

**CCRE PRESENTS -  
SURVIVING CLIMATE  
WHIPLASH:  
STATEWIDE SOLUTIONS  
FOR HOUSING AND  
FUTURE DEVELOPMENT**



CENTER FOR  
CALIFORNIA  
REAL ESTATE



# PREFACE

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This report outlines a summary from a panel of experts convened in July 2023 by the Center for California Real Estate (CCRE), an institute of the CALIFORNIA ASSOCIATION of REALTORS® (C.A.R.), discussing the impacts of climate change on California’s water systems and infrastructure. Exploring current challenges and possible solutions to confront “climate whiplash,” the topic precipitated a thought-provoking discussion on the state’s water future. CCRE panelists outlined a wide range of issues from droughts and wildfires to water infrastructure and conservation all with the goal of ensuring the long-term sustainability of the Golden State’s water supply.

Joining the panel’s moderator John Sebree, C.A.R. Chief Executive Officer, were Karla Nemeth, Director of the California Department of Water Resources; Dave Eggerton, Executive Director of the Association of California Water Agencies; Erik Porse, Director of the California Institute for Water Resources; and Jeff Schroeder, Senior Vice President of Land Acquisition & Planning for Ponderosa Homes and Chair of the California Building Industry Association.

# BACKGROUND

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The Center for California Real Estate (CCRE) is an institute founded by the CALIFORNIA ASSOCIATION OF REALTORS® (C.A.R.) dedicated to intellectual engagement in the field of real estate. Its mission is to advance industry knowledge and innovation with an emphasis on convening key experts and influence-makers. CCRE reflects C.A.R.’s increasing role in shaping the future of the industry by advancing innovative policy solutions and active dialogue with experts and industry stakeholders. Additional background on CCRE and C.A.R. can be found at [ccre.us](https://ccre.us).

# KEY TAKEAWAYS:

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- With climate change extremes causing higher temperatures and prolonged droughts, California faces water supply challenges.
- Recent funding investments for water infrastructure provide a reprieve to a system embattled by intensifying weather patterns. Yet, to avoid repeating mistakes from the past, these modernization efforts must encompass new approaches.
- Balancing various water supply needs from agricultural to urban interests present challenging decisions for policy makers. The impacts of climate change exacerbate these difficult choices.

# PART I: WEATHER EXTREMES

Shifting weather patterns are producing trends misaligned with historical data, making planning for the state's water future increasingly challenging. Prior to this year, California suffered from the driest three years on record and experienced an extended arid period from 2000 to 2021, the most drought-stricken timeframe in 1,200 years.

Around the new year, weather patterns radically changed. During that period, the Golden State endured a deluge of precipitation from a series of atmospheric rivers. After three weeks of consistent storms, causing subsequent flooding and landslides, some areas of the state received the highest amount of rainfall accumulation seen in the past 161 years. With the sheer volume of water from the winter storms, reservoirs and basins were restored to levels not seen in years.

Considering this "climate whiplash," C.A.R. CEO John Sebree asked the panel to contextualize the current and future drought status of the state. Panelists provided a broader understanding to the current respite. They confirmed that while the Golden State is technically no longer in a drought, historical trends foreshadow future dry spells even during times of water abundance.

Cautioning the audience to remain diligent, Dave Eggerton, Executive Director of the Association of California Water Agencies (ACWA), warned, "We know that the drought is coming back. It's a continuous issue we deal with, and we have to plan for it." Erik Porse, Director of the California Institute for Water Resources, opined on the recent dry periods and stressed, "These are some of the most significant periods of drought on record. [...] And this influences how we now consider climate whiplash because these droughts are elongated. They're more likely to be more extreme and they're more likely to be more frequent."

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**- Erik Porse**

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Prolonged dry spells have also correlated with other extreme patterns such as wildfires. In recent years, the state has endured billions of dollars of damages from record-breaking wildfires, leading multiple private insurers to announce they would pause issuing new policies in the state. Jeff Schroeder, Senior Vice President of Land Acquisition and Planning for Ponderosa Homes, commented on the current issues preventing some homeowners from securing insurance. He asserted if adequate changes were made, the insurance market would have the capacity to mitigate risks. His proposed solutions involved regulatory rollbacks and added flexibility for the insurers.

# PART II: WATER INFRASTRUCTURE

Moving and storing water requires an intricate natural and artificial infrastructural system. These transportation avenues and holding containers allow for water conservation efforts across a complicated terrain. Providing context for existing physical structures and future plans, panelists explored efforts to revitalize systems in need of upgrades.

The late half of the 20th Century included some of the wettest years in recent history, and the modeling used to design current water systems is now antiquated. Porse mentioned the present-day infrastructure was designed and built during these periods of relatively wet years, but with the advent of the 21st Century's much drier conditions, these systems are being tested by extreme weather patterns.

Panelists contended the demand for water will only increase, and approaching this challenge with the same solutions used in the past will not meet future needs. With ambient temperatures trending in an upward direction, Nemeth mentioned these higher temperatures serve as the new foundation for how the state plans its future water needs.

After decades of water infrastructure disinvestment, panelists applauded recent efforts by the government to reinvest in critical water systems. Eggerton stated that much-needed reinvigoration of funding moves the state toward a more sustainable water future, alluding to federal legislation such as the Inflation Reduction Act and Infrastructure Investment and Jobs Act.

With the infusion of federal resources, the state is also moving forward on initiatives of its own. Nemeth highlighted the bipartisan efforts in the state to streamline the California Environmental Quality Act (CEQA), a permitting process that works to reduce environmental harms. Although Governor Newsom signed these bills in July 2023, she acknowledged

more work is needed to protect the environment while also expediting projects.

Furthering Nemeth's comments on modernizing rules, Schroeder reinforced the need for CEQA changes, expressing his frustration with the state's subjectivity in deciding which projects receive expedited treatment. He expressed, "We're willing to give a CEQA pass to a stadium for football, but we're not willing to give a CEQA pass for much needed water resource components. [...] If water is a priority in the state, then we need to have the ability to get things done in a timely fashion" and avoid lengthy court delays.

Additional state and local efforts are underway to continue the momentum of water infrastructure investment. Advocating for the California State Legislature to include a water bond initiative on the 2024 ballot, ACWA is backing this proposal. As of today, multiple bond proposals are moving through both chambers, including one measure that would inject over \$15 billion to harden defenses against the impact of climate change.

Other infrastructure projects are considered essential in helping protect the longevity of the state's surface water supply. Surface water is precipitation that is collected in above-ground storage structures such as streams, lakes, reservoirs, and canals. As rising temperatures cause surface water to evaporate quicker, water use will also follow an ascending trajectory. Therefore, multiple surface water projects are either underway or in conception throughout the state to fortify the water supply. And while some have encountered setbacks, panelists assured they will move forward. Such projects in planning or under construction include:

- **Sites Reservoir**, a \$4.4 billion project to add dams on the Sacramento River to assist with storage during wet years like this past winter.

- **Los Vaqueros Reservoir**, a \$1.25 billion project to improve the Bay Area and Central Valley water supply.
- **Pure Water Southern California**, a supplemental drought-resistant solution to purify and recycle wastewater to a potable standard.
- **San Luis Reservoir**, jointly owned by the federal and state government, considerations are underway to increase storage capacity.

Another important part of the infrastructural system includes the 400-plus miles of canals that transport water through the California Aqueduct, a component of the State Water Project (SWP). However, the SWP, a state-owned water and power system providing water to 27 million of California's 39 million residents, no longer has the same efficacy as it did decades ago. This is due to land subsidence caused by decades of over-use in the groundwater supply. Groundwater is precipitation that naturally seeps into subterranean-level basins or is artificially added via injection wells. When these basins have more water withdrawn than added, the land itself can sink. Nemeth commented that this subsidence can expose vulnerabilities to flooding because "we no longer have the capacity in that canal to move [high volumes of water]. And that's simply because it has sunk along with the land."



While hydrological advancements in research are evolving, challenges remain to fully harness the state's available natural resources. Even though California borders the largest body of water in the world, the process to desalinate that water to a potable standard requires high amounts of energy. In a hypothetical scenario where the SWP relied solely on desalinated water for its supply, Nemeth stated, "We would need a desalination plant every four miles off the coast of California, from the Oregon border to San Diego." Adding the current scale of existing desalination plants is "really de minimis in the scheme of things for our water supply needs" and dwarfed in comparison to other forms of existing infrastructure. However, some parts of the state rely on this technology to supplement its water supply needs. For example, the City of San Diego is moving forward with plans to use a recycled water program that includes the relatively costly choice of using desalinated water.

While surface water projects receive much of the public attention, a higher volume of water lies beneath the surface in the groundwater supply. Taking centuries or millennia to accumulate, Nemeth stated, "We have about 10 to 12 times the amount of water storage in underground aquifers than we do in surface water reservoirs." Adding to the importance of groundwater at a major source, she noted it accounts for 40 percent of California's normal water supply and 60 percent in times of drought.

Porse reiterated that relying on surface water infrastructure alone will be insufficient for the long term. He spotlighted additional state efforts to harness nature's built-in water storage capacity with the passage of the Sustainable Groundwater Management Act (SGMA) in 2014. SGMA was designed to create stability in the state's groundwater supply by requiring local entities to develop sustainably plans aimed at limiting overdrafts by 2040.

Additional nature-based solutions can be utilized to preserve and connect the water



supply. Porse noted that river systems and aquatic habitats assist with water management by limiting evaporation and increasing the interconnectedness of waterways. He concluded that when artificial infrastructure efforts are combined with nature-based approaches, this solution is consonant with the more traditional methods of the last century.

## PART III: BALANCING CONSERVATION AND THE ECONOMY

Highlighted by intensifying climate extremes, leaders face challenges of balancing growth and water conservation. The lack of available housing supply in California emphasizes the importance of state collaboration for sustainable development. Nemeth acknowledged the state's housing targets and emphasized the need to build more through an intentionally expedited process.

In 2022, builders across the state constructed over 120,000 homes, representing a 0.85 percent increase from 2021 and the highest percentage increase since 2008. These newly constructed homes have higher water efficiency in comparison to those built decades ago, according to Schroeder. He added, "The marginal impact that building a new house that uses so little water has on [the] water supply situation, it's nominal."

Nearly half the urban water allocation is utilized in existing homes' landscaping and outdoor purposes. Due to the increase in ambient temperatures, these existing lawns and outdoor landscaping will demand more water use in the future, according to Nemeth. She encouraged creativity with how Californians reuse and recycle surface water and groundwater, especially when considering its outdoor use.

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*- Jeff Schroeder*

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The business industry has also taken steps to conserve water through its landscaping practices. For example, Schroeder's company, Ponderosa Homes, no longer installs grass turf in its projects because they "want to provide landscaping that fits into the climate and the environment" that is native to California. Acknowledging a balance is needed between landscaping aesthetics and water conservation, Nemeth implored "it really is time" for residents to reconsider how they currently use water to sustain landscaping.

Schroeder asserted water efficiency improvements should also come from retrofitting residential and commercial buildings that were developed in a different era. The state's existing 15 million residential units use significantly more water per square foot than new projects, especially when "the majority of those [existing units] were built under different building codes."

Schroeder suggested – acknowledging the potential pushback from his REALTOR® audience – that point-of-sale rules would serve as the most effective way to get older homes upgraded to today's standards. He suggested homeowners spend money earned from home equity on upgrading plumbing and irrigation systems to increase water efficiency.

Recognizing that not all home sales come with large profits, he said the state could develop legislative fixes and funding formulas based off home profitability. These resources would in turn be used to equitably upgrade residential plumbing systems while simultaneously protecting the water supply.

A July 2023 survey by the Public Policy Institute of California found that about seven out of ten Californians believe climate change is having at least some present-day effects on their local communities. Included in this survey are rural agricultural areas of the state acutely experiencing these climate impacts. Producers are heavily reliant on the state's water supply, using approximately four times the amount of water as urban areas. Rising temperatures and extended droughts are straining water resources in these communities. Nemeth asserted that the transition from row crops (e.g. tomatoes and lettuce) to permanent crops (e.g. vineyards and orchards) has put an additional hardened demand with less flexibility on the water systems.

The state government is implementing climate-adaptive solutions to the emerging challenges from higher temperatures and intense droughts. Current programs are under-way to incentivize water allocation withholdings and limit water use in these arid regions. Nemeth highlighted DWR's work with state water districts and local farmers to repurpose land in locations such as the Central Valley. Historical groundwater overdrafts have been more common in this part of the state, dwindling the local water systems and risking draining area wells. Therefore, DWR has initiated issuing tens of millions of dollars to local farmers in exchange for them withholding their water allocation. These efforts will aid the state in eliminating overdrafting in the enrolled acreage and help meet its groundwater goals for the coming decades.

Water use in California is traditionally presented as 80 percent agricultural use and 20 percent urban use for homes and businesses. However, panelists argued there is much

nuance within this binary delineation. Porse asserted that when urban dwellers consume food raised and grown in the state – including berries, nuts, meat and fish – then “you are actually consuming water that was in California.” And while that water technically came from agricultural use, it was ultimately imbedded in the food consumed within an urban area; this is an example of what panelists dubbed as a “one water” concept. They contextualized that the Golden State's water supply is not limited by physical boundaries or definitions, and “one water” reflects the realities of a more integrated approach to understanding future conservation efforts.

## PART IV: CONCLUDING REMARKS

Climate extremes pressure state leaders to make controversial decisions on certain projects. Program and funding decisions come at the cost to some while potentially benefitting others. Such challenging program decisions were raised by REALTOR® attendees, commenting that Sustainable Groundwater Management Act (SGMA) implementation is causing a strain on farmers' businesses. Eggeron paid homage to the important



cultural and economic impacts of the agricultural industry. He acknowledged that environmental implementations from SGMA will ultimately cause some farmers to cease operations, which he called a “really sad thought.” However, he encouraged support for this work as a long-term investment, saying it “will affect our future and our kids’ future.” Nemeth also acknowledged these difficult circumstances but suggested, “The cost of doing nothing is orders of magnitude higher than the pain of making the adjustment.”

Another climate change-inflicted challenge facing decision makers is the potential for infrastructure degradation and failure. Panelists warned that proposed plans must move forward to avoid catastrophic failures. The Delta Conveyance Project is an example of one such plan. It is a State Water Project proposal to divert water from the Sacramento-San Joaquin Delta to other parts of the state. Over the decades, multiple iterations of this project have morphed into the current proposal by Governor Newsom, which is approximately one-third of the size from previous proposals. Speaking to its fraught history stemming back to the 1960s, Nemeth conceded, “It’s very challenging because it’s a project that really tunnels through the Delta and creates a lot of construction [...] for communities that do not see the benefit.”

Much of the controversy arises from the environmental impacts from construction. Additionally, local communities fear the exportation of their own water resources to other parts of the state. Nemeth attempted to assuage concerns, highlighting how the project balances environmental impacts and also seeks to maintain a water supply for millions of Californians. She stressed, “[This] isn’t about moving ever more water from northern California to other parts of the state. It really is about making existing water supplies more reliable in the event of these kinds of climate threats.”

Engaging and informing the public on projects like this and other water educational resources is an ongoing effort. Annual reports issued by local water agencies release information on the drinking water supply quality from tested samples. The Golden State has over 400 local water boards and agencies covering approximately 90 percent of the population. These agencies are subject to a high level of scrutiny, with drinking water supplies heavily regulated by government entities. Calling attention to the emergence of water supply threats, Eggerton emphasized, “It’s a huge focus of our attention state and federally right now. The challenge for us is we need to find a pathway that we can deal with it and protect public health,” while developing science-based solutions that mitigate economic ramifications. And while the remaining drinking supply is covered by mostly smaller systems that have only some reporting requirements, the state has made a concerted effort to increase support. Speaking to ongoing efforts over the past decade, Porse noted approximately \$1.3 billion has been allocated by government agencies to these resource-deprived systems.

Government entities and organizations collaboratively work on educational programming, ensuring members of the public receive accurate information about water conservation efforts happening in their local communities. Nemeth referenced “Save Our Water” which was created to make water conservation habitual in the daily lives of Californians. The program helps educate people on the water supply and effective ways to increase personal conservation practices. More information on this effort can be found at [SaveOurWater.com](http://SaveOurWater.com).

ACWA has its own effort aimed at educating the public on current and future water infrastructure projects called “QuenchCA.” Eggerton highlighted the importance of local water agencies’ role in these projects and the overall management of California’s water system, especially given climate change’s



impact. More information on this effort can be found at [QuenchCA.com](http://QuenchCA.com).

Panelists agreed these myriad initiatives by public and private entities are paving the way for fortification of the state's water supply. Attendees were urged to build relationships with their local water agencies and continue to educate the public on water needs in their own communities and throughout the state.

Climate change's impact on extreme weather patterns presents challenges for leaders throughout the state. As Californians continue coping with higher temperatures, prolonged droughts, and engulfing storms, panelists concluded solutions cannot exist in silos. State and local entities will need to continue working with members of the public to ensure infrastructure projects receive support. They also emphasized the importance of individuals either beginning or continuing making changes in their own lives to help conserve water. To maintain a sustainable water future in the face of climate change, more work remains by all Californians throughout the state.

# PANELISTS



**Dave Eggerton,**  
**Executive Director of the Association of**  
**California Water Agencies**

Dave Eggerton is the Executive Director of the Association of California Water Agencies (ACWA), the largest water organization of its kind in the nation. He leads a professional staff of approximately 40 employees, with offices in Sacramento and Washington, D.C., managing a statewide association whose more than 460 members are responsible for about 90 percent of the water delivered in California. Prior to joining ACWA, Eggerton served as general manager of the Calaveras County Water District from 2014-2018. Eggerton has been an active member of ACWA since 2004, serving on the Board of Directors, as well as on the association's State Legislative Committee, Water Management Committee, and Federal Affairs Committee.



**Karla Nemeth,**  
**Director, California Department**  
**of Water Resources**

Karla Nemeth was appointed Director of the California Department of Water Resources by Governor Edmund G. Brown Jr. in January 2018 and reappointed by Governor Gavin Newsom in June 2019. Nemeth oversees the Department and its 4,000 employees whose mission it is to manage and protect California's water resources. In cooperation with other agencies, DWR manages California's water resources. Prior to joining DWR, Nemeth worked at the California Natural Resources Agency as Governor Brown's deputy secretary and senior advisor for water policy since 2014. She was the Bay Delta Conservation Plan project manager from 2009 to 2014.



**Erik Porse,**  
**Director of the California Institute**  
**for Water Resources**

Erik Porse is the Director of the California Institute for Water Resources and an Associate Cooperative Extension Specialist within the University of California Division of Agriculture and Natural Resources (UC ANR). Erik is an engineer, environmental scientist, and policy analyst who focuses on interdisciplinary research for water resources and environmental management. Erik has a Ph.D. in Civil and Environmental Engineering (water resources) from UC Davis and has authored over 50 reports and peer-reviewed articles.



**Jeff Schroeder,  
Senior Vice President of Land Acquisition  
and Planning, Ponderosa Homes:**

Jeff Schroeder is Senior Vice President of Land Acquisition and Planning at Ponderosa Homes. Ponderosa Homes, founded in 1968, builds communities in Pleasanton, Livermore, Danville, Pleasant Hill, Tracy and Palm Desert, California. Jeff oversees all of Ponderosa's land acquisition, entitlement and development activities. Schroeder started his homebuilding career at Dividend Homes and has held land acquisition and planning positions at A-M Homes, Greystone Homes and Ryland Homes. He is a licensed real estate broker. He is a past chair of the Building Industry Association of the Bay Area. He currently serves as the chair of the California Building Industry Association PAC and is on its executive committee and board of directors.



**John M. Sebree  
Chief Executive Officer, State Secretary,  
CALIFORNIA ASSOCIATION OF REALTORS®**

John Sebree joined the CALIFORNIA ASSOCIATION OF REALTORS® as chief executive officer and state secretary in early 2022, overseeing the association's objectives, business development, strategic planning, legislative policies and creating products so that real estate professionals can remain at the center of the real estate transaction and succeed in today's rapidly changing real estate market. Sebree previously served as chief executive officer of Missouri REALTORS® for more than seven years. Prior to his move to Missouri, Sebree served as Senior Vice President of Public Policy for Florida REALTORS® for 11 years. Prior to that, he worked in the Government Affairs division of the NATIONAL ASSOCIATION OF REALTORS® (NAR) in Washington, DC for 13 years. Sebree was a Senior Legislative Representative working with the congressional delegations of eight states. Prior to NAR, Sebree worked for two years for the U.S. House of Representatives Committee on Banking, Finance and Urban Affairs. He was a 2017 inductee to NAR's Almon R. Bud Smith Leadership Society, which recognizes leading contributors to the real estate industry and the profession. Additionally, he is a Founding Member of LGBTQ+ Real Estate Alliance. A native of Kentucky, Sebree received a bachelor's degree in Business Management from Northern Kentucky University, where he was Student Body President. He earned an MBA from George Washington University in Washington, DC.



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