tools that can complement them by evaluating items like water temperature on a daily time step may be considered and integrated into the analysis as well.

tributaries and in the Delta, and will allow individual river systems to perform important analysis and understand parameters such as water temperature.

This work group has also clarified details of habitat enhancements proposed in the VAs so these assets can be analyzed for anticipated outcomes. Two different analytical tools will be used to evaluate the habitat assets– one in the tributaries and the other in the Delta. The first tool will assess the relationship between water flows and habitat improvement and expansion in each tributary and produce information to evaluate whether the combination of flow and non-flow measures meets specific suitability requirements and can support healthier native fish populations. The other Delta-focused tool utilizes a hydrodynamic model to evaluate the impacts of different variations of flow and habitat assets on various fisheries habitat indicators such as water depth, velocity, salinity, etc. Ultimately, the CalSIM and SacWAM hydrological analyses must be paired with these two habitat appraisal tools to produce an overall assessment of the VAs' combined flow and habitat approach and its ability to contribute to the Bay-Delta Plan's objectives.

The Assets to Outcomes workgroup is also developing biological and environmental targets (BETs) for the VAs to guide both finalization of the agreements and scientific monitoring and decision-making during the 15-year term of the agreements. Some BETs will establish compliance targets, which will define the intended contribution of the VAs towards meeting the legal and policy requirements of the Bay-Delta Plan. Other BETs will serve as benchmarks to track the success of the VAs by evaluating their effectiveness in improving the success of native fish and wildlife at different life stages and in different locations; understanding the response of native fish and wildlife; and improving scientific understanding throughout the watersheds. This work group will need to finalize BETs and integrate them into the governance, science and adaptive management program so they can inform the deployment of available assets to provide the greatest biological benefits. These activities will be completed in coordination with the Governance, Science and Adaptive Management Work Group.

In a separate but related process, the State Water Board is developing a set of biological goals as required by the current Bay-Delta Plan. These biological goals are broader and concern all implementation actions in the Bay-Delta watershed, including actions that are required for water rights holders who are not parties to a VA. The BETs developed through the VAs process will be integrated with the State Water Board's broader biological goals.

In the coming months, the work group will work closely with the State Team to explore further revisions to flow modeling and to discuss the results of analysis of flow and non-flow assets. This discussion is expected to yield a preliminary quantitative and qualitative assessment of the outcomes of the VAs and a description of how VAs outcomes compare with the outcomes expected from the State Water Board's unimpaired flow approach. This group will also need to finalize a set of biological and environmental targets, describe how these targets will be incorporated into the VAs, and inform the

drafting of a report to examine and articulate the scientific basis for the VAs approach to attaining required outcomes.

Governance, Science and Adaptive Management Work Group

This work group has made significant progress since March 1 developing recommendations for the governance and science program of the VAs. The description of the proposed VAs governance now includes:

1. Principles to guide how parties to the VAs will work together to implement the agreements;
2. A collaborative governance structure intended to balance regional capabilities and constraints in the tributaries and the Delta with a systemwide approach;
3. A consensus-oriented strategic planning and decision-making approach for the deployment of VAs assets that is intended to be science-based and transparent; and
4. A process for reviewing progress toward desired environmental and biological outcomes and recommending adjustments to the deployment of assets to achieve improved outcomes.

These recommendations have been informed by successful collaborative governance structures for shared water management in other areas of the country, which have been highlighted by consultants from Compass—a nationally recognized expert on water governance retained by this work group.

The updated VAs science program description includes functions and products that are intended to: track and report on the deployment of VAs assets and associated progress toward VAs targets; help reduce management-relevant uncertainties; and recommend adaptive management adjustments to the deployment of VAs assets (to the extent that the deployment of VAs assets is flexible).

Several important aspects of the VAs governance system are unresolved and require additional detail on the VAs assets and resolution of several key policy questions. These policy questions include, but are not limited to: 1) the State Water Board's role in VAs implementation; 2) how funding for habitat projects and science activities will be collected and allocated, and how state funding will be used; 3) whether there should be a single, master agreement for all parties or individual agreements, and who the signatories should be; and 4) what will happen if desired or required environmental outcomes (as defined by BETs) fail to materialize, despite compliance with deployment requirements for VAs assets. The Policy Work Group is the designated forum for discussion of issues and will be addressing them in coming weeks. While these questions are being discussed and resolved, this work group will further develop proposed governance structures and processes for specific tributaries and the Delta.

Policy Work Group

In February, a Legal Work Group was organized to draft the Planning Agreement submitted to the State Water Board on March 1. This Planning Agreement identified several critical path legal and policy issues that must be resolved to complete the proposed VAs. Accordingly, consensus on these issues is critical to successful VAs. In April, a Policy Work Group was formed that includes representatives of each tributary participating in the VAs and environmental conservation organizations to discuss and recommend to the Plenary aligned approaches on these important critical path issues.

The Policy Work Group has focused on five principal issues:

1. Whether the Bay-Delta Plan should be amended to include a new or modified water quality objective related to the viability of native fishes;
2. What assurances the State Water Board should provide that it will not require additional contributions of flows or funds from the parties during the term of the VAs;
3. How should the State Water Board enforce the commitments contained in the VAs;
4. How the VAs relate to non-settling parties; and
5. What happens at the end of the VAs' 15-year term.

Working closely with the State Team, the Policy Work Group met regularly in May and June to develop a document that identifies key options for resolving critical path issues and provides a brief policy rationale for each option. The Policy Group continues to meet weekly to discuss these options with the intent of coalescing around agreed-upon approaches.

Looking ahead, the stakeholders, through a regular plenary group meeting, will consider the Policy Work Group's options for resolving these issues. After resolution, the Legal Work Group will undertake drafting legally operative text for incorporation of these policy and legal issues into the VAs.

Schedule Moving Forward

Over the next three months, the three work groups will continue to discuss, develop and ultimately finalize needed components of the proposed VAs. The State Team will need to review the VAs in a comprehensive form, with each of these components inserted, to come to a collective conclusion as to whether the VAs can provide the reasonable protection of beneficial uses required by law.

By October of this year, the State Team expects to have the modeling and scientific analysis nearing completion and the governance and adaptive management structure in close to final form. Assuming the critical path policy and legal questions are also either resolved or close to resolution, the State Team should have enough information

on each of the component parts to determine the adequacy of the VAs by October 15.

If the State Team decides to recommend that the State Water Board consider the VAs in their current form, the State Water Board will proceed to complete the remaining analyses required by law. First, the scientific basis report being developed by the State Team with input from the Assets to Outcomes working group will be submitted for independent scientific peer review. On the current timeline, that process will be complete by the spring of 2020. During this time, the VAs parties will continue to make refinements to the biological and environmental targets.

Second, as contemplated by the Planning Agreement, the State Water Board will also need to complete environmental review of the VAs and the updated Water Quality Control Plan pursuant to the California Environmental Quality Act (CEQA). While this process will be time consuming, it will be a priority of the State Water Board to complete. On the current timeline, a draft CEQA document would be released for public comment in the summer of 2020, with a finalized document complete by the following year. With successful VAs in place, implementation of the updated Bay-Delta Plan could begin immediately thereafter.

PG&E's planned power shutdowns could choke off vital water supplies

San Francisco Chronicle | July 9, 2019 | Kurtis Alexander

PG&E's plan to prevent wildfires with widespread power shut-offs means no lights, no refrigeration and no internet in many parts of California.

It could also mean limited use of toilets and taps, an inconvenience that water and sewer districts across the state are scrambling to address before a blackout comes and nature calls.

Utilities, including several in the Bay Area, simply don't have the backup power to replace the electricity that Pacific Gas and Electric Co. normally provides for water delivery and sewage treatment. The agencies are trying to make their operations more energy efficient and adding alternative power sources in case the cord is cut, but it may not be enough.

Already agencies are warning customers of possible water shortages and sewer backups. A loss of water, or drop in water pressure, could also be problematic for firefighters needing to douse any blazes.

"This is a big challenge," said Dave Eggerton, executive director of the Association of California Water Agencies, a trade group representing hundreds of utilities. "It's operationally challenging, it's very expensive, and some of our member agencies are incurring explosive costs."

PG&E began shutting off power to rural areas last year on warm, windy days to reduce the risk of an electrical line sparking a wildfire. Company lines have been blamed for igniting numerous blazes in recent years, including the deadly Camp Fire in Paradise in November.

This year, PG&E announced that it would be expanding the precautionary shut-offs to include the company's entire Northern California service area. The power provider warned that outages could last two days or more.

While many of the state's utilities have backup power to draw water from key supplies, say a reservoir or a well, and to run their sewage treatment facilities, the alternative power sources are not typically designed to last multiple days.

Additionally, some districts don't have enough backup electricity to power the pumps that move water and sewage to where it needs to go. Many deal with sprawling service areas with hundreds of miles of pipeline.

"It's going to be an ordeal," said Rick Rogers, manager of the San Lorenzo Valley Water District in the Santa Cruz Mountains, where most of his 30 pump stations that help get water to more than 23,000 people don't have backup power.

The district has a handful of portable generators, which are used to run the occasional pump that loses power during a winter storm. But with a widespread outage, like what's expected during PG&E shutdowns, the district would have to prioritize which pump stations get power, first trying to get water to the elderly and people with "critical needs."

The district's board of directors recently approved the purchase of eight new generators, some of which may cost more than \$100,000. However, the money won't be available until next year. Making matters worse, PG&E deems the district's service area, which includes the wooded communities of Boulder Creek and Scotts Valley, to be at high risk of a shut-off this year.

"We're sending out flyers, putting ads in papers, requesting people not to use water during outages," Rogers said.

The East Bay Municipal Utility District, which serves 1.4 million people, has begun a similar conservation campaign. Residents in the fire-prone Berkeley and Oakland hills get much of their water from local tanks, which are filled by pumps, not all of which have backup power.

"We want to make sure we have water in those tanks not only for our customers but for firefighters in those areas," said Andrea Pook, spokeswoman for the district.

EBMUD is asking people to use less water during a power shut-off while trying to get more generators in place to maintain adequate water supplies. The agency's board has signed off on an agreement to rent 29 generators for four months this year at a cost of \$409,000.

In the Sierra foothills, the El Dorado Irrigation District east of Sacramento has already spent \$800,000 on additional generators. Not only will the backup power help keep water flowing to the 129,000 people in the district's service area but, just as important, it will keep sewage moving.

The district's sewage system relies on a series of lift stations to push waste across mountains and valleys to one of five treatment plants. The stations require power to operate.

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Optimism for Adopting Voluntary Approach to California's Water Goals

AgNetWest | July 8, 2019 | Brian German

There is hope that a more localized voluntary approach will be adopted to better address California's water goals, in lieu of regimented guidelines to be implemented statewide. There has been significant concern regarding the State Water Resources Control Board's plan for regulating minimum flow requirements for some of the state's waterways and the impact that will have on communities.

"It doesn't provide for any flexibility on managing resources or improving environmental projects. There are a number of voluntary agreements that are being adopted or in the process of being negotiated that would do that," said Executive Director of the California Farm Water Coalition, Mike Wade. "We think the voluntary agreement process is a much more flexible one, that provides flexibility for water users but also provides money and water supply for the environment."

Wade noted that Governor Gavin Newsom and his agency staff appear to be receptive to the idea of voluntary agreements. "They believe that a voluntary approach to water supply and ecosystem management is better than a restrictive, top-down regulatory approach and we're hopeful that that goes through and that we see these voluntary agreements adopted," Wade said.

Another concerning factor in addressing California's water goals is the introduction of Senate Bill 1 (SB-1) the California Environmental, Public Health, and Workers Defense Act of 2019. Wade explained that SB-1 would codify in California some of the federal regulations such as the 2008 and 2009 biological opinions.

"It upends California's water management. It takes away the ability to use the science that we've learned over the last ten years and it locks us into the regulatory structure from ten years ago that has failed," said Wade. "We're hopeful that SB1 gets amended and that the water provisions are changed so that we have that flexibility with voluntary agreements."

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Conservation Coalition Outlines Goals for Governor Newsom's "Water Portfolio" Plan

Sierra Sun Times | July 8, 2019

July 8, 2019 - Sacramento – A coalition of 55 conservation, fishing, recreation, water policy, and environmental justice groups from throughout California, representing hundreds of thousands of Californians, sent a letter to state officials last week thanking the Governor for his "...leadership in tackling California's water issues."

The letter expresses support of the Newsom's Water Portfolio planning process and explains how the groups in the coalition plan to contribute to this new process.

Kate Poole, Senior Director for the Natural Resources Defense Council (NRDC) said, "The state of California lacked a sensible water strategy for too long. The Newsom Administration's water portfolio approach can show the world how fishable, swimmable, drinkable waters are the foundation of a sustainable water future."

Jon Rosenfield, Senior Scientist with San Francisco Baykeeper said, "The governor's approach can put us on the path to water sustainability that will provide safe drinking water for all Californians and the flows needed to protect our rivers, lakes, and bays. It would be a terrible irony if water conserved by Portfolio projects were soaked up by wasteful practices that bloat our demand for this limited resource. California doesn't manage its water well —and that hurts our communities and wildlife."

"To be successful, the Water Portfolio plan must accomplish two goals," said Barbara Barrigan-Parrilla, executive director of Restore the Delta. "First, it needs to reduce reliance on Delta water use. Second, it must create regional water projects that solve water challenges experienced by environmental justice communities from the North Coast down to Chula Vista while producing local green jobs throughout the state."

Excerpts from the Letter:

"The 'water resilience portfolio' (Water Portfolio) described in your April 29 Order offers the State the opportunity to set us on the course towards sustainable water resources management that would ensure fishable, swimmable, and drinkable waters for all Californians. Many of our organizations plan to engage with your administration to offer specific proposals for projects that will deploy limited water resources more efficiently.

"The old models of California water policy are failing to serve the public interest, even if they serve private interests. The Water Portfolio should establish a new model for managing California's water, grounded in the public interest and long-term sustainability."

"The two main concerns in developing a Portfolio Plan, according to the coalition are:

Guaranteeing safe and affordable clean drinking water for all Californians; and

Protecting and restoring healthy rivers and the Bay-Delta estuary, and the public benefits that they provide."

The letter concludes:

“We look forward to working with your administration to help create a statewide Water Portfolio that establishes a new culture of water use in California built on sustainable policies and infrastructure.”

Audubon California

California Sportfishing Protection Alliance

Environmental Justice Coalition for Water

Friends of the River

Pacific Coast Federation of Fisherman’s Associations

Restore the Delta

San Francisco Baykeeper

Sierra Club California

South Yuba River Citizens League

The Bay Institute

Natural Resources Defense Council

The Nature Conservancy

Alameda Creek Alliance

American River Conservancy

American Whitewater

California Striped Bass Association

California Striped Bass Association, West Delta Chapter

Central Sierra Environmental Resource Center

California Wilderness Coalition

Cal Trout

Center for Biological Diversity

Coast Action Group

Clean Water Action

California Water Impact Network (C-WIN)

Endangered Habitats League

Environmental Water Caucus

Leonardo DiCaprio Foundation

Fly Fishers of Davis

Foothill Conservancy
Friends of Harbors, Beaches & Parks
Golden Gate Salmon Association
Golden West Women Flyfishers
Greater Stockton Chamber of Commerce
Greywater Action
Institute for Fisheries Resources
Little Manila Rising
Los Angeles Waterkeeper
Lower Sherman Island Duck Hunters Association
Merced River Conservation Committee
Mono Lake Committee
Nature in the City
Northern California Council, Fly Fishers International
Protect American River Canyons
Reinvent South Stockton Coalition
Reinvent Stockton Foundation
San Francisco League of Conservation Voters
San Joaquin County Hispanic Chamber of Commerce
Social Eco Education
Southern California Watershed Alliance
The River Project
Third City Coalition
Tuolumne River Conservancy, Inc.
Tuolumne River Trust
Ventura Coastkeeper
Winnemem Wintu Tribe
Wishtoyo Chumash Foundation
Source: Merced River Conservation Committee

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Market-based program would encourage farmers to buy, sell local groundwater

Bakersfield.com | July 7, 2019 | John Cox

A local water district is developing a novel, market-based groundwater trading program that, if successful, could be expanded or copied to help Central Valley farmers cope with new state restrictions against over-pumping the region's aquifers.

The Rosedale-Rio Bravo Water Storage District's pilot program, set for testing later this summer or early fall, would allow certain landowners to buy or sell groundwater to or from another property owner within the district.

Water trading is not entirely new to California, and similar projects exist in other states. But the district's model appears to be the first such program being designed specifically to meet Central Valley agriculture's need to make groundwater use sustainable over the long term, as required under 2014's Sustainable Groundwater Management Act.

CONSERVATION BENEFITS

A report produced in part by The Environmental Defense Fund, which plans to work with Rosedale-Rio Bravo and Idaho consulting firm WestWater Research to administer the program, lauds water trading as a promising strategy for helping farmers smoothly and effectively reallocate water toward high-value uses.

"Appropriately constructed," the report states, "groundwater trading offers enormous potential to encourage and reward groundwater conservation."

Rosedale-Rio Bravo General Manager Eric Averett likened the system to a checking account. Farmer members of the district would receive a periodic groundwater allocation, as called for under SGMA. Their account would then be credited or debited, depending whether they bought or sold groundwater within the district.

The idea is that SGMA provides a base and water trading allows adjustments.

"SGMA is a requirement that we balance our checkbooks, and the (water-trading) market basically, you know, gives people who have perhaps been writing too many checks the ability to purchase water from those who have not been writing as many," Averett said.

Some growers might choose to fallow their land for a year in order to sell their allotted groundwater to another farmer, though both parties would still have to pay their district assessment fee regardless, he said.

RESTRICTIONS

Restrictions would apply. Only farmers would be eligible to trade water under the program, not commercial or residential property owners. Also, traders would have to have more than 10 acres within the district.

Other limitations may also be introduced, Averett said, such as rules on how much water total may be moved from one part of the district to another. The 44,000-acre district is mostly located north of Rosedale Highway west of Allen Road; all but 9,000 acres are used for agriculture.

Averett doesn't anticipate very large amounts of water changing hands under the pilot program. He said individual trades will likely measure in the thousands of acre-feet but not the tens of thousands. Trades would not require approval under the system, he added.

(One acre-foot is enough water to cover an acre of land one foot deep.)

State water officials were unavailable to comment on the project.

SOFTWARE DETAILS

Rosedale-Rio Bravo has hired a third party software developer to create the project's trading platform and base it on assessor parcel numbers, which are unique identifiers tied to real estate records. The program may be created in such a way that trades are carried out anonymously on both sides of the transaction.

Written materials provided by Averett state each eligible district member might receive an annual allocation of 3.13 acre-feet that can then be traded.

Averett said other water districts around the Central Valley are looking at the idea, with an eye toward possibly replicating it elsewhere. That's partly why the underlying software is being written in open-source computer coding, so it can be shared and adjusted.

The water district's request for proposals to develop the program's software states expansion of the program is a desired goal, and the platform "should be constructed such that additional geographies with differing water trading rules and accounting can be added as needed."

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John Cox can be reached at 661-395-7404. Follow him on Twitter: @TheThirdGraf. Sign up at Bakersfield.com for free newsletters about local business.

California needs Sites Reservoir. Here's why

Cal Matters | July 7, 2019 | Fritz Durst and Douglas Headrick, Special to CALmatters

California's aging water infrastructure desperately needs an upgrade.

Shorter, more intense rain storms, less snowpack and more prolonged stretches of drought reflect the reality of climate change. There's no one project, no single action, that will save California from a dry and unreliable water future.

We need a broad portfolio of solutions that includes storage above and below ground, conservation, and other options such as traditional recycled and potable reuse to help ensure we can better manage this vital resource when the next inevitable drought comes along.

And we also need cooperation at local, state and federal levels to advance a 21st century solution.

One part of that solution is the proposed Sites Reservoir.

Located in Colusa and Glenn counties west of the Sacramento River, Sites would be multi-benefit 1.8-million-acre foot reservoir. It would capture and store storm water capture that currently runs to the ocean.

Today, much rainfall from extreme storms, especially those that occur back-to-back when the ground is saturated, runs off before it can be conserved for use when environmental, urban and agricultural needs are greater.

Sites Reservoir would capture a portion of that water for use during drier periods, and would become part of other drought-management tools that would addressing California's water management challenges into the 21st century and beyond.

Simply put, Sites Reservoir would significantly improve the state's existing water management system in drier years and restore much needed flexibility in the water grid.

If Sites Reservoir had been operational this year, California would have been able to capture more than one million acre-feet of additional water. An average California household uses between one-half and one acre-foot of water per year.

Each year we delay in building Sites Reservoir we lose an opportunity to increase the value of storm-related water and excess flood flows for multiple benefits, including the environment.

In fact, Sites Reservoir would help provide critical environmental benefits that do not currently exist, but are needed to help aquatic species and other habitat withstand drier year conditions. Up to 40% of the project's water would be dedicated for state and federal agencies to address these environmental needs.

With the continued onset of climate change, the cold water stored in other, upstream, major reservoirs will be less, making it more difficult to manage the temperature of water released for salmon and other species downstream.

During drier periods, the operation of Sites Reservoir will allow Shasta, Oroville and Folsom reservoirs to conserve more cold water later into the summer months for the benefit of fisheries.

In addition, Sites Reservoir would benefit the local and regional economy in a portion of California that continues to struggle economically, through job creation and local flood protection.

Project construction would create hundreds of jobs during the construction period of seven years, using a skilled and trained workforce, who would be paid a living wage to support a strong middle class in Northern California.

In addition, Sites would provide critically-needed flood protection to disadvantaged communities and to Interstate 5, which was closed twice in the last three years due to major floods in Colusa County.

Several Northern California public agencies are developing Sites Reservoir to operate in a sensible and sustainable manner that helps the state balance the needs for environmental, urban and agricultural water supplies.

Because of its many benefits, the project enjoys broad support and has secured \$816 million in state funding and \$449 million in federal funding. Currently, 29 agencies throughout California are participating in the project's development, and the U.S. Bureau of Reclamation has signaled its intent to become a major cost-sharing partner.

California must modernize its water supply systems. We believe, along with many others, that Sites is a critical piece to the puzzle. With Gov. Gavin Newsom in office and a new energy in the Capitol, we must advance this project.

The voters in 2014 overwhelmingly passed Proposition 1, which expressed the voters desire that more water storage needs to be in place before the next drought. California simply can't afford to wait any longer to build Sites Reservoir.

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Fritz Durst is chair of the Sites Joint Powers Agreement board of directors, Fritz.durst@gmail.com.

Douglas Headrick general manager of the San Bernardino Valley Municipal Water District, douglash@sbgmwd.com. They wrote this commentary for CALmatters.

California was warned about climate change 30 years ago. Now it's feeling the effects
Los Angeles Times | June 27, 2019 | Julia Rosen



Frank Gehrke, chief of the California Cooperative Snow Surveys Program, looks over a nearly snow-less meadow near Echo Summit, Calif., in January 2018. Climate change will cause more precipitation to fall as rain rather than snow, reducing mountain snowpacks. (Rich Pedroncelli / AP)

Back in 1989, Californians received a sobering warning: The accumulation of heat-trapping gases in the atmosphere would likely bring more droughts, floods, fires, and heat waves to the state.

In the thirty years since, those projections of what would happen in a warming world have proven to be remarkably prescient.

"We've already observed some of the things we expected in 1989," said Susan Fischer Wilhelm, a research manager at the California Energy Commission, the agency that compiled the report.

The assessment laid the groundwork for what has arguably become the country's most ambitious effort to address global warming.

But to many who worked on the report, looking back on it now only underscores how long we've waited to act — and how much time has been wasted.

"I felt a sense of pride of being able to participate in something like this, but also a sense of regret for us as a society," said Les Baxter, who worked on the report as a policy analyst at the CEC and is now vice president of program strategy for the Pew Charitable Trusts.

"We've known what we need to do and we just keep refusing to do it."

The report might have remained lost to history if Gary Estes hadn't been going through boxes in his garage last year and stumbled upon a copy.

For decades, Estes has organized the annual California Extreme Precipitation Symposium. And he decided to use this year's meeting as an opportunity to look back at the 185-page report.

"I thought it would be an appropriate thing to do 30 years later," said Estes, a citizen activist and self-described "energy nut."

The symposium, held this week at UC Davis, brought together university and government scientists to discuss report's findings.

Its state-specific projections were drawn from scientific studies and assessments by the U.S. Environmental Protection Agency that were released in the late 1980s, as well as from detailed analyses conducted by state agencies.

"I was impressed with the level of rigor that they were able to bring," said Wilhelm, who gave a presentation at the symposium outlining what we knew then and what we know now.



Changes in seasonal precipitation patterns challenge water managers, who must save enough water for the summer while preventing dams from overflowing in the winter and spring. (Rich Pedroncelli / AP)



California Water Service district manager Toni Ruggle surveys the Feather River at Bedrock Park downstream from the Oroville Dam in 2017. (Brian van der Brug / Los Angeles Times)



Byron Sher, who served in both the state assembly and senate, authored many of the state's landmark environmental laws. (Robert Durell / LAT)



California's cap and trade system regulates emissions by oil refineries and other polluters. (Christina House / For The Times)



Air quality was one of the first targets of state lawmakers who wanted to address global warming. (Francine Orr / Los Angeles Times)

The report explained that doubling the concentration of carbon dioxide in the atmosphere would raise temperatures in California by roughly 3 degrees Celsius — which will happen by mid-century if emissions continue to rise, according to the most recent California Climate Change Assessment.

Then, as now, climate models showed no clear change in the state's average annual precipitation. But the authors noted that 3 degrees of warming would reduce the area of mountain snow cover by half. And it would increase the frequency and severity of winter floods, as more water fell as rain instead of snow. (Both changes have already started to occur, Wilhelm said.)

In contrast, spring runoff would drop by a third. (They've already fallen over the last century, Wilhelm said.)

The authors added that, although there was still debate among scientists at the time, climate change could also bring more variable weather.

The report outlined the ways in which changes in the seasonal pattern of precipitation would pose problems for the state's reservoirs, which would have to release water during the rainy season to avoid overflowing. (That's exactly what happened in the the 2017 Oroville Dam crisis.)

In the summer, water shortages would impact ecosystems, farmers and hydropower production, the authors wrote. Heat and drought would stress forests, which would likely "experience lower growth and higher susceptibility to fires, insects, and disease." (This, too, has come to pass.)

The report also warned that climate change would raise sea level, increase electricity demand, worsen air quality, increase heat-related deaths and be a drain on the state's economy.

"It strikes me that we were right on," said Kari Smith, now a division manager at the San Jose Clean Energy department who helped oversee the report when she worked at the CEC. "I don't think there was anything that we said that is radically off-base."

If anything, she said, the report underestimated the degree to which climate impacts are interrelated. For instance, in 1989, few foresaw that wildfire risk would cause utilities to consider cutting power to thousands of residents, jeopardizing the reliability of electricity.

The report came about after the legislature asked the CEC to assess "the effect of global warming trends on California's energy, economy, environment, agriculture, and water."

Soon after, the CEC released the state's first inventory of greenhouse gas emissions in 1990 and a set of climate policy recommendations in 1991.

AB 4420, the 1988 bill that mandated the reports, was introduced by Byron Sher, a Stanford law professor and state politician best known for authoring California's clean air and safe drinking water acts.

Global warming had just begun to seep into the public consciousness. Alarmed by signs of environmental change and the results of early climate models, scientists were going public with their concerns about what many then called the "greenhouse effect."

Sher immediately saw the threat to California.

"The heat is on," he told the Sacramento Bee in 1989. "The state can either ignore what science is telling us or we can respond to this challenge in a responsible way."

Sher's bill was part of a flurry of bipartisan political activity on climate change across the country. In his 1988 presidential campaign, George H.W. Bush vowed to combat the greenhouse effect with "the White House effect."

In Congress, Democrats and Republicans introduced more than a dozen bills to curb atmospheric pollution. Several called for reducing greenhouse gas emissions to 20% below 1988 levels by the year 2000. (Around the same time, the world agreed to phase out ozone-destroying substances under an agreement that President Reagan helped negotiate.)

By comparison, AB 4420 was relatively modest, said Kip Lipper, who was Sher's chief of staff and helped draft the bill.

But AB 4420 had the distinction of actually passing. (The assembly voted 58 to 13 in favor of the bill; the senate voted 38-0.

"It's the first law enacted anywhere in the United States that used the term 'global warming,'" said Lipper, who still serves as the chief policy advisor for energy and environment to the president pro tem of the state senate.

Lipper said the report didn't make a big splash. But it did provide a basis for everything that came later, including the state's renewable energy portfolio standard and its cap-and-trade program.

"We tried to seed the ground, if you will, by saying, 'Let's just get a report. Let's have this task for look at this,'" he said.

It would be 12 years before the next piece of climate legislation passed. And AB 32 — which set the state's first emissions reduction target — didn't become law until 2006.

The reasons for the slow response are familiar: the daunting scope of climate change, the challenges of transitioning away from fossil fuels, and tenacious opposition by industry.

But many say there was also uncertainty about the reality of climate change in the 1980s.

While the report found that global warming posed a significant risk to California, it also acknowledged that the matter wasn't entirely settled. In fact, the authors devoted six pages to "Challenges to the Global Warming Concept."

Baxter felt that the theory was solid, but that there wasn't enough evidence that it was happening yet.

"I remember thinking to myself, 'Well, we'll know enough in 20 or 25 years,'" he said.

Such reservations made it hard for politicians to push for action, even if they cared deeply about global warming, Smith said. "It was difficult to lead with climate change for a long time because it was considered maybe a little radical."

Instead, leaders looked for ways to get at climate mitigation by focusing on other objectives, like improving air quality and energy efficiency.

That was a start, but not enough to tackle the problem, she said.

Today, scientists have no doubts about climate change and Californians see the impacts all around them.

"We now have observed data — not projections, nothing speculative — to show climate-related trends that are already affecting the state in ways that were anticipated 30 years ago," Wilhelm said.

Indeed, if the report's authors erred in any way, it was that they didn't anticipate just how fast these changes would occur.

"They thought that we had at least 100 years before it became existential," Smith said.

"Now, 30 years later, we're recognizing that it all happened a lot more quickly than we anticipated."

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Bureau of Reclamation releases funding opportunity for water reclamation and reuse research studies

Funding is available for communities to conduct research needed to explore the use of recycled or reclaimed water

For Release: June 27, 2019

Media Contact: Peter Soeth, 303-445-3615, psoeth@usbr.gov



Photo of an existing Title XVI project. Funding is available for projects to establish or expand the use of water reclamation and reuse.

WASHINGTON — The Bureau of Reclamation is releasing a funding opportunity for entities to submit research proposals that address water supply challenges by establishing or expanding the use of water reclamation and reuse, improving existing water reuse facilities, and/or streamlining the implementation of state-of-the-art technology for new facilities.

"Helping communities study how they can implement water reclamation and reuse into their water management portfolio will enable a broader use of recycled water," said Reclamation's Title XVI Program Coordinator Amanda Erath.

Funding is available in three categories.

Funding Group I: Desktop research studies to develop science and decision-support tools to assist communities in decision-making related to implementing or expanding water reclamation projects. Up to \$150,000 in federal funding is available per project.

Funding Group II: Research studies focused on improvements to existing facilities that could be implemented at the research study sponsor's location but that also may include broad benefits for the industry. Up to \$300,000 in federal funding is available per project.

Funding Group III: Research studies that focus on state-of-the-art technology verification at a new proposed location or community that may also result in broader benefits for the industry. Up to \$750,000 in federal funding is available per project.

Those eligible to apply for this funding opportunity are state, regional or local authorities; Indian tribes or tribal organizations; or entities such as a water district, wastewater district or rural water district. Applicants must be located in the western United States, a United States Territory or Hawaii. Applicants must be willing to provide at least 75-percent or more of the total project cost.

The funding opportunity is available at www.grants.gov by searching for funding opportunity number BOR-DO-19-F009. It will close on September 23, 2019.

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Reclamation is the largest wholesale water supplier in the United States, and the nation's second largest producer of hydroelectric power. Its facilities also provide substantial flood control, recreation, and fish and wildlife benefits. Visit our website at <https://www.usbr.gov> and follow us on Twitter @USBR.

Reclamation makes funding available for applied science grant projects to inform water management decisions

For Release: June 27, 2019

Media Contact: Peter Soeth, 303-445-3615, psoeth@usbr.gov

Applied Science Grants are available to develop hydrologic and water management tools.

WASHINGTON — The Bureau of Reclamation is releasing an applied science grant funding opportunity for non-federal entities to cost-share on projects to develop hydrologic information and water management tools and improve modeling and forecasting capabilities.

Project results must be readily applicable by water managers and include tools and information that can be used to support water supply reliability, management of water deliveries, water marketing activities, drought management activities, conjunctive use of ground and surface water, water rights administration, ability to meet endangered species requirements, watershed health, conservation and efficiency and other water management objectives.

"Improving the information and tools for water managers is important for Reclamation as it supports water supply reliability efforts throughout the western United States," said Reclamation Program Coordinator Avra Morgan.

Federal funding will not exceed 50-percent of the total project cost. Funding is available in two categories.

Funding Group I: Up to \$150,000 in federal funds per agreement provided through this funding opportunity for projects that generally should be completed in two years.

Funding Group II: Up to \$300,000 in federal funds per agreement provided through this funding opportunity for projects that generally should be completed in three years.

Those eligible to apply for this funding opportunity are states, tribes, irrigation districts, water districts, or other organizations with water or power delivery authority located in the western United States, U.S. Territories, Alaska or Hawaii. Universities, non-profit research organizations and nonprofit organizations are eligible to apply but must partner with an organization as outlined in the funding opportunity.

This funding opportunity has two submittal periods. Proposals received before October 30, 2019, 4:00 p.m. Mountain Daylight Time. This funding opportunity will be updated to provide a second application deadline in fiscal year 2020 for proposals to be considered for fiscal year 2020 funding, contingent on appropriations. The funding opportunity is available at www.grants.gov by searching for funding opportunity number BOR-DO-19-F012.

To learn more about Applied Science Grants, please visit <https://www.usbr.gov/watersmart/appliedscience>.

For more than 100 years, Reclamation and its partners have worked to develop a sustainable water and power future for the West. This program is part of the Department of the Interior's WaterSMART Program, which focuses on improving water conservation and reliability while helping water resource managers make sound decisions about water use. To find out more information about Reclamation's WaterSMART program, visit <https://www.usbr.gov/watersmart>.

This funding opportunity also supports the President's memorandum on Promoting the Reliable Supply and Delivery of Water in the West.

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Reclamation is the largest wholesale water supplier in the United States, and the nation's second largest producer of hydroelectric power. Its facilities also provide substantial flood control, recreation, and fish and wildlife benefits. Visit our website at <https://www.usbr.gov> and follow us on Twitter @USBR.

California Senate approves Newsom bill to protect utilities from wildfire costs

Los Angeles Times | July 8, 2019 | Taryn Luna



A home burns as the Camp fire rages through Paradise, Calif., on Nov. 8, 2018. Gov. Gavin Newsom wants to tap ratepayers for \$10.5 billion to help utilities deal with costs they face when found responsible for igniting wildfires. (Noah Berger / Associated Press)

There's been no shortage of criticism for Gov. Gavin Newsom's plan to help California's largest utilities stave off bankruptcy from costs associated with wildfires: No focus on prevention efforts. More difficulty proving utility negligence. Too much of the financial burden falling on millions of utility customers.

The governor, six months into his first year in office, managed to overcome some of those complaints with a Senate vote of approval Monday. But he still faces a crucial test this week as he attempts to convince the rest of the California Legislature to ratify a multibillion-dollar utility wildfire fund before lawmakers leave Sacramento for a one-month recess.

"This is his first time up to bat on a very big issue," said Joseph S. Tuman, a professor of political and legal communications at San Francisco State University. "It's important for him to have success with this."

The legislation marks Newsom's most consequential effort yet to leverage his political power in enacting major legislation, with his reputation on the line.

The governor won approval for Assembly Bill 1054 Monday on a 31-7 bipartisan vote, sending it to the lower house. Newsom still needs support from a supermajority of lawmakers in the Assembly, which is expected to vote on the bill as soon as Thursday.

Several senators said the bill appropriately balances the interests of Californians and the state's power companies.

“This is about ratepayers,” said Senate President Pro Tem Toni Atkins (D-San Diego). “This is about fire victims. It would be irresponsible not to take action.”

Lawmakers from both parties share concerns about any proposal that could be cast as a gift to power companies that have been responsible for wildfires in their communities. Newsom’s plan would take \$10.5 billion from California ratepayers to help utilities pay wildfire costs, which critics say is an unfair burden for electricity customers with no guarantees that the corporations will operate their systems safely.

Late last month, nine legislators sent him a letter criticizing the bill for failing to address wildfire prevention.

“At a time when we have a \$20-billion surplus, could we not make some of that money available to keep Californians safer?” asked Assemblyman Jim Wood (D-Healdsburg), who signed the letter to the governor.

Credit ratings agencies have inserted a sense of urgency into the process, threatening to downgrade the investment grades of Southern California Edison and San Diego Gas & Electric if the state fails by Friday to pass legislation that would significantly reduce utility companies’ financial liability for wildfires.

With Pacific Gas & Electric in the midst of federal bankruptcy proceedings, Newsom hired top law firms and investment analysts earlier this year — at a cost of \$6 million — to help him develop a solution. The governor argues that his answer will cost ratepayers less than inaction. The bill requires utilities to pay claims for 2017 and 2018 wildfires without raising rates for their customers in order to access the fund.

Doing nothing would be “a catastrophic consequence to ratepayers, and I think most objective people that have looked at this would say that’s the option that will most impact customers,” Newsom said last week. “None of this is easy. I took the oath of office with this predicament, and sort of inherited a challenge here. I’m not trying to defer responsibility. Quite the contrary, I’ve owned this.”

Newsom’s proposal offers two different options to shore up the industry’s finances and avert another utility bankruptcy.

One model offers investor-owned utilities a \$10.5-billion line of credit through an extension of an existing fee on electricity bills. A power company could use the money to pay costs that exceed its insurance coverage for wildfire damages, and it would be responsible to repay the loans if it failed to appropriately manage its system to prevent the fire.

A second option would establish a first-of-its-kind annual utility safety certification process before the onset of wildfire season. In order to qualify, companies would have to tie executive compensation to safety performance, create a safety committee on its board of directors and be implementing their wildfire mitigation plans.

A company that earned a safety certification before wildfire season would be allowed to dip into a wildfire fund, supported from the \$10.5 billion from ratepayers and at least another \$10.5 billion from the utilities.

The wildfire fund would act as a second insurance policy for the utilities. The companies would only have to pay it back, up to a cap, if they behaved unreasonably to cause a fire. The safety

certification would also shift the burden of proof away from a utility, requiring outside groups to intervene in regulatory proceedings and raise serious doubt that the electrical corporation operated its system reasonably before a wildfire. Critics have said the shift would make it harder to prove that a utility is at fault.

Edison and SDG&E formed a lobbying coalition with electrical workers and other business and community groups, called Action for Wildfire Resiliency, and have turned to Twitter to pressure individual lawmakers to support the governor's bill. After raising concerns about Wall Street lobbying for the bill, the Utility Reform Network, a ratepayer advocacy group, joined the utilities in supporting the proposal at a committee hearing on Monday.

Michael Aguirre, the former city attorney of San Diego who now represents customers in cases against the utilities, called the proposal "a funding mechanism to do more wildfires because they've given up on stopping them." If the bill is signed into law, Aguirre said he would sue the state in federal court for violating the Takings Clause in the U.S. Constitution.

"The Takings Clause says you can't take someone's property without due process of law and making me prove that you don't have a right to my money is not due process," Aguirre said about the money ratepayers will be forced to contribute to the wildfire fund.

Wood said he supports Newsom's attempts to keep the power companies afloat. He also believes the state needs to spend more money to harden homes in fire-prone areas and educate residents about ways to manage their property to reduce the likelihood of burns — funding which was omitted from the budget signed by Newsom last month, a spending plan that dedicated nearly \$1 billion to emergency response, wildfire recovery and prevention projects such as forest thinning.

"That's historic investment into emergency management and wildfire prevention," Newsom said last week. "But is there a lot more to do? Absolutely, and we're committed to doing that over the course of the next couple of years."

Sen. Brian Dahle (R-Bieber) said the bill isn't a fix-all.

"This is a step in the right direction to stabilize our utilities and then we need to tackle the big problem, which is vegetation management, in our state," said Dahle, who voted for the bill on Monday.

The California Forestry Assn., a collection of forest owners, mills and others with ties to the industry, agrees with Wood and the other lawmakers. Rich Gordon, president of the association, said there's not enough money to treat all of California's forest lands, which cover one-third of the state. But Newsom should dedicate more funding to create fuel breaks around vulnerable communities and defensible space near homes, he said.

"The bill, as currently crafted, protects utilities and provides them with an opportunity to stay somewhat solvent, but it doesn't provide any protection for the folks who are also going to be contributing through the continuation of a fee toward that fund," Gordon said.

It's unclear if the governor has enough votes to pass the bill in the Assembly. Newsom's top advisors have been meeting with Republicans and Democrats in both houses over the last several weeks.

Democrats in the Senate successfully negotiated for legislative amendments last week that created stronger rules for the safety certification process that ties executive pay to safety performance. The amendments would also allow for on-the-ground safety audits.

Wood, who represents part of Sonoma County devastated by fire in 2017, wouldn't say if he plans to support or oppose the legislation.

"I don't want to hold something hostage, but I do want people to know that I'm serious," Wood said. "I'm not going away. These are valid concerns."

Assembly Speaker Anthony Rendon (D-Lakewood) said he's held discussions and meetings about the legislation for several days.

"We take it seriously," Rendon said. "We certainly understand that something needs to be done quickly. At the same time, we're not going to rush it at the sake of good policy."

Others say they are concerned about the lack of transparency and time for public input. The bill was amended late Friday while many Californians were taking a long holiday weekend and hastily approved by the state Senate on Monday.

Newsom said last week that the ratings agencies may give the Legislature a few extra days to pass the bill if lawmakers make substantial progress this week. If the Legislature shows it is "moving with sincerity toward coming up with some resolution," he said, it could also make it less likely that utilities would file for bankruptcy in the event of a downgrade.

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California's big PG&E wildfire bill: What you need to know

San Francisco Chronicle | July 8, 2019 | JD Morris

California lawmakers are having one of their most substantive debates yet in response to the catastrophic wildfires that devastated the state in 2017 and 2018.

A major bill crafted to enact Gov. Gavin Newsom's plan for addressing the wildfire crisis surrounding the state's investor-owned electric utilities moved swiftly through the Senate on Monday, won approval, and now heads to the Assembly. The bill, AB1054, would set up a new \$21 billion fund to help utilities endure future wildfire costs.

The bill would have major consequences for Pacific Gas and Electric Co., which filed for bankruptcy protection in January because of its massive wildfire liabilities, and its Southern California counterparts.

Newsom previously challenged the Legislature to act on this issue by Friday, but he later told The Chronicle "the sky is not gonna fall" if it takes longer. Southern California Edison and San Diego Gas & Electric face potential credit rating downgrades if the deadline isn't met.

What would the bill do? The marquee component of AB1054 is a new wildfire fund that would help PG&E and the Southern California utilities if their power lines are involved in more conflagrations. PG&E could access the fund only if it resolves its current wildfire claims and exits bankruptcy protection by June 30 of next year. The bill would also require electric utilities to seek annual safety certifications from the state. And it would change the way regulators consider whether utilities can pass any wildfire costs along to their customers. If the company in question has a valid safety certification, regulators would presume the utility's conduct was reasonable, unless another party could raise "serious doubt," in which case the utility would have to prove it acted reasonably. The bill would also create an advisory board that would make recommendations about wildfire safety to state regulators.

Who will pay for it? To finance the fund, the state would continue a Department of Water Resources charge that puts a few extra dollars on customers' monthly utility bills. The charge, which originates from the energy crisis in the 2000s, was supposed to end in the coming years, and the governor's advisers have said its extension could net \$10.5 billion. Utilities themselves would also likely be expected to match the \$10.5 billion using money from their shareholders, bringing the total direct contributions from the companies and their customers to \$21 billion.

How likely is the bill to pass? Lawmakers need to assemble a two-thirds majority in order for AB1054 to become law. Some members have pushed for additional provisions, including around wildfire prevention and preparedness, and some consumer advocates have voiced discomfort with parts of the bill. But it's not clear yet how much organized opposition the legislation will face — if any. Up From The Ashes, a group that lobbies for wildfire victims, and the California State Association of Counties have both said they support the bill. PG&E has taken a neutral position, according to a company spokeswoman.

What's not in the bill? Notably, AB1054 does not propose any changes to inverse condemnation, the legal doctrine that holds California utilities responsible for damage caused by their equipment even if they were not negligent. PG&E cited the "unique nature of California's doctrine of inverse condemnation" as one of many factors it weighed before deciding to file for bankruptcy protection.

Are there other related bills? Yes. When lawmakers amended AB1054 on Friday, they split part of it off into another bill for procedural reasons. The second bill would create a new entity called the California Catastrophe Response Council to oversee the administrator of the wildfire fund. The council would be made up of several state government representatives, including the governor or someone he designates and two people appointed by the Legislature, serving alongside three members of the public appointed by the governor. The bill would also create a new government entity called the Office of Energy Infrastructure Safety that would eventually assume the duties of a temporary wildfire safety division that would be established at the California Public Utilities Commission. The second bill can pass on a majority vote, but it would only be operative if AB1054 passes as well.

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State Senate Passes Bill to Create California Wildfire Fund

KTLA 5 | July 8, 2019 | Associated Press

California senators approved a proposal Monday aimed at stabilizing the state's electric utilities and putting a renewed focus on safety in the face of devastating wildfires caused by utility equipment, with supporters calling it a plan that holds utilities accountable and protects ratepayers.

"Make no mistake — this is not a utility bailout, it's a ratepayer bailout," said Sen. Bill Dodd, a Napa Democrat and one of the bill's co-authors.

Lawmakers and Gov. Gavin Newsom are rushing to pass a package of wildfire bills by Friday before lawmakers take a monthlong break and as ratings agencies consider whether to further downgrade the credit ratings of the state's investor-owned utilities. California's wildfire season has already begun.

The proposal now heads to the state Assembly.

The bill creates a wildfire fund of tens of billions of dollars that utilities can tap to help pay for wildfire damages if they follow certain safety steps, including tying executive pay to safety. Utilities and ratepayers would pay into the fund. Utilities would also have to invest billions in wildfire mitigation efforts.

A coalition of groups has rallied around the measure, from labor unions representing utility workers to wildfire survivors, who see the bill as giving them more leverage as Pacific Gas & Electric Corp. goes through the bankruptcy process. A watchdog group, The Utility Reform Network, also supported the bill Monday, praising provisions on wildfire mitigation and tying CEO pay to safety.

Although it won bipartisan support, lawmakers said it wasn't perfect. Some questioned whether it would raise utility bills, while others said it didn't do enough to protect homes or manage vegetation that fuels wildfires. Sen. Scott Wiener, the only Democrat to vote against the bill on the Senate floor, said it was a missed opportunity to move the state away from reliance on investor-owned utilities.

California's three major utilities — PG&E, Southern California Edison and San Diego Gas & Electric — are owned by investors.

"We need to take what is a broken model right now in terms of investor-owned utilities in California and look toward the future," Wiener said.

The bill is speeding quickly through the Legislature; it was introduced less than two weeks ago and amended significantly last Friday. It had its first public hearing roughly six hours before it went to a vote on the full Senate floor.

"It's a little rushed," said Republican Sen. John Moorlach, though he voted to pass it.

It is a sprawling piece of legislation and has turned into a battleground for special interests. It provides, for example, broad worker protections if a utility changes ownership or sells off some of its assets. Wiener said that would make it harder for municipal electric utilities to buy assets from major power companies, potentially stifling efforts to expand publicly owned electric systems.

Last week Newsom acknowledged the complexity of the issue and said in response to critics that doing nothing would be catastrophic for utility ratepayers.

“None of this is easy,” Newsom said then. “I think it’s the best of all the options and, in the absence of others being presented, I think it’s the one most likely to get the votes.”

The urgency to act comes after California experienced two of its most devastating wildfire seasons in 2017 and 2018, with some of the worst blazes blamed on utility equipment. PG&E Corp. filed for bankruptcy in January as it stared down potentially tens of billions of dollars in liability costs.

Under the plan, utilities would have to get a new safety certification and show their conduct was reasonable in order to tap it. If a utility has the safety certification, it would be presumed to have acted responsibly, shifting the burden to victims or others to show they did not. If victims’ groups raise serious doubt about the utility’s conduct, the burden would then shift back onto the utility.

It also creates a new Wildfire Safety Advisory Board with appointees from the governor and legislative leaders to advise the California Public Utilities Commission. The Associated Press reported that the original version of the legislation would have automatically exempted all communications between the board and the Public Utilities Commission from public disclosure and exempted it from some portions of the state’s open meetings law.

The bill has been changed to remove the open meetings law exemptions, and it no longer includes a blanket disclosure exemption. Instead, the Public Utilities Commission or the board would have to assert privilege in individual cases.

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Wildfire panel recommends extending safeguards to water agencies

Ventura County Star | July 6, 2019 | Arlene Martinez

When the Thomas Fire reached Ventura city limits early on Dec. 5, 2017, a critical tool to help curb the flames quickly disappeared: water.

Some of the more than 500 people who ultimately lost their homes sued Ventura over that lack of water, though they later directed their energy at Southern California Edison, which investigators found caused the fire.

Nearly a decade earlier, what became known as the Freeway Complex Fire started in Orange County, the result of a disabled vehicle. The fire raced from Route 91 across Chino Hills State Park and into the city of Yorba Linda.

As in Ventura, hydrants ran dry and residents fled as their homes burned down. A group of homeowners sued, ultimately winning a \$69 million settlement in their case against the water agency.

Protecting a water agency that 'didn't cause the fire'

As fires across the state grow larger and more damaging, water agencies have ramped up efforts to avoid facing an outcome like the Yorba Linda Water District. They're asking lawmakers to shield them from paying for damages related to fires they didn't start but weren't able to help put out.

"Yorba Linda didn't start the fire, didn't cause the fire and didn't do anything to allow the fire to spread," said Marc Marcantonio, the water district's general manager, referring to the 2008 fire.

The group of more than three dozen water districts and labor unions — which includes Yorba Linda but not Ventura — found support in a commission who spent the first half of the year considering the long-term costs and liabilities associated with utility-started fires.

The five-member panel, the Commission on Catastrophic Wildfire Cost and Recovery, sent its final report to Gov. Gavin Newsom and the state Legislature last month. Among its recommendations was replacing the liability interpretation of inverse condemnation for electric and water utilities with a fault-based negligence standard.

"Converting this strict liability regime to a fault-based standard reduces the burden to taxpayers by removing significant wildfire liability, decreasing the cost of capital, and reducing the risk of bankruptcy, while maintaining a robust incentive for utilities to mitigate wildfire risk," the report states.

In inverse condemnation cases, the argument is that by failing to protect a house during, for example, a fire, it's an illegal taking of a property.

"Our general feeling is the tool firefighters use to put out fires, including water systems, shouldn't be held responsible for fires they don't cause," said Justin Skarb, director of community affairs and government relations for California Water Service and part of the Coalition for Fire Protection and Accountability.

California Water Service serves 2 million customers, including some in Thousand Oaks.

Brian Kabatech, a Los Angeles attorney representing some of the Ventura-area homeowners suing Southern California Edison for damages received in the Thomas Fire, said it may sound logical, but utilities have a high level of responsibility "If you're a monopoly you're the only show

in town," he said. "The burden that goes with that are things like the inverse condemnation laws."

Water companies are in a better position than most to understand the increasing risk they face as a result of wildfires and other weather extremes, he said. It might encourage them to better prepare for such events, by getting generators or taking other measures.

The risk shouldn't lie just with impacted homeowners, he said.

"It's better ultimately that the people who can afford to pay for it, pay it, as opposed to some innocent homeowners being left out in the cold," he said.

Managing the growing risk of wildfires

The Commission on Catastrophic Wildfire Cost and Recovery came out of legislation signed into law in September by then-Gov. Jerry Brown.

The panel met five times and took testimony from fire victims, governments, utilities, ratepayer advocates and others, according to the final report's executive summary.

To help spread out the costs of fire damages and prevention, the commission recommended lawmakers set up a fund to more equitably split the charges. The size of the fund wasn't identified but it should not be set up to "incentive risk" – moving to a fire-prone area, remaining underinsured or failing to mitigate fire hazards – and it should still penalize utilities "not found to be prudent," the report says.

The report also makes several recommendations around insurance. Many who lost their homes in the Thomas Fire found out just how underinsured they were after the Thomas Fire, a situation many across the state likewise found themselves.

Insurers should have to prove the coverage they're offering reflects the cost to rebuild, insurers should be required to offer coverage if certain risk reduction standards are met and the state should maintain the current risk-based approach to pricing, the report recommends. The state should not subsidize insurance in high-risk areas by raising cost in low-risk areas.

Kabatech said the issue of insurance hasn't been talked about enough. "Why is there such severe underinsurance?...It's a really serious issue and most people gloss over it."

Skarb and Marcantonio, echoing the explanations of many water agencies, said water systems aren't designed to fight wildfires.

Things like generators will only go so far, Skarb said.

Marcantonio said managing wildfires was a complex problem that needed a wide range of solutions. There needed to be more discussion on better managing urban wildlife interface areas, and in bringing local, state and federal fire, water and environmental leaders together to work toward better outcomes, he said.

The answer can't be spending millions on infrastructure that in most cases, isn't necessarily practical or the best way to deliver water to communities, he said.

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California lawmakers race to pass wildfire legislation by July 12

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Lawmakers in Sacramento may be on the cusp of making significant changes in the way utilities pay for the cost of devastating wildfires caused by their own equipment and maintenance programs. But they are racing against the clock and, in some cases, criticism over whether their legislative fixes amount to a big bailout for power companies.

It also marks the first major political test for first-year Gov. Gavin Newsom, who is pushing legislators to bring a bill to his desk that he thinks will get money promptly into the hands of fire victims, ensure some long-term financial stability for the state's three investor-owned-utilities, calm down Wall Street ratings agencies and reduce the risks of more fires ripping through the Golden State.

Newsom wants wildfire legislation before him by July 12, the last day lawmakers are in session before they take a one-month summer recess. The date also serves as an indicator whether the Legislature will likely put any changes into place before fire season goes into full swing, thus delivering a signal to ratings agencies mulling whether to issue another round of downgrades to California's power companies.

Assembly Bill 1054 is the most far-reaching of the wildfire bills at the State Capitol. It has been marked as an "urgency statute" that can go into effect almost immediately but would require a two-thirds majority rather than a simple majority.

"Financially unstable electrical utilities will put wildfire victims in jeopardy and cause California families to see their electrical bills skyrocket," Newsom said June 21. "In the coming days, I will continue working with the Legislature to turn this framework into a package of bills that make the changes we need."

AB 1054 runs largely in parallel to the plans outlined by the Newsom administration. It would create a \$21 billion insurance fund that utilities could tap into, provided they meet the requirements of a newly instituted safety certification process.

To earn the certification, the utilities would have to undergo a review process each year, tie executive compensation to safety performance and establish a wildfire safety committee on their boards of directors.

The power companies could access the money if a fire caused by their equipment results in more than \$1 billion in property damage — but only if the California Public Utilities Commission, or CPUC, determines they acted prudently. If the commission rules they acted recklessly, the utilities have to shoulder the costs.

Some of the bill's critics have questioned whether the CPUC will go easy on the utilities, saying the commission has a history of being too accommodating to industry.

The fund would be run by a panel called the California Catastrophe Council composed of state government officials, including the governor or someone designated by the governor.

The fund would be financed half by the utilities (San Diego Gas & Electric, Southern California Edison and Pacific Gas & Electric) and half by ratepayers.

Under the bill, customers would keep paying \$2.50 a month for a bond established in the wake of the California energy crisis through the Department of Water Resources. Instead of terminating the charge, the fee would be extended with the money going to the wildfire fund.

The utilities would be required to spend a combined \$5 billion every three years to reduce the risks of wildfires in their respective service territories, on top of what they are already spending. The power companies would be allowed to pass those costs onto customers but they could not earn a profit on that spending. An advisory board under the CPUC's new Wildfire Safety Division would have authority over the utilities' mitigation plans.

State regulators have estimated about 10 percent of California wildfires can be traced to power line issues.

The bill does not specifically address the state's legal doctrine of "inverse condemnation" that power companies have long sought to eliminate but it does make a subtle yet likely significant change.

Once a utility gets certification, proof of liability would shift. Parties looking to recover costs from power companies would have to prove a utility failed to manage its systems prudently or acted negligently. For years, the burden of proof has been placed on utilities to show they acted responsibly.

The proposed change is one of many reasons San Diego attorney Michael Aguirre is opposed to the legislation.

"So you're asking me for money but I have to prove to you why I shouldn't have to pay? That is really a fundamental change of the utility code that's been in effect for a hundred years," said Aguirre, who has battled SDG&E in the utility's quest to recover \$379 million in costs from the 2007 wildfires in the San Diego area from customers.

"This is a utility company dream come true, where you just basically tap into the power of the state of California to charge utility customers unlimited amounts of money for the foreseeable future."

Aguirre said the bill is being rushed through the Legislature, and its section calling for ratepayers to pay into the insurance fund by extending the \$2.50 a month fee will be subject to legal challenges.

SDG&E representatives have not come out in favor of AB 1054 although in an email to the Union-Tribune, a company spokeswoman called it "a good starting point."

"A comprehensive solution should be adopted to adequately protect the interests of all Californians and should take into account the significant investments our region and SDG&E have made over the past decade to protect our communities from devastating wildfires," communications manager Denice Menard said.

Since the 2007 Witch, Guejito and Rice fires destroyed more than 1,300 homes, killed two people, injured 40 firefighters and forced more than 10,000 to seek shelter at Qualcomm Stadium, SDG&E has spent about \$1 billion in ratepayer funds on programs to fight and prevent wildfires in its service territory.

SDG&E has also joined Southern California Edison and the International Brotherhood of Electrical Workers union in establishing a lobbying effort called WildfireAction.com that is pushing lawmakers “to help California better prevent, prepare for and respond to the increased frequency and severity of the threat of wildfires.”

Credit ratings agencies such as Moody’s, Fitch and Standard & Poor’s have downgraded California utilities in recent months, citing “the potential for multi-billion dollar exposure related to wildfire risk.”

Moody’s dropped Southern California Edison’s rating in March to a level two notches away from speculative grade, or junk. It downgraded SDG&E as well, to a level three notches from junk. Moody’s withdrew ratings from PG&E in February after the Northern California utility filed for bankruptcy.

The ratings agencies have warned of further downgrades unless California institutes legislative or regulatory changes to shore up the long-term financial prospects of the state’s power companies.

Downgrades increase the utilities’ cost of borrowing, which is passed on to customers.

After Newsom introduced the wildfire proposal last month, Moody’s vice president Jeff Cassella released a statement saying the measure “appears to include several credit supportive elements to mitigate wildfire risk” for utilities but “the extent of the credit support will depend on the details.”

Paul Patterson, an analyst who covers utilities for the New York City research firm Glenrock Associates, said he thinks the ratings agencies may not consider July 12 a drop-dead date to decide whether to issue downgrades or not.

“I can’t really speak for Wall Street but it would be preferable that the governor’s deadline would be met but we’ll see what happens,” Patterson said. “I think it depends on how far along they are (with a legislative solution). If they leave (July 12) in disagreement, if there appears to be some impasse that isn’t bridgeable, I think that could be a problem.”

Patterson said he believes California policymakers need to make changes when it comes to wildfire liability and a properly crafted safety certification program for utilities could lead to a situation “where one doesn’t have to wonder whether or not some gigantic wildfire is going to basically wipe out a company.”

Aguirre, however, said ratings downgrades are not necessarily something to be feared.

“I would tell the ratings agencies you’re right to downgrade (California utilities) because their management doesn’t deserve a passing grade,” Aguirre said. “If you send the message that management is not doing well, the institutional investors will demand new management come in and take the steps necessary to provide safe electricity. This will help send the kind of message to the market that correction is needed.”

A coalition of renewable energy trade associations including wind, solar and geothermal sources has come out in favor of AB 1054.

“Our renewable projects have brought clean energy to California attracted by forward looking policies and financially stable utilities,” Jan Smutny-Jones of the Independent Energy Producers

said in a statement. "California's energy future is dependent upon getting to a financially stable market, as AB 1054 intends."

Another section of the bill relating to the Wildfire Safety Advisory Board has drawn criticism. As written, the legislation would exempt the board from the state's Open Meeting Act and some of its communications could be done in private "to encourage candid and timely advice" by the board to the CPUC's Wildfire Safety Division.

"It is basically in violation of the California constitution," said April Maurath Sommer, executive director of the Wild Tree Foundation, an environmental group based in the Bay Area. "The public should be able to know what the government is doing, This is a real transparency problem that I can't see that there's any benefit to."

Newsom said the proposal is not in its final form and may very well change.

The legislative debate comes as the number and intensity of fires in California is on the rise.

According to CalFire's list of the 10 most destructive wildfires in state history, seven of them have occurred since 2015. Six of the 10 have occurred in just the past two years.

Last November's Camp Fire in PG&E's Northern California service territory killed 85 people, making it the single deadliest fire in state history. PG&E cited \$30 billion in potential liabilities when it filed for bankruptcy protection in January.

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Continuation of Drought Legislation Sought by Bipartisan Western Senators

California Water News Daily | June 27, 2019

Four western senators are looking to build on Senator Dianne Feinstein's (D-CA) 2016 California drought legislation that was included in the Water Infrastructure Improvements for the Nation (WIIN) Act. Senators Feinstein, Cory Gardner (R-CO), Martha McSally (R-AZ.) and Kyrsten Sinema (D-AZ) recently introduced bipartisan legislation, the Drought Resiliency and Water Supply Infrastructure Act, a bill to improve the nation's water supply and drought resiliency.

Supporters of the legislation are numerous but include the Association of California Water Agencies (ACWA) and more than 35 water agencies, California cities and other water-related entities. The bill is generous in extending funding under the WIIN Act for an additional five years. Funds are earmarked for \$670 million for surface and groundwater storage projects, and supporting conveyance; \$100 million for water recycling projects; and \$60 million for desalination projects.

"In Colorado and the West, combatting drought requires a comprehensive approach. Storage and conservation are key parts of our water resource management," said Sen. Gardner. "Tens of millions of people in the western United States rely on Colorado rivers to provide water for agricultural, municipal and consumptive use, as well as support for our growing recreation economy. In the face of these challenges, I'm proud to be joining this bipartisan legislation that will aid efforts to prevent severe water shortages."

The new Drought Resiliency and Water Supply Infrastructure Act will create a new loan program for water agencies at 30-year Treasury rates (currently about 2.6 percent.) This is to encourage investments in new water supply projects; repayment can be deferred until five years after completion of the project. In a nod to restoration of habitats and environmental projects the bill authorizes \$140 million for forest, meadow and watershed restoration and projects that benefit threatened and endangered species.

Offsetting the time, money and effort of resiliency and water storage projects the new legislation extends existing WIIN Act provisions and allows water districts to prepay their outstanding capital debts and convert to indefinite length water supply contracts to bring in additional revenue within the next 10 years. It also creates a process to deauthorize inactive water recycling project authorizations.

"The effects of climate change are here to stay, and one enormous effect on the West is more – and more severe – droughts," said Sen. Feinstein. "As California continues to recover from a historic drought, the Lawrence Berkeley National Laboratory now estimates that the Sierra snowpack, a primary source of water for California, will decrease by 79 percent by the end of the century. If we fail to prepare for this contingency, life in California will be forever altered. Longer and more severe droughts will change the face of our state, undermine our economy, result in more wildfires, devastate our agriculture sector and require draconian water restrictions. To counter this, we must act now, and this bill will help toward that goal."

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In an Era of Extreme Weather, Concerns Grow Over Dam Safety

Many of the United States' 91,000 dams are aging and sorely in need of repairs that could collectively cost tens of billions of dollars. Experts are increasingly worried that as extreme precipitation events increase, dams are at greater risk of failure, threatening lives and posing environmental risks.

YaleEnvironment360 | July 9, 2019 | Jacques Leslie



Workers repair the damaged Oroville Dam spillway in Northern California in March. California Department of Water Resources

It is a telling illustration of the precarious state of United States dams that the near-collapse in February 2017 of Oroville Dam, the nation's tallest, occurred in California, considered one of the nation's leading states in dam safety management.

The Oroville incident forced the evacuation of nearly 190,000 people and cost the state \$1.1 billion in repairs. It took its place as a seminal event in the history of U.S. dam safety, ranking just below the failures in the 1970s of two dams — Teton Dam in Idaho and Kelly Barnes in Georgia — that killed 14 and 39 people, respectively, and ushered in the modern dam safety era.

The incident at the half-century-old, 770-foot-high Oroville Dam, which involved partial disintegration of its two spillways during a heavy but not unprecedented rainstorm, signaled the inadequacy of methods customarily used throughout the country to assess dam safety and carry out repairs. It occurred as federal dam safety officials have made substantial progress in updating methods of dam assessment, in the process propelling dam safety practices into the 21st century. But federal and state dam safety officials have been unable to procure from disinterested state legislatures and Congress the tens of billions of dollars needed for repairs to the nation's aging dam infrastructure.

Largely as a result of the funding shortfall, in its latest infrastructure report card, in 2017, the American Society of Civil Engineers (ASCE) gave the nation's 91,000-plus dams a D grade, the same grade they have received in every ASCE report card since the first one was issued in 1998. The ASCE

estimated the cost of rehabilitating dams whose failure would threaten human life at nearly \$45 billion, and the cost of fixing all dams in need of repair at more than \$64 billion. This year, the Association of State Dam Safety Officials (ASDSO) arrived at an even higher number — nearly \$71 billion for all dams.

“Regular citizens are unaware that the dams around them may be risks,” says one official.

“There’s a huge backlog of rehabilitation needs regarding dams in our country,” said Lori Spragens, ASDSO’s executive director. “Regular citizens are unaware that the dams around them may be risks, and there’s not enough public awareness for people to be prepared, just like they would be for a tornado or an earthquake.”

And scientists say the likelihood of dam failures — which not only threaten lives but also release toxic sediments trapped in reservoirs behind many dams — will increase as extreme precipitation events become more frequent in a warming world.

Aside from about 1,500 dams owned by federal agencies, regulating dam safety is chiefly a state responsibility, and states vary widely in their commitment to the task. Across the nation, each state dam inspector is responsible on average for about 200 dams, a daunting ratio, but in some states the number is much higher. Oklahoma, for example, employs just three full-time inspectors for its 4,621 dams; Iowa has three inspectors for its 3,911 dams. Largely because of its legislators’ distrust of regulation, Alabama doesn’t even have a safety program for its 2,273 dams.

States require inspections of “high-hazard-potential” dams, whose failures would cause fatalities, every two-and-a-half years on average, but actual inspection intervals are much longer. Eleven states don’t inspect “low-hazard-potential” dams — dams that don’t threaten lives or property — at all.

Among states given high marks for their programs are Pennsylvania, New Jersey, Colorado, Washington, New Mexico, and, at the top of most lists, California, which spends the most of any state on dam safety, more than \$21 million in 2017. Yet an independent report on the causes of the Oroville incident published in January 2018 faulted California’s dam safety practices in numerous ways.



An aerial view of the damaged Oroville Dam spillway in California, and the debris field just below, in February 2017. California Department of Water Resources

While the dam was inspected regularly, safety officials failed to look more deeply into the dam's history, and consequently missed deficiencies in its main spillway that stemmed from its design and construction. California's Department of Water Resources was "overconfident and complacent about the integrity" of its dams, and was "chronically" understaffed, the report said. And the department lacked expertise in dams' secondary structures, such as the failing spillways.

"The fact that this incident happened to the owner of the tallest dam in the United States, under regulation of a federal agency, with repeated evaluation by reputable outside consultants, in a state with a leading dam safety regulatory program, is a wake-up call for everyone involved in dam safety," the report said. "Challenging current assumptions on what constitutes 'best practice' in our industry is overdue."

Until the 1970s, information about the nation's dams was scant: some hadn't been inspected for decades, and nobody knew how many existed. After numerous dam disasters, the nation's first dam inventory in the early 1970s established the existence of nearly 90,000 non-federal dams, most of them small. Inspections of about 9,000 of them found that a third were unsafe. Since the federal government had no responsibility for those dams, the states then began to take their dam safety responsibilities seriously.

Dam safety programs are generally considered to have improved since then, but dam failures — the rapid, uncontrolled release of water when dams are breached or collapse — are still frequent. According to the ASDSO, between January 2005 and June 2013, state dam safety programs reported 173 dam failures and 587 "incidents" — events that probably would have resulted in failures if not for quick interventions. Fatalities caused by dam failures are far less common. Since the collapse of the Kaloko Dam in Hawaii in 2006, which killed seven people, no deaths occurred until this March, when Nebraska's Spencer Dam, just 29 feet high, gave way to epic floodwater, sweeping away a house with a man inside it in the floodplain below.

Since 2008, at least 10 dam failures have each killed 10 or more people globally.

One sure way to eliminate a dam's danger is to dismantle it, but the impact on safety of the budding U.S. dam removal movement has been minimal. One reason is that most of the removed dams were small, less than 25 feet high; another is that relatively few dams have been removed. Last year marked a high point, with 99 dams taken down. But that number represents only about a thousandth of the nation's dam stock.

Conservation groups and anglers' organizations such as Trout Unlimited have led the drive to take down U.S. dams, often to help restore long-blocked fish migrations. These groups note that removing a small dam may cost less than repairing it. But removing a large dam can cost as much as building it in the first place. Efforts to dismantle large dams on major rivers, such as the Snake River in the Pacific Northwest, have faced strong resistance from business groups and utilities, which defend the dams for generating hydropower and creating reservoirs used to ship grain and other commodities.

As sobering as the problem of dam safety is in the United States, consider that aside from Australia, Canada, and Western Europe, dam safety standards in the rest of the world lag behind the U.S. Catastrophic failures are frequent: Since August 2008, when a dam in Nepal gave way, killing 250 people, at least 10 dam failures have each killed 10 or more people. In January, a mining dam in southeastern Brazil collapsed, killing about 300 people. Last year, a dam under construction in Laos crumbled, killing 40 people and leaving 6,600 homeless, and a dam in Kenya burst, killing 48 people.

In the U.S., three interlocking developments have impeded improvements in dam safety in recent decades. First, the nation's dams are growing old: their average age is 57. By that age, seepage can start to erode dams' foundations — the U.S. Army Corps of Engineers spends about \$200 million a

year to address seepage on its dams alone. And parts such as spillway gate, motors, winches, and generators wear out and need replacement.

Second, dams are vulnerable to so-called “hazard creep”: their danger increases as development occurs downstream. A dam that was rated “low-hazard-potential” when it was built because nobody lived in the floodplain below may become a “high-hazard-potential” dam once people move into the area. As a result, even though new dam construction in the U.S. virtually stopped in the 1970s, the number of high-hazard-potential dams has grown from 9,314 in 1999 to 12,557 in 2017. High-hazard-potential dams must conform to a more rigorous safety standard than lesser-rated dams, but if funds aren’t available, the necessary upgrades won’t be made. And dam safety officials are often slow to reclassify dams. Neither Kaloko nor Spencer dams, for example, were rated high-hazard before their fatal collapses.

Hazard classifications have other problems, too. Owners of high-hazard-potential dams are supposed to maintain emergency action plans to notify downstream residents of imminent danger from a dam, but according to Mark Ogden, an ASDSO outreach specialist, nearly 20 percent of high-hazard-potential dams lack such plans.

And while hazard classifications take into account threats to human life, they don’t consider the environmental and economic damage that could be caused by the release of toxic sediments. That sediment may include agricultural pesticides, mining tailings, and industrial chemicals.

The methods dam designers have customarily used are increasingly considered inadequate.

Despite the potential dangers posed by dams, many people living on property that would be flooded if a dam fails are unaware of that possibility, in part because federal officials blocked public access to inundation maps after the September 11, 2001 terrorist attacks. In recent years, some states have again made the maps available. California requires that prospective buyers be informed if a property is in an inundation zone, a practice that should be far more widespread.

The third development affecting dam safety is a deepening understanding of hydrological conditions and earthquakes, both of which are vital considerations in dam design. Assumptions about floods and precipitation when dams were built were typically based on a short history of hydrological data, and another half-century or more of information often has pointed to different conclusions. Climate change, which is intensifying both floods and drought, has further undermined those assumptions.

The result is that the methods dam designers and safety officials have customarily used are increasingly considered inadequate. Dam design traditionally has been based on calculations of its watershed’s “probable maximum flood,” or PMF, the largest flood that could conceivably occur there. High-hazard-potential dams were supposed to be able to safely handle PMFs; low-hazard dams usually were required to contain some fraction of their PMFs. And if accumulating hydrological data showed that a dam’s original PMF was too low, the dam could be labeled out of compliance and required to undergo repairs, often by enlarging its spillway. Indeed, about half the investment in dam repairs throughout the U.S. involves modifying spillways to accommodate larger floods, according to Eric Halpin, who retired in January after 14 years as chief of dam and levee safety at the Army Corps of Engineers.



*More than 6,000 people were left homeless after a dam under construction in Laos crumbled in July 2018, flooding towns downstream.
NHAC*

NGUYEN/AFP/Getty Images

But focusing solely on PMFs entirely omits the varying levels of risks that dams may pose. One PMF may be calculated to have a one-in-a-thousand chance of occurring in a given year, while another might be pegged at one-in-a-million. And a few people might live in the floodplain below one dam, while a million might live downstream from another. As a result, the Bureau of Reclamation abandoned its focus on PMFs in favor of risk-based assessments about 25 years ago, and the Army Corps of Engineers followed a decade later. Now risk assessment is making its way into the procedures of some state dam safety agencies.

Incorporation of climate change into dam safety practices is still limited by scientists' inability so far to quantify the frequency and intensity of future flooding in particular localities. One small step in that direction has been taken at California's Folsom Dam, which recently became the first dam to use National Weather Service forecasts about future precipitation to help guide decisions about whether to release water from the dam's reservoir. Until now, release decisions were based entirely on readings of precipitation that had already occurred.

Even with smart measures like these, major advances in dam safety almost certainly won't occur until legislatures begin appropriating many billions of dollars more for repairs. Instead, since a majority of dams are privately owned, about half the states have shifted to owner-responsible inspection systems, in which dam owners are required to hire inspectors and pay for the inspections themselves instead of relying on state inspectors.

"In my last 15 years in government," Halpin said, the Army Corps of Engineers "invested half-a-billion to a billion dollars a year in infrastructure repairs. During that same period, Congress appropriated \$200 billion for emergency funds to repair infrastructure damage from storms" such as Katrina and Sandy. "Everyone knows it's more cost-effective to prevent damage than to repair it, but it's not in the national will yet. This is not politically sexy."

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Jacques Leslie is a regular Los Angeles Times op-ed contributor. His book on dams, "Deep Water: The Epic Struggle Over Dams, Displaced People, and the Environment," won the J. Anthony Lukas Work-in-Progress Award for its "elegant, beautiful prose." He recently published an ebook, "A Deluge of Consequences," that portrays a project in Bhutan to counter flooding caused by climate change.