

Activating the Corporate Sector as a “Lever” to Push a Water Resilience Tipping Point in California and Beyond; A Q&A with the Pacific Institute, a Global Water Research Organization

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Abstract: In this Q&A, *Journal of Sustainability Education (JSE)* senior editor Amanda Bielawski interviews Cora Kammeyer, research associate at the [Pacific Institute](#), a California-based non-profit research center focused on global water challenges. Together, they discuss the role of sustainability education, specifically within the corporate sector, in achieving water resilience in the midst of a changing climate in California and beyond. Following a discussion of California’s water challenges, this piece explores how the [California Water Action Collaborative \(CWAC\)](#) brings together corporations, including Coca-Cola, Google, and Proctor & Gamble, with NGOs such as The Nature Conservancy, WWF, and the Environmental Defense Fund, to engage in collective action and drive corporate water literacy. The interview explores, in part, why the corporate sector is “one of the biggest and most important levers for achieving global water security.”

Keywords: Water; California; corporate water stewardship; flood; drought; groundwater; climate change; corporate social responsibility (CSR); collective action

In water-stressed California, non-drought years bring 2.3 trillion-gallon water deficits and entire regions rely on water imported from hundreds of miles away. Researchers at the California-based [Pacific Institute](#), a non-profit global water research organization, say climate change and its impacts to the water cycle present an “existential threat”—both to the economy and society as a whole.

While California is already “one of the most hydrologically variable places in the world,” Pacific Institute researchers underscore that “climate change is turning up the dial on this variability, leading to what scientists are calling ‘precipitation whiplash.’” In other words, droughts have become even more intense—and so have floods. For instance, Pacific Institute researchers pointed out that 2016 ended the five *driest* years in California’s recorded history followed by 2017, which was the *wettest*.

This intensifying climate variability, combined with California’s ongoing water supply-and-demand challenges, presents specific risks to the state’s economy and the corporate entities that base part or all of their supply chains here. Consider, as the Pacific Institute points out, that, while California receives just 1% of the United States’ geographic annual average rainfall, it generates fully 14% of U.S. gross domestic product (GDP), making it the fifth-largest economy in the world.

According to Cora Kammeyer, research associate with the Pacific Institute, expanded public education that increases diverse stakeholders’ awareness of “the connections between water and the state’s economic and ecological health” should be a primary strategy for ensuring a water resilient California in the midst of a changing climate. Kammeyer further underscored that this process will mean “reevaluat[ing] our economic and social priorities around water.”

In this Q&A, *Journal of Sustainability Education (JSE)* senior editor Amanda Bielawski spoke with Kammeyer to explore the role of sustainability education in driving a water resilience tipping point in California and beyond, with a specific emphasis on education within the corporate sector. As Kammeyer pointed out, societal demands on the corporate sector to engage in sustainability-related social responsibility have surged. However, she stated, “the level of ‘water literacy’ ranges broadly” among corporate entities, and there is “still a gap in understanding or motivation that is preventing needed corporate investments in water efficiency and conservation.”

In 2014, the Pacific Institute, secretariat of the United Nations (UN) Global Compact’s CEO Water Mandate, co-founded the [California Water Action Collaborative \(CWAC\)](#), to drive such corporate water literacy and action. By engaging corporations like Coca-Cola, Google, and Proctor & Gamble with environmental NGOs such as The Nature Conservancy, WWF, and the Environmental Defense Fund, Kammeyer pointed out that CWAC “brings together ‘unlikely bedfellows’ to enable unprecedented collaboration” on water resilience.

While some suggest focusing on policy and regulation solutions in requiring the corporate sector of engage in water-resilient practices, Kammeyer argued we need “both” governance-based solutions and collective action, such as that exemplified by CWAC. She further noted that such collective action “is the only way to genuinely overcome complex water challenges with interrelated social, environmental, and economic dimensions.”



Figure 1. Members of the California Water Action Collaborative (CWAC) learn about a stream restoration project in the Tahoe National Forest.

In the interview that follows, Kammeyer highlighted why the corporate sector, specifically, is “one of the biggest and most important levers for achieving global water security.” According to Kammeyer, one of the primary reasons that businesses, including both agriculture and industry, have such power to push toward a water resilience tipping point is that they constitute 90% of water withdrawals.

Bielawski (JSE): Cora, thank you for joining us here at the JSE to discuss the role of education in moving toward a more water resilient California and world in the midst of a changing climate. We’ll be focusing specifically on the role of corporate water responsibility and leadership in the system of change. Before we discuss some of the sustainability education specifics, could you help contextualize some of the water challenges California is currently facing—and how climate change is exacerbating those challenges? First, what is the Pacific Institute’s view of California’s current level of water security and how has this changed over time?

Kammeyer (Pacific Institute): “California is a water-scarce state, meaning that the demand for water resources exceeds the available supply. The state supports 12% of the U.S. population, generates 13% of its agricultural value and 14% of its GDP, while receiving only 1% of its average rainfall. To achieve this, we incur a water deficit of 6 million acre-feet (2.3 trillion gallons) each year, even when we’re not in a drought.

California is also one of the most hydrologically variable places in the world, as described [here](#), with long dry periods followed by a deluge of rainfall. Droughts and floods have influenced the history and development of California over the past several centuries, and paleoclimate evidence shows that the region has experienced these dramatic swings from wet to dry for thousands of years. For example, studies of tree rings in California allow scientists to understand long-term historical patterns of wet/dry variability, as described [here](#). Additionally, [this map](#) from the California Water Blog

provides a sense of that variability over the past 60 years, showing that California has the biggest year-to-year rainfall fluctuations in the nation.

I'll also point out that California has some of the most extensive and complex water infrastructure in the world, with aqueducts carrying water from where it's plentiful to where it's needed, often over distances of hundreds of miles. Pressures from continued economic and population growth and climate change, as well as the need to restore degraded ecosystems, have led to concerns over our ability to meet future water demands.



Figure 2. Blackwood Creek, a tributary stream to Lake Tahoe in northern California.

California is reaching, and in many cases has exceeded, the physical, economic, ecological, and social limits of traditional supply options. Rivers are over-allocated, and options for new surface reservoirs are expensive, politically controversial, and offer only modest improvements in water supply. Likewise, groundwater is so severely over-drafted in parts of the state that the ground is sinking beneath our feet. Cities, farms, and ecosystems often compete for scarce water resources.”

Bielawski (JSE): As you’ve explained, even without a changing climate, California’s water challenges are significant. How, specifically, does the changing climate add complexity and severity to those challenges?

Kammeyer (Pacific Institute): “The changing climate is leading towards hotter, longer droughts interspersed with more intense storms. For example, 2012 to 2016 comprised the five hottest, driest years the state of California has ever experienced, and then 2017 was the wettest water year on record. While dramatic wet-dry swings are not uncommon for California, climate change is turning up the dial on this variability, leading to what scientists are calling “precipitation whiplash.” This means that while the average amount of precipitation may stay the same, that precipitation will come in just a handful of intense rain events during the winter, leaving the rest of the year dry and with higher average temperatures.

This pattern is increasing the likelihood and intensity of droughts, floods, and fires, all of which threaten water security. Longer, hotter droughts will force communities to stretch limited supplies further. Shorter, wetter storms will damage infrastructure, including water distribution and treatment infrastructure. Fires will damage infrastructure, degrade water quality, and require water supplies to fight.”

Bielawski (JSE): In the face of these climate-related factors, what is the Pacific Institute’s projection for future water resilience in California? What are the major factors that will influence how well the state weathers its water future?

Kammeyer (Pacific Institute): “California can be water resilient in the face of climate change, but it will take a reevaluation of our economic and social priorities around water. Some of the strategies required to reach water resilience include integrated regional water planning, meaningfully incorporating best-available climate change models into planning and decision-making, and implementation of groundwater sustainability laws. We also need to address sea level rise and flood planning, reform water allocations, and make large-scale investments in updating and increasing the resilience of water infrastructure.”

Bielawski (JSE): How substantially has California already responded to these emerging challenges? And, how much urgency has climate change contributed to the need for water resilience action and education?

Kammeyer (Pacific Institute): “In the face of these challenges, Californians are moving in the right direction. More homes and farms are using efficient technologies and practices than ever before. Efforts are being made to save and restore devastated ecosystems. There is a new awareness of the connections between water and the state’s economic and ecological health. There are increasing investments in floodplain restoration, green infrastructure, and storm warning systems to address flood risks.

California has also been a global leader on climate change mitigation for decades, having set ambitious greenhouse gas reduction targets starting in 2000 and having been the first state to develop a carbon cap and trade program in 2006.

But, much more needs to be done, including improved regulations and management, better pricing and financial tools, and expanded public education and technological innovation.

Due to the political and economic complexity of water in California, there has been insufficient urgency and action on building water resilience in the face of climate change. But just last year, in 2019, California Governor Gavin Newsom wrote an executive order calling for a ‘water resilience portfolio that meets the needs of California’s communities, economy, and environment through the 21st century,’ with an emphasis on preparing for climate change. Hopefully, this will drive swifter and bolder action on water and climate in California.”

Bielawski (JSE): What is the Pacific Institute’s call to action? In other words, what are the major strategic things you are pushing for to improve water resilience in the state amidst the realities of climate change?

Kammeyer (Pacific Institute): “With a growing population and economy, and a changing climate, there is no question we need to make major investments to sustain and improve California’s water systems. California has the opportunity to model what a resilient water system looks like, combining nature and technology to future-proof water supplies.

But we need solutions that are socially equitable, environmentally responsible, and financially sensible—solutions that are better for our planet and pocketbooks. Some of these solutions include continuously improving water efficiency both in cities and on farms as well as investing in alternative water supplies, including stormwater and water recycling.

We also need to address the inequities underlying how water resources are managed. For instance, we need to ensure safe drinking water and sanitation systems are available to all, and that they are priced so that everyone can afford them while covering the cost of providing service. Additionally, we need to rethink economic priorities, including the trade-offs of different water uses. And, we need to protect and restore ecosystem on the brink of collapse.

Bielawski (JSE): This leads us into discussing engagement of the corporate sector. Before we dive specifically into the Pacific Institute’s involvement in the California Water Action Collaborative (CWAC), we will start more broadly. From your perspective, what factors encourage corporate water engagement? In other words, what’s in it for the corporate sector?

Kammeyer (Pacific Institute): “Water risks to business are increasing, especially when considering climate change impacts on water resources. The World Bank (2016) estimates that water shortages will cause economic growth in 2050 to be 6% lower than it would be otherwise under business-as-usual scenarios. Upwards of 70% of companies reporting to CDP (2018) are now reporting water risks to their business. In addition, water efficiency makes business sense because it can reduce costs, and water efficiency is often a ‘keystone’ indicator for overall operational efficiency at a given factory, store, office, etc. Lastly, the social expectation of corporate responsibility is mounting. For example, employee recruitment and retention is increasingly influenced by a company’s commitment to sustainability.”

Bielawski (JSE): What role do you see the corporate sector playing in moving toward water resilience? How are businesses most effectively engaged?

Kammeyer (Pacific Institute): “There are five key steps of corporate action on water, as outlined in the CEO Water Mandate’s Water Stewardship Journey illustrated below in Figure 3. The first step is good water management within a company’s own operations, which means investments in water efficiency and conservation onsite, ensuring all employees have access to safe drinking water, and taking steps to prevent water pollution.



Figure 3. From: “The Water Stewardship Journey” infographic.

From: CEO Water Mandate. Retrieved from:

<https://ceowatermandate.org/university/101-the-basics/lessons/the-water-stewardship-journey/>

The second step requires looking beyond what we often call the ‘fence line’ of operations and understanding the water challenges in the communities where a company has operations, supply chains, and customers. Education is a key component of this step, because it requires deeper knowledge of water issues and how factors like climate change will affect things.

The third step is taking what was learned in step two to develop a comprehensive strategy around water. This is where a company decides and lays out what role it will play in contributing to water resilience, and sets goals and targets to measure its success.

The next two steps, engagement and communication, are about working with others to achieve water resilience together. These steps emphasize the importance of companies acting with integrity and transparency when it comes to water, particularly when collaborating with communities, governments, and other external stakeholders.

The number of companies that are on this water stewardship journey—that are increasing operational water efficiency, assessing their water-related risks, and setting and

communicating corporate water stewardship goals—has been growing steadily. This makes a lot of sense given companies’ exposure to water-related risks. Today, 77% of companies responding to the CDP Global Water Report, the world’s leading corporate disclosure mechanism for water, report exposure to substantive water risks (CDP, 2018). The financial impact of water insecurity is already being felt by companies, with U.S.\$38.5 billion in water-related financial losses experienced in 2018 by companies reporting to the CDP Global Water Report (CDP, 2018).

But, despite this increase in awareness and commitments, companies’ water use continues to rise, indicating that there is still a gap in understanding or motivation that is preventing needed corporate investments in water efficiency and conservation.”



Figure 4. The Global Water Report 2018 (CDP, 2018) found that water withdrawals rose substantially during the four years preceding the report at the same time that an increasing number of the same companies set targets to reduce such withdrawals.

From: Global Water Report 2018. CDP Worldwide. Retrieved from: <https://www.cdp.net/en/research/global-reports/global-water-report-2018>.

Bielawski (JSE): Is it possible we are approaching a tipping point for corporate involvement on water action?

Kammeyer (Pacific Institute): “Globally, I think we are close to a tipping point in corporate water stewardship. We have just hit a tipping point with corporate commitments on climate change. Major brands like Microsoft and Starbucks are committing to carbon neutrality; over 87 major companies—together representing a market capitalization of over U.S.\$2.3 trillion—have committed to achieving net-zero carbon emissions by 2050. I think that a wave of ambitious corporate water stewardship commitments, in line with achieving the UN Sustainable Development Goal 6 on water and sanitation, will follow soon after these carbon commitments.

In California water, I think tipping points only truly come during times of drought or flood. We saw this with the last major drought sparking the passage of the state’s first-ever groundwater sustainability legislation in 2014. With an understanding of this reality, we can plan for the opportunity that the next crisis will present. We’ll be ready to push towards that tipping point and advance bolder action towards a water resilient future for California.”

Bielawski (JSE): How much pressure has climate change, specifically, placed on water issues to force such a tipping point of response in the corporate sector? What are other factors in addition to climate change pushing this tipping point?

Kammeyer (Pacific Institute): “It is important to remember that water is the primary medium through which everyone, including companies, will experience the effects of climate change. Increasing droughts, floods, storms, and rising seas due to climate change are all water-related. Climate change is also introducing a large amount of uncertainty in natural hydrologic systems, which is forcing planners and decision-makers to use new models and approaches for preparing for the future. We are already seeing the water-related impacts of climate change affect companies’ bottom lines, both in terms of drought and water scarcity and in terms of property loss and damage due to flooding. While climate change is certainly intensifying many water-related challenges, it is important to remember that many of these challenges would exist regardless of climate change. Our unsustainable patterns of consumption and economic systems already create major water challenges because they do not account for the impacts and externalities of near-boundless extraction and pollution of water resources.”

Bielawski (JSE): What is the Pacific Institute’s view on the role corporate entities should play in water stewardship?

Kammeyer (Pacific Institute): “The scope and scale of the water and climate crisis warrant bold and urgent action by all, including the business community. Globally, business (agriculture and industry) accounts for 90% of water withdrawals (Food and Agriculture Organization of the United Nations, n.d.). This makes corporate water stewardship one of the biggest and most important levers for achieving global water security.

Climate change and the water impacts that stem from it pose an existential threat to our economy and our society. The pace at which we mitigate and adapt to climate change and its water impacts must accelerate.

It’s clear that business action is a key component of achieving this acceleration. California is the fifth-largest economy in the world, so California’s business sector has a critical role to play in securing our water future. There are many companies that are already taking significant action to address water and climate challenges. But there is more that business can and must do to address the issue of water security and climate resilience. In order to achieve a climate-resilient, water-secure economy and society, in

the United States and globally, businesses must go beyond tackling the challenges in their own operations and seek to be solutions-providers in their supply chains and with their customers. This happens by sharing knowledge and resources and working collaboratively across sectors and stakeholder groups.”

Bielawski (*JSE*): Now that we’ve covered some of the broader issues of corporate water action, let’s turn more specifically to the California Water Action Collaborative. How did CWAC start and what role did the Pacific Institute play in its formation?

Kammeyer (Pacific Institute): “In 2014, the Pacific Institute, in its role as secretariat of the UN Global Compact CEO Water Mandate, helped found the California Water Action Collaborative or CWAC—unfortunately but affectionately termed ‘the quack.’ First, for context, I’ll share some more details about the CEO Water Mandate. The CEO Water Mandate is a commitment platform for business leaders and learners to advance water stewardship, housed within the UN Global Compact. In implementing water stewardship, endorsing companies identify and reduce critical water risks to their businesses, find water-related opportunities, and contribute to water security and the Sustainable Development Goals. The CEO Water Mandate is now endorsed by over 170 companies from a range of industry sectors and regions around the world. For the past 10 years, the Pacific Institute has acted as co-secretariat of the CEO Water Mandate, running the program on behalf of the UN Global Compact.

Now, let’s talk more specifically about CWAC. The idea for CWAC was born out of a meeting hosted by the CEO Water Mandate in Los Angeles in 2014. At this point, California was suffering from its worst drought on record. Several meeting attendees—from multinational food and beverage companies to leading environmental organizations—expressed a desire to better understand California’s water challenges, identify geographies and issues of shared interest, and collaborate to make positive impacts on water security in the state.



Figure 5. Members of CWAC tour marshes and salt ponds along the southwestern edge of the San Francisco Bay.

Since its inception, CWAC has grown to 30 members, including 13 environmental NGOs and 17 companies from the food, beverage, technology, and retail sectors. Some household names of members include Coca-Cola, Google, Microsoft, and Proctor & Gamble on the corporate side; and The Nature Conservancy, WWF, and the Environmental Defense Fund on the environmental NGO side. Readers can see a full list of CWAC members [here](#). The current cohort of CWAC members have come to the consortium through various means. There was a small core group of founding members in 2014. From there, the group has grown through a combination of active recruitment and companies and organizations requesting to join.”

Bielawski (JSE): What attracts corporations, specifically, to be involved?

Kammeyer (Pacific Institute): “This platform allows corporate leaders to develop or find and support projects that create positive water outcomes for California. This can help companies reduce water risks, meet water stewardship goals, and practice good corporate citizenship, which can enhance a company’s brand, reputation, employee morale, and more.

In addition to project outcomes, the value of CWAC lies in peer learning and information exchange among members. Through biannual in-person meetings, members develop trust-based relationships where important topics can be discussed candidly, and solutions are brainstormed freely. Corporate members can understand the material water risks in California by talking to NGO members and peer companies. NGO members can increase the visibility and scale of their projects through corporate engagement.”

Bielawski (JSE): Specifically related to sustainability education, the focus of the JSE, how much did the corporate CWAC members know about water issues before joining CWAC? How much of your job is to educate the corporate sector about water issues? What role do the NGOs and foundations on CWAC play in that effort?

Kammeyer (Pacific Institute): “The level of ‘water literacy’ ranges broadly among corporate CWAC members, from companies with sustainability staff who are just beginning to understand the California water context to companies that have a dedicated water stewardship lead with a hydrology background. Within CWAC, the NGO members often play an educational role for the corporate members. At our last in-person meeting, for example, members from the Pacific Institute, The Nature Conservancy, Environmental Defense Fund, and Sustainable Conservation co-created a ‘California Water 101’ presentation for the group. NGO members and guest speakers also regularly present on topical water issues on CWAC’s monthly videoconference calls. This kind of background information, particularly on the key policy and management issues facing the state, and in a format where members can ask questions, is hugely valuable. It helps to build a shared understanding of California’s water challenges among CWAC members.”

Bielawski (JSE): What is CWAC’s specific preferred strategy to engage corporate leaders with water issues?

Kammeyer (Pacific Institute): “The three priorities of CWAC are to build social capital for improved local water management; return water to natural systems; and drive corporate water stewardship aligned with global, state, and local water goals. CWAC members—companies, environmental nonprofits, and other leaders—collaborate to design, implement, and scale actions that address the state’s most pressing water challenges and enhance its climate resilience.

CWAC currently has a portfolio of 11 projects. Those projects range from on-farm irrigation and nutrient efficiency, to restoration and invasive plant removal in headwaters, to groundwater recharge, to sustainable urban landscapes. By the latest estimate, CWAC projects have saved over 250 million gallons of water; returned 2.4 billion gallons of water to the system; sequestered or saved 2.8 million tons of CO₂-equivalent; and restored over 460 acres of land.”



Figure 6. Little Five Lakes in Sequoia National Park.

Bielawski (JSE): CWAC seems to take a more collaborative approach, seeking to engage corporate leaders more gently in the water discussion. Various strategies—some more confrontational and others more collaborative—exist to engage corporate entities in water issues. For instance, on the more confrontational side, some NGOs use litigation to hold corporations responsible for water issues. Why does the Pacific Institute believe that a different type of corporate engagement—such as collaboration and education through CWAC—is an important engagement strategy? How does this strategy exist alongside the traditional law and policy strategy of required action?

Kammeyer (Pacific Institute): “Since our founding in 1987, the Pacific Institute has cut across discipline and sector boundaries and actively collaborated with a diverse set of

stakeholders, including policymakers, scientists, corporate leaders, international organizations, advocacy groups, and local communities. We believe that this is the most effective approach to forging effective real-world solutions, as do our fellow CWAC members.

In the corporate water stewardship world, ‘collective action’ has become a core component of the water strategies of leading companies. This reflects the reality that addressing water risks and capturing water stewardship opportunities depends on the support of other stakeholders. In many cases, collective action is the only way to genuinely overcome complex water challenges with interrelated social, environmental, and economic dimensions.

The collective action approach, when executed effectively, establishes enduring, productive relationships among a range of groups who share water resources and face shared water challenges. This collaborative approach is not without its challenges, including the complexities of sharing information, making joint decisions or commitments, and sharing responsibility for implementation. And it is worth noting that corporate water stewardship alone, even when executed collaboratively, will not solve all water challenges. Effective and appropriate public sector water governance, including policy and regulation, is also critical for achieving water security. We need both.”

Bielawski (JSE): Do you see CWAC as an example for how other states and regions may engage the corporate sector in water issues moving forward?

Kammeyer (The Pacific Institute): “Yes. CWAC is a leading-edge model of collective action to advance regional water resilience. It brings together ‘unlikely bedfellows’ to enable unprecedented collaboration around water. This model could be scaled and replicated in other water-stressed locations around the world. By taking a systems-based, collaborative approach to understanding and addressing water problems, the scale and impact of solutions can be dramatically increased. By telling the story of CWAC, we hope to catalyze this approach to advance water security and climate resilience in other places, something corporate CWAC members with multinational value chains have already expressed interest in pursuing.”

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