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November 29, 2021

**SENT VIA EMAIL** (teresa.alvarado@cwcc.ca.gov)

Chair Teresa Alvarado  
California Water Commission Members  
California Water Commission  
P.O. Box 942836  
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RE: WSIP Feasibility Determination for Pacheco Dam Project  
December 15, 2021 Commission Meeting

Dear Chair Alvarado and Members of the Commission:

This letter pertains to the upcoming feasibility determination for the Pacheco Dam project for purposes of receipt of funding under the Proposition 1 Water Storage Investment Program (“WSIP”). It is written on behalf of Stop Pacheco Dam, which is a coalition working to protect Santa Clara County’s ratepayers and the environment, as well as working ranchlands, from this wasteful and high-risk project.<sup>1</sup> The Stop Pacheco Dam coalition is concerned that the Pacheco Dam project, as currently proposed by the applicant, Santa Clara Valley Water District (“Valley Water”),<sup>2</sup> would be both extremely environmentally damaging and also does not meet public funding requirements under Proposition 1. While the Pacheco Dam is not worthy of public funds under Proposition 1, the coalition supports the California Water Commission’s (“Commission”) important work to help ensure water supplies for Californians that are fully compliant with WSIP requirements.

The Pacheco Dam project has changed in significant ways subsequent to the initial application for WSIP funds in 2017 and the subsequent conditional eligibility determination. Specifically, the location of the proposed new dam was moved more than a mile upstream from the new dam location identified in 2017. The new dam would inundate over 8 miles of previously undisturbed Pacheco Creek and an even larger area of

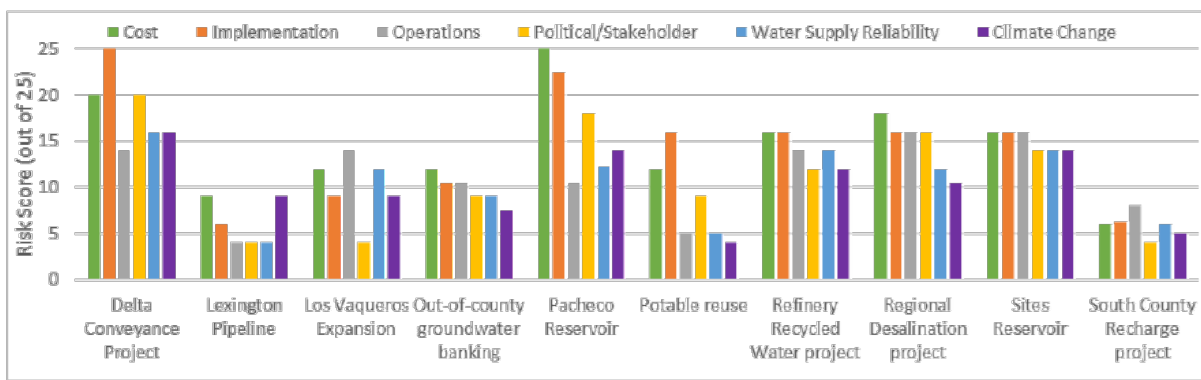
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<sup>1</sup> See [stoppachecodam.org](http://stoppachecodam.org) for more information about the coalition.

<sup>2</sup> We note that while the San Benito County Water District and Pacheco Pass Water District are listed as project partners, those entities have not actively participated in the Commission’s process. As an example, only Valley Water has made a commitment to the Department of Water Resources for not less than 75 percent of the non-public benefit cost share of the project.

previously undisturbed lands containing rich biological and cultural resources, including unique riparian forests. Newly inundated lands in the 2021 footprint include Henry Coe State Park as well as the Nature Conservancy’s Romero Ranch conservation easement. The cost of the project has also increased dramatically, from an initial estimate of \$969 million, to a current estimate of \$2.12 billion, more than double its original estimate. While Valley Water has represented to the Commission that the dam is feasible, its own internal analysis by a team of experts showed that the new dam project is one of the highest risk projects under consideration in its 2040 Water Supply Master Plan.<sup>3</sup>

**FIGURE 3. PROJECT RISK SCORE BY CATEGORY.**



Despite Valley Water’s claims to the Commission, the recently released Supplemental Feasibility Documentation Water Storage Investment Program: Pacheco Reservoir Expansion, Project dated November 2021 (“Feasibility Documentation”) fails to substantiate the feasibility of the project as required by Water Code section 79757, subdivision (a) and section 1603 of Title 23 of the California Code of Regulations. In the Feasibility Documentation, Valley Water presents a benefit-cost analysis to support its claim of economic feasibility, which includes an assessment of public benefits in support of its application for WSIP funding. We asked Dr. Jeffrey Michael to review the

<sup>3</sup> Assessed risk categories included cost, implementation, operations, political/stakeholder, water supply reliability, and climate change. See Attachment 3 of Valley Water’s October 22, 2021 Meeting Agenda Item 2.1, available at: <https://scvwd.legistar.com/LegislationDetail.aspx?ID=5186615&GUID=416421D9-406F-4949-9CD2-AEC50CA2C916&Options=&Search=>

Feasibility Documentation with respect to economic and financial feasibility of the project. The attached report by Dr. Michael finds that:

- Valley Water Did Not Follow Established Standards for Valuing Public Benefits
- Ecosystem Benefits Are Not Justified
- Emergency Water Supply Benefits Are Extremely Overstated
- The Feasibility Documentation's Estimated Benefits from M&I Water Supply and M&I Water Quality are Underwhelming
- Ability-To-Pay Analysis Ignores State Standards for Affordability, the Local Cost-of-Living Crisis, and Recent State Analysis Showing Santa Clara Water Bills Are Unaffordable for Disadvantaged Communities

Dr. Michael finds that a more accurate net present value of benefits ranges from \$274.3 million to \$381.8 million, while the Pacheco Feasibility Documentation claims a benefit estimate of \$2,558 million. Thus, Dr. Michael finds Valley Water has overestimated the project benefits by a factor of 7 or more, the calculated benefit ratio for the most likely level of public benefits would be 0.01, and the benefit ratio for the maximum plausible public benefits of the project at 0.23. As a result, the benefits of the Pacheco Dam project do not justify the value of a \$496.7 million WSIP award, let alone the \$2.1 billion in total costs.

In addition, Valley Water released its Draft Environmental Impact Report ("Draft EIR") on November 18, 2021. Our initial review of the Draft EIR (which is nearly 2,000 pages long, not including appendices), indicates that Valley Water has failed to adequately disclose or mitigate the environmental effects of this massive new dam project. The Draft EIR does identify 13 significant and unavoidable impacts of the project, four of which relate to Cultural and Tribal Cultural Resources. In a supplemental submittal to the Department of Fish and Wildlife, our biologist will explain how Valley Water has failed to properly account for the project's significant biological impacts, including the failure to account for physical changes caused by the project that are not fully mitigated. (See 2016 WSIP TR, pp. 1-4, 4-92 to 4-92; see also Cal. Code Regs., tit. 23, § 6004, subds. (a)(3), (a)(3)(B), (a)(4)(K).) Valley Water also has grossly underestimated the project's environmental mitigation costs, and overestimated the potential value of the project to the South-Central California Coast Steelhead.

The Cultural and Tribal Cultural Resources impacts of this project are also extremely troubling. With an inundation area of about 1,500 acres of land, most of which would be newly inundated, unique cultural resources that are part of what is known as the "Pacheco Complex" would be destroyed as a result of the project. This area was

extensively settled, and cultural sites in the project area are documented to be over 3,000 years old. There is also a strong and potentially undiscovered presence of artifacts. Archaeological surveys have documented at least 42 cultural sites that would be degraded or destroyed by the construction of the Pacheco Dam.<sup>4</sup> In particular, much of the unique “cupule rock art” located along Pacheco Creek would be in the inundation area and permanently destroyed.<sup>5</sup> Traditional methods of stewardship would allow for the restoration of Steelhead habitat while also preserving sensitive sites and artwork; a new and larger reservoir in this location would run counter to those efforts.<sup>6</sup> Inundation of these culturally significant sites would also preclude future archeological research and learning about these past inhabitants of the Diablo Range.

\* \* \*

In summary, new information from Valley Water made available to the public just this month shows that the Pacheco Dam project:

- Does not meet economic or financial feasibility requirements as required in the Water Code, the Commission’s regulations or the 2016 Water Storage Investment Program Technical Reference; and
- Is not environmentally feasible as will be explained further in a subsequent submission.

As a result of these and other deficiencies, the Commission lacks the necessary evidence to make the feasibility findings required by Water Code section 79757, subdivision (a). Valley Water appears to have failed to adequately apprise Commission and Department of Fish and Wildlife staff of the feasibility of this new dam project. Allowing the Pacheco Dam project to proceed farther in the WSIP process would undermine the credibility of the groundbreaking WSIP program and would also be unfair to other applicants for funding that have followed WSIP requirements.

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<sup>4</sup> East Bay Times – <https://www.eastbaytimes.com/2017/08/16/human-remains-and-artifacts-found-at-proposed-dam-site/>.

<sup>5</sup> Research Paper on Indigenous Sites Along the Diablo Range – <https://escholarship.org/content/qt2gj7b7gz/qt2gj7b7gz.pdf?t=krnjj2>.

<sup>6</sup> Amah Mutsun Tribal Band, Threats to Sacred Land – [http://www.protectjuristac.org/wp-content/uploads/2021/01/Amah\\_Mutsun\\_2021-four-current-threats-to-sacred-lands.pdf](http://www.protectjuristac.org/wp-content/uploads/2021/01/Amah_Mutsun_2021-four-current-threats-to-sacred-lands.pdf).

Chair Teresa Alvarado & California Water Commission Members  
California Water Commission  
November 29, 2021  
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Thank you for considering this information and please feel free to contact me ([osha@semlawyers.com](mailto:osha@semlawyers.com), 916-455-7300) with any questions.

Very truly yours,

**SOLURI MESERVE**  
A Law Corporation

By:   
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Attachment: Review of the Pacheco Dam Feasibility Documentation: New Pacheco Dam Is Economically and Financially Infeasible, by Dr. Jeff Michael

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# **Review of the Pacheco Dam Feasibility Documentation: New Pacheco Dam Is Economically and Financially Infeasible**

November 29, 2021

**Dr. Jeffrey Michael, Ph.D.**

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### 3.5. Alternative projects outside Pacheco Creek are erroneously dismissed

Valley Water uses only one alternative project estimate to assess the ecosystem benefits of the Pacheco Dam. The Feasibility Documentation provides a short-list of potential substitute projects, but rejects them all and does not consider projects that could be conducted away from Pacheco Creek. The WSIP TR recommends that “alternatives that could provide the same benefits in the same place are preferred, but alternatives that provide similar benefits close to the project can be considered” (pg. 5-14).<sup>3</sup> It is not necessary to use releases to Pacheco Creek to measure the ecological benefits. Non-use values for threatened species are not typically location specific unless the location is unique (Freeman 2014). There are numerous steelhead restoration projects that could be implemented within the region and state that would provide the benefit of steelhead population protection. The cost of these projects should be the basis of any application of the least-cost alternative method.

### 3.6. Steelhead projects regionally and across the State demonstrate that the Pacheco Dam ecological benefits are grossly inflated

#### 3.6.1. South Central California

The West Coast Region of the National Marine Fisheries Service (NMFS) has a recovery plan for South-Central California steelhead (SCCCS) which are a threatened species. The SCCC population is located in watersheds from the Pajaro River (boundary between Sant Cruz and Monterey Counties) south to Arroyo Grande Creek (San Luis Obispo County). NMFS estimates the recovery cost for the SCCC population will be \$560 million borne over the next 80 to 100 years (NOAA 2013, pg. xvii). The benefits of the myriad of projects proposed in this recovery plan, with the intent of removing the species from the endangered species list, far outweigh the benefits of the improvement in habitat on Pacheco Creek alone. Nevertheless, the benefit estimate Valley Water has placed on this habitat improvement is nearly three times the estimated cost for substantially improving steelhead habitat throughout the entire range of the species.

#### 3.6.2. Western United States

Even more extraordinary is the comparison of the estimate of benefits of habitat improvements in Pacheco Creek to the money spent from the Pacific Coastal Salmon Recovery Fund to reverse declines in Pacific salmon and steelhead. The program was established by Congress in 2000 and as of October 2019 has awarded \$1.4 billion in funds for salmon and steelhead restoration in five western states; Alaska, Washington, Oregon, California, and Idaho.<sup>4</sup> The funds have allowed states and tribes to undertake 13,700 projects, restoring 1.1 million acres of spawning and rearing habitat. Valley Water claims the benefits of Pacheco Dam to steelhead are \$1.5 billion, roughly equivalent to the total amount invested in salmon and steelhead recovery by the federal government over the last 20 years.

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<sup>3</sup> The WSIP TR also notes, “this approach is similar to the NMFS’ 2009 Biological Opinion on Chinook Salmon and Sturgeon, which suggests that alternatives be evaluated and agencies may select an option that is most practical. “NMFS cares only that the stressor be sufficiently reduced” and less about the option selected.”( WSIP TR, pg. 5-14, fn. 1).

<sup>4</sup> <https://www.fisheries.noaa.gov/west-coast/endangered-species-conservation/pacific-coastal-salmon-recovery-fund>

### 3.6.3. Individual Projects

Individual projects demonstrate much lower costs for very high value steelhead benefits. For example, at the Nimbus Hatchery in Folsom a two-year project is underway to construct a 1,900 foot fishway that adds additional natural spawning habitat and allows more fish to reach the hatchery area before they die. In addition, the project is providing enhancements for public viewing of the spawning salmon and steelhead by constructing an underwater viewing area. The cost of this project is \$9.7 million.<sup>5</sup> It is clear that this project provides a high level of both use and nonuse benefits for salmon and steelhead at a fraction of the cost of the Pacheco Dam project.

The Battle Creek Salmon and Steelhead Restoration Project is a twenty-year project located in Shasta and Tehama Counties. The project restored 42 miles of habitat on Battle Creek and an additional 6 miles on tributaries. In addition, the Project reduced migration barriers at hydroelectric facilities including multiple dam removals, a mile long bypass canal, and fish ladders.<sup>6</sup> This is probably the largest salmon and steelhead project in California, and its ecological benefits are clearly larger than the proposed Pacheco Dam. For reference, this project costs \$162 million (\$2021), one tenth the cost of the “alternative project” used as the basis of the benefits estimate for the Pacheco Dam.

### 3.7. Reasonable Range of Benefits

Because Valley Water provides little evidence that increased dam releases will improve the steelhead population in Pacheco Creek, these ecosystem benefits are likely zero. Furthermore, the comparison of costs for other steelhead habitat improvement projects and increased water flow, to the benefits estimate in the Feasibility Documentation, show there are alternatives with significantly lower costs. The examples in Table 1 demonstrate the outrageous magnitude of the estimated ecosystem benefits compared to real world benefits estimates.

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<sup>5</sup> <https://www.usbr.gov/mp/cao/hatchery/>; <http://carmichaeltimes.com/articles/2020/0827-Freeway-for-Fish-Heads/index.php?ID=8810>

<sup>6</sup> Battle Creek Salmon and Steelhead Restoration Project, September 2017. <https://www.battle-creek.net/restoration.html>

**Table 1. Potential Alternatives Projects to Value Ecosystem Benefits to Pacheco Creek (Net Present Value in \$2021)**

<b>Physical Benefit</b>	<b>Total Cost</b>
<b>Valley Water Claim – Cost of Smaller Pacheco Dam that Dedicates All Water Supply to Steelhead Benefits<sup>7</sup></b>	<b>\$1,491.5 million</b>
<b>Large projects with more benefits than Pacheco Dam</b>	
Restore salmon and steelhead habitat in Battle Creek – 48 miles of riparian and stream restoration, multiple dam removals, canal	\$162 million
Steelhead Recovery Plan for Pajaro River and Salinas River Core 1 Population (Pacheco Creek is part of the Pajaro River complex) <sup>8</sup>	\$117 million (NPV)
<b>Potential alternative benefit estimates (\$2021)</b>	
Purchase 4,300 AF/yr of Agricultural water at \$316-\$749/AF over time <sup>9</sup>	\$81.5 million (NPV)
Purchase 4,300 AF/yr of M&I water at \$761-929/AF over time <sup>10</sup>	\$105.8 million (NPV)

Because the Feasibility Documentation does not predict a population improvement, the maximum benefit estimate would likely be equivalent to the value of the additional agricultural water. The cost of purchasing agricultural water is used as the basis for a maximum plausible value for the ecosystem benefits for steelhead. The total net present value of 4,300 AF per year is \$81.5 million (Table 2).

**Table 2. Alternative Estimate of Ecosystem Benefits for the Pacheco Dam Project**

	<b>Valley Water Claim</b>	<b>Maximum Plausible Value</b>	<b>Most Likely Value</b>
<b>Estimated Benefits (\$M)</b>	\$1,491.5	\$81.5	\$0

<sup>7</sup> From Table 4-17, Valley Water 2021.

<sup>8</sup> From Table 20, Page E-9 NOAA 2013 expressed in 2021 dollars.

<sup>9</sup> From Table 5-5 Delta Export \$/AF in below normal water year converted to 2021 dollars (California Water Commission 2016, pgs. 5-16&17). Net present value calculation assumes a linear increase in cost between 2030 and 2045.

<sup>10</sup> From Table 4-9 Cost of M&I water during below normal year (Valley Water 2021, pg. 4-12). Net present value calculation assumes a linear increase in cost between 2030, 2040, 2050 and 2060.



## 4. Other Ecosystem Benefit Considerations

The Feasibility Documentation includes construction mitigation costs of \$59.7 million and claims that this will fully mitigate project impacts as required in the WSIP TR.<sup>11</sup> This figure does not appear to be justified and may be inadequate to fully mitigate the impacts of the new dam. The Feasibility Documentation Appendix (October 2021) does not discuss this issue. Any unmitigated environmental impacts that would occur during and after the construction period should be monetized and subtracted from Valley Water's claimed ecosystem benefit. This is yet another way in which Valley Water appears to have vastly overstated ecosystem benefits from the project.

## 5. Emergency Water Supply Benefits Are Extremely Overstated

The Feasibility Documentation claims emergency water supply benefits with a cumulative present value of \$792.2 million, or \$21.5 million annually. The emergency water supply benefits are based on the risk of a simultaneous flood of twenty or more islands in the Delta that disrupts water supplies from the State Water Project and Central Valley Project for an extended time. The Feasibility Documentation grossly overstates these benefits by misusing outdated and invalid risk estimates, and assuming an implausible no-project scenario. In addition, the report completely ignores more recent analysis of this risk from the Department of Water Resources (DWR) and Valley Water's own water management plan. Under more realistic scenarios, the emergency water supply benefits of Pacheco dam are at or near zero. The maximum plausible emergency water supply benefit from Pacheco dam is just over \$1 million annually, meaning that the Feasibility Documentation overestimates water supply benefits by at least a factor of 20.

The Feasibility Documentation's estimate of emergency water supply benefits is based on a misuse of the Delta Risk Management Study (DRMS) (DWR et al. 2009). Specifically, it errs in three significant ways: 1) overestimates Delta levee failure probabilities, 2) overestimates the duration of an interruption in Delta water supply, and 3) overestimates the economic loss from interruptions. A frequently occurring mistake in the analysis is that it assumes that no other actions have been taken or will be taken to reduce these risks, whether in the Delta itself, or through local actions that are specified in Valley Water's own Water Supply Master Plan (Valley Water 2019).

### 5.1. Risk of Delta failures is grossly inflated using an outdated and invalid study

The Feasibility Documentation assumes a grossly inflated probability of a catastrophic 20-30 delta island failure event taken directly from the outdated Delta Risk Management Study (DRMS) against clear warnings against such action in the study itself and ignoring more recent assessments. The first page of the report of the Independent Review Panel of the DRMS study states, "the IRP cautions users of this revised DRMS Phase 1 report that **future estimates of consequences must be viewed as projections that can provide relative indicators of directions of effects, not predictions to be interpreted literally**" (CALFED Science Program Independent Review Panel 2008, pg. 3)." The Feasibility Documentation ignores this warning

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<sup>11</sup> Valley Water 2021, pg. 6-5.

and more recent studies of Delta levees, and directly uses the outdated and inaccurate failure probabilities – assuming a 4.2% annual probability of a catastrophic 20-30 delta island failure event.

## 5.2. Recent data and reports on risk are ignored

The Feasibility Documentation also ignores recent history, failing to use the 15 years of observation since the DRMS levee failure estimates were released in 2006 to evaluate its reasonableness. According to DRMS, the expected number of Delta island breaches between 2006 and 2021 is around 40, in reality there have been no breaches of this type. The Feasibility Documentation cites a DRMS estimate of a 42% probability of at least one delta island levee breach annually which equates to a 1 in 3,500 chance that the levees would perform as well as they actually have over the past 15 years. Clearly, the Feasibility Documentation fails to apply even the most basic reasonable test of direct observation to its assumptions.

DWR does not assume failure probabilities of this magnitude. In 2013, DWR's Bay Delta Conservation Plan (BDCP) Economic Benefits Analysis used a 2% failure probability based on the DRMS analysis, less than half the 4.2% probability assumed in the Pacheco Feasibility Documentation. This 2% probability in the 2013 report is actually cited in the Feasibility Documentation, yet no explanation is given for why they did not use this more recent assessment.

The Pacheco Dam Feasibility Documentation also ignores other reports of Delta levees that show Delta levees to be in far better condition than estimated in DRMS such as Chapter 5 of the 2012 Economic Sustainability Plan, and more recently, the Delta Stewardship Council's Delta Levee Investment Strategy (Delta Protection Commission 2012; <https://deltacouncil.ca.gov/dlis/>). With an average \$22 million per year investment since the 1980's, there has been about a 50 percent reduction in levee failures in the Delta, according to DWR (Department of Water Resources 2019).

## 5.3. The duration of water supply interruptions is overstated

The Feasibility Documentation greatly overstates the likely duration of water supply interruptions from a delta levee failure scenario. Specifically, it assumes a 12-month outage, which is more than double current estimates and is double the state's current 6-month planning guidelines for the same scenario. In fact, DWR has revised its estimate of likely water supply outage from such an event to weeks and months, not years. In 2015, the Director of DWR changed the description of seismic induced outages from years to weeks and months. "The shutdown could last for weeks or months depending upon how much fresh water was available to flush salt water out of the Delta"<sup>12</sup>

By 2018, DWR's official guidance was to plan for a 6-month outage. "In consideration of this fact, DWR has asked urban water agencies to assume a 6-month Delta outage when preparing water supply reliability analyses as part of their Urban Water Management Plans" (Sunding 2018, pg. 28). Valley Water's 2020 Water Shortage Contingency Plan states "multiple earthquake-generated levee breaches and levee slumping along the freshwater pathway can be repaired in less than six months. Significant improvements to the central and south Delta levee

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<sup>12</sup> <https://mavensnotebook.com/2015/07/13/media-call-director-mark-cowin-on-the-revised-environmental-documents-for-california-water-fix/>

systems along the emergency freshwater pathway began in 2010 and are continuing.” Thus, the expected duration of a water supply interruption from a catastrophic levee breach scenario is less than 6 months according to Valley Water’s own planning documents.

#### 5.4. The costs of water supply interruptions are grossly overstated

The Feasibility Documentation overstates the cost of water supply interruptions by overestimating the amount of water supply shortages and underestimating the ability of the agency to manage shortages. Valley Water’s 2020 Water Shortage Contingency Plan states the following about a six-month outage to Delta water supplies, “The impacts of such an outage are largely operational as retailers would be required to use groundwater instead of their usual treated water supplies and Valley Water would actively manage the groundwater recharge program to meet countywide needs. Even with increased pumping, groundwater storage is estimated to remain in the normal (Stage 1) range. Thus, the impacts of a six-month Delta outage are manageable assuming a normal starting position (Valley Water 2020, pg. 11).” In addition, the Feasibility Documentation overestimates future shortages from these outages by ignoring planned water supply and storage investments. For example, it assumes water recycling capacity remains below 27,000 AF, whereas Valley Water’s 2020 Water Supply Master Plan forecasts 48,000 AF of recycled water supply will be available by 2040.

#### 5.5. The plausible range of emergency water supply benefits is between zero and \$1.2 million annually

Zero emergency water supply benefits are likely for several reasons. As stated above, Valley Water’s own planning documents describe the impacts of a 6-month delta supply outage as operational and manageable, and not requiring conservation efforts unless it occurred during a severe drought. In addition, DWR, with the support of Valley Water, proposes to build a Delta water conveyance tunnel largely for the purpose of eliminating this risk. If this project went forward, the emergency water supply benefits claimed by Pacheco dam would no longer exist.

In addition, Delta levees are likely to continue improving with additional public and local investment. The water supply disruption described in the Feasibility Documentation is only one part of the massive consequences of large-scale Delta levee breaches, should they occur. Such an event would likely create mass fatalities and devastating property damage.<sup>13</sup> The people of California would enjoy a much broader range of benefits, including saving lives, communities, other infrastructure, and water supplies from an increased levee investment strategy. The Feasibility Documentation’s claim of emergency water supply benefits is based on a very tenuous assumption that significant actions will not continue to be taken to bolster Delta levees against this broad array of consequences, in the absence of the Pacheco Dam project. Thus, there are three reasons to believe that Pacheco dam would actually provide little to no emergency water supply benefits.

The maximum plausible emergency water supply benefit is about \$1.175 million per year (Table 3). This value can be derived by calculating Valley Water’s share of statewide benefits assessed in two studies by DWR. Valley Water receives about 3.6% of water exported from the

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<sup>13</sup> DRMS estimated 700 fatalities from a 20-30 island breach scenario, which would make it the deadliest disaster in California since the 1906 San Francisco earthquake. It also estimated local property and infrastructure damage comparable to the Camp Fire that destroyed the town of Paradise in 2018.

Delta.<sup>14</sup> The first report is the 2013 BDCP Economic Benefits analysis. In this analysis, the expected annual benefit for safeguarding the state from an earthquake induced Delta levee failure was estimated at \$32.64 million (2021\$). Applying this benefit estimate to Valley Water’s share (3.6%) produces a \$1.175 million annual benefit.<sup>15</sup> In a more recent 2018 economic analysis, DWR estimated the statewide cost of a 7.5 month outage to Delta water exports at \$499 million. If we assume a 1% annual probability of a catastrophic Delta levee failure and Valley Water’s share (3.6%), the annual benefit of emergency protection is \$0.18 million annually (Sunding 2018). It should be noted that this 7.5-month outage is longer than expected and thus the estimated annualized value of emergency protection benefit is likely overstated. While we believe the lower values in more recent estimates are more likely, we use this \$1.175 million as the maximum plausible value of annual expected emergency water supply benefits.

**Table 3. Value of Emergency Water Supply (Net Present Value \$2021)**

	<b>Valley Water Claim</b>	<b>Maximum Plausible Value</b>	<b>Most Likely Value</b>
<b>Estimated Benefits (\$M)</b>	\$792.2	\$26	\$0

## 6. The Feasibility Documentation’s Estimated Benefits from M&I Water Supply and M&I Water Quality are Underwhelming

Valley Water used its WEAP model to value an estimated 3,595 AF increase in average M&I water supplies that would result from the construction of Pacheco Dam. The increase in water supply varies across water year types from wet to critically dry, with the largest increase in water supplies occurring in critically dry years. Using the WEAP model, the weighted average value of M&I water supplies across all water year types is estimated to be \$903 AF in 2030 and rises to \$1,115 AF by 2060. While I did not specifically review Valley Water’s WEAP model, it is worth noting that the unit values for M&I water are somewhat higher than other similar estimates. Most notably the Los Vaqueros feasibility documentation estimates the value of M&I water delivered to the South Bay in a critically dry year at \$1,094 in 2030, compared to \$1,222 value used by Valley Water in the Pacheco Feasibility Documentation.

Because I have not reviewed the WEAP model in depth and the physical water supply benefits of Pacheco Dam are low, this analysis accepts Valley Water’s M&I values for Pacheco Dam even though its unit values for M&I water appear to be high. Similarly, I did not specifically review the claimed water quality benefits. Because I did not review the water quality benefits and this value is relatively low compared to the project costs, this analysis uses Valley Water’s estimate of water quality benefits. My use of these values in the present analysis should not be considered an endorsement.

<sup>14</sup> Valley Water’s Water Supply Master Plan states they receive an average of 162,000 AF annually in Delta exported water through the State Water Project and Central Valley Project. The Delta Stewardship

<sup>15</sup> Council reports average Delta water exports of 4.5 million acre feet over the past 15 years. Thus, Valley Water represents about 3.6% of the total water supply exported from the Delta.

The Pacheco Dam Project would produce a very modest increase in the M&I water supply and do so at much higher costs than other projects in Valley Water's master plan.<sup>16</sup> The M&I water supply benefits and costs also look poor compared to other surface storage proposals under consideration by the WSIP. For example, the Los Vaqueros Reservoir Expansion project increases the M&I water supplies to the Bay Area by 32,400 AF/year at a projected construction cost of \$894.8M. Comparing Los Vaqueros numbers to the 3,595 AF/year M&I water supply yield for the Pacheco Dam at a construction cost of \$2.1 B shows the Pacheco Dam would provide one tenth the water supply for three times the cost.

## **7. Ability-To-Pay Analysis Ignores State Standards for Affordability, the Local Cost-of-Living Crisis, and Recent State Analysis Showing Santa Clara Water Bills Are Unaffordable for Disadvantaged Communities**

Valley Water's assessment of ability-to-pay (Feasibility Documentation, section 5.5.2) relies on a single, outdated federal standard from over 40 years ago. The 1980 EPA affordability threshold of 2.5% of median household income has not been utilized by the State of California for many years, because it is obviously irrelevant to the current, economic reality of California households. Since 1980, it is well-known that income inequality and the general cost-of-living have soared across California, especially in Santa Clara County. Valley Water's use of this obsolete federal standard while ignoring recent State assessments is methodologically invalid and stunningly insensitive to the extreme cost pressures and economic hardships faced by many Santa Clara County households.

### **7.1. Valley Water ignores the State's 1.5% Affordability Threshold and the State Water Boards's Drinking Water Needs Assessment**

As recently highlighted by the Public Policy Institute of California,<sup>17</sup> the State of California has used a 1.5% of median household income as a water affordability threshold for many years, not the outdated 2.5% of median household income used by Valley Water. Furthermore, recent analysis by the State Water Board has used two additional affordability thresholds; extreme water bill and the prevalence of water shut-offs.<sup>18</sup> As shown in Figure 2, most of the local water agencies served by Valley Water exceed at least one or more of these affordability thresholds and the region stands from the rest of the State for having acute affordability challenges.

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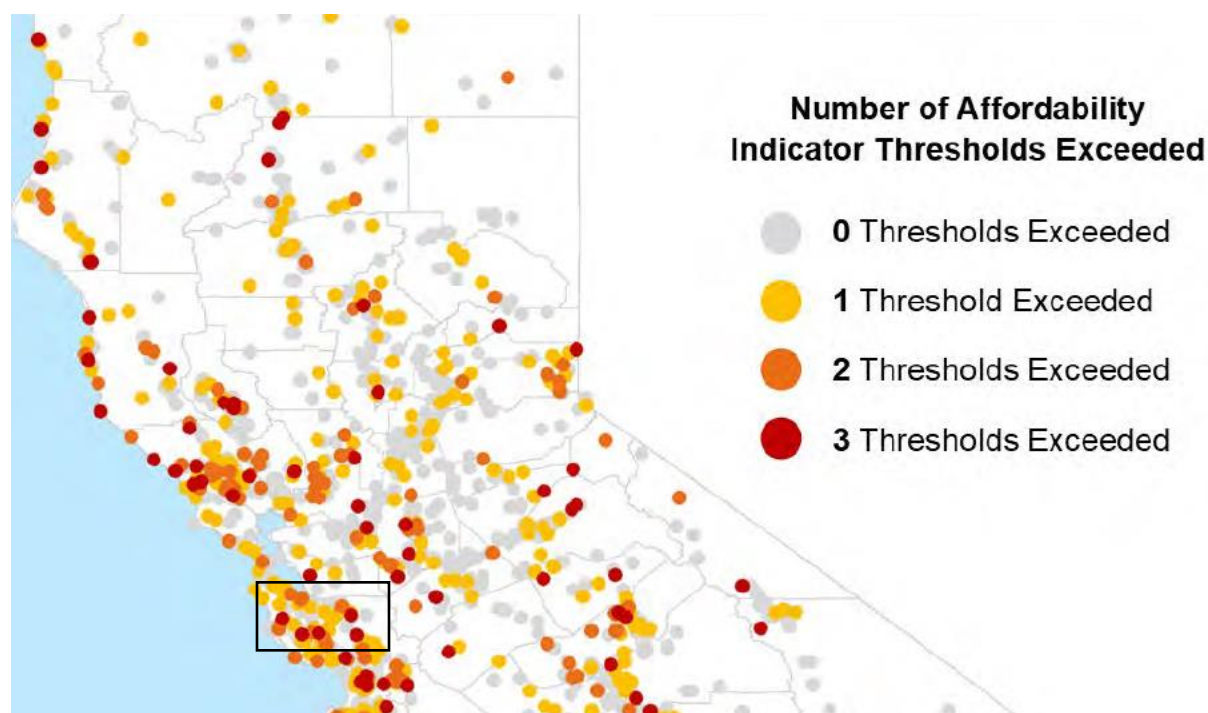
<sup>16</sup> Santa Clara Valley Water District October 22, 2021 Special Meeting, Agenda item 4.

<sup>17</sup> <https://www.ppic.org/publication/water-affordability/>

<sup>18</sup>

[https://www.waterboards.ca.gov/drinking\\_water/certlic/drinkingwater/documents/needs/2021\\_needs\\_assessment.pdf](https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/documents/needs/2021_needs_assessment.pdf)

**Figure 2.** State Water Resource Control Board Assessment Shows Almost All Santa Clara County Water Districts Exceed Affordability Thresholds. (From Figure 49, page 122 of State Water Board’s 2021 Drinking Water Needs Assessment.)



## 7.2. Valley Water ignores the cost-of-living crisis in Santa Clara County

It is stunning that Valley Water’s Feasibility Documentation ignores the well-known cost-of-living challenges facing Santa Clara County households when considering their ability-to-pay higher water bills. Experts in water policy agree that this broader affordability context is important. For example, the Public Policy Institute of California states, “More precise local measures of affordability—for instance, [including housing costs in calculations](#)—could better inform affordability programs.”

The following are just a few facts describing the burden and impact of the region’s cost-of-living on Santa Clara County households.

- Total monthly bills for Santa Clara County residents are the highest in the United States (Doxinsights 2021).
- Overall cost of living in San Jose is estimated to be 215% above the U.S. average (bestplaces.net 2021).<sup>i</sup>
- A record 56% of Silicon Valley residents say they plan to leave in the next few years with 84% citing the cost of living as the main reason they plan to move (Joint Venture Silicon Valley 2021).

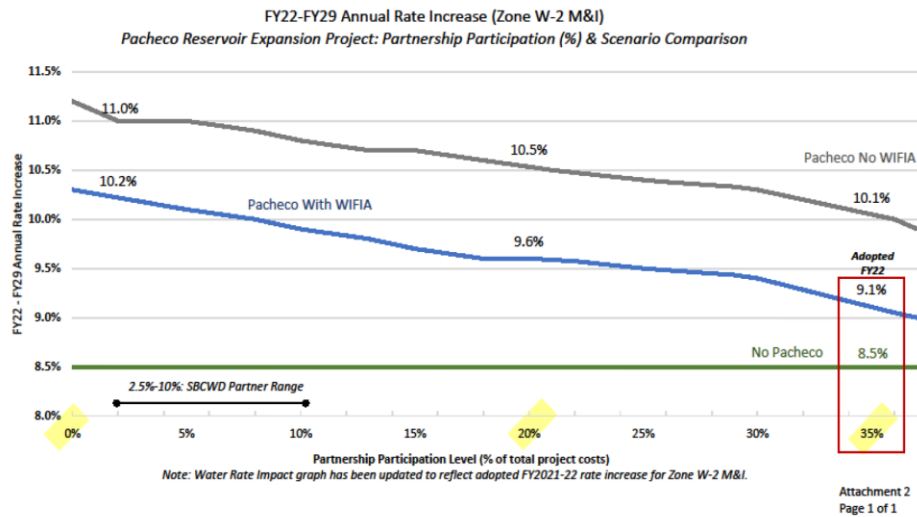
Clearly, the capacity of Santa Clara households to bear any increase to their monthly bills, whether water or otherwise, is zero.

7.3. Valley Water’s representations of rate increases from the new Dam are misleading.

Valley Water has provided the required commitment letter to CWC for not less than 75% of the non-public benefit costs share of the Pacheco. But in materials presented to its Board of Directors to justify this commitment, Valley Water used just one very misleading rate impact graph to support a massive financing commitment to the Pacheco Dam.<sup>19</sup>

**Figure 3.** Sole exhibit presented to Valley Water board prior to finance commitment vote (SCVD November 9, 2021 board meeting, Agenda item 7.1, attachment 2).

**Water Rate Impact**



The figure above shows the estimated impact on average rate increases from FY 2022 to 2029, but Pacheco Dam construction is expected to run from 2025 to 2032. Thus, this average calculation includes many pre-construction years with near zero costs, and only extends through half of the construction period.

The rate increase graphic suggests a 0.6% annual rate increase over 7 years (4.2% cumulative) assuming high partnership participation and low-cost WIFIA financing and a worst-case scenario of 2.5% annual rate increases (19% over 7 years) results from constructing Pacheco reservoir. These small rate increases are clearly insufficient to support this financing commitment.

Valley Water District’s most recent Comprehensive Annual Financial Report shows the district had \$500 million in long-term debt, and water rate revenue of \$267 million in 2020.<sup>20</sup> Financing an estimated 75% of Pacheco’s \$2.2 billion cost would more than triple the long-term debt and require rate increases several times larger than Valley Water claims in the rate increase graphic.

Taken together, these findings show that Valley Water has not adequately assessed the capacity of its ratepayers to handle the massive costs allocated to them for the Pacheco project

<sup>19</sup> SCVWD November 9, 2021 meeting, Agenda item 7.1, attachment 2.

<sup>20</sup> [https://www.valleywater.org/sites/default/files/2021-02/FY2020-CAFR\\_0.pdf](https://www.valleywater.org/sites/default/files/2021-02/FY2020-CAFR_0.pdf)

and the large rate increases that will result. Valley Water ignored state standards for water bill affordability, as well as recent state findings that water bills are not affordable in their service area. To add insult to injury, Valley Water used a clearly misleading and incomplete estimate of water rate impacts to support its financial commitment letter to WSIP.

## 8. Alternative Estimate of Benefits and Conclusion

Valley Water's Feasibility Documentation does not follow well established economic analysis practices, as documented in the WSIP Technical Reference. As a result, its benefit cost analysis includes grossly inflated benefits to justify its enormously expensive dam project (California Water Commission 2016). Most importantly, the Feasibility Documentation used a smaller version of the Pacheco Dam Project itself, and clearly invalid approach that gives the absurd result that the value of ecosystem benefits soars in response to rising project costs, not physical improvements in ecosystem benefits. Valley Water ignores the WSIP Technical Reference's specific warning against this approach, and it is clearly not the least cost method of providing steelhead benefits. Second, the Feasibility Documentation uses an outdated study to value emergency water benefits, and ignores real world recent data to develop risks for a Delta levee failure. Again, Valley Water is grossly inflating the benefits to justify its costly project.

Table 4 compares Valley Water's claimed benefits to more accurate values. Using the discount rate and duration assumptions of the feasibility study (2.5% discount rate and 100-year lifespan, 2021 dollars as illustrated in Tables 4-18 and 4-19 of the Feasibility Document), a more accurate net present value of benefits ranges from \$274.3 million to \$381.8 million. This compares to the Feasibility Documentation's present value benefit estimate of \$2,558 million, the vast majority of which are invalid ecosystem benefits. **Thus, the Feasibility Documentation (and the information upon which Proposition 1 funding is based) overestimates the project benefits by a factor of 7 or more.** Even with these wildly inflated benefits, the Feasibility Documentation analysis only found that benefits slightly exceeded costs for a benefit-cost ratio of 1.18. Using more appropriate benefit values shows that Pacheco Dam badly fails a benefit-cost test. The maximum plausible benefit-cost ratio is 0.18 and the most likely benefit-cost ratio is 0.13. **With costs approximately six times larger than the maximum plausible value of benefits, Pacheco Dam is clearly not economically feasible as required by WSIP.**



*Table 4. Alternative Estimate of the Net Present Value of Benefits of the Pacheco Dam Project*

Category	Valley Water Claim (\$M)	Maximum Plausible (\$M)	Most Likely Benefits (\$M)
<b>Public Benefits</b>			
<b>Ecosystem Improvement in Pacheco Creek</b>	\$1,491.5	<b>\$81.5</b>	\$0
<b>Ecosystem Improvement in San Joaquin River Watershed</b>	\$6.4	<b>\$6.4<sup>1</sup></b>	\$6.4 <sup>1</sup>
<b>Emergency Response</b>	\$792.2	<b>\$26</b>	\$0
<b>Non-Public Benefits</b>			
<b>M&amp;I Water Supply</b>	\$142.5	<b>\$142.5<sup>1</sup></b>	\$142.5 <sup>1</sup>
<b>M&amp;I Water Quality</b>	\$125.4	<b>\$125.4<sup>1</sup></b>	\$125.4 <sup>1</sup>
<b>Total Benefits</b>	\$2,558	<b>\$381.8</b>	\$274.3
<b>Total Costs</b>	\$2,120	<b>\$2,120</b>	\$2,120
<b>Benefit Cost Ratio</b>	1.18	<b>0.18</b>	0.13

<sup>1</sup>Directly from Pacheco Reservoir Feasibility Documentation (Valley Water 2021)

In addition to economic feasibility, WSIP requires financial feasibility. As previously discussed, Valley Water’s ability-to-pay analysis is grossly inadequate to support a finding of financial feasibility. In addition, financial feasibility requires “that beneficiaries of non-public benefits are allocated costs that are consistent with and do not exceed the benefits they receive.” (WSIP TR, pg. 3-4). Table 4 shows that the net present value of non-public benefits accruing to Valley Water ratepayers is \$267.9 million, the sum of municipal and industrial water supply and water quality benefits. These benefits are less than one-sixth the \$1,664.4 million in costs that are allocated to Valley Water ratepayers in Table 5-12 of the Feasibility Documentation. The Feasibility Documentation appears to justify the difference with public ecosystem benefits. However, as discussed repeatedly in this review, those public benefits are wildly inaccurate. Furthermore, these public benefits do not accrue exclusively to Valley Water ratepayers as the cost allocation assumes. **As a result of a) an inaccurate ability-to-pay analysis, and b) Valley Water ratepayers have allocated costs that exceed the benefits they receive, the Feasibility Documentation finding that Pacheco Dam is financially feasible is incorrect and unsupported.**

Finally, the revised public benefits also reveal that Pacheco Dam does not generate public benefits sufficient to justify its WSIP grant award. The Maximum Conditional Eligibility Determination was set at \$496.7 million. The calculated benefit ratio for the most likely level of public benefits as 0.01 and the benefit ratio for the maximum plausible public benefits of the project at 0.23 (Table 5). Clearly, the benefits of the Pacheco Dam Project do not justify \$496.7 million in WSIP funding for public benefits.

*Table 5. Public Benefit Ratio for WSIP Award*

<b>Category</b>	<b>Valley Water Claimed</b>	<b>Maximum Plausible</b>	<b>Most Likely</b>
Total WSIP Maximum Conditional Eligibility Determination Amount (\$ millions)	\$496.7	<b>\$496.7</b>	\$496.7
Present Value of Total Net Public Benefits (\$ millions)	\$2,290.1	<b>\$113.90</b>	\$6.40
<b>Public Benefit Ratio</b>	<b>4.61</b>	<b>0.23</b>	<b>0.01</b>

In conclusion, as a result of multiple fatal errors in the Feasibility Documentation, there is an insufficient basis for the Commission to find that the Pacheco Dam project is economically and financially feasible.

## References

- Bestplaces.net. 2021. Cost of Living in San Jose California.  
[https://www.bestplaces.net/cost\\_of\\_living/city/california/san\\_jose](https://www.bestplaces.net/cost_of_living/city/california/san_jose).
- CALFED Science Program Independent Review Panel. 2008. Review of the Delta Risk Management Strategy Phase 1 Report. October.
- California Water Commission. 2016. Water Storage Investment Program: Technical Reference. November.
- California Water Commission. 2018. Public Benefit Ratio Review Summary: Pacheco Reservoir Expansion Project. February 1.
- Delta Protection Commission. 2012. Economic Sustainability Plan for the Sacramento-San Joaquin Delta. January 19. <http://delta.ca.gov/wp-content/uploads/2021/05/Delta-Economic-Sustainability-Plan-2012-508.pdf>
- Department of Water Resources. 2019. State Funds Awarded for Delta Levee Improvement and Rehabilitation Projects. Annual Report to the Delta Stewardship Council. November.
- Doxoinsights.2021. Regional Bill Comparison 2021. <https://www.doxo.com/insights/regional-bill-comparison/>
- DWR, USACE, and DFG (California Department of Water Resources, U.S. Army Corps of Engineers, and California Department of Fish and Game). 2009. *Final Phase 1 Report. Risk Analysis 2005 Base Year Results, Risk Report: Section 14. Delta Risk Management Strategy*. March.
- Freeman, Myrick R., JA Herriges, CL Kling. 2014. The Measurement of Environmental and Resource Values: Theory and Methods.
- Joint Venture Silicon Valley. 2021. 2021 Silicon Valley Poll.
- NOAA: West Coast Region National Marine Fisheries Service. 2013. South-Central California Steelhead Recovery Plan. December.
- Santa Clara Water District. 2017a. Benefit Calculation, Monetization, and Resiliency. A3: Monetized Benefit Analysis. Pacheco Reservoir Expansion Project. August.  
[SCVWDPacheco\\_BMCRA03\\_Monetized\\_Benefits\\_Analysis.pdf | Powered by Box](#)
- Santa Clara Water District .2017b. Eligibility and General project Information A1: Executive Summary. Pacheco Reservoir Expansion Project. August.  
[SCVWDPacheco\\_EGPIA01\\_ExecutiveSummary.pdf | Powered by Box](#)
- Sunding, David. 2018. Economic Analysis of Stage I of the California Waterfix: Costs and Benefits to Urban and Agricultural Participants. Prepared for California Department of Water Resources. Page 28.
- Valley Water. 2019. Santa Clara Valley Water District Water Supply Master Plan 2040. November.  
[https://www.valleywater.org/sites/default/files/Water%20Supply%20Master%20Plan%202040\\_11.01.2019\\_v2.pdf](https://www.valleywater.org/sites/default/files/Water%20Supply%20Master%20Plan%202040_11.01.2019_v2.pdf)

Valley Water. 2020. Santa Clara Valley Water District 2020 Water Shortage Contingency Plan. June. <https://fta.valleywater.org/dl/UvrQU06QpP>

Valley Water. 2021. Supplemental Feasibility Documentation Water Storage Investment Program. Pacheco Reservoir Expansion Project. November. <https://cadwr.app.box.com/s/nnojv5aovyd92xspa5ucc4cnyun7h/file/885519971460>

## Dr. Jeffrey A. Michael Biographical Sketch

Dr. Jeffrey Michael is Director of Public Policy Programs and Professor of Public Policy at the University of the Pacific, McGeorge School of Law. Prior to his appointment as Director, he was Executive Director of the Center for Business and Policy Research (CBPR) in Pacific's Eberhart School of Business while holding a joint appointment as Professor of Public Policy at McGeorge. He is based at Pacific's Sacramento campus.

Jeff is well-known for economic forecasts and research reports on business and public policy issues impacting Northern California. Jeff's work with CBPR focused on issues of regional growth and sustainability, including job growth, water resources, transportation, and housing. His research has been published in scholarly journals and books such as the *Journal of Law and Economics*, *Energy Policy*, and *Ecological Economics*, and he has been a principal investigator on over \$5 million in grants and contracts.

Jeff is a recognized expert in California water issues, leading major research projects for state and local government agencies and has been invited to testify as an expert to the legislature and various state boards and commissions on these topics. In recent years, he was recognized as one of six experts to watch on the economics of California water by *Water Deeply*, received the Carla Bard Environmental Education Award from the Bay Institute, and a resolution of commendation from the California Assembly for "invaluable contributions to state policy on water issues.

Jeff is frequently quoted in the local and national press and speaks about the economic outlook and policy issues to civic and business organizations. Before coming to Pacific, he was faculty, Associate Dean, and Director of the Center for Applied Business and Economic Research at Towson University in Maryland. Jeff received his Ph.D. from North Carolina State University, M.S. from the University of Maine, and B.A. from Hamilton College.