



via email: [deltaconveyancecomments@water.ca.gov](mailto:deltaconveyancecomments@water.ca.gov)

14 December 2022

Carolyn Buckman, Assistant Deputy Director  
California Department of Water Resources  
Attention: Delta Conveyance Office  
P.O. Box 942836  
Sacramento, CA 94236-0001

**Subject: Restore the Delta Comments on Delta Conveyance Project Draft  
Environmental Impact Report (Tunnel DEIR)**

To whom it concerns:

This letter originates from lands of the Lisjan Ohlones in the East Bay, of Yokut lands in the Stockton area, and Miwok lands of the Delta further north. These lands represent the great connections of the San Francisco Bay with the Delta estuary.

Restore the Delta (RTD) is a grassroots campaign of residents and organizations committed to restoring the Sacramento-San Joaquin Delta so that fisheries, communities, and family farming can thrive there together again; so that water quality is protected for all communities, particularly environmental justice communities; and so that Delta environmental justice communities are protected from flood and drought impacts resulting from climate change while gaining improved public access to clean waterways. Ultimately our goal is to connect communities to our area rivers and to empower communities to become the guardians of the estuary through participation in government planning and waterway monitoring. RTD advocates for local Delta stakeholders to ensure that they have a direct impact on water management decisions affecting the well-being of their communities, and water sustainability policies for all Californians.

We summarize our general comments in this cover letter. Our detailed specific comments on this Tunnel DEIR chapters and related appendices in Attachment 1 of our letter. We include other attachments as needed to support Attachment 1, and these additional attachments are listed after our signatures to this cover letter.

Our letter also incorporates by reference the comments of the Shingle Springs Band of Miwok Indians, the group letter led by Natural Resources Defense Council, the group letter led by Central Valley Air Quality, and the group letter led by Sierra Club California.

## **General Comments**

RTD has reviewed many sections of the Tunnel DEIR on the Delta Conveyance Project (Tunnel Project). We conclude that its hydrologic and operational modeling efforts proceed from premises that are far less certain in reality than DWR appears to believe. The Tunnel DEIR also minimizes and marginalizes Delta environmental justice communities, and uses unbalanced methods to obscure and erase the likelihood of Tunnel Project effects on these communities.

The fact there is yet another Delta conveyance project (the previous one being “California WaterFix”) for the public to evaluate (and likely reject) is evidence of a continuing failure of state and federal water policy to address expected and unfolding effects of climate change on the San Francisco Bay-Delta Estuary and its greater watershed. The existence of this Tunnel DEIR is itself a marker of continuing, if more subtle, climate denialism by the California Department of Water Resources. The Tunnel Project will not save the Delta, and it probably will not save the State Water Project’s and Central Valley Project’s reliance on Delta exports either.

The very definition of the Delta’s role as an estuary is being disrupted by climate change now. Climate change undermines the engineered role the Delta plays in redistributing California’s water from north to south. Tides threaten to gain the upper hand on both the estuary and the Delta common pool from which millions of people draw fresh water for drinking and irrigating. The proposed Tunnel Project is seen by the State of California as THE engineering solution to this problem. But the problem of salinity management is not so susceptible of simplistic engineering solutions like the Tunnel Project.

A stated purpose of the Tunnel Project is to invest billions of dollars to maintain a *status quo ante* of water deliveries from the State Water Project. It does little to address climate adaptation in the Delta and fails to preserve through-Delta conveyance which both systems will continue needing if they are to operate as they do at present. It has never been less certain that a tunnel project is a good idea any longer. The rest of our comments will make a case for why this is so.

The other Delta Tunnel objectives are contrived selling points to augment this fundamental purpose.

Along with the present threat of losing salinity control, many other climate extremes, emergencies, and tipping points are increasingly coming into focus. And while RTD would never accuse DWR and the Bureau of ignoring or denying climate change, these two major governmental water agencies are nonetheless derelict in responding to it. DWR in particular is hide-bound in its loyalty to a Delta conveyance approach eclipsed by the emerging and growing effects of extreme heat and extreme storms.

A huge failure of imagination by DWR is on display in this DEIR. Each of its alternatives is vulnerable to the slings and arrows of expected climate change effects, which we will go into further below when commenting on project modeling methods and results. But what we see displayed in the Tunnel DEIR is a complete failure of state water officials to imagine alternative approaches these last few years since the demise of California WaterFix in early 2019. Instead, DWR has focused narrowly on preserving a system whose mode of obtaining and distributing water supplies may already be beyond preservation and protection by the time it is completed.

In general, DWR's approach to climate change is to take the likelihood of extreme storms and the supplies that could be skimmed from their runoff, while discounting other major climate change effects. It is unrealistic and unwise, however, to pick and choose which climate change effects to analyze when striving to comply with full disclosure laws like CEQA. Reality will bring them all at varying times and intensities. DWR's climate change rationales and modeling of the future for the Delta Tunnel Project is wholly inadequate because they ignore the panoply of extreme heat, expanding hot seasons, and assume current sea level rise projections remain reasonable in light of new scientific information about tipping point elements that we summarize in this comment letter. This Tunnel DEIR was out of date for climate change science when it was released this July. The Tunnel Project is out of step with looming realities of climate change and should be discontinued immediately so that other climate mitigation, adaptation, and resilience investments may be planned and implemented sooner than later.

We are deeply disappointed that DWR ignored its *Your Delta, Your Voice* Survey as a basis for informing how and what kind of environmental, environmental justice, and community impacts the Delta Tunnel Project would impose on the Delta EJ community both of the direct Legal Delta and of the Delta Region as a whole. It is plainly obvious that 1) the Legal Delta as well as the Delta Region are *bona fide* environmental justice communities, with relatively small proportions of white and wealthy populations; 2) Delta residents AND Delta region community members rely substantially on the Delta directly, and the north Delta in particular, for subsistence fishing, and it is thus an environmental impact to have both fishing spots taken away from anglers and fish removed from the vicinity for North Delta Intakes construction activities; and 3) in the operational phase, lost flows in the Delta will increase salinity in the Delta as it reduces flows in north and central Delta channels, and thereby contributing to the spread of harmful algal blooms which will disproportionately injure Delta people who rely on fishing and broad outdoor activities to enjoy the Delta. In sum, the Delta Tunnel Project will harm such beneficial users of water as fish, outdoor water-contact recreation, and environmental justice communities.

Thank you for considering our comments on this Tunnel DEIR.

Sincerely,



Barbara Barrigan-Parrilla  
Executive Director



Tim Stroshane  
Policy Analyst

Attachments:

1. RTD's Specific Comments on the Delta Conveyance Project Tunnel DEIR
2. Table of North Delta Intakes Usage Frequency
3. Commenting on a State Water Resources Control Board staff report about Climate Change and Water Rights in March 2021
4. RTD Protest Letter of June 4, 2021 to State Water Resources Control Board concerning DWR and Bureau Temporary Urgency Change Petition

5. RTD Protest Letter of April 6, 2022 to State Water Resources Control Board concerning DWR and Bureau Temporary Urgency Change Petition
6. RTD Comment Letter of July 18, 2022 to U.S. Army Corps of Engineers concerning North Delta Barriers notice of DWR barriers proposed for Steamboat and Miner Sloughs
7. RTD Comment Letter of August 22, 2022 to DWR concerning West False River Drought Salinity Barrier Draft Environmental Impact Report
8. Extreme Heat Index Days for Sacramento Valley, Delta, and San Joaquin Valley Counties during 21st Century
9. Delta Flows Upstream and Downstream of North Delta Intakes
10. Early September 2022 Sacramento River Flow and Salinity Conditions at Isleton with West False River Barrier in Place
11. Comparison of Monthly Average Sacramento River near Freeport Flows in Appendix 4B and Appendix 5A
12. Visual Land Use Projections by United States Geological Survey, 2010-2100 by Western Geographical Science Center
13. List of Restore the Delta Commenters

cc: E. Joaquin Esquivel, Chair, State Water Resources Control Board  
Dorene D'Adamo, Vice-Chair, State Water Resources Control Board  
Nichole Morgan, Member, State Water Resources Control Board  
Sean Maguire, Member, State Water Resources Control Board  
Laurel Firestone, Member, State Water Resources Control Board  
Michael George, Delta Watermaster  
Dillon Delvo, Little Manila Rising  
Matt Holmes, Little Manila Rising  
Irene Calimlim, Greenlining the Hood  
Jasmine Leek, Third City Coalition  
Tama Brisbane, With Our Words, Inc.  
Regina Chichizola, Save Our Salmon  
Kasil Willie, Save Our Salmon  
Chief Caleen Sisk, Winnemem Wintu Tribe  
Gary Mulcahy, Government Liaison, Winnemem Wintu Tribe  
Malissa Tayaba, Shingle Springs Band of Miwok Indians  
Krystal Moreno, Shingle Springs Band of Miwok Indians  
James Sarmento, Shingle Springs Band of Miwok Indians  
Doug Obegi, Natural Resources Defense Council  
Kate Poole, Natural Resources Defense Council  
Brandon Dawson, Sierra Club California  
Jonathan Rosenfield, San Francisco BayKeeper  
Harry Black, City Manager, City of Stockton  
Melinda Terry, North Delta Water Agency  
Dante Nomellini, Central Delta Water Agency  
John Herrick, South Delta Water Agency  
Thomas Keeling, Freeman Firm  
Stephen J. Welch, General Manager, Contra Costa Water District  
Kelley Taber, Somach Simmons & Dunn  
Osha Meserve, Soluri Meserve  
Stephanie Safdi, Stanford Mills Environmental Law Clinic  
Deborah Sivas, Stanford Mills Environmental Law Clinic



## **Attachment 1**

### **RTD's Specific Comments on the Delta Conveyance Tunnel DEIR**

#### **Executive Summary**

Reviewing the Executive Summary, we count 17 significant and unavoidable impacts of the proposed Tunnel project on the environment.<sup>1</sup> Among these impacts will be loss of prime agricultural farmland, loss of local non-tribal cultural resources, transportation and air quality impacts, and painful loss of tribal cultural resources. There are other impacts omitted, belittled, or greenwashed by the Tunnel DEIR. The California Department of Water Resources (DWR<sup>2</sup>) appears to us to claim reliance on mitigations that are provided by other entities doing restoration or other work in the Delta region that will essentially be public subsidies to the project and its beneficiaries, state and federal water contractors.

The tally of significant and unavoidable environmental impacts of the proposed project would be even greater were it not for inclusion by DWR of environmental commitments, actual CEQA-compliant mitigation measures, a compensatory mitigation plan, and a community benefits program for the project.

1) **“Environmental Commitments and Best Management Practices”**—DWR uses a large number of these “ECs” and “BMPs” to build into the project description actions that will mitigate project **construction period** effects. These are used especially to address construction-related impacts of trucks, engine and equipment emissions, dust, alteration of channel beds and other habitat, among many others. These are listed in Appendix 3B, which supports Chapter 3 about the project description, pages 3B-1 and -2 and Table 3B-1. Generally, ECs/BMPs are actions that do not exceed what normal local permit conditions would require of private sector developers altering the environment on the scale DWR proposes doing. These are stated as “commitments” because DWR is an agency of the State of California, and the state of California is legally exempt (i.e., immune) from local regulations (much like the University of California is exempt from local ordinances, but may choose to abide by them for the sake of community harmony between town and gown).

By proposing ECs and BMPs DWR seeks recognition as a good corporate citizen by claiming these ECs and BMPs will be part and parcel of the Tunnel's project description. The challenge lies in how to enforce the ECs and BMPs DWR says it is committing to, to avoid having them become window-dressing and greenwashing. We insist that ECs and BMPs be incorporated into the Mitigation Monitoring Program Plan required as part of the process of certifying the Final EIR on the project and final project approval by DWR. We are concerned with how and whether they will be monitored and enforced and by whom. By insisting they be folded into the Mitigation Monitoring Program Plan, they would be visible to someone with authority and expertise to implement and enforce them, and should be transferred into contract terms with contractors

---

<sup>1</sup> In all, there are 71 potentially significant impacts identified in the Executive Summary of the Delta Conveyance Project Draft EIR applies mitigations to render them less-than-significant. The SU (significant and unavoidable) impacts we count in the Executive Summary include: AG-1 and -2; AES-1 through -3; CUL-1 through -5; TRANS-1, AQ-5 and -6; NOI-1; Paleo-2; and TCR-1 and -2.

<sup>2</sup> We write “DWR” here, but as it concerns construction and buildout matters, we really mean DWR, the Delta Conveyance Design and Construction Authority (DCDCA), the State Water Contractors, the general construction contractor and all subcontractors hired by each of these agencies to construct Tunnel project facilities and systems. On these matters, “DWR” is shorthand for these entities as well in this letter.

doing the work. Enforcement of the ECs and BMPs must also be built into the contracting structure used to carry out project construction so that from the general contractor all the way to various on-the-ground electrical, mechanical, construction, and structural contractors these commitments and practices are adhered to, while originating from the Mitigation Monitoring Program. Among other best practices followed should be commitments by DWR to adhere to DWR minority- and women-owned business enterprise contracting policies.

**2) Mitigation Measures**—These are actions required under CEQA that could reduce potentially significant environmental effects to the point where they are no longer significant or are avoided altogether. As mentioned, part of formal mitigation under CEQA and final project approval, DWR will be required to prepare a mitigation monitoring plan (MMP) prior to project approval that specifies what is to be done, how, by whom, and when it is to be completed. The project cannot be approved without an MMP.

**3) Compensatory Mitigation Plan**—This “CMP” is proposed primarily for the Tunnel’s otherwise significant and unavoidable impacts on aquatic and terrestrial species and ecosystems in the Delta, which will be legion. This plan focuses on habitat restoration work to create wetland and other freshwater habitat in the Delta to make up (that is “compensate”) for losses of habitat due to tunnel construction elements—roads, shafts, new levees, damage internal to channels during the construction period from coffer dams, noise, and other environmental disturbances that will destroy and otherwise reduce habitat for or cause take of special status and listed species. Among the questions about the CMP will be whether DWR is providing enough mitigating habitat *on its own*, or whether it is justifiable that DWR can point to other restoration projects under way, required by other habitat conservation plans or other initiatives from other entities.<sup>3</sup> RTD’s view is that to rely on others’ good works defeats the point of project proponents’ accepting responsibility and being accountable for mitigating impacts they cause with their projects.

Given this overall framework of mitigation approaches in the DEIR, RTD went through the Executive Summary and identified impacts that were considered significant before mitigation and then less than significant after DWR applied “MM CMP: Compensatory Mitigation Plan” to them, as though CMP was a wild card in rummy or a “get out of jail free” card.

There are 55 such impacts (which do not overlap with significant and unavoidable [SU] impacts) identified in the Executive Summary that are considered significant and then have “MM CMP: Compensatory Mitigation Plan” listed among the mitigations (or as the sole mitigation) and comes out the other side with the impact after mitigation being LTS or “less than significant.”<sup>4</sup>

There are eight impacts where the CMP is the sole mitigation. Seven (7) are for biological resources; only one is for an impact of some other kind: AQ-10, which applies to non-Alternative 5 alternatives. Given that the CMP applies primarily to Bouldin Island and adjacent sites along

---

<sup>3</sup> That is, will DWR fully compensate with restorative mitigations in lieu of the impacts to ecosystem values the Delta Tunnel Project will cause? Or will DWR prefer to claim benefits of restorative actions for which other entities are responsible?

<sup>4</sup> Less-than-significant impacts in the Tunnel DEIR that are claimed as mitigated by the Compensatory Mitigation Plan (CMP) include: AQUA-1 and -2; AQUA-5 through -7; Bio-1 through -5; Bio 7 through 14; Bio-16; Bio-18; Bio-20 through -48; Bio-51; Bio-53 through -56; and AQ-10—a total of 55 CMP impacts.

State Route 12 toward Interstate 5, we regard the CMP with skepticism, but acknowledge that further analysis of this is beyond the scope of our capacity to comment. Please refer to the group letter led by Natural Resources Defense Council for more detailed analysis.

4) **Community Benefits Program**—This portion of the Tunnel DEIR is arguably the most slippery part of this project description. It would have two principal features: 1) a Delta Community Fund; and 2) “Economic Development and Integrated Benefits.” DWR describes the CBP in two places—Chapter 34 and Appendix 3G, but RTD views the CBP as an essential part of the project description, not an afterthought.

The CBP “is a set of commitments made by project proponents and created in coordination with the local community to address local effects that may occur from large infrastructure projects. These commitments are usually made separate from, and in addition to, permit conditions or environmental mitigation required through CEQA or other environmental regulatory compliance processes” whose scope does not reach to the level of the local economy’s status with respect to project impacts. The Tunnel Project has region-scale impacts on the Delta, should it be built. The Tunnel DEIR acknowledges that a major operational impact will be reducing Sacramento River flows (and hence flows to its distributaries in north and central Delta channels) and reducing the estuary’s ability to repel tidal salt waters which are ever-present (see Attachment 9 to this letter). Such operational impacts will have economic and ecological impact on the Delta region, and a Community Benefits Program must be developed to mitigate the economic and ecological effects of Tunnel operations on Delta communities, especially environmental justice communities.

***One challenge for the Delta community with this type of mitigation approach will be whether the diverse class, race, and gender segments of the community can come together to craft what it wants to see and then organize politically and legally to extract it from DWR and the State of California.***

As with all of these “mitigation approaches,” as DWR calls them, the real test of their effectiveness will be whether they can be enforced on DWR, and whether DWR proves itself a good and diligent developer and neighbor after over 70 years of treating the Delta like a social, economic, ecological, and cultural afterthought.

## **Project Purpose, Objectives, Description, and Alternatives**

The “fundamental purpose” of the proposed Tunnel project is to restore and protect the reliability of State Water Project (SWP) deliveries and, potentially, Central Valley Project deliveries south of the Delta, “consistent with the Water Resilience Portfolio” in a “cost-effective manner.”

Additionally, the Tunnel Tunnel DEIR offers some related objectives to further justify the project:

- To “help address” sea level rise and other reasonably foreseeable climate change consequences and extreme weather events.
- To minimize public health and safety effects of catastrophic levee failures from a major seismic event that would salinize the Delta.

- To protect the ability of the SWP “and potentially the CVP” to meet contractual obligations for water supply deliveries consistent with state and federal Endangered Species Act and Delta Reform Act requirements and mandates.
- To provide “operational flexibility to improve aquatic conditions in the Delta and better-manage risks of further regulatory constraints on project operations.”<sup>5</sup>

The proposed project, then, is essentially seen by DWR as a climate-adaptation action that would invest at least \$16 billion in capital to construct a set of diversions to a tunnel from a watershed whose future hydrology will be quite different from its past and present.

RTD agrees that the central questions surrounding the proposed Tunnel project include the future of the Delta<sup>6</sup> and the future utility of existing SWP and CVP pumping and conveyance facilities should neither water system be able to export fresh water from Delta channels in the not-too-distant future. The Delta has been the key fulcrum—the topographic low point—from which both the SWP and CVP have transferred water from northern to southern regions of California.

The future of this system of north-to-south water redistribution is threatened with extinction in the era of climate change and sea level rise.

Since the 1930s it has been established knowledge and practice that a fresh-water hydraulic barrier to incoming tidal salt water is necessary to divert water and facilitate exports of surplus supplies from the Delta.<sup>7</sup> This barrier volume is factored into how much water is released to meet Delta export contractor water demands with acceptable salinity levels during normal operations of both CVP and SWP. It is sometimes referred to as “carriage water” since it “carries” water for export from the Delta Cross Channel (when it is open) to the central Delta to the San Joaquin River.<sup>8</sup>

In April 2022 (just eight short months ago), the upstream storage situation became so dire DWR and the Bureau of Reclamation feared there may not be enough water in the coordinated

---

<sup>5</sup> *Delta Conveyance Project DEIR*, Chapter 2, Project Purpose and Objectives, pp. 2-2, lines 23-38, to p. 2-3, lines 1-4. Hereafter cited as *Tunnel DEIR*, accessible at <https://www.deltaconveyanceproject.com/read-the-document>.

<sup>6</sup> By the “future of the Delta” we are concerned about its future as a cultural and historical place; as a source of outdoor recreation and drinking water to adjacent cities and towns of the region; as an estuary; as a productive agricultural community; and as an array of tribal homelands and environmental justice communities seeking reconnection with the estuary.

<sup>7</sup> California Department of Public Works, *Bulletin 27, Variability and Control of Salinity in the Sacramento-San Joaquin Delta*, 1931, pp. 44-45, accessible at <https://archive.org/download/variationcontrol27calirich/variationcontrol27calirich.pdf>. See also Tim Stroshane. 2015. “A Century of Delta Salt Water Barriers in the Delta.” Prepared for Restore the Delta, June, accessible at <http://restorethedelta.org/wp-content/uploads/2015/06/A-Century-of-Delta-Salt-Water-Barriers-2015-06-05.pdf>.

<sup>8</sup> In dry years, when water transfer markets form, a factor for carriage water must be incorporated into each transfer to ensure each water deal is consummated to the satisfaction of the receiving party (in terms of quantity of acceptable-quality water). This is important because operation of a Tunnel Project would eliminate need for carriage water from transfers and regular export operations more generally.

CVP/SWP system to maintain this hydraulic barrier, according to their petition for urgent changes to their water rights in the Delta. Continuing to meet existing Delta water quality objectives, claimed DWR and the Bureau, would deplete much needed storage last spring that would otherwise serve fish and wildlife habitat, Delta water quality, and Delta exports at low health and safety minimum levels. The two agencies stated clearly that drought impacts also threatened the Delta itself with massive salinization:

Further impacts could even result in a “loss of control” over salinity encroachment in the Delta in 2022 and into 2023 in a continued drought scenario. “Loss of control” describes a condition in which very low storages in the major Project reservoirs will not allow sufficient release capability to control intrusion of ocean water into the Delta, which would make the Delta water quality incompatible with in-Delta beneficial uses. This condition would persist until Northern California receives rainfall that produces sufficient runoff to flush the Delta of ocean water, which would once again allow for these in-Delta beneficial uses. Failure to sufficiently control Delta salinity would jeopardize the ability to provide for minimum health and safety supplies for communities both within the Delta and those who rely upon the Delta for water supply.<sup>9</sup>

Deliveries to senior water right contractors at quantities at all close to those in 2020 and 2021 had already depleted reservoir storage, though such facts are omitted from this frightening discussion of loss of salinity control in Delta waters. This scenario must be avoided as long as possible given the threats of climate change and sea level rise. Senior water rights contractors should share in a significant portion of these water expenditures, since, after all, they received beneficial deliveries while many other contractors and the rivers’ ecosystems received little or no supplies during this drought. They were dealt winning hands from the CVP and SWP in 2020, 2021, and in 2022 (except for the Sacramento River Settlement Contractors who accepted an 82 percent reduction in 2022 in their senior supplies from Shasta Lake). In so doing, deliveries to senior contractors in both projects contributed greatly to the predicament where SWP and CVP operating staff could lose salinity control in the Delta. Senior water rights were privileged over the following year’s protection of the Shasta Lake cold water pool for Sacramento River salmon and any cold water Lake Oroville could deliver to the Lower Feather River.<sup>10</sup>

Continuing application of the legal doctrine of prior appropriation applied to CVP and SWP allocations and operations under such dire storage and weather conditions would be madness, and therefore an unreasonable use and diversion (from storage) of water precisely because it undermines present operations that entail through-Delta conveyance of stored supplies for export to CVP and SWP contractors. If there was ever a time when supplies of the two projects

---

<sup>9</sup> California Department of Water Resources and US Bureau of Reclamation, *Temporary Urgency Change Petition Regarding Delta Water Quality*, March 18, 2022, pages 1-17 to 1-18. Emphasis added. Accessible at [https://www.waterboards.ca.gov/waterrights/water\\_issues/programs/applications/transfers\\_tu\\_notices/2022/20220318\\_tucp.pdf](https://www.waterboards.ca.gov/waterrights/water_issues/programs/applications/transfers_tu_notices/2022/20220318_tucp.pdf).

<sup>10</sup> Marc Dadigan and Annelise Pierce, “‘We Had No Choice’: ACID Agreed to Water Cuts During Negotiations with Federal Officials,” *Shasta Scout* 13 October 2022, accessible at <https://shastascout.org/we-had-no-choice-acid-reluctantly-agreed-to-severe-federal-water-cuts-during-negotiations%ef%bf%bc/>.

should be equitably shared so that all farming regions of California could receive some level of climate change mitigation, this is that time.

The above quote so much as agrees and presages that loss of salinity control in the Delta would “jeopardize the ability to provide for minimum health and safety supplies for communities both within the Delta and those who rely upon the Delta for water supply.” Environmental justice communities with small community water systems and wealthier communities reliant on Delta supplies for drinking water would be harmed if insufficient water is devoted to protecting the hydraulic barrier in the Delta.

Three municipal water agencies diverting water directly from Delta channels: Contra Costa Water District, the City of Antioch, and the City of Stockton’s Municipal Utilities Department would also be harmed. DWR and the Bureau of Reclamation have ignored the rights and water quality needs of these water agencies—who serve about 750,000 people—to have safe and good quality drinking water to divert for their municipal and domestic customers. These agencies will likely face higher water treatment costs to protect their customers from high salt concentrations and harmful cyanobacteria, as well as other water quality risks of Delta inflows and outflows—and which would ensue from construction and operation of the Delta Tunnel project.

In addition, nearly 80 Delta-based small community water systems could be harmed, if not immediately, not long after loss of salinity control occurs.<sup>11</sup> There are numerous CVP and SWP municipal and industrial contractors that rely on imported water in the San Joaquin Valley, San Luis Obispo and Santa Barbara counties, and the service area of the Metropolitan Water District of Southern California.<sup>12</sup> Cities like Tracy, Fresno, Bakersfield and others would be affected. National wildlife refuges rely on imported supplies from the Delta in the San Joaquin River and Tulare Lake basins. Loss of salinity control would worsen drought conditions for native and introduced fish and wildlife species dependent on these water ways, as well as migratory waterbird populations.<sup>13</sup>

---

<sup>11</sup> California Department of Water Resources, *Small Water Suppliers and Rural Communities at Risk of Drought and Water Shortage Vulnerability and Recommendations and Guidance to Address the Planning Needs of These Communities*, Report pursuant to Section 10609.42 of the California Water Code, Draft, March 2020, prepared by Water Use Efficiency Branch, supplemental Excel database file containing SWS Risk Scores. Accessed 21 September 2022 at <https://data.cnra.ca.gov/dataset/drought-risk-small-suppliers-and-communities>.

<sup>12</sup> Metropolitan’s service area comprises urbanized portions of Ventura, Los Angeles, Orange, San Bernardino, Riverside, and San Diego counties.

<sup>13</sup> San Joaquin River Exchange Contractors normally import Delta flows that originate in Shasta Lake. On April 1, the Bureau announced that these senior water rights contractors would start receiving deliveries from releases at Friant Dam (Millerton Lake), already “calling” on their basic, original water rights transmuted under drought conditions to what storage is available at Millerton Lake behind Friant Dam. Such early deliveries to senior water rights contractors are exactly the kind of action the Bureau took with releases in 2021 from Shasta Lake. The strategy is to send along deliveries while there are still supplies in the lakes; pay little heed to what is left for meeting other water supply or environmental compliance requirements. The April 1 announcement by the Bureau will affect municipal and domestic supplies for the cities of Fresno, Bakersfield, Lindsay, Orange Cove, and Strathmore, all of whom contract for water service from the Friant-Kern Canal. These communities and the agricultural districts throughout the Friant-Kern Canal service area will likely be forced to pump more groundwater to maintain water service to their customers.

Other effects to consider with climate change include salt intrusion and how that will negatively impact the water quality of this supply system. During droughts, salinity penetrates the Delta, which could not only expose Delta agriculture to more saline irrigation supplies, but also compromise the quality of water exported south of the Delta, where current climatic conditions (desert ecosystem) require crops to need more water in Kern county. This is mainly due to a combination of historical geology of the region as prior to being a landmass, it was under the ocean and modern salt intrusion increases. The Delta is a transition zone between freshwater and saltwater, therefore salinity in the Delta is a water quality issue that may affect water use for industrial, municipal, agricultural, fish and wildlife purposes and services. Forces that can increase salinity levels in the Delta include: *tidal forces, agricultural run-off, exports and freshwater inflow from the Sacramento and San Joaquin rivers*.<sup>14</sup> Even though naturally, with current conditions most water contains salt and irrigation adds salt to soil overtime especially in arid and semi arid areas that also experience less rainfall and poor drainage (due to clay in the layers of the soil).<sup>15</sup> Although DWR and the U.S. Bureau of Reclamation (USBR) manage salinity in compliance with the State Water Board decision 1641 to protect water quality with flow and salinity objectives, during drought conditions, Delta water quality will be compromised due to lack of flow and salt intrusion.<sup>16</sup> *Delta Adapts* modeling shows that droughts will become more frequent due to climate change and this will cause significant and more severe water shortages.<sup>17</sup> If sea level rise is projected to increase, the combined outcome of that on water supply will cause *Delta exports to decrease 10 percent a year on average and 20 percent in drier years*. Increase in temperatures will also cause snowpack to reduce, alter runoff patterns and increase water demand (especially south of the delta, in order to irrigate commodity crops like almonds).

Current salty soil conditions and increased temperatures pose a threat to current Delta conditions due to lack of flow and salinity intrusion. With increased temperatures in the future, Delta exports will fall 4 million acre feet in 25 percent of years. Variability in precipitation will give rise to extreme wet and extreme dry years where the North Delta storage reservoirs are expected to decrease more than 1 million acre feet annually.<sup>18</sup> This will not only affect California farmers down south but also Delta communities and farmers who rely on Delta water uses as episodic water quality declines will pose a threat to residents (among them are Environmental Justice communities) and their livelihood.<sup>19</sup> Climate change will also reduce reservoir storage in all year types, meaning less water can be carried over from one year to the next, increasing the water supply system's vulnerability to droughts and impacts when they occur. Though current conditions pose a threat to Delta water quality and ecosystem conditions, it is clear that the discussed future climatic conditions will pose an even larger threat on the reliability of meeting water demand and water quality for export south of the Delta. Therefore, it may be worthwhile to consider a project that not only addresses but mitigates these issues in a sustainable manner to ensure the reliability of north to south Delta exports and water quality for Delta agriculture, Delta

---

<sup>14</sup> Delta Stewardship Council. 2022. *Delta Plan Performance Measures, Salinity*, accessible at: <https://viewperformance.deltacouncil.ca.gov/pm/salinity>.

<sup>15</sup> Food and Farm Discussion Lab. 2017. *Soil Salinity Threatens California Farms*, accessible at: <http://fafdl.org/?p=3919>.

<sup>16</sup> *Delta Adapts*, p. 5-31.

<sup>17</sup> *Delta Adapts*, p. 5-34.

<sup>18</sup> *Delta Adapts*, p. 5-56.

<sup>19</sup> *Delta Adapts*, p. xiii.



communities, and farming communities in Southern California that are dependent on the quality of this water supply.

The implications we outline here are of course partial, but the point is there are drastic stakes should salinity control fail in the Delta. The curtailments occurring in the CVP enabled more water to be kept in storage to protect young salmon, staving off cultural genocide against Northern California Indian Tribes, and protecting not only Delta environmental justice communities but also the “27 million Californians” that DWR so proudly boasts of serving with clean water at two of its web pages.

The Tunnel Project points to a future where the supplies of both the CVP and SWP would be restored and protected, yet the Tunnel Project would still require continuing through-Delta conveyance as did California WaterFix. (See Attachment 2 to this letter.)

Unfortunate events at least partially attributable to climate intervened in the accustomed operations of the CVP and SWP. Already in 2021 and 2022, RTD staff have participated in seven sets of discussions and public meetings with state agencies about the threat to the state’s water supply and losing control of salinity in the Delta under the current technological regime of through-Delta conveyance to export pumps in the south Delta. These included:

- Commenting on a State Water Resources Control Board staff report about Climate Change and Water Rights in March 2021. (See Attachment 3 to this letter).
- Dramatic and unexpected loss of runoff in April 2021 led to DWR and the Bureau suddenly filing a temporary urgency change petition (TUCP) with the State Water Board to relax Delta water quality objectives to store more water in reservoirs. (See Attachment 4 to this letter).
- Dramatic loss of snowpack between December 2021 and March 2022 that led again to DWR and the Bureau suddenly filing another TUCP with the State Water Board to relax Delta water quality objectives to store more water in reservoirs. (See Attachment 5 to this letter.)
- Participating in the Delta Stewardship Council two-day science symposium about salinity management in the Delta, on April 26-27, 2022.
- Participating in the Delta Watermaster’s meeting with Delta and upstream water right holders’ representatives about “Water Management in the Delta” about climate change and water rights on July 14, 2022.
- Commenting July 18, 2022, on the U.S. Army Corps of Engineers’ notice of undertaking NEPA environmental review on DWR’s proposal to install rock barriers in Steamboat and Miner Sloughs in the North Delta. (See Attachment 6 to this letter.)
- Commenting on DWR’s Tunnel DEIR for the West False River Barrier on August 22, 2022. (See Attachment 7 to this letter.)

We list all of these processes and comment opportunities not just to show how busy RTD has been. We list them because common to each they illustrate the salinity emergency for which the State has so far failed to prepare adequately. Salinity management in the Delta is out of balance. The very definition of the Delta’s role as an estuary is being disrupted by climate

change now. Climate change undermines the engineered role the Delta plays in redistributing California's water from north to south. Tides threaten to gain the upper hand on both the estuary and the Delta common pool from which millions of people draw fresh water for drinking and irrigating at some point each year. The proposed Tunnel Project is seen by the State of California as THE engineering solution to this problem. But the problem of salinity management is not so susceptible of ready, if also complex, engineering solutions like the Tunnel Project.

A stated purpose of the Tunnel Project is to invest billions of dollars to maintain a *status quo ante* of water deliveries by the State Water Project. It does little to address climate adaptation in the Delta and fails to preserve at the same time as it continues to rely on through-Delta conveyance into the future. It has never been less certain that a tunnel project is a good idea any longer. The rest of our comments will make a case for why this is so.

### **Chapter 3 Project Description and Alternatives**

While the Tunnel Project clearly needs all components described in Chapter 3 of the Tunnel DEIR, the North Delta Intakes (or Diversions) will drive the majority of operational impacts as they affect the Delta in the future. These effects are most important to evaluate in the vicinity of 2040, a few short years after the project's construction would theoretically be completed.<sup>20</sup> We focus our comments on the project description for Alternative 5, the Bethany Alignment. Its components would include a somewhat eastern alignment, but would branch off more directly south toward Bethany Reservoir, rather than veer toward Clifton Court Forebay (the existing SWP regulating reservoir that serves water directly to the Banks Pumping Plant). Banks at present serves water to Bethany Reservoir; for North Delta Diversions (NDDs) to the Tunnel, the Bethany Alignment would bypass Banks to deliver water directly to Bethany Reservoir via a new pumping plant at the foot of the hills below the lake.

For CEQA purposes, alternatives are to be evaluated in terms of how and whether alternatives reasonably meet the project purposes defined by the project proponent, DWR in this case. The fundamental purpose stated by DWR is to ensure somehow that SWP and potentially CVP deliveries can be maintained into the future in the face of climate change impacts that are expected in and to the Delta. The nine alternatives are mere variations on one theme of subterranean Delta conveyance, all of which are single-tunnel configurations of differing capacities and alignments. No other meaningful reasonable alternatives are put forward that seek to devise other non-Delta export means of somehow preserving and protecting water supplies to these same contractors served south of the Delta by the SWP and CVP. Each alternative assumes that the Delta must be altered and amended to preserve existing contractual arrangements.

A huge failure of imagination by DWR is on display in this DEIR. Each of these alternatives is vulnerable to the slings and arrows of expected climate change effects, which we will go into

---

<sup>20</sup> *Tunnel DEIR*, Chapter 4, p. 4-8, lines 2-3, states that the project's construction period would last between twelve and fourteen years. Chapter 1, Section 1.5.2.4, lists all 28 needed reviews and approvals for the Delta Tunnel Project. Assuming the project somehow obtains all necessary approvals by 2024 or 2025, and that the project experiences no delays relative to this projected timeline, the project would be operational no earlier than about 2038. So project impacts at 2040 should be thought of as being in operation for just two to four years for purposes of this comment letter.

further below when commenting on project modeling methods and results. But what we see in the Tunnel DEIR is a complete failure of state water officials to imagine alternative approaches these last few years since the demise of California WaterFix in early 2019. Instead, DWR has focused narrowly on preserving a system whose mode of obtaining and distributing water supplies may already be beyond preservation and protection by the time it is completed.

In 2009, at the behest of Governor Arnold Schwarzenegger, the California Legislature passed the Sacramento-San Joaquin Delta Reform Act. This act contains a provision that DWR refuses to engage with, the “reduced Delta reliance” mandate of Water Code section 85021. This section states in full:

*85021. The policy of the State of California is to reduce reliance on the Delta in meeting California’s future water supply needs through a statewide strategy of investing in improved regional supplies, conservation, and water use efficiency. Each region that depends on water from the Delta watershed shall improve its regional self-reliance for water through investment in water use efficiency, water recycling, advanced water technologies, local and regional water supply projects, and improved regional coordination of local and regional water supply efforts.*

There are no exceptions in this mandate. The proposed Tunnel Project does not comply in the slightest with it. In fact, though its “fundamental purpose” is to preserve and maintain SWP deliveries through time into a highly uncertain future shaped by extreme heat, extreme storms, and eventual sea level rise in the Delta, it would accomplish this by increasing, not reducing, its reliance on the Delta for reliable water supplies to SWP customers. And many local and regional water agencies are initiating their own steps to reduce their reliance on the Delta. They are increasing their local and regional self-sufficiency and improving regional coordination to preserve and protect water supplies for the local and regional agencies that serve thousands of irrigating farmers, water-consuming industrial businesses, and millions of California residents who perpetually need safe, clean drinking water.

Reasonable alternative approaches should include reimagining the Tunnel Project revenue bonds as instead a fund for a state water infrastructure plan identifying potential south-of-Delta locations for recycled and reclaimed water production plants large enough and cost-effective enough to re-use existing San Joaquin Valley sources of surface and groundwater. These sources could make up for lost supplies from north of the Delta as climate change takes its anticipated toll. In other words: a Valley-wide regional water self-sufficiency program that would be backed by property tax and revenue base that could support bonds for local and regional self-sufficiency investments. It is often assumed that agriculture may not be able to support such technologies the way that wealthier cities can. (If agriculture is to continue, farmers may not be able to afford NOT to.) Alternatives like this have not been seriously investigated. Existing SWP and CVP water supplies are already heavily subsidized by California and United States taxpayers, while some agricultural producers have gotten individually wealthy off water and other governmental support such as crop subsidies (including payments not to grow crops).<sup>21</sup>

---

<sup>21</sup> Within State Water Project contractor home jurisdictions many contractors are required by their SWP contracts to levy property tax charges on all residents. This holds true in the largest jurisdictions, Santa

State water officials, elected leaders, and all other interested parties—which means at least those Californians who engage with water policy debates and struggles—should be addressing how to overcome effects of the Delta’s vulnerabilities on their own regions from climate change from now on. The kinds of projects recently announced as receiving funds from federal infrastructure bill appropriations serve as examples for such a future.<sup>22</sup> These projects already match up with the Delta Reform Act mandate as substantial investments in “water use efficiency, water recycling, advanced water technologies, local and regional water supply projects, and improved regional coordination of local and regional water supply efforts,” that reduce Delta reliance for California’s future water needs.

The State of California has itself pushed for a number of new approaches to state water policy, conservation, and regional coordination of supplies, but needs to do more. It can start by ending its distraction and infatuation with Delta Tunnel conveyance. Redirecting expenditure of scarce public capital on the Tunnel Project to climate-resistant projects would truly make California a more resilient state in 2040 than it would be having spent untold billions on the Tunnel Project.

### **Chapters 4, 5, 6, and 30: Appendices, Framework, and Methods of the Tunnel DEIR**

These chapters and appendices of the Tunnel DEIR are best read as extensions of Chapter 2 and 3. They continue to describe and elaborate the project description’s operational activities through use of hydrologic and systems operation modeling methods. One cannot make sense of the full scope of project impacts by just examining each alternative’s facilities and the bypass operational flow criteria presented at the conclusion of Chapter 3. Chapter 4 describes how the rest of the Tunnel DEIR is organized to take advantage of the modeling methods and results on display in Chapters 5 and 6 and the associated appendices of each of these three chapters.

Moreover, readers cannot make sufficient sense of any Tunnel Project alternatives without understanding how the Tunnel DEIR handles climate change matters, which are presented in Chapter 30 and Appendix 30A. As a result, we offer comments on these various sections of the Tunnel DEIR together here.

#### *Hydrologic and System Operation Modeling and Climate Change*

*“Since all models are wrong the scientist must be alert to what is importantly wrong. It is inappropriate to be concerned about mice when there are tigers abroad.”<sup>23</sup>*

---

Clara Valley Water District and Metropolitan Water District of Southern California, to ensure that even in times when direct water rate revenues are insufficient due to drought, the overall property tax base of each contractor’s jurisdiction provides additional support to the system to avoid financial default.

<sup>22</sup> U.S. Department of the Interior Press Release, 18 August 2022, “President Biden’s Bipartisan Infrastructure Law to Help Communities Reduce Vulnerability to Drought,” accessed 15 September 2022 at <https://www.doi.gov/pressreleases/president-bidens-bipartisan-infrastructure-law-help-communities-reduce-vulnerability>.

<sup>23</sup> G. Box. 1976 “Science and Statistics,” *Journal of the American Statistical Association* 71(356): 792. December. Accessible at [http://jupiter.chem.uoa.gr/thanost/papers/papers8/JAmStatAssoc\\_71\(1976\)791.pdf](http://jupiter.chem.uoa.gr/thanost/papers/papers8/JAmStatAssoc_71(1976)791.pdf).

The premise of Tunnel DEIR methods is to rely on assumptions that facilitate marketing of proposed project to water contractors, agencies, and officials who entertain doubts about it. Hydrologic and system operations modeling were used to represent how California WaterFix would deliver supplies restored and protected from climate change back in 2013. Similarly, the CalFED Bay-Delta Program EIR/EIS in 1998-2000 relied on modeling to show “no net loss” to Delta exports along with all of the other investments that program would make in the Delta. These were narratives DWR wanted its water contractors to hear.

DWR describes its modeling approach as entailing use of general circulation models (GCMs) that produce globally averaged results for temperature and precipitation changes, based on inputs that include greenhouse gas emissions and geophysical relationships between and within the Earth’s atmosphere, oceans, and continents. These models are then “downscaled” to smaller geographic subsets of Earth, including down to the scale of a region and topography the size of California. Outputs from these downscaled models then become inputs for a number of other models. The main model for this DEIR is CalSim 3, which simulates operational interactions and produces a variety of reservoir storage, stream flow, Delta flows and exports, and water contractor delivery estimates for SWP and CVP operations.

Reliance on hydrologic and system operations modeling (e.g., CalSim 3) continues acceptance that the past is a guide to the future of California weather and climate, embodying the concept of “stationarity.” But stationarity is dead and human-caused climate change has killed it.<sup>24</sup>

Assuming stationarity of hydrological futures is probably the main way to preserve illusions that the Tunnel Project can meet its fundamental purpose of preserving and protecting SWP water supply. It is a softer form of climate change denial, but is denial nonetheless. “The inflow hydrology for the existing conditions model is based on assumptions of stationarity,” states the Tunnel DEIR. “CalSim 3 represents the hydrology of the rim watersheds as *preprocessed time series of unimpaired flows to the stream system derived from observed streamflow records*,” the Tunnel DEIR states elsewhere, adding, “In contrast, the hydrology of the valley watersheds is simulated using a rainfall-runoff model, soil moisture accounting in the root zone, and a distributed fine element mode of the underlying groundwater aquifer.” Each hydrologic model component to CalSim 3 relies on the past as a guide to the present, as it does for the No Project Conditions for 2040.<sup>25</sup> But we no longer live in that world; to proceed on its remnant bread

---

<sup>24</sup> P.C.D. Milly, J. Betancourt, M. Falkenmark, R.M. Hirsch, Z.W. Kundzewicz, D.P. Lettenmaier, and R.J. Stouffer. 2008. “Stationary is Dead: Whither Water Management?” *Science* 319: 573-574, 1 February. They write: “Stationarity is dead because substantial anthropogenic change of Earth’s climate is altering the means and extremes of precipitation, evapotranspiration, and rates of discharge of rivers. Warming augments atmospheric humidity and water transport. This increases precipitation, and possibly flood risk, where prevailing atmospheric water-vapor fluxes converge. Rising sea level induces gradually heightened risk of contamination of coastal freshwater supplies. Glacial meltwater temporarily enhances water availability, but glacier and snow-pack losses diminish natural seasonal and interannual storage....Stationarity cannot be revived. Even with aggressive mitigation, continued warming is very likely given the residence time of atmospheric CO<sub>2</sub> and the thermal inertia of the Earth system.” In other words, stationarity cannot return because heat increases yet to come are irreversibly baked in.

<sup>25</sup> *Tunnel DEIR*, Appendix 5A, Section B, Subsection B.10.1, “Climate Change Under Existing Conditions,” p. B-65, lines 24-29; and Appendix 5A, Section B, Subsection B.5.1, “Hydrology,” p. B-18, lines 22-25; on No Project conditions in 2040, see *ibid.*, p. B-65, lines 14-22.

crumbs is importantly wrong; DWR's modeling directs their readers' attention to the Tunnel Project's production of "mice" while the "tigers" lie in wait.

### Heat Events and Hot Seasons

RTD believes that DWR has sincerely attempted to adjust its 1922 through 2013 unimpaired flow time series—what DWR believes is a usable past—so that effects of climate change are present, reflected in, and expressed through CalSim 3's computations. We are equally as sincere in expressing our concern that CalSim 3 fails to take account of the potential for extended drought, extreme heat events and lengthened hot seasons, recurring extreme storms, and eventual sea level rise.

We cannot assume that droughts are exclusively hot periods—they may be extended periods where precipitation is low or non-existent relative to society's needs. They may or may not involve extreme heat. Climate scientists warn that such is here already and more lies ahead. Extreme heat events are extended heat waves where daily high temperatures break local records, generate intense regionally expressed demand for air conditioning and drinking water, and pose health risks overnight when people, wildlife, and plants have difficulty cooling down before another hot day comes. Lengthened hot seasons means that dry seasons have on average more days of extreme heat in the future than at present.

Extreme storms occurring more frequently does not mean that their occurrence would end or meaningfully reduce the duration of droughts; it may merely mean that such storms could bring intense precipitation and flooding with property damage and loss of life even in the midst of a drought.

Sea level rise can reflect two processes of climate warming simultaneously: 1) thermal expansion of oceans occurs when the seas store more heat; warmer water is less dense than cooler; and 2) aggregate melting of continental glaciers in Antarctica and Greenland, whose fresh glacial melt adds water volume to a warming ocean and circulates to all other oceans on Earth, thereby raising sea levels eventually everywhere, including the Sacramento-San Joaquin River Delta, which is connected at sea level to San Francisco Bay.

SWP and CVP facility failures also could occur as a consequence of a more extreme climate future in California should water facility maintenance lag, as occurred in February 2017 at Oroville Dam and its spillways.

Timing and sequencing of such occurrences are all but impossible to predict or forecast. Despite this, climate scientists demonstrate that due to mounting heat from greenhouse gas emissions and atmospheric circulation changes such events (i.e., droughts, extreme heat, extreme storms) are statistically speaking ever more likely in the future. Rhoades et al examined Sierra Nevada snowpack and climate change's effect on ten major reservoirs (representing nearly half of California's surface storage) and found that "end-of-century peak snowpack timing occurs four weeks earlier than at present and that peak water volume in these reservoirs would be 79 percent lower."<sup>26</sup> Swain et al found changes in atmospheric circulation altered the

---

<sup>26</sup> A.M. Rhoades, A.D. Jones, and P.A. Ullrich, 2018. "The Changing Character of the California Sierra Nevada as a Natural Reservoir," *Geophysical Research Letters* 45 <https://doi.org/10.1029/2018GL080308>.

probability of extreme climate events in the Northern Hemisphere, and that patterns in the northeastern Pacific show a statistically significant change in seasonal precipitation and temperature extremes resulting from thermal expansion of the atmosphere and sea level pressure and causing in turn “increasing anomalous northeastern Pacific ‘ridging patterns’ similar to that observed during the 2012-2015 California drought.”<sup>27</sup> Swain et al found in 2018 that human-caused climate change contributed to large increases in the frequency of wet extremes. They also found smaller “but statistically robust” increases in dry extremes as well, from which they project “a 25% to 100% increase in extreme dry-to-wet precipitation events...despite only modest changes in mean precipitation. Such hydrological cycle intensification would seriously challenge California’s existing water storage, conveyance and flood control infrastructure.”<sup>28</sup> And Persad, et al, using ten statistically downscaled global climate models and two emissions scenarios, found large agreement across models that “collectively point toward an increasingly volatile, temporally concentrated, and extreme precipitation future for the state” further reducing “projected reliability and sustainability of current water management practices to a greater degree than would be inferred from changes in total annual precipitation alone.”<sup>29</sup>

Extreme heat events of longer duration are also (statistically speaking) expected and to break records, as occurred in early September 2022 throughout California, Nevada, and parts of the American West, and in the Pacific Northwest in June 2021. The Tunnel DEIR acknowledges a place for elevated temperatures grasping project impacts:

Higher temperatures when combined with moderate or low precipitation, would result in extreme aridity and drought. Higher temperatures may also increase evapotranspiration rates, which could increase water demand in some locations. Reduced soil moisture would also exacerbate the risk of catastrophic wildfire, bring longer fire seasons with more frequent wildfires, expand fire-prone areas, and heighten post-fire impacts and may also affect the amount of runoff available to place in storage. Healthy watersheds provide much of the state’s water supply, protect water quality, and help reduce flood severity downstream but wildfire can catastrophically damage watersheds along with human infrastructure [citation] and aquatic resources.<sup>30</sup>

None of these acknowledgements find their way into actual DWR modeling methods, that we could discern. The sun’s rays striking surface water reservoirs evaporate a daily fraction. Reservoir managers must account in their management methods for evaporation from each reservoir for managing operations each day. Accordingly, CalSim 3 also includes a reservoir evaporation rate into its computations. But it appears to us that this evaporation factor, while unique to each reservoir included in the model, represents evaporation as a *static* input, rather than a *dynamic* one that would in reality respond over time to changes in atmospheric

---

<sup>27</sup> D.L. Swain, D.E. Horton, D. Singh, and N.S. Diffenbaugh. 2016. “Trends in atmospheric patterns conducive to seasonal precipitation and temperature extremes in California,” *Science Advances* 2; e1501344. 1 April. <https://doi.org/10.1126/sciadv.1501344>.

<sup>28</sup> D.L. Swain, B. Langenbrunner, J.D. Neelin, and A. Hall. 2018. “Increasing precipitation volatility in twenty-first-century California,” *Nature Climate Change* 8, pages 427–433 <https://www.nature.com/articles/s41558-018-0140-y>.

<sup>29</sup> G.G. Persad, D.L. Swain, C. Kouba, and J. P. Ortiz-Partida. 2020. “Inter-model agreement on projected shifts in California hydro climate characteristics critical to water management,” *Climatic Change* 162, pages 1493–1513 <https://doi.org/10.1007/s10584-020-02882-4>.

<sup>30</sup> *Tunnel DEIR*, Appendix 4A, Consideration of 2070 Conditions, p. 4A-4, lines 21-27, p. 4A-5, lines 1-2.



evaporative demand as extreme heat plays out in California.<sup>31</sup> Continuing emission of methane and carbon dioxide from state reservoirs will add to greenhouse gas emissions as they do from reservoirs globally as well.<sup>32</sup>

DWR is familiar with supply surprises from anomalous weather (see Attachment 4)7. By the beginning of Water Year 2021 “with relatively high carryover storage after the dry year of 2020,” DWR and the Bureau “helped to meet D-1641 requirements through the winter and early spring.” But suddenly conditions worsened. DWR and the Bureau found that precipitation was below 50 percent of average, resulting in many reservoirs being “below average” in storage. “This was uncharacteristic,” they state in a 2021 TUCP, “and likely due to unpredictable dry soils soaking up snowmelt and substantially reducing runoff into CVP and SWP reservoirs.”<sup>33</sup> They blamed Nature to avoid taking any responsibility for their suddenly diminished ability to control flows and water quality throughout the Bay-Delta estuary watershed in April and May 2021.

Nature was not strictly unpredictable in this matter, had DWR been alert to the significance of dry atmosphere and soils. While in the wake of Sierra wildfires in recent years thirsty soils absorbed large portions of snowmelt that spring but it was also possible that the atmosphere may well have evaporated water directly from snow. A warmer atmosphere is well-known by climate scientists to hold more moisture as water vapor, what is known to scientists as “evaporative demand.” In late April and early May, the Sierra Nevada experienced an early heat wave.<sup>34</sup> It is well known that snow can evaporate directly to air, bypassing water’s liquid phase through a physical process known as “ablation.”<sup>35</sup> Climate scientist Michael Dettinger alluded to this and related evaporative processes in a December 2020 interview with the Public Policy Institute of California in which he spoke of a “thirsty atmosphere”:

The atmosphere has the capacity to draw water up from the land through evaporation. Five factors affect how much water the atmosphere can take up: how warm it is, how humid, the amount of sunshine, the amount of wind, and the available water in soils, plants, lakes, etc.

---

<sup>31</sup> *Tunnel DEIR*, Appendix 5A, Section B.3, Table 5A-1, p. B-3. This table discloses input data to the CalSim 3 time series, without describing whether input data like evaporation rate is an input variable responsive to changes in atmospheric evaporative demand. On the dynamics and spatial extent of evaporative demand in the United States, see C.M. Albano, J.T. Abatzoglou, D.J. McEvoy, J.L. Huntington, C.G. Morton, M.D. Dettinger, and T.J. Ott. 2022. “A Multidataset Assessment of Climatic Drivers and Uncertainties of Recent Trends in Evaporative Demand across the Continental United States.” *Journal of Hydrometeorology* 23: 505-519, April, accessible at <https://doi.org/10.1175/JHM-D-21-0163.1>.

<sup>32</sup> C. Soued, J.A. Harrison, S. Mercier-Blais, and Y.T. Prairie. 2022. “Reservoir CO<sub>2</sub> and CH<sub>4</sub> emissions and their climate impact over the period 1900-2060.” *Nature Geoscience* 15: 700-705, September; and C. Soued. 2022; accessible at <https://www.nature.com/articles/s41561-022-01004-2>. “Long-term effect of reservoir emissions on the climate is increasingly dominated by methane.” *Nature Geoscience* 15: 694-695, September, accessible at <https://www.nature.com/articles/s41561-022-01023-z>.

<sup>33</sup> California Department of Water Resources and United States Bureau of Reclamation. 2021. Temporary Urgency Change Petition Regarding Delta Water Quality, 17 May, p. 4, (PDF page 13), accessible at [https://www.waterboards.ca.gov/drought/tucp/docs/2021/20210517\\_dwr\\_usbr\\_tucp.pdf](https://www.waterboards.ca.gov/drought/tucp/docs/2021/20210517_dwr_usbr_tucp.pdf). See also Attachment 4 to this letter.

<sup>34</sup> For example, the Feather River Basin city of Quincy at approximately 3,400 feet elevation experienced a high temperature of 85 degrees F on Thursday, April 29. See Attachment 5 to this letter.

<sup>35</sup> “Ablation” defined at <https://nsidc.org/cryosphere/glossary/term/ablation>.

Scientists often refer to the first four as the atmosphere's "thirstiness," or evaporative demand. It varies hour to hour, season to season, and year to year based on these factors.

...

A thirstier atmosphere means the same amount of precipitation leaves less water for plants, streams, reservoirs, and aquifers. We get less benefit from precipitation because a larger proportion goes back into the thirsty atmosphere. Smaller storms in particular may bring little to no water benefit at all if the atmosphere is thirsty.

The bottom line is this—as the atmosphere becomes thirstier, the land becomes drier, even if the amount of precipitation stays the same. Increased persistence and frequency of dry conditions means increased frequency and intensity of drought.<sup>36</sup>

This was an extreme heat event for the month of April and early May 2021, not some gradual, linear, routine occurrence predictable in time series modeling results. In addition to this spring heat wave in California, recent extreme heat projections from general circulation models used by the International Panel on Climate Change (IPCC) show increased frequency of and population exposure to extreme heat index days (defined as including temperature plus humidity factored in) in the United States throughout the rest of this century.<sup>37</sup> The Union of Concerned Scientists published a scientific report and produced a web site that makes heat index day results available nationwide.<sup>38</sup>

Their heat index projections are dramatic for Central Valley counties during the rest of this century. (See Attachment 8 to this letter.) For Sacramento Valley counties, the historical (1971-2000) average number of days with the heat index exceeding 90 degrees F will increase on average at mid-century by 82 percent (from about 58 to 103 days per year) and by the end of the century, about 138 percent (from about 58 to 132 days per year). In other words, the hot season in the Sacramento Valley is projected to nearly double by mid-century and could triple by the end of the century.

---

<sup>36</sup> Dettinger interviewed by L. Pottinger, "Droughts Aren't Just About Water Anymore," blog post December 15, 2020, for Public Policy Institute of California accessible at <https://www.ppic.org/blog/droughts-arent-just-about-water-anymore/>.

<sup>37</sup> A "heat index day" occurs when combined temperature and relative humidity produce a "feels like" temperature. "The HI [heat index] serves as a primary basis for the issuance of heat advisories by the US National Weather Service and has been correlated to heat-related mortality, according to climate scientists at the Union of Concerned Scientists and elsewhere." See K. Dahl, R. Licker, J.T. Abatzoglou, and J.D. Declet-Barreto, 2019. "Increased frequency of and population exposure to extreme heat index days in the United States during the 21st century," *Environmental Research Communications* 1(7), accessible 16 September 2022 at <https://iopscience.iop.org/article/10.1088/2515-7620/ab27cf>.

<sup>38</sup> See the Union of Concerned Scientists' publicly available report, Dahl, K., E. Spanger-Siegrfried, R. Licker, A. Caldas, J. Abatzoglou, N. Mailloux, R. Cleetus, S. Udvardy, J. Declet-Barreto, and P. Worth. 2019. *Killer Heat in the United States: Climate Choices and the Future of Dangerously Hot Days*. Cambridge, MA: Union of Concerned Scientists. <https://www.ucsusa.org/resources/killer-heat-united-states-0>. See also Mera, R., N. Massey, D.E. Rupp, P. Mote, M. Allen, and P.C. Frumhoff. 2015. "Climate change, climate justice, and the application of probabilistic event attribution to summer heat extremes in the California Central Valley," *Climatic Change* 133: 427-438. DOI: <https://doi.org/10.1007/s10584-015-1474-3>.

For Delta counties, the same measures for the 90 degree F heat index are 103 percent (from about 40.4 days historically to 82 days at mid-century, more than doubling) and 186 percent (from 40.4 days to 115.4 days, nearly tripling by 2100).

In San Joaquin Valley counties, the 1971-2000 period saw about 51 days on average with the heat index at or above 90 degrees F—less than two months typically in the summer. By mid-century, UCS results indicate that these counties will see about 86 such days per year on average by mid-century and about 109 by the end of the century where the heat index exceeds 90 degrees F. The experiential change would be from just shy of two months to about three months by mid-century, to over three and a half months by 2100. Similar percent-change extensions of extreme heat seasons are reported by UCS for the Bay Area and southern California (Attachment 8).

Projected heat indices in California (and the United States) will place millions of people at greater risk of illness and death from heat levels exceeding their abilities to sweat and naturally cool themselves if they lack access to cool drinking water, indoor air conditioning, and cool nights for restorative sleep.<sup>39</sup> California agriculture will experience these extreme heat events and expansion of hot seasons. Persistence of heat in the Central Valley is likely a significant threat to agriculture and water supply.<sup>40</sup>

To our knowledge none of the analyses available from the Union of Concerned Scientists' heat index projections have been applied to models used to project climate change impacts to the state's water supply and agriculture. But results such as these appear to us as a flaw in DWR's hydrologic and systems operation modeling. We found statements in Appendix 5A describing the modeling methods and results. "Under future (2040) conditions, further adjustments were made to the [CalSim 3] model logic and tables defining CVP allocations and reservoir operating rules to adapt that project operations to the effects of climate change."<sup>41</sup> Section B.10 of this appendix states in part:

CalSim 3 is a monthly model developed for planning level analyses. For existing conditions the model is run using historical observed or reconstructed unimpaired runoff, but with 2020 level water demands, facilities, regulations, and operations criteria. Output from the 94-year simulation does not provide information about historical conditions, but does provide information about storage, flow, and water deliveries that could occur under the historical weather sequence. Similarly, the No Project Alternative (2040) model provides information about storage, flow, and water deliveries that would occur under *a repeat of the historical weather sequence* transformed for (a) climate change and (b) operations of water

---

<sup>39</sup> Dahl, K., et al. 2019. Increased frequency of and population exposure to extreme heat index days in the United States during the 21st century. *Environmental Research Communications*. 1: 075002. Accessible at <https://iopscience.iop.org/article/10.1088/2515-7620/ab27cf>; and Dahl, K., et al. 2019. *Killer Heat in the United States: Climate Choices and the Future of Dangerously Hot Days*. Prepared for Union of Concerned Scientists, July. Accessible at <https://www.ucsusa.org/sites/default/files/attach/2019/07/killer-heat-analysis-full-report.pdf>.

<sup>40</sup> T.B. Pathak, M.L. Maskey, J.A. Dahlberg, F. Kearns, K.M. Bali, and D. Zaccaria. 2018. "Climate Change Trends and Impacts on California Agriculture: A Detailed Review." *Agronomy* 8(3): 25, accessible at <https://www.mdpi.com/2073-4395/8/3/25/pdf?version=1520492505>.

<sup>41</sup> *Tunnel DEIR*, Appendix 5A, Section B Modeling Technical Appendix, p. B-64, lines 34-36.

management facilities to account for sea level rise, changes in land use and population, and associated water demands and water use.<sup>42</sup>

Under Section B.10.5, Extreme Conditions, this appendix acknowledges that, “The model cannot represent the unique real-time policy decisions that SWP and CVP operators make in consultation with regulatory agencies under extreme circumstances and that deviate from standard operating policies.” But such “extreme circumstances” for DWR extend primarily to “severely low reservoir storage or inability to meet flow requirements or senior water rights, and should not necessarily be understood to reflect literally what would occur” in any given alternative:

These simulated conditions (e.g., low storage), in real-time operations would be avoided by making policy decisions on other requirements in prior months. In actual operations, *as has always been the case in the past*, the project operators would work in real-time to satisfy legal and contractual obligations given the extreme conditions.

Frequency of extreme conditions is expected to increase in the future under the combined effects of climate change and sea level rise.<sup>43</sup>

This acknowledgement, and others<sup>44</sup>, means that the Tunnel DEIR’s hydrologic and system operations modeling actually does not *account* or incorporate extreme conditions into CalSIM 3 modeling computations and results for the Tunnel DEIR. We are left to believe that DWR treats such expected events and trends as doubling or tripling of the duration of extreme heat index (hot) seasons as exogenous to, and disconnected from, for example, reservoir evaporation rates.<sup>45</sup> There also is no examination of reservoir evaporation rates in Chapter 30, Climate Change. This chapter acknowledges the lengthening of a “dry season” relevant to agriculture’s future:

Broadly, California is expected to experience a *long dry season and increased numbers of dry days and dry years* and more frequent heavy precipitation and flood events, although future total precipitation projections remain uncertain. [citation to the Fourth California Climate Assessment 2018] The modeling for this study relies on an ensemble of climate projection scenarios to account for a range of climate change outcomes; *however, it does not explicitly resolve or investigate precipitation extremes*.

---

<sup>42</sup> Tunnel DEIR, Appendix 5A, Section B Modeling Technical Appendix, p. B-65, lines 14-22. Emphasis added.

<sup>43</sup> Tunnel DEIR, Appendix 5A, Section B Modeling Technical Appendix, p. B-66, lines 25-28. Emphasis added.

<sup>44</sup> Tunnel DEIR, Chapter 30, Climate Change, pp. 30-12, lines 34-41, to p. 30-13, lines 1-30, recount climate change trends in the study area, and summarize them in some detail in Table 30-2 (p 30-14 to 30-15) but appear not to be built into Tunnel Project modeling.

<sup>45</sup> The expansion of extreme heat index seasons will of course increase demand for fresh water by all plants, whether forest species and other wild land vegetation communities, or crops in human agriculture. Plants need water for growth and cooling. Increased heat requires plants to devote more water taken up through roots to cooling plant tissues, limiting water available for growth. Crops will become thirstier as a result, driving up demand for irrigation water, of which there will be less in the future because of heat driven changes to California’s climate and precipitation patterns.

...

Warmer air temperatures may increase soil moisture loss and lead to drier soils, affecting both drought events and seasonal dryness; seasonal impacts will vary (e.g., earlier soil drying in the spring may lead to prolonged summer dryness).<sup>46</sup>

Again, while DWR does acknowledge the likelihood of lengthening dry seasons, their choice of terms excludes from the notion of “dry” the increasingly likely prospect of extreme heat in that same future, which strikes us as a kind of climate denial by DWR. But extreme heat conditions are definitely inconvenient for modeling of hydrologic and system operations describing a tunnel project that assumes at least that “future total precipitation projections remain uncertain” for California.

One way to handle uncertainty is to express modeling results as a range from low to high figures, the way the Ocean Protection Council brackets its estimates of future sea level rise along California’s coast. But DWR’s operational results are not bracketed within a potential range, but are instead presented as one set of results for reservoir storage, stream flows, Delta exports, and water deliveries to SWP and CVP customers across the range of water year types for each alternative at 2040, as shown in Appendices 5B and 6A as though modeled hydrologic and water supply outcomes are pretty certain. DWR’s modeling results overpromise reliability of water supplies for and from the Delta Tunnel Project, while declining to acknowledge supply volatility to come.

Chapter 6 reveals water supply modeling results without the Tunnel Project in place. End of September reservoir storage will decrease on average between four and 15 percent in the transition from existing conditions (2020) to No Project future conditions (2040). South-of-Delta storage at San Luis Reservoir is projected to fall ten percent for both the CVP and SWP portions of San Luis capacity. Meanwhile, long-term average deliveries for the SWP are expected to decrease by seven percent and for the CVP by 13 percent. Dry and drought year deliveries for the SWP are projected to fall ten percent (but just four percent for the Feather River Service Area senior water users), and 13 percent for the CVP (while both CVP Exchange and Settlement Contractors see small increases of three and five percent, respectively). (Senior water rights have their privileges.) Surplus water supplies (e.g., Article 21 water) within the SWP are projected to decrease from 65 percent at present (2020) to 53 percent. These are all results without the Tunnel Project in place.<sup>47</sup>

Chapter 6 goes on to compare existing condition storage and deliveries for the two water systems from all nine proposed Tunnel Project alternatives, and nearly all SWP customers come out smelling like roses. Total Table A deliveries (those to contractors not otherwise part of the Feather River Service Area and its senior water users) across the alternatives see long term average *increases* of between 12 and 15 percent, and average supplies rise from 3.5 million acre-feet (MAF) in 2020 to just over 4 MAF for nearly all the alternatives (topped by Alternative 5, the preferred alternative). The Feather River senior water users will see essentially no

---

<sup>46</sup> *Tunnel DEIR*, Chapter 30, Section 30.2.2.2, Twenty-First Century Climate Change Projections for California, p. 30-11, lines 30-35, and p. 30-12, lines 8-10. Emphasis added.

<sup>47</sup> *Tunnel DEIR*, Chapter 6, pages 6-38 and 6-39, Table 6-2 and Table 6-3.

change from existing conditions to the fully operational Tunnel Project, because they are, as always, assumed to be first in line for SWP deliveries anyway.

Dry and drought year supply performances for SWP contractors will be on the order of 15 to 23 percent greater for Table A contractors and slight decreases of zero to one percent for the Feather River seniors—priority has its privileges, even in modeling.

Total CVP deliveries are expected to rise by just one percent for most alternatives as compared with 2020 conditions, and no change for the senior Exchange and Settlement contractors over the present. During dry and drought years, most alternatives will see small changes of one to nine percent over existing conditions, and again no change expected for the Exchange and Settlement contractors over present dry and drought years.<sup>48</sup>

The Tunnel Project's performance in these model results confirms DWR's stated objective back in Chapter 2 of the Tunnel DEIR that the fundamental purpose of the proposed project is protection and maintenance of SWP, and potentially CVP, contractual deliveries. But DWR has had to assume away a lot of important aspects of climate effects that await us.

This performance is compared in Chapter 6 only to existing conditions, however, and not to the future No Project conditions which show painful decreases in supplies and deliveries for both SWP and CVP.<sup>49</sup> To find the comparison of the Tunnel Project's performance by alternative against future conditions, one must go to Appendix 6A, the Water Supply 2040 Analysis. There, the Tunnel Project performs lavishly for the SWP as compared with the CVP. Table A contractors will see between 11 and 16 percent increases over 2040 No Project conditions, with the preferred Alternative 5 seeing the biggest gains—exceeding even existing conditions in 2020, and in dry and drought years, Table A contractors will enjoy 25 to 35 percent greater supplies in 2040 from the Tunnel Project. Feather River senior water users will see virtually no change neither from existing condition projections nor 2040 future conditions; their privileges will remain intact.

CVP contractors are projected to see little change in their delivery fortunes from the Tunnel Project in 2040 as compared with the No Project condition. We think there is quite likely an error in the modeling results portrayed in Appendix 6A, however. Table 6-5 in Chapter 6 indicates alternative results for South of Delta agricultural contractors of little change from existing deliveries of around 571,000 acre-feet (571 TAF), to a range of between 588 to 621 TAF among the nine alternatives. However, Table 6-2 in Chapter 6 shows a dramatic 88 percent decrease from existing conditions (2020) to no project conditions (2040) for an absolute delivery level to these agricultural contractors of just 71 TAF in dry and drought years and a 51 percent decrease over the long-term average of all years in the modeling time series. Table 6-5 shows a dramatic increase in South-of-Delta agricultural contractors of from three to nine percent from existing conditions to delivery performance across the nine alternatives. To what are these discrepancies attributed? We presume it is attributable to the storing of former carriage water supplies later to be delivered south of the Delta, but would carriage water savings really be that

---

<sup>48</sup> *Tunnel DEIR*, Chapter 6, pages 6-41 and 6-42, Table 6-5.

<sup>49</sup> This separation of supply results reflects the CEQA mode of analysis of Chapter 6 while the NEPA mode of analysis is provided in Appendix 6A.

dramatic? If they are dramatic, is it DWR's intent to deprive the Delta of needed fresh water flows?

There is more. Table 6A-1 in Appendix 6A detracts from these results in Chapter 6. In this appendix, CVP dry and drought year deliveries decrease from 571 to 58 TAF for CVP South-of Delta agricultural contractors, and across the nine Tunnel Project alternatives only increases between 5 and 47 percent (with preferred Alternative 5 increasing south-of Delta agricultural deliveries by just 17 percent) over the 58 TAF delivery figure without the project in 2040. How are Table 6-5 (Chapter 6) results to be resolved with Table 6A-1 results, in addition to Table 6-2 results? To say the least one of these tables has something wrong, and DWR needs to clarify them. These are central to the sales and promotion message of the Tunnel Project, particularly to wary south of Delta agricultural contractors, but they each tell a very different story. We are left wondering what DWR's true intent is regarding water winners and losers.<sup>50</sup>

While DWR investigates this modeling problem, the department's modelers should also reconsider their expectations that California winter precipitation will increase and that SWP and CVP supplies can be maintained by the proposed project.

Pacific Northwest National Laboratory (PNNL) scientists Lu Dong and Ruby Leung and NASA Jet Propulsion Laboratory scientists Baijun Tian and Xinyu Dong studying the Coupled Model Intercomparison Project (CMIP5 model ensemble used by the IPCC), have found greater uncertainty about the future of United States West Coast precipitation in the future than has been supposed by conventional California water wisdom. Specifically, they found a persistent bias in many of the CMIP5 models that misrepresents (one might say, double-counts) storm activity from the intertropical convergence zone, or ITCZ. This region of the Pacific just north and south of the equator is an important locus for the origins of western United States weather and our "Mediterranean" climate. Northeast and southeast trade winds collide in this region and, driven by sunlight and warm water, tremendous convective (upward moving) clouds form all the way to the upper atmosphere before being captured and moved by other wind patterns, such as the jet stream, to other parts of the globe, including western North America.

According to a PNNL science journalist, "Many climate models mistakenly depict a double ITCZ: two bands appearing in both hemispheres instead of one, which imbues uncertainty in model projections. Scientists refer to this as the double-ITCZ bias."<sup>51</sup>

Dong and Leung in a separate study examined the existing CMIP5 models and found "statistical and mechanistic links between the double-ITCZ bias and the models' outputs." Most of the models predict that California seasonal precipitation will concentrate into the winter months making them wetter, while springs and falls will be drier. Correcting for the double-ITCZ bias in the models reduces California's winter precipitation to "no change" in the winter, and in further drying of spring and fall seasons here, according to analysis of the double-ITCZ bias in these

---

<sup>50</sup> *Tunnel DEIR*, Appendix 6A, Water Supply 2040 Analysis, p. 6A-3 and 6A-4, Table 6A-1.

<sup>51</sup> See B. Tian and X. Dong, 2020. "The Double-ITCZ Bias in CMIP3, CMIP5, and CMIP6 Models Based on Annual Mean Precipitation." *Geophysical Research Letters* 47, accessible at <https://doi.org/10.1029/2020GL087232>.



models.<sup>52</sup> According to Tian and Dong, there remains some double-ITCZ bias in the newest CMIP6 models now in development.<sup>53</sup>

We apprise DWR of the double-ITCZ bias in the general circulation models included in the CMIP series to make DWR and its water contractors aware of scientific research into this area of modeling, research, and which does not appear to be evident in the Tunnel DEIR. GCMs and the CMIP5 models provide crucial inputs to CalSim 3, which in turn supplies input results for use in other models used to analyze impacts of the Tunnel Project. The importance of being correct about winter season precipitation is critical to the Tunnel Project's purpose, objectives, and the premises on which the Tunnel DEIR's modeling is constructed. Assuming the PNNL and JPL scientists are correct and future winter precipitation is overstated in the models on which CalSim 3 relies, then long-term average reservoir storage and future stream flows, Delta exports, and water contractor deliveries may be overstated. Such overstatement could affect CalSim 3-modeled SWP supply categories like Articles 21 (surplus water) and 56 (SWP supplies available for use, storage, and sale outside of SWP service area). If DWR's modeling premises turn out to be incorrect and in fact future winter precipitation would be no greater than at present, then DWR, water contractors, and joint powers authorities could find themselves wasting a great deal of their ratepayers' capital pushing the Tunnel Project forward, and finding it drier than expected in the operational period of the project's life. We request DWR address this as new information in a supplemental DEIR and delay issuing an FEIR until then.

In addition to increased chances of flood occurring at the North Delta Intake sites, future climate change conditions have the potential to encroach on the reliability of water exports. The fundamental goal of the Tunnel Project is to "modernize aging SWP infrastructure in the Delta to restore and protect the reliability of SWP water deliveries in a cost-effective manner," but as the climate changes the reliability of Delta water exports will decrease.<sup>54</sup> The Delta Stewardship Council notes that, "extreme drought conditions (those similar to conditions in 2012 to 2016) are expected to be seven times more likely by the year 2050. These drought conditions will contribute to making Delta water exports less reliable in the future. Outside of these conditions, Climate change impacts across all water year types will reduce the amount and quality of water but effects will be greater in dry years. Additionally, climate change will also reduce reservoir storage in all year types (dry, wet, etc.) which will cause less water to be carried over from one year to the next. Therefore, the water supply system's vulnerability will increase.

This could be a potential issue that DWR should reevaluate for the future success and maintenance of the project as a whole. Would a project that accommodates for these changes and projected export needs be more beneficial to invest in? After all, exploiting the further demand of water to meet increased export needs will not sustain the project since climate change poses a threat to the water supply system as a whole. Even though current water quality can be regulated with a two-foot sea level rise through 2050, it is negligent to ignore that higher

---

<sup>52</sup> See B. Bane, "Error Correction Means California's Future Wetter Winters May Never Come," accessible at <https://phys.org/news/2020-12-error-california-future-wetter-winters.html>. The scientific article on which Bane's piece is based is L. Dong, L.R. Leung, J. Lu, and F. Song. 2021. "Double-ITCZ as an Emergent Constraint for Future Precipitation Over Mediterranean Climate Regions in the North Hemisphere." *Geophysical Research Letters* 48, accessible at <https://doi.org/10.1029/2020GL091569>.

<sup>53</sup> Tian and Dong, *op. cit.*, note 51 above.

<sup>54</sup> California Department of Water Resources. 2022. *Delta Conveyance*, accessible at: <https://water.ca.gov/deltaconveyance>.

temperatures, increased precipitation, sea level rise and run off patterns will make managing Delta water quality a challenge. During extreme drought conditions which are expected to increase in frequency and intensity and will force DWR to address water shortages with trade-offs.<sup>55</sup>

### Relevant Tipping Points

The Tunnel DEIR further assumes that its projections even to 2040 are relatively sure, by virtue of ignoring uncertainties of looming climate change tipping points when Earth's cumulative warming reaches 1.5°C over pre-industrial activity. A recent literature survey in *Science* considered nine distinct "global core" tipping elements and seven "regional impact" tipping elements. Tipping points are defined as critical thresholds "at which a tiny perturbation can qualitatively alter the state or development of a system." The survey found the nearest-term global core and regional impact tipping elements with high near-term likelihood of failing at 1.5°C warming include the "global core" elements of Greenland ice sheet, the West Antarctic ice sheet, a Labrador sub-polar gyre in the Atlantic Ocean; and includes among regional impact elements low latitude coral reefs, abrupt thaw of boreal permafrost (which could release large quantities of methane and CO<sub>2</sub> into the atmosphere, accelerating global heating), and potential loss of non-polar alpine glaciers.<sup>56</sup>

Ice sheet losses and permafrost thawing will have grave implications for California's water systems depending upon how quickly developed nations' greenhouse gas emissions drive the temperature 1.5°C above pre-industrial levels. We are now estimated to be at about 1.2°C of warming. The implications include effects on frequency and duration of droughts, frequency of extreme atmospheric river storms, and the rate at which sea level rise in San Francisco Bay and Delta proceeds relative to the speed with which aridification unfolds in the Central Valley. These potential tipping points could upend assumptions on which Tunnel Project modeling are built. For instance, what are the potential interactions between different such climate tipping points? Will they result in dramatically hotter and longer droughts in California than even the Union of Concerned Scientists projected? Will extreme storms, bracketed for now as ARkStorm 2.0<sup>57</sup>, be more extreme than imagined even in present-day scenarios because of such interactions among tipping point effects? We don't know; more to the point, the Tunnel DEIR as a decision document fails utterly to recognize such tipping points and whether this project represents a good investment given compounding climate risks.<sup>58</sup> It is instead an elaborate sales pitch.

### Sea Level Rise and the North Delta Intakes' "Invulnerability"

---

<sup>55</sup> Delta Stewardship Council. 2021. *Delta Adapts: Creating a Climate Resilient Future Executive Summary*, p. xii-xiii, accessible at <https://deltacouncil.ca.gov/pdf/delta-plan/2021-06-25-delta-adapts-vulnerability-assessment.pdf>. See also pp. 5-52 on water supply sensitivity. Hereafter, *Delta Adapts*.

<sup>56</sup> D.I. Armstrong McKay, A. Staal, J.F. Abrams, R. Winkelmann, B. Sakschewski, S. Loriani, I. Fetzer, S.E. Cornell, J. Roskstrom, and T.M. Lenton. 2022. "Exceeding 1.5°C global warming could trigger multiple climate tipping points." *Science* 377, 9 September, Table 1, p. 3, and Figure 2, p. 8, accessible at <https://doi.org/10.1126/science.abn7950>.

<sup>57</sup> Huang, X. and D.L. Swain. 2022. "Climate change is increasing the risk of a California megaflood." *Science Advances* 8: accessible at <https://doi.org/10.1126/sciadv.abq0995>.

<sup>58</sup> K. Mackenzie. 2021. "What Smart People Get Wrong about Climate Change Extremes." *Bloomberg News*, 10 September, accessible at <https://www.bloomberg.com/news/articles/2021-09-10/what-smart-people-get-wrong-about-climate-change-extremes>.

The sales pitch extends further to the North Delta Intakes beyond CalSim 3 modeling results. “The project intake locations are not vulnerable to sea level rise from a water quality perspective,” the Tunnel DEIR states firmly deep in Appendix 5A, Section F.

“SCHISM modeling<sup>59</sup> presented here indicates that the salinity intrusion from the sea level rise will not affect the intake locations. The effects of sea level rise on salinity intrusion do not appear to progress far above the confluence of Sacramento River, Cache Slough, and Steamboat Slough. While it is not a conclusion based on the SCHISM modeling described in here, it is important to note that the intake facilities are designed to accommodate water level elevations corresponding to 10.2 ft of sea level rise and 200-year flood flows under climate change conditions projected for the end of the century.”<sup>60</sup>

This is a sales pitch on the scale of the unsinkable Titanic in light of the array of extreme heat and storms, tipping point effects, and other non-linear and non-routine prospects we face with climate change in the Central Valley and Delta. It epitomizes DWR’s exuberantly loyal faith in the assumed truth of CalSim 3, Delta hydrodynamics, and SCHISM modeling to arrive at this assertion.

When we examined the analyses in Subsection F.7 of Appendix 5A, we found we had a number of questions. Model results are based on two studies: one in which “Delta inflows, exports, and channel depletions were held at historical levels and salinity changes modeled as a consequence of sea level rise (the “water quality impact” approach)<sup>61</sup>; and a second “water cost” approach addressing how much water would be needed (that is, “expended”) to maintain salinity at specific levels in the western Delta to avoid having salinity intrusion at the north Delta intakes.<sup>62</sup>

The impact approach found, unsurprisingly, that as sea level rise proceeded, “salinity intrusion progresses upstream towards Rio Vista.” This intrusion is due to increased tidal flow and “accentuated vertical exchange flow.” As salinity increases in the river channel there, “the longitudinal gradient of salinity (from Collinsville to Rio Vista) also increases and excites further...(density driven) mixing that arise when salinity becomes stratified.” Yet in none of the modeled scenarios did salinity intrusion advance more than about 15 kilometers (about 9.4

---

<sup>59</sup> “SCHISM is a 3-dimensional hydrodynamic model of the San Francisco Bay and Delta....Applied to the Delta, SCHISM requires a mesh and other spatial inputs, bathymetry boundary inflows, outflows and exports, estimates of Delta channel depletions, and atmospheric forcing.” *Tunnel DEIR*, Appendix 5A, Section F, Subsection F.4, p. F-3, lines 13, and 25-26.

<sup>60</sup> *Tunnel DEIR*, Appendix 5A, Section F, Modeling Technical Appendix—Sea Level Rise and Delta Water Quality Modeling, p. F-2, lines 10-17.

<sup>61</sup> “This approach does not reflect how the SWP and CVP managers may adapt reservoir operations and Delta exports to reduce Delta salinity, assuming current D1641 salinity requirements would continue. Additionally, the water uses in the Delta and Delta exports remained unchanged from the historical values even though sea level rise may result in high salinity in the Delta...which is unsuitable for agricultural or municipal water purposes....This approach was also used to assess the vulnerability of the project intakes to the increased salinity intrusion resulting from the sea level rise...” *Tunnel DEIR*, Appendix 5A, Section F, Subsection F.3.1, “Water Quality Approach,” p. F-2, lines 26-35.

<sup>62</sup> “The salinity that results...is far more similar to historical conditions than results obtained from the impact approach. However, the quantity of water required to maintain compliance is simply assumed to be available even if it is several millions of acre-feet s may not be a plausible representation of extreme cases.” *Tunnel DEIR*, Appendix 5A, p. F-3, Lines 7-11.

miles) upstream from the junction of Sacramento River, Cache Slough, and Steamboat Slough, well downstream of the North Delta Intakes.

“This topic is revisited in Section F.7.4,” states the appendix at this point, but no such section exists; Appendix 5A text organization only goes to Section F.7.3, “Intake Location Vulnerability,” which does appear to provide some explanation, so perhaps this a typographical error.<sup>63</sup> This section purports to examine how far upstream salinity in the Sacramento River travels when sea level rise reaches 10.2 feet above present conditions. Under these conditions, the SCHISM model results indicate that intrusion occurred but went only as far as Isleton, and similarly for Steamboat Slough. “It appears that the abrupt transition to a narrower, shallower more riverine environment above the Sacramento-Cache-Steamboat junction imposes an important step down in up-estuary salinity transport along the mains Sacramento River upstream of Rio Vista.” This appendix surmises that salinity intruding upstream encounters “a steep gradient...at the junction that does not progress significantly beyond one tidal excursion upstream.” This is explained, states the appendix, by the bathymetry of the Sacramento-Cache-Steamboat junction. The steep gradient represents a “sudden transition to shallower water” which “acts as a check on sea level rise response....Upstream from the junction..., the water is much shallower and incursions by salinity are quickly pushed back on the ebb tide. To the extent that freshwater flows over salt water, this would occur at the shelf-like entrance to the downstream reach.”<sup>64</sup>

Bathymetry is neither geology nor structure; it merely describes water depth at a given location. RTD calls this “gradient” a “shoal” for purposes of our comments. Reasoning from bathymetry, while intriguing, fails utterly to account for what this shoal consists of. Is it some type of bedrock like sandstone (or something harder)? Or does this shoal represent a lingering bathymetric remnant of Gold Rush legacy sediments washed from the northern Sierra mines via hydraulic mining techniques? If this shoal is not bedrock, then it must be characterized by its sedimentary composition and assessed for its potential erodibility and structural tenacity. If this shoal erodes away in five more years (as much of the rest of Gold Rush era sediments have, even to the point where Delta and San Francisco Bay waters are considered much clearer now) then how steep will the shoal’s gradient remain at the junction? If the shoal is eroding, then what does that do to DWR’s static analysis of the invulnerability of the North Delta Intakes to sea level rise?

In early September 2022, RTD was contacted by a long-time interior Delta resident reporting that the Sacramento River was flowing upstream at present, and that this alarmed him. We believe he was seeing the combined effects of tidal flow at that particular moment, so we checked California Data Exchange Center sensors from Freeport down to Rio Vista, and found that tidal influence was in fact intruding up the Sacramento River all the way to the Delta Cross Channel just measured in California Data Exchange Center sensors upstream of Walnut Grove. However, salinity (measured as electrical conductivity) was reaching only as far as Isleton, where the sensor reached a peak EC of 912.61. (See Attachment 10 to this letter for flow and EC records for late August through September 7 at these two sensors.) At Georgiana Slough just upstream, EC reached just 139.0 at noon the day before and 122 EC around the same time the Isleton readings were taken at 12:45 AM on September 7, though upstream flow reached negative 6,580 cfs (-6,580 cfs).

---

<sup>63</sup> *Tunnel DEIR*, Appendix 5A, p. F-12, lines 9-19.

<sup>64</sup> *Tunnel DEIR*, Appendix 5A, p. F-21, lines 22-29, p. F-22, lines 4-5, F-23, lines 3-10 and 14-22.

This intrusion is happening currently with existing sea level and bathymetric conditions. Is it realistic for DWR to be certain that tidal intrusion will not reach the North Delta Intakes by century's end, or even sooner especially when Greenland and West Antarctic ice sheets collapse and the world reaches 1.5°C of warming (with attendant continued heat expansion of oceans contributing to sea level rise? We are skeptical not just because of the recent high salinity readings at Isleton but also because of looming global tipping points mentioned earlier.

The water cost approach helps illustrate why the loss of salinity control in the present would be disastrous for SWP and CVP customers and all other Delta water users.

#### North Delta Intakes Priority Sensitivity Analysis

The Tunnel DEIR acknowledges that operational criteria for the North Delta Intakes prioritize continued use of existing south Delta diversions.<sup>65</sup> Attachment 2 to this letter quantifies this by visually interpreting graphs provided in Appendix 5A of how frequent north Delta intake operations would be on average by month. Weighting each month's frequency of operation, we estimate the North Delta Intakes would operate just 42 percent of the time, while operations of the south Delta pumping plants and Clifton Court Forebay would occur the remaining 58 percent of the time. North Delta Intake operations are quite similar for all nine alternatives, so they are each tightly bunched on the modeling result graphs around these percentages making visual interpretation relatively straightforward (Attachment 2).

By comparison, we estimated in 2014 that California WaterFix's two tunnels would have operated, according to its environmental documentation, about 48 percent of the time. Climate change adjustments to DWR's modeling may have something to do with this decrease. With the project expected to cost about the same as California WaterFix, and with less capacity, the cost-effectiveness of the Tunnel Project is reduced relative even to WaterFix, partly because it fails to achieve WaterFix's redundant design and economies of scale.

Appendix 4B, however, is a "sensitivity" analysis that "considers whether operational flexibility could change the types of effects disclosed in the main body of the Draft EIR. While this operational scenario is not part of the project and is not reasonably foreseeable, and therefore not required to be analyzed under [CEQA], some shifting from existing southern diversions to proposed northern diversions could occur to help achieve project objectives." DWR proposes for this sensitivity analysis to

augment the ability to divert excess flows or improve operational efficiency to meet Delta water quality requirements. The proposed operation of the project continues to prioritize the diversions from the south Delta export facilities to the same extent as under existing conditions, while only using the north Delta diversion to (1) augment exports in winter and spring when excess flows are present or (2) shift some diversions from the south Delta facilities to the north Delta intakes if it is efficient to meet Delta water quality standards."<sup>66</sup>

All the comparisons are based in 2020 conditions, not 2040 which would be more realistic. DWR turned to CalSim 3 to model the effect of these revised criteria on reservoir storage, stream

---

<sup>65</sup> "The proposed Delta Conveyance Project and project alternatives operations prioritize State Water Project...exports from the existing south Delta diversion over exports from the proposed new north Delta intakes." *Tunnel DEIR*, Appendix 4B, p. 4B-1, lines 3-5.

<sup>66</sup> *Tunnel DEIR*, Appendix 4B, p. 4B-1, lines 29-34.

flows, Delta exports, and through-Delta survival of juvenile Chinook salmon. For storage, DWR modeling results indicate that Shasta, Oroville, and Folsom see small increases in end of September storage, between 8 and 14 TAF under existing conditions. For monthly streamflows, the modeling suggests there would be only small changes in streamflows, including at Freeport on the Sacramento River where average monthly flow changes would range from an increase of 138 cubic feet per second (cfs) in July to a decrease of -245 cfs in April.

We are troubled by the existing conditions monthly flows reported in Table 4B-2, however. These conflicting modeling results are excessive relative to long-term averages reported in modeling results in Appendix 5A, Section B. Attachment 9 to this letter shows the wide percentage and absolute discrepancies between what is reported as modeling results for Sacramento River near Freeport in the two different appendices. How does DWR explain this?

Delta export results, which include modeling results for Delta outflow, reveal that the prioritization of North Delta Intakes over south Delta facilities for export pumping would yield only a marginal increase in total SWP exports over the Tunnel DEIR export results (2 TAF) for Alternative 5. This is a very marginal outcome for a scenario which is supposedly a study of what impact more aggressive use of the North Delta Intakes would yield to exports. The same table, however, makes clear that Delta outflow would be dramatically reduced by operation of either Alternative 5 as the preferred project in the EIR (reducing Delta outflow from existing conditions by 589 TAF) or as the “NDD priority” Alternative 5 of Appendix 4B (reducing Delta outflow by 613 TAF, 24 TAF more of a reduction than for the preferred alternative, Alternative 5).<sup>67</sup> It seems clear that aggressive use of North Delta Intake priority would net only small boosts to yield while severely damaging the estuary. We see little value to anyone in this scenario, except billable hours for water attorneys.

Appendix 4B found that “in general, north Delta diversion prioritization...gave little difference in estimates” of juvenile Chinook salmon survival relative to the performance of the intakes in the preferred alternative despite reducing upstream flows notably during the December through June period.<sup>68</sup>

A water quality analysis in Appendix 4B was then performed to gauge “sensitivity” of greater usage of north Delta intakes greater during December through June. It indicates a few things to us:

- How is it that Alternative 5’s compliance record with the Emmaton water quality objective of D-1641 would be identical with Existing Conditions in 2020 (despite reducing Sacramento River flow below Hood during operations)? Why, if Alternative 5’s compliance record is the same as Existing Conditions, does Alternative 5 have a higher “percent of days exceeded” than SWP and CVP operations during existing conditions in Table 4B-5?<sup>69</sup> Is there an error in the table?
- It appears to us from Table 4B-6<sup>70</sup> that operation of the north Delta intakes on the Sacramento River removes water from that river which would normally flow through the

---

<sup>67</sup> *Tunnel DEIR*, Appendix 4B, p. 4B-6, Table 4B-3.

<sup>68</sup> *Tunnel DEIR*, Appendix 4B, p. 4B-9, Figure 4B-5, and quote from p. 4B-10, lines 17-19, and compared with Table 4B-4.

<sup>69</sup> *Tunnel DEIR*, Appendix 4B, p. 4B-16, Table 4B-5.

<sup>70</sup> *Tunnel DEIR*, Appendix 4B, p. 4B-16, Table 4B-6.

Delta Cross Channel (when open) and Georgiana Slough (especially), leaving the central Delta channels, such as the mainstem San Joaquin and the lower Mokelumne distributaries, to receive both more tidal flow (definitely salty) and more San Joaquin River flow, which is saltier than the Sacramento generally. We observe that comparison of Table 4B-5 with Table 4B-6 water quality results is evidence that the proposed Tunnel Project, Bethany Alignment, removes substantial volumes of fresh water from the Delta and would result in poorer water quality in the central and south Delta than at present. Table 4B-6 also indicates there would be a 13 percent increase in the frequency with which the Jersey Point salinity objective in D-1641 would be violated between just the preferred Alternative 5 and existing conditions, and an 11 percent increase in Jersey Point salinity violations with the reprioritized north Delta intakes of Alternative 5.

- There would be a 16 percent increase in Rock Slough (drinking water) salinity objective violations by Alternative 5, yet only a small increase in Rock Slough violations with the reprioritized north Delta intakes of Alternative (two percent), according to Table 4B-7.<sup>71</sup> Rock Slough is the entry point for Contra Costa Water District's (CCWD) Contra Costa Canal intake to water treatment. CCWD serves hundreds of thousands of eastern and central Contra Costa County with affordable, fresh drinking water direct from the Delta. A 16 percent increase in potential violations from Alternative 5 is unacceptable.

The second portion of the water quality analysis addressed residence time of water in the Delta from June through November—the season during which most harmful algal blooms (HABs) occur. This analysis relied on DSM2, a commonly used model for analyzing hydrodynamics and water quality conditions in Delta channels. Since the North Delta Intakes sensitivity analysis changed only operating criteria for December through June, the only month overlapping the two analytic periods is the month of June. DWR presented no results for this, instead stating, “There may be some limited increase in residence time for the month of June [for the reprioritized intakes]...when compared to Alternative 5 because of the reduction in total south Delta exports.” But the analysis pooh-poohs additional risk of HABs, which can be present in June and even in May, we at Restore the Delta have found. Yet, “water temperatures [in June] are cool and growth rates are low compared to the peak growing season of July through September,” states Appendix 4B.<sup>72</sup> This “sensitivity” analysis is premised solely on existing conditions, but it is insensate with respect to climate change’s effects on the future of HABs in the Delta, say at 2040, especially in light of projected increases in extreme heat index days and expansion of the hot season in the five Delta counties (see Attachment 8 to this letter). In other words, May and June temperatures are likely to warm, extending the time period for which conditions are conducive to HAB formation and spread.

### *Phase 2 Bay-Delta Plan Omission and Alternate Regulatory Scenario Sensitivity (ARSS) Analysis*

We were dismayed to discover in Appendix 3A that the analytic framework of the Tunnel DEIR omits “Phase 2” Bay-Delta Water Quality Control Plan (Bay-Delta Plan) update for Delta outflows, Sacramento River and Delta Tributary Streams. This Bay-Delta Plan amendment has

---

<sup>71</sup> *Tunnel DEIR*, Appendix 4B, p. 4B-17, Table 4B-7.

<sup>72</sup> *Tunnel DEIR*, Appendix 4B, p. 4B-17, lines 24-34.



been on hold, delayed ever since proposed voluntary agreements have been undertaken with enthusiastic, if misplaced, support from the Newsom Administration. The amendment is officially included in neither existing conditions of 2020 (which is perhaps more forgivable given the present timing of VA negotiations) nor in the 2040 No Project future scenario. The “description” of this project/program in Appendix 3C fails to explain why Phase 2 is treated differently from Phase 1 (for San Joaquin River flow objectives whose implementation has also been delayed), which is nonetheless included in both existing conditions and 2040 No Project scenarios. DWR needs to provide an explanation and reasonable justification for Phase 2’s omission, since the State Water Board had released a scientific basis report on this Phase of regulation in 2017 along with a framework document in the summer of 2018 that suggested an unimpaired flow criterion of 55 percent for the Sacramento River Basin streams’ inflow to the Delta.

We find it especially alarming that DWR also omits Phase 2 from its 2040 No Project scenario. This omission implies strongly that DWR believes (because it has reason to believe behind the scenes) there will be no such regulatory framework for the Sacramento River over the next 18 years after DWR and the State Water Board have succeeded already in delaying a full Bay-Delta Plan update for the last 16 years. Assuming continued delay strongly suggests DWR gives no quarter to Delta environmental justice communities, to Indian tribes who view the Delta as ancestral homelands, nor to the fisheries and aquatic systems that have languished without protective water quality regulation for now a generation. This omission of Phase 2 strongly implies that our grievances and concerns must languish for yet another generation.

This omission further foregrounds the voluntary agreements (VAs) so adored by state and water agency officials. At present, many water agencies throughout the Delta watershed, from Fresno to Redding, are negotiating with each other to reach “voluntary agreements” (VAs) over how to apportion flows to and through the Delta estuary. Appendix 4C of this Tunnel DEIR is an attempt to indicate how and under what regulatory conditions the North Delta Intakes of the Tunnel Project (Alternative 5) would mesh with some aspects of VAs under negotiation. This appendix “considers possible regulatory requirements for water quality and flow when an updated Bay-Delta Plan is implemented.” It also offers a view of “the potential effects of the project under the Alternate Regulatory Scenario...”<sup>73</sup> Because the VAs are neither complete nor public (but since DWR is party to the negotiations ongoing) it includes some provisions from the March 2022 memorandum of understanding, though the ARSS DWR created for this analysis does not pretend to be the same thing as the March MOU.

This whole Tunnel DEIR and scenario-slinging effort is fraught with wistful, magical thinking and this appendix suggests that at least for the VA provisions it incorporates, all the effort adds to little. First, it examines, as did Appendix 4B, what changes would occur with respect to the existing conditions baseline, without considering the 2040 scenario, so this “sensitivity analysis” takes no obvious account of climate change in reaching its conclusions. This is fallacious.

Second, the VAs are proposed to have an eight-year term (which is just over one-third the length of time that D-1641, our present failing water quality regulatory framework has been in effect), renewable for another seven years, for a total of 15 years. Fifteen years gets us somewhat close to 2040 (perhaps 2039 or 2038 depending on when a new Bay-Delta Plan/VA is adopted and implemented). Arriving at VAs, while a beehive of billable hours for many water attorneys throughout the Delta watershed, has been a mirage since they were announced in

---

<sup>73</sup> *Tunnel DEIR*, Appendix 4C, p. 4C-1, lines 24-26.

mid-2018 and presented in December 2018. For four years the VAs have been a chimera whose rumored twists, turns, “agreements to agree,” and vaunted but still invisible outcomes would be superior to whatever regulatory scheme the State Water Resources Control Board could create. And yet—the magical thinking part—this appendix analyzes a comparison to existing conditions across the board, as though the VAs were implemented tomorrow.

Still, DWR sought an analysis of a chimeric ARSS based on VA provisions in its Tunnel DEIR. It updated two elements of the 2019 VAs modeling effort by reducing SWP and CVP exports to reflect those in the 2022 VAs MOU, and included a hypothetical Friant VA that would reduce recapture of San Joaquin River Restoration Program flows at SWP and CVP Delta export pumps (in other words, those restoration flows would also contribute to Delta outflow). But there are many flow components of previous VA versions omitted from this analysis, and Appendix 4C acknowledges that “the process to incorporate new diversions into the updated Bay-Delta Plan is not yet developed” though “the VA flows are to be protected from diversion.”

From this analysis we glean little change in any reservoir storage and stream flows though Alternative 5/VAs and just Alternative 5 (existing condition) flows would reduce Sacramento River flow downstream of “North Delta Diversion” by a few thousand cfs primarily in winter months and in July.<sup>74</sup> A similar impact pattern is visible in the results for net Delta outflow.<sup>75</sup> Indeed a similar pattern is shown for X2, the estuarine water quality objective measured in kilometers from the Golden Gate at San Francisco, which shifts upstream by a few kilometers for Alternative 5’s existing condition, but is similar to existing conditions with Alternative 5/VAs.<sup>76</sup>

In addition to the underwhelming impact of ARSS provisions on Alternative 5 benefits, Alternative 5/VAs exports would have less benefit to total Delta exports in winter and spring months, while having little difference in summer and fall. Alternative 5 without the VAs, would generate on the order of 40 to 50 TAF more in the months of January and February, and yearly would tend to deliver about 250 to 300 TAF annually more in exports than would Alternative 5/VAs.<sup>77</sup> While these results might make VAs less attractive to water contractors, the ARSS suggests that applying some VA provisions into operational analysis of Alternative 5 would have a small impact on exports for little gain to other water quality and flow indicators. We conclude from the ARSS appendix to this point that there will be more gains to stream flows, Delta outflow and the Sacramento River without Alternative 5 (or any other alternative). Such futility means that the State Water Resources Control Board should just go ahead with applying unimpaired flow objectives suggested in the 2018 State Water Board framework for Phase 2—and dispense with both the Tunnel Project and the ARSS.

Furthermore, this appendix examined water quality impacts of the ARSS—that is, Alternative 5/VAs—as compared with Alternative 5. It reveals that Alternative 5 is bad for Delta water quality—at Emmaton, Jersey Point, and Rock Slough. The impact pattern for these two bad ideas (Alternative 5 and VAs) is that Alternative 5 takes a given regulatory framework (whether existing conditions or “Alt Reg” VAs) and renders worse water quality outcomes. Alternative 5 at Emmaton increases violation days by seven percent under present D-1641 rules. The ARSS

---

<sup>74</sup> *Tunnel DEIR*, Appendix 4C, pp. 4C-5 to 4C-9, Figures 4C-1 through 4C-8 for reservoir storage; pp. 4C-10 to 4C-16, Figures 4C-9 through 4C-16 for streamflow.

<sup>75</sup> *Tunnel DEIR*, Appendix 4C, p. 4C-14, Figures 4C-15 and 4C-16.

<sup>76</sup> *Tunnel DEIR*, Appendix 4C, p. 4C-15, Figure 4C-17.

<sup>77</sup> *Tunnel DEIR*, Appendix 4C, pp. 4C-16 to 4C-17, Figures 4C-19 and 4C-20.

regulatory framework without Alternative 5, however, reduces water systems' violation days from 556 to 324 at Emmaton, a 42 percent improvement in water quality compliance there. Alternative 5 increases violation days at Emmaton by six percent in combination with the ARSS. Alternative 5 is just bad for water quality there.

It's worse at Jersey Point and at Rock Slough. At Jersey Point, placing the ARSS framework over existing conditions would reduce violation days by 30 percent, and at Rock Slough by 20 percent. But add in Alternative 5 and the violation days rise: it worsens Jersey Point violation days by 13 percent, and at Rock Slough by 16 percent. Adding Alternative 5 to the ARSS boosts violation days 24 percent at Jersey Point and 22 percent at Rock Slough.<sup>78</sup>

While DWR draws no conclusions in Appendix 4C, we conclude that the Tunnel Project is bad for Delta water quality—and bad for ecosystems and drinking water quality for Delta residents—regardless of the regulatory framework within which it would operate. The Tunnel Project, this ARSS analysis in Appendix 4C shows, is a parasite on Delta freshwater flows, and it is reflected in the increases in violation days that the project's operations add to the regulatory framework within which it would operate.

#### *Concluding Remarks on Chapters 4 through 6, and Chapter 30*

In general, DWR's approach to climate change is to take the likelihood of extreme storms and the supplies that could be skimmed from their runoff, and to discount other major climate change effects. It is unrealistic and unwise, however, to pick and choose which climate change effects to analyze when striving to comply with full disclosure laws like CEQA. Reality will bring them all at varying times and intensities. DWR's climate change rationales and modeling of the future for the Delta Tunnel Project is wholly inadequate for ignoring the panoply of extreme heat, expanding hot seasons, and assuming current sea level rise assumptions from other state agencies remain reasonable in light of new scientific information about tipping point elements that we summarize in this comment letter. This Tunnel DEIR was out of date for climate change science when it was released this July. The Tunnel Project is out of step with looming realities of climate change and should be discontinued immediately so that other climate mitigation, adaptation, and resilience investments may be planned and implemented sooner than later.

## **Chapter 7, Flooding**

As we have already discussed above, the DEIR's analyses of sea level rise and extreme storm impacts in actual modeling methods minimize these important aspects of future climate change impacts. Flows in DWR's analytic methods and modeling feed into its treatment of flood impacts from and on the proposed North Delta intakes of the Delta Tunnel Project, for which DWR claims will avoid flooding and provide reliable SWP and CVP deliveries south of the Delta. In the *Draft Environmental Impact Report Explained*, the Department of Water Resources states that the fundamental purpose of the Delta Conveyance project is to create new intake and conveyance facilities to ensure their reliable operation for SWP and CVP water deliveries South

---

<sup>78</sup> *Tunnel DEIR*, Appendix 4C, p. 4C-22 Tables 4C-3, 4C-4, and 4C-5.

of the Delta.<sup>79</sup> With this in mind, DWR recognizes that the project alternatives will address and mitigate for sea level rise and any foreseeable climate change impacts in order to ensure that the project minimizes public health and safety impacts.<sup>80</sup> Modeling in the EIR suggests that there will be very gradual capturing of wet winter flows that on average there will be 0.08-foot increment increase of water surface elevation during flood flows because intakes crowd the channel. The 0.08-foot value is not an accurate depiction of projected climate changes that will occur in the next fifty years. The Tunnel DEIR evaluates the probability of flood and associated impacts from the North Delta Intakes almost entirely based on current climate conditions.

The Tunnel DEIR fails to disclose accurately the baseline flood risk in the Delta. It is composed of both sea level rise and growing risk of extreme storms. Current Flood insurance rate maps from the Federal Emergency Management Agency (FEMA) are presented in the Tunnel DEIR. The DEIR implies that the current 100- and 500-year floodplains under FEMA are adequately described to address flood concerns but in actuality, the maps have expired and take as long as seven years to revise. A recent *Washington Post* analysis of videos from residents experiencing destructive floods found that current FEMA mapping as relevant flood destruction occurred in homes far from water sources, and which were unaccounted for in flood insurance rate maps.<sup>81</sup> Therefore they do not keep up with climate change impacts on flood risk. But by relying on the map, the Tunnel DEIR implies that communities near the North Delta Intakes and lower San Joaquin will experience a less than 1 percent of flood risk presently and indefinitely.<sup>82</sup>

Additionally, revisions made to FEMA maps can be disputed or rejected by local and state entities if FEMA's changes deem an area incapable of economic development due to flood risk. Given known inadequacies of FEMA flood risk maps, the Delta Stewardship Council's flood hazard projection map for 2050 shows these areas will have a one-in-ten chance of flooding—NOT one-in-a-hundred, as implied by the FEMA map. Stockton and lower San Joaquin county are also highly sensitive to San Joaquin river inflow assumptions.<sup>83</sup> The DSC's flood projections for communities and cities near the North Delta Intakes like Courtland and Hood show a 2 to 10 percent annual chance of flooding with risk increasing from 18 to 65 percent over ten years under the Flood hazard map for 2085 conditions from the Delta stewardship council—much higher risk than hinted at by the Tunnel DEIR.<sup>84</sup>

---

<sup>79</sup> California Department of Water Resources, *Delta Conveyance Project Draft Environmental Impact Report Explained*, July 2022, p. 3, accessible at [https://assets.website-files.com/627d556b0f4f5370e839b988/62e08f2e9432a72128856e5b\\_DCP%20Draft%20EIR%20Explained\\_July%202022\\_FINAL\\_ADA.pdf](https://assets.website-files.com/627d556b0f4f5370e839b988/62e08f2e9432a72128856e5b_DCP%20Draft%20EIR%20Explained_July%202022_FINAL_ADA.pdf); also *Tunnel DEIR*, Chapter 2, p. 2-2 to 2-3.

<sup>80</sup> *Tunnel DEIR*, Chapter 7: Flood Protection, Draft Environmental Impact Report Explained, 2022, p. 3, accessible at: <https://cadwr.app.box.com/s/lg4ega6ld9tc2xlt0xshl3kg70bbjc8a>.

<sup>81</sup> Samuel Oakford, John Muyskens, Sarah Cahlan, and Joyce Shogun Lee, "America Under Water: Extreme floods expose the flaws in FEMA's risk maps," *Washington Post*, 6 December 2022, more accessible at: <https://www.washingtonpost.com/climate-environment/interactive/2022/fema-flood-risk-maps-failures/>

<sup>82</sup> California Department of Water Resources, Chapter Seven: Flood Protection, Draft Environmental Impact Report Explained, 2022, p. 9, more accessible at: <https://cadwr.app.box.com/s/lg4ega6ld9tc2xlt0xshl3kg70bbjc8a>

<sup>83</sup> *Delta Adapts*, p. 4-13, Figure 4-3, accessible at <https://deltacouncil.ca.gov/pdf/delta-plan/2021-06-25-delta-adapts-vulnerability-assessment.pdf>.

<sup>84</sup> *Delta Adapts*, p. 4-14, Figure 4-4.

Reliance on the FEMA maps understates the flood threat to Delta communities and adjacent cities leads to environmental justice impacts. Chapter 30 of the Tunnel DEIR shows that Legal Delta communities are majority communities of color and Native Americans. Many are tenants and do not own the land or housing in which they reside. Reliance on outdated flood hazard maps leaves homeowners and renters in communities and cities like Courtland, Hood and Stockton in the dark about dangers from flood risks they face. Tenants are especially at risk as they are not informed on the flood risks that their homes may undergo.

Based on current projections, sea level will increase from 0.6 to 1.1 feet by 2050. Sea level rise beyond 2050 is projected at 1.2 to 2.7 feet with an upper range estimate of 5.8 feet under a moderate emissions scenario. Under an extreme emissions scenario, sea level will increase by 1.7 to 3.4 feet with an upper range of 6.9 feet.<sup>85</sup> Past 2150, global mean sea level (GMSL, an integrative measure of the state of the climate system, including the ocean and ice-covered portions of Earth)<sup>86</sup> will rise even with low warming levels of 1.5 degrees celsius the committed sea level rise associated will be about 3 meters (about 10 feet). For upper range increases due to high warming levels there will be a rise of 6 meters (about 20 feet) for 2 degrees celsius. The rise of sea levels are indisputable and ice mass loss in Greenland can induce sea level increases in the Northwest and Southwest coastal regions of North America.<sup>87</sup>

With sea levels on average expected to increase by seven feet by century's end and the increased intensity and frequency of extreme storms by the middle, it appears dubious to us that the 0.08 feet flood impact of the tunnel project is even the relevant measure or question of flood impact here. The more relevant question is, why place tunnel intakes along the most flood-powerful river in California, making it flood vulnerable when high king tides coincide with extreme storm runoff?

Expected increases in extreme storm frequency also brings the daunting consequence of scouring flows during flood events that can facilitate the motion of sediment particles. This raises concern over sediment build-up at the North Delta Intakes. Though the Tunnel DEIR mentions some mitigation for the anticipated normal hydrological build-up of sediment in the Delta, it is evident that there is no solid plan or mitigation tactic put in place to prevent or stop sediment from building up during an extreme storm/flood event. Extreme storm sediment and

---

<sup>85</sup> *Delta Adapts*, p. 5-4.

<sup>86</sup> The National Aeronautics and Space Administration describes GMSL this way: "[Global mean sea level](#) provides an integrative measure of the state of the climate system, encompassing both the ocean and [cryosphere](#) (ice covered portions of Earth), and it can be viewed as an important indicator of what is happening to the climate in the present and what may happen in the future. Long-term changes in [global mean sea level \(GMSL\)](#) are predominantly driven by three processes:

**Ice Melt:** Due to the warming atmosphere and ocean, [ice sheets](#) and mountain [glaciers](#) are melting, resulting in the addition of [fresh water](#) into the ocean.

**Thermal Expansion:** Ocean water expands as it absorbs trapped heat, causing sea levels to rise.

**Land Water Storage:** Water that is either removed from land (through groundwater pumping, for example) or impounded on land (through dam building, for example) can cause a net change in the total water found in the ocean." Accessible 22 November 2022 at <https://sealevel.nasa.gov/understanding-sea-level/global-sea-level/overview>.

<sup>87</sup> National Oceanic and Atmospheric Administration, *Global and Regional Sea Level Rise Scenarios for the United States*, Section 2: Future Mean Sea Level: Scenarios and Observation-Based Assessments, 2022, p. 7, accessible at <https://oceanservice.noaa.gov/hazards/sealevelrise/sealevelrise-tech-report-sections.html>.

debris at the Sacramento is where sediment can build due to raging rivers that can pick up more sediment faster due to peak flows.<sup>88</sup> Depending on how extreme storms are and how quickly they subside due to climate change patterns, sediment could build up in front of the intake sites. Peak sediment and pollutant load occurs during the rising limb of the storm hydrograph.<sup>89</sup> Deposition of sediment and pollutant loads occurs as peak flows subside. Similar to barrages, intakes also trap sediment and need to be flushed from time to time even under current climatic conditions.<sup>90</sup> The fish screens and sedimentation ponds of the tunnel project intakes could clog badly during extreme storm runoff plus tidal maximum events. In projects where the flow regime is modified, which is the case with the SF Bay Delta waterways, accumulation of sediment at an intake is a common phenomenon that occurs in dams, reservoirs and intake pumps. Indeed, it is well if not widely known that many Sierra Nevada reservoirs have growing sediment buildups in their basins against dams, volumes of which were once transported downstream before dams blocked river channels and slowed river velocities. Extreme storm runoff can mobilize and scour sediment thereby increasing flood and erosion risks to these facilities. Below dams, less sediment load in flow releases increase the erosive power of high flows and contribute to high sediment loads that reach the Delta.

Sediment may also be contaminated with pollutants and other contaminants. In the San Francisco Bay, no sites in the area were classified to have no contaminants, instead 77 percent of the area was classified as impacted by pollutants and contaminants.<sup>91</sup> In this area, the observed sediment contaminants were three times greater than that measured in other regions. Sedimentation on its own poses several threats to California's water supply, water quality, environmental health and public safety.<sup>92</sup> It is no surprise that sediment build up at intake pumps poses a health concern, but when coupled with atmospheric rivers and intense storms, it proves to be a major flaw in project design when it comes to preventing flood impacts as the climate adapts.

Atmospheric river storms are one of the main threats posing flooding concerns as the same hazards present during sunny-day conditions are more prevalent during high water events.<sup>93</sup> Additionally, Delta water levels are influenced by Golden Gate tide levels. Levee failure and extreme seepage can occur in the Delta during these events due to storm surges combined with

---

<sup>88</sup> N. Knowles, 2002. Natural and Management influences on freshwater inflows and salinity in the San Francisco Estuary at monthly to interannual scales. *Water Resources Research*, accessible at doi: <https://doi.org/10.1029/2001WR000360>.

<sup>89</sup> M. Karimaee Tabarestani and A.R. Zarrati. 2015. Sediment transport during flood event: a review. *International Journal of Environmental Science and Technology*, accessible at doi: <https://doi.org/10.1007/s13762-014-0689-6>.

<sup>90</sup> C. Gabbud and S.N. Lane. 2016. Ecosystem impacts of Alpine water intakes for hydropower: the challenge of sediment management. *WIREs Water* 3: 41, accessible at <https://wires.onlinelibrary.wiley.com/doi/pdf/10.1002/wat2.1124>

<sup>91</sup> Southern California Coastal Water Research Project. 2008. Sediment Quality in California Bays and Estuaries, p. 1 and p.iii, accessible at: [https://www.waterboards.ca.gov/water\\_issues/programs/bptcp/docs/sediment/sedimentqual\\_baysestuarie\\_s.pdf](https://www.waterboards.ca.gov/water_issues/programs/bptcp/docs/sediment/sedimentqual_baysestuarie_s.pdf).

<sup>92</sup> R.J. Mahoney. 2018. Sedimentation in California Reservoirs: A Long-Term Problem of Immediate Concern. *California Water Law Journal*, accessible at <https://waterlawjournal.com/sedimentation-in-california-reservoirs-a-long-term-problem-of-immediate-concern/>.

<sup>93</sup> *Delta Adapts*, p. 3-17.



winter tides and wind waves.<sup>94</sup> Shallow localized flooding can occur around the North Delta Intakes due to natural depressions and flooding conditions can be exacerbated due to high-water events that are caused by stormwater runoff like the megastorm that threatens California in the future.<sup>95</sup> Moreover, these levees will not withstand the pressure from the under-appreciated risk of severe floods. Data from UCLA climate scientist Daniel Swain reveals that “the coming superstorm is a rapid procession of atmospheric rivers and will be the ultimate test of the current dams, levees and bypasses in place.” It is known that levee failures can also damage key features of the Delta ecosystem existing on the heavily altered landscape, including managed wetlands. Global warming is expected to worsen droughts and storms as warmer air can hold more moisture while the atmospheric rivers will carry more precipitation. After a month, 16 inches of rain will fall across the state.<sup>96</sup>

The continual burning of fossil fuels will heat up the planet and thus increase the chances of a month-long, state-wide megastorm as temperatures climb another 1.8 degrees Fahrenheit which is what current trends suggest. Studies of this hypothetical megaflood project that \$725 billion in property damage and economic destruction will ensue.<sup>97</sup> Delta flooding will not only interrupt the conveyance of water for in Delta users who rely on Delta water supply, but will also have impacts on environmental justice communities in cities like Stockton and Antioch where equity is also a factor.<sup>98</sup> Moreover, the Delta Stewardship Council data shows, “California is already experiencing warmer temperature, more extreme heat, harsher storms that increase flood risk and rising sea levels.”<sup>99</sup> With the combination of these factors, there is a high probability that flooding will occur all over the state but will mainly impact cities like Stockton which are underfunded due to their status as a resource extraction region to support other sectors in California’s economy. If DWR does not increase flood risk management in San Joaquin County, such extreme storms will threaten the operation of the existing export pumps, which will still be in use the majority of the time despite tunnel construction and operation, and will endanger the lives and homes of environmental justice communities living in one of the most vulnerable flood points in the state. According to the Delta Stewardship Council’s Climate Vulnerability Assessment, 17,000 homes will be affected by flooding and \$28 billion dollars in damages for critical buildings will ensue for the city of Stockton. Families living at Conway Homes in south Stockton are just one example of communities that will be affected by this. The tunnel distracts DWR from solving this important climate change challenge in the Delta, and eats up funding that should be used to help protect the state’s 13<sup>th</sup> largest city.

The billions to be spent on the proposed Tunnel Project could be used instead for more effective climate adaptation purposes like flood protection investments throughout the Delta. There are many flood facilities that need funding now and soon but are deferred and delayed actions. For example, the State Plan for Flood Control (SPFC) is a comprehensive plan for levee protection

---

<sup>94</sup> Peter D. Bromirski, *Storm Surges in the San Francisco Bay/Delta and nearby Coastal Locations*, 2008, p. 29, accessible at [https://www.researchgate.net/publication/266069797\\_Storm\\_surge\\_in\\_the\\_San\\_Francisco\\_BayDelta\\_and\\_nearby\\_coastal\\_locations](https://www.researchgate.net/publication/266069797_Storm_surge_in_the_San_Francisco_BayDelta_and_nearby_coastal_locations).

<sup>95</sup> *Tunnel DEIR*, Appendix 7A: Flood Protection Analysis, p. 7A-10, accessible at: <https://cadwr.app.box.com/s/dcb5klvarbi1hb4e90mrd8coi5zmvht5>.

<sup>96</sup> Zhong, “Megastorm,” p. 2.

<sup>97</sup> Zhong, “Megastorm,” p. 3.

<sup>98</sup> *Delta Adapts*, p. xii.

<sup>99</sup> *Delta Adapts*, p. 3-10.



throughout the Delta watershed. Though in theory, levees set to protect cities and sites from Sacramento to Merced County seem like a good fit, DWR ignores deferred maintenance for SPFC levees needed to account for climate change impacts. SPFC includes 1,600 miles of levee and 150 reservoirs that protect the Central Valley.<sup>100</sup>

This becomes a main point of concern for cities like Stockton, Lathrop and Manteca. The levees that are currently in place were built in the 1920s then updated by the Army Corps of Engineers after the 1944 Flood Control Act before being updated for 200 year level protection after Hurricane Katrina.<sup>101</sup> In the southern Delta, the Lower San Joaquin River Flood Control Project is also part of SPFC facilities and includes levees that protect, or partially protect, urban or urbanizing communities such as Stockton, Lathrop, and Manteca.<sup>102</sup> The Sacramento River Flood Control Plan (SRFCP) and Lower San Joaquin River Flood Control Project also protect islands within the Delta, such as Sherman Island, Jones Tract, Upper Roberts Island, Middle Roberts Island, and Lower Roberts Island.<sup>103</sup> Non-SPFC levees also protect portions of the deep-water ship channels to the two major inland ports at Sacramento and Stockton.<sup>104</sup> Though updates improved the levees, the infrastructure is still inadequate to provide real protection from atmospheric rivers that are expected to increase in frequency as the climate continues to warm.<sup>105</sup> While SPFC levees are under the jurisdiction of DWR for maintenance and inspection every five years, non-SPFC levees are the responsibility of landowners and local reclamation districts.<sup>106</sup> DWR recognizes that the levee systems surrounding each Delta island along the central, eastern, and Bethany Reservoir alignments (where various facilities are located) provide the first line of defense against flooding.<sup>107</sup> However, this assumes that the levees are continually updated to protect against climate change conditions.

---

<sup>100</sup> DWR 2022 Central Valley Flood Protection Plan Update, pp. xxiv <https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Flood-Management/Flood-Planning-and-Studies/Central-Valley-Flood-Protection-Plan/Files/CVFPP-Updates/2022/Central-Valley-Flood-Protection-Plan-Update-2022.pdf>; see also DWR, Central Valley Flood Protection Plan Conservation Strategy, 2016, pp.6-14 [https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Flood-Management/Flood-Planning-and-Studies/Central-Valley-Flood-Protection-Plan/Files/CVFPP-Updates/Files/2016-CVFPP-Conservation-Strategy\\_ay11.pdf](https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Flood-Management/Flood-Planning-and-Studies/Central-Valley-Flood-Protection-Plan/Files/CVFPP-Updates/Files/2016-CVFPP-Conservation-Strategy_ay11.pdf).

<sup>101</sup> D. Des Jardins. 2017. "Urban Delta: 235,000 people at risk from levee failure in Stockton," accessible at: <https://cah2oresearch.com/2017/02/27/urban-delta-264000-people-at-risk-from-flooding-in-stockton-area/>

<sup>102</sup> SJAFCA, Lower San Joaquin and Delta South Regional Plan, 2014, pp. 13 and 51 <https://www.sjafca.org/home/showpublisheddocument/178/637195161638300000>.

<sup>103</sup> *Delta Adapts*, p. 7-17, accessible at <https://deltacouncil.ca.gov/pdf/delta-plan/2021-06-25-delta-adapts-vulnerability-assessment.pdf>.

<sup>104</sup> DWR, *State Plan of Flood Control Descriptive Document*, 2022, Figure A-9. Detail 8: American River from Carmichael Bluffs to Sacramento River at River Mile 50, accessible at [https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Flood-Management/Flood-Planning-and-Studies/FSSR-and-SPFC/2022-SPFC\\_508.pdf](https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Flood-Management/Flood-Planning-and-Studies/FSSR-and-SPFC/2022-SPFC_508.pdf).

<sup>105</sup> Zhong Raymond, The New York Times, The Megastorm That Could Inundate California, 2022, p. 5, accessible at: <https://www.nytimes.com/interactive/2022/08/12/climate/california-rain-storm.html>.

Hereafter Zhong, "Megastorm."

<sup>106</sup> DWR, *State Plan of Flood Control Descriptive Document*, 2022, pp. 6-4, accessible at [https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Flood-Management/Flood-Planning-and-Studies/FSSR-and-SPFC/2022-SPFC\\_508.pdf](https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Flood-Management/Flood-Planning-and-Studies/FSSR-and-SPFC/2022-SPFC_508.pdf).

<sup>107</sup> California Department of Water Resources, Appendix 7A: Flood Protection, Analysis, 2022, p. 7A-9, accessible at: <https://cadwr.app.box.com/s/dcb5klvarbi1hb4e90mrd8coi5zmvht5>

The main issue that local flood agencies and the entities in charge of maintenance of SPFC levees face is that they lack the proper funding for such projects. For every ten dollars Sacramento receives for flood control, Stockton only gets one dollar. When local flood agencies are attempting to garner enough funding for both SPFC and non-SPFC levees, it is clear that the issue behind funding is tied to the economic investment of a certain area outside of flood infrastructure improvements. For instance, when looking at the Mossdale project under the San Joaquin Area Flood Control Agency's (SJAFCA) belt, the existing plan to meet the state requirements is to (1) repair the ongoing Levee Seepage Repair Project (LSRP); and (2) SJAFCA Levee Improvements to achieve 200-year flood protection project. The estimated cost for this project is \$270 million and is expected to come from the following resources: a regional development impact fee, an assessment of all benefiting properties, the Mossdale Tract Enhanced Infrastructure Financing district (EIFD), and remaining funds from the completion of RD 17's Levee Seepage Repair.<sup>108</sup>

Chris Elias, executive director of SJAFCA, notes that, "If the levees were to be strengthened, the areas behind them often become attractive for development (fancier homes, bigger buildings, more people).<sup>109</sup> In other words, federal agencies consider recreational and other economic investments over saving homes and lives. Not funding infrastructure projects that induce growth in flood prone areas is a huge issue as it is almost impossible to raise funds for a local levee especially if it is difficult to justify economic activity or facilitate growth from the project. That becomes evident when analyzing a large area like south Stockton (one of San Joaquin's major cities) as flood protection projects have been on pause for years because "the Army Corps of Engineers fears it would spur growth." DWR projects that a \$30 billion investment is needed to keep the Central Valley safe, yet in the last fifteen years, the state has only allotted \$3.5 billion.<sup>110</sup> Even without the funding or climate change flood protection improvements, DWR claims that the new SPFC levee would extend to existing levees at the north and south ends of the intake structure to ensure that there is proper flood protection around the site, surrounding areas and down into structure for a 200-year flood event due to sea level rise. However, that is not the case as the current RD 17 levees protecting the Mossdale Tract Area do not provide a 200-year flood protection level as required by state law.<sup>111</sup>

The Tunnel DEIR acknowledges that Stockton will be affected by Delta flooding as the region is dependent on Delta water supply. Though inland, the Delta is vulnerable to rising seas. The stability of the levees protecting the community are tested daily by tides, river inflows, and a rising sea level. Stockton is a port city surrounded by bodies of water with decaying levee systems that were built long ago, before climate change and water diversion infrastructure was set in place. These levees will not withstand the pressure from the broadly under-appreciated risk of severe floods. Additionally, levee failure could degrade Delta water quality if waters rush into a heavily subsided Delta island, pulling higher-salinity water, mainly from direct tidal action. More importantly, there is no accountability to ensure that levee improvements are made as DWR relies on several entities (local and federal agencies) to make the appropriate decisions

---

<sup>108</sup> San Joaquin Area Flood Control Agency, Reducing Flood Risk for the Mossdale Tract, 2019, accessible at: <https://www.sjafca.org/projects/mossdale-tract>.

<sup>109</sup> Zhong Raymond, The New York Times, The Megastorm That Could Inundate California, 2022, p. 7, accessible at: <https://www.nytimes.com/interactive/2022/08/12/climate/california-rain-storm.html>

<sup>110</sup> R. Zhong, "Megastorms," p. 7.

<sup>111</sup> *Tunnel DEIR*, Chapter 7, p. 7-39, accessible at: <https://cadwr.app.box.com/s/lq4ega6ld9tc2xlt0xshl3kg70bbjc8a>.

and adjustments when the funding is not adequate in vulnerable Delta flood point areas like San Joaquin County. This project cannot properly be executed without ensuring that its impacts and the lasting impacts of climate change are not fully addressed or mitigated.

Lastly, the Tunnel DEIR should address the degradation of levee roads due to high volume truck traffic during tunnel related construction. It will add another cost to maintain these roads to ensure that flooding does not occur once the new intakes become operational. (Actually, the roads will have to be built up continuously during the 12 to 14 long years of construction. Will DWR and CalTrans care about levee roads once it's over?) Current flood prevention measures are inadequate and generalized and thus need further analysis to ensure the protection of the communities impacted.

There is insufficient evidence and analysis in the Tunnel DEIR that the new intakes will not be affected by sea level rise from intense heavy rains due to climate change. Its modeling suggests that there will be very gradual capturing of wet winter flows that on average there will be 0.08 increment increase of sea level rise (under Alternative 5) because intakes crowd the channel.<sup>112</sup> Sea level rise during and after construction are projected to have little to no significance with a 0.08 increase. Sea level rise will displace and raise some small amount of water but this analysis completely ignores massive flooding as a whole during and after construction. DWR's analysis reports on average increases while ignoring worst-case scenarios for flood impacts and damages. Additionally there is no evidence in the Tunnel DEIR to suggest that the Sacramento River intakes will not succumb to flooding thus raising concerns for Delta communities like Clarksburg, Locke, Isleton, Courtland, and Hood which need protection from flooding induced by the tunnel and climate change. Environmental justice communities in the North Delta are also at risk due to possible sediment build-up at the intakes, while in Stockton the onset effects of climate change that will put our current levees to the test. Instead, the state and DWR need to sit down with SJAFCA and environmental justice communities affected by potential flooding to discuss allocation of their resources and time. The Tunnel DEIR makes it clear that the project is meant to "help" the Delta while ignoring needed levee improvements in the north, central and south Delta. There is an urgent need to improve existing Delta conditions outside of this project first, to ensure adequate flood protection. Yet, DWR simultaneously downplays their calculations concerning climate change effects on sea level rise and related water elevations while needlessly inflating confidence in mitigation measures. It is time that DWR makes protecting the lives of Delta residents from flooding as much as they prioritize export.

The Tunnel DEIR makes clear that the project is meant to "help" the Delta while ignoring needed levee improvements in the north, central and south Delta. DWR needs to re-allocate their resources for levee upgrades instead of focusing on the tunnel project in order to protect Delta residents from the current and projected climate change conditions (such as ark storms, sea level rise, etc.) that will pose a threat to current levee infrastructure. The DEIR inflates confidence in mitigation measures while also suggesting that their analyses on sea level rise are accurate and true, but they do not meet current climate projections and worst-case scenarios. Furthermore, sediment buildup can occur at the North intakes and will pose a flood threat to North Delta communities and DWR must develop a more comprehensive mitigation strategy to

---

<sup>112</sup> Under Alternatives 1, 3, and 5, WSEs for the 100- and 200-year flood event would increase by a 28 maximum of 0.08 foot (RM 45.6; see Figure 7-2 for the corresponding location) in the river reaches 29 with urban levees and 0.10 foot (RM 40.0) in the river reaches with non-urban levees when 30 compared to existing conditions (Table 7-2). p. 7-40.

prevent buildup of sediment and fish in their screens and consequently the intakes. The dangers of flood are looming over Delta residents and are only expected to worsen, therefore there is an urgent need to shift the focus on how the state can properly fund the flood risk management projects first, before using up resources for a tunnel that will only exacerbate current flood and climate threats.

## **Chapter 9, Water Quality**

Water quality is at the heart of Tunnel Project impacts. The project's "footprint" is large in the Delta for both its construction and operational period effects. This reality is dismissed in the Executive Summary of the DEIR where all 17 Tunnel project water quality impacts are deemed less than significant, and only one—Impact WQ-6, relating to mercury impacts from Tunnel operations effects—is to be mitigated by a mercury monitoring and management plan. We remind DWR that it is the *implementation* of such a plan not its proposing that complies with CEQA.

Mercury is, of course, a legacy contaminant embedded in Delta channel sediments since the gold rush 170 years ago. Disturbance of mercury can lead to bacterial transformation of elemental or ionized mercury into methyl mercury. This form becomes bio-available and can be accumulated into tissues of a variety of aquatic organisms. Some of these could be consumed by birds, mammals, and humans.<sup>113</sup> In-channel construction and ecosystem restoration activities could mobilize methylmercury contamination if not properly and consistently mitigated. Construction of intakes in the North Delta and construction activities associated with Bouldin Island's "compensatory mitigation" actions are two concerning areas we have that the mercury management and monitoring plan must mitigate to prevent methylmercury contamination.

As with flooding impacts, water quality impacts appear to be modeled along the same narrow, gradualistic basis as with surface flows (Chapter 5), and water supply (Chapter 6). Impact analysis recognizes no role for the presence of new North Delta intakes having disturbed channel sediments at any point in the Tunnel's construction period, coupled with high runoff from extreme storm events that may scour channel beds and mobilize contaminants like methylmercury and bioavailable selenium. Any legacy pesticide contaminants could also become bioavailable ecologically and in drinking water supplies drawn from Delta channels. Chapter 9 does a poor job at best of disclosing where these and other contaminants as well as the most at-risk small community drinking water systems may likely co-occur in Delta channels so that decision makers may realistically assess risks of Delta tunnel intakes construction and operation. California's drinking water maximum contaminant load for mercury is 2 µg/L while in the California Toxics Rule it is set at 0.05 µg/L in water. It appears from Appendix 9A screening analysis that there is no set standard for methylmercury, which is far more toxic than elemental mercury.<sup>114</sup>

Selenium contamination can also result from soil and sediment disturbance as well as water column partitioning in which elemental or ionic forms of aqueous selenium become bio-available and accumulate upward from the base of benthic food webs. While proximate selenium contamination risk is greatest during extended droughts, new levels of selenium are mobilized

---

<sup>113</sup> *Tunnel DEIR*, p. 9-114, lines 38-46, p. 9-115, lines 1-5.

<sup>114</sup> *Tunnel DEIR*, Appendix 9A, Table 9A-6, p. 9A-24.

for deposition downstream by storm events causing erosion in selenium-rich soils of the western San Joaquin Valley; past hydrologic and selenium monitoring indicate that even with the Grassland Bypass Project capturing and diverting runoff away from Mud Slough and Salt Slough, such pulses of selenium loading supply new increments of available selenium to downstream San Joaquin River and south Delta channels where, once flow peaks subside and residence time of water increases, selenium partitioning resumes. Such events, as they may affect both methylmercury and selenium, are not examined in the DEIR. The DEIR fails to adequately address these pathways for methylmercury and selenium contamination in the Delta. North Delta intake operations can also result in exportation of methylmercury and selenium contaminants, the risk of which is inadequately examined in the DEIR.

The rest of our water quality comments will address the interactive effects of harmful algal blooms, reduced Delta flows, and North Delta intake operations.

The Port of Stockton operates two aeration facilities in the channel, constructed by DWR in 2007, to improve dissolved oxygen concentrations. The Port of Stockton operates the aerators whenever dissolved oxygen concentrations drop below 5.2 mg/L from December through July, or below 6.2 mg/L from August through November.<sup>115</sup>

We appreciated that the DEIR acknowledges the Port of Stockton's dissolved oxygen (DO) aerators help address the DO impairment in the Deep Water Ship Channel (DWSC). In the past absent the DO aerators, fish kills occurred in the DWSC, creating a barrier to both escaping adult salmon looking to spawn, and juvenile salmonids heading to the Bay and Pacific Ocean. Surviving fish would have to deplete precious fat reserves when rerouting to avoid the DWSC. Whether the DO problem in the DWSC killed fish directly or not, it had a negative impact on San Joaquin River salmon survival.

In the current era of harmful algal blooms (HABs), the DEIR fails to acknowledge that these same aerators may represent a mitigation for bolstering DO concentrations may now contribute to aerosolizing HAB cells and toxins—in effect converting a serious water quality problem into an air quality problem as well.

It is hypothesized that those same bubblers distress the surface of the water enough to aerosolize toxins. RTD is working with University of North Carolina HABs researchers to confirm, but it appears to be a case of a solution to one problem now creating a new problem. Should air testing by UNC find links between air and water, this will represent new information relating to the Delta Tunnel Project that will require that impacts from North Delta intake operations be re-examined and a supplemental environmental impact report prepared to address them.

The situation with DO aerators raises questions about Tunnel Project operational flow effects. By removing flow in the Sacramento River, there will be less flow remaining to enter the Delta Cross Channel when that facility is open (presently for much of the summer and fall when migrating salmonids are largely absent), and whose flows enter the Central Delta and under low flow conditions may result in less fresh water mixing as far south and east as the DWSC and downtown Stockton than would now occur in the absence of North Delta intake operations. The reduction in these fresher flows would be replaced by poorer quality flows (that is, more saline flows) from either the San Joaquin River or from tidal action. We find no analysis of this

---

<sup>115</sup> *Tunnel DEIR*, Chapter 9, p. 9-13, lines 32 to 34

component of flow in Chapter 9 of the DEIR. It represents a direct operational impact of the North Delta intakes on residence times and flows of water in this part of the Delta. Residence times are an important factor recognized to contribute to blooms of harmful cyanobacteria.

It is well-established scientifically that nitrogen and phosphorus and their bio-available nitrate and phosphate forms are also key nutrient factors in HAB production. We find it alarming then to read in the Delta Tunnel Project DEIR that

Nitrogen and phosphorus water quality objectives have not been developed or adopted into WQCPs for waterbodies within the study area.<sup>116</sup>

High nutrient concentrations have also been suggested as facilitating the spread of invasive macrophytes throughout the Delta; however, at this time the exact role of nutrients in driving macrophyte expansion remains unknown.<sup>117</sup>

The first quote is alarming because it describes an egregious omission from Delta water quality regulation generally. We note that Appendix 9A at least finds that the State of California has drinking water quality objectives for nitrite and nitrate, but not phosphorus.<sup>118</sup> Neither regional water board plans nor objectives of the California Toxics Rule regulate these nutrients. These two nutrients are drivers for HABs and if the Tunnel Project is built, the impact of both the North Delta intakes and the Bouldin Island Compensatory Mitigation Plan on nutrient discharges, flows, and stagnant water must be carefully considered.

The second quote is concerning because it makes clear that high nutrient concentrations facilitate spread of invasive macrophytes (many of which are also known as submerged aquatic vegetation). We appreciate this passage acknowledging the importance of ammonium ( $\text{NH}_4^+$ ) nutrient food sources for HAB formation. This section however fails to acknowledge that nitrate and phosphate nutrients stimulating invasive macrophyte growth contributes to greater water clarity and greater penetration of sunlight into the water column adjacent to these plants. Invasive macrophyte growth eases greater sunlight access into the water column, another key factor in HAB formation because of cyanobacteria's reliance on photosynthesis when other factors are present. This portion of the "setting" section of Chapter 9 of the DEIR should be revised and clarified to reflect this indirect relationship between nutrients, macrophytes, and sunlight as factors in HAB formation.

[M]onitoring for cyanotoxins has been dependent on funds that support bloom response, special projects, or opportunistically at other Delta locations ... As such, Delta CHAB and cyanotoxin monitoring has generally been inconsistent and incomplete in terms of geographic coverage, which makes it difficult to assess changes over time. Nevertheless, the California Cyanobacteria and Harmful Algal Bloom Network Harmful Algal Bloom incident report portal and published studies suggest that cyanotoxins are increasing since they were first detected in the Delta.<sup>119</sup>

We appreciate as well that DWR recognizes that HABs monitoring needs funding for more research. When we can't put together a solution for HABs, why are we discussing changing Delta hydrology and ecology with a huge new Tunnel? We find this confusing and perverse.

---

<sup>116</sup> *Tunnel DEIR*, Chapter 9, pp. 9-17, lines 12 to 13.

<sup>117</sup> *Tunnel DEIR*, Chapter 9, pp. 9-17, lines 42 to 44.

<sup>118</sup> *Tunnel DEIR*, Appendix 9A, Table 9A-6, p. 9A-24.

<sup>119</sup> *Tunnel DEIR*, Chapter 9, p. 9-27, lines 27 to 31.

The Tunnel DEIR also comments:

Microcystis blooms and associated microcystins have occurred in the SWP/CVP export service area waterbodies including San Luis Reservoir. However, only low levels (i.e., <1 µg/L reportable limit) of microcystins have been measured in Delta waters exported from Banks and Jones Pumping Plants to the SWP and CVP.<sup>120</sup>

DWR also makes a point that's concerning because the quote above indicates that low concentrations of *Microcystis* are making it through the export pumps. Suddenly the threat of HABs problems increase as the water exported south becomes stagnant in storage. Combine this with nutrient loading, which could still find a way down those pipelines, and heat; suddenly the bloom threat isn't just a Delta concern anymore. We need to solve the problems at the Delta's source before we start exporting MORE water down south.

Analyses of reverse flow effects upstream of the project alternative intakes indicates that a very slight increase in reverse flows would be associated with intake operations. The results of these analyses are provided in Chapter 5, Surface Water and the potential for effects on the Freeport Regional Water Facility and Sacramento River Regional Wastewater Treatment Plant operations are addressed in Chapter 21, Public Services and Utilities.<sup>121</sup>

We think this is a weak assessment of the risk and likelihood of reverse flows impacting the North Delta intakes. Reverse flows in the vicinity of Freeport from North Delta intakes operation are not an impact that would occur tomorrow or even two years from now, but one that would occur 12 to 14 years beyond the point at which the Delta Tunnel actually obtains sufficient approvals to begin construction work. Final approvals could take several more years, in which case, the Delta tunnel project would begin operations around 2040. The potential for extreme heat and extended heat seasons in Central Valley summers and early autumns undermines DEIR blithe assurances that reverse flow risks would be "very slight."

We have already commented on DWR's claim that even with sea level rise, the North Delta intakes will be located above any point of inundation from rising sea levels at Clarksburg and Courtland (see "Sea Level Rise and the North Delta Intakes' 'Invulnerability'" above). Suffice to say that DWR's analysis does not account for the type of geology comprising the "shoal" at the bend in the Sacramento River near Rio Vista.

But reverse flows are already occurring during drought in the Delta. Just three months ago, early on September 7, 2022, during the recent extreme heat event that California experienced, electrical conductivity (a common salinity measure) just downstream of Isleton in the central Delta, was measured at 912.61 µS/cm at 3:00 in the morning, and the day before the value was about 840 µS/cm. At this point in time, tidally unfiltered flow downstream of Isleton included tidal ebb flows amounting to 16,454 cfs at about 8:00 AM, against an upstream tidally influenced flow of about -10,923 cfs at about 11:30 PM the night before. (For data charts obtained from the California Data Exchange Center, see Attachment 10 to this letter.) While not reversing flow all the way up to Freeport at this point in time, it is clear that tidally-influenced flow in the Sacramento was reaching close to Isleton at this point in our current drought, and under worse drought conditions (influenced by increased heat and evaporative demand in the atmosphere for

---

<sup>120</sup> *Tunnel DEIR*, Chapter 9, p. 9-28, lines 1 to 3.

<sup>121</sup> *Tunnel DEIR*, Chapter 9, p. 9-31, lines 27 to 31.



water vapor) it is entirely plausible that saline reverse flows would reach the North Delta intakes, let alone Freeport. Courtland is just 26 miles upstream of Isleton with no apparent obstructions.

We remind DWR too that East Bay Municipal Utilities District modeled reverse flows and flow events at its Joint Freeport Diversion Facility with Sacramento County Water Agency. The district found that during the modeling period based on 1976-1991 hydrodynamics in the Delta—which is much earlier in our climate-altered hydrologic epoch—there was far greater potential for reverse flows with North Delta intake diversions occurring in the future than if no such intakes were present. When such reverse flows occur it can force Freeport Regional Diversion Facility to under go temporary but costly shutdowns to avoid poor quality water.<sup>122</sup>

Reverse flows affect nutrient build-up and water stagnation, which once again add to favorable conditions for HAB formation. Reverse flows also cause issues with fish migration.<sup>123</sup> Such flows ought to be taken far more seriously than DWR appears to in this section.

CMP construction activities, through excavation, grading, and other soil disturbance in and around waterways, could cause temporary increases in suspended sediment or increased contaminant concentrations in runoff to adjacent surface waters.<sup>124</sup>

This is a problematic statement because DWR claims it could be "temporary" and it's unclear how long that "temporary" could be. In the interview with John Morais (Should be uploaded to Youtube by Friday), at time stamps 0:13 and 2:25 you can see sediment trapped in aquatic weeds and John Morais points out that this sediment has been building up over years, making navigation more and more problematic. That and the sediment build up starts to form more shoreline, constricting those areas in Walnut Grove. This is why we are skeptical of the use of the word "temporary" because the sediment problems outside of this site are not being solved? How can we expect sediment problems to be solved in the site?

Even with the Central Valley RWQCB's irrigated lands regulatory program efforts and point-source discharge regulations to decrease and control sources of nutrient loading, nutrient levels throughout the Delta are not a limiting factor to macrophyte or algae growth in Delta waters.<sup>125</sup>

This quote reveals the ineffectiveness of voluntary regulation of nitrogen and phosphorus based nutrients. We need more action from the Regional Board and from other agencies to deal with nutrient problems, which is why it needs to be taken as seriously with the Delta Conveyance Project. This project will actively remove flows that could otherwise help dilute and disperse nutrient loads and concentrations, but with their removal will enable nutrients to continue supplying HAB formation and spread in the Delta when other factors also permit.

---

<sup>122</sup> Testimony and Presentation exhibits of Dr. Benjamin Bray, East Bay Municipal Utilities District, August 31, 2016, Exhibits 101 and 152, California WaterFix Change Petition Archive in Restore the Delta's archives.

<sup>123</sup> Vogel, D.A. 2004. *Juvenile Chinook Salmon radiotelemetry studies in the northern and central Sacramento-San Joaquin Delta, 2002–2003*, Final Report. Contract report for CALFED, administered by the National Fish and Wildlife Foundation. Red Bluff (CA): Natural Resource Scientists, Inc. 188 pages. available at: [https://www.waterboards.ca.gov/waterrights/water\\_issues/programs/bay\\_delta/wq\\_control\\_plans/2006wqcp/exhibits/append2/doi/doi-16.pdf](https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/wq_control_plans/2006wqcp/exhibits/append2/doi/doi-16.pdf).

<sup>124</sup> Tunnel DEIR, Chapter 9, p. 9-46, lines 37 to 38.

<sup>125</sup> Tunnel DEIR, Chapter 9, p. 9-121, lines 17 to 19.

The project alternatives would result in some seasonal differences in Delta inflow rates from the Sacramento River relative to existing conditions. However, for many months, there would be little to no change in flow under the project alternatives relative to existing conditions, and for those months when there are changes in flow the flow rates would be within the range occurring under existing conditions. ... Consequently, there would be negligible, if any, flow-related changes to nitrogen and phosphorus concentrations in rivers upstream of the Delta.<sup>126</sup>

Changes to inflow is exactly the problem with this tunnel project in terms of nutrients and nutrient loading. It would make sense that there would be no changes to flow in upstream rivers, but the issue is in-Delta flows. It's necessary to point out that freshwater flow is essential for in-Delta purposes pertaining to managing nutrient loading. As we point out in our previous comment, more in-Delta flows would help to reduce, dilute, and disperse nutrient loads and concentrations. Additional flows would also reduce residence time of water in Delta channels and cul-de-sacs, reducing the stability of the water column on which HABs depend as another factor in their formation.

This assessment focuses on the June through November time period when CHABs have been present within the Delta.<sup>127</sup>

The Tunnel DEIR focuses on the HABs season in the Delta as ranging from June through November. The month of May should be included as well as April since by 2040 under our present global warming average temperature trajectory, the hot season through the Central Valley will be lengthening (see Attachment 8).

As part of RTD's mission to undertake systematic water quality and HABs monitoring and testing in partnership with the Central Valley Regional Water Quality Control Board (Region 5), our staff has been trained to use appropriate personal protective equipment when in the field gathering data. Their PPE includes masks, gloves, and solutions for hand-washing to guard against lung and skin irritations that can ensue when in proximity to HABs. Our staff has been trained to wear PPE as soon as a bloom is present in the area. This raises the question of public safety because if it is a safety practice to wear PPE in the field, why isn't there a similar safety notice for the public? Public safety implications from HABs are not examined as part of DWR's HABs discussion in relation to tunnel operations, despite significant safety concerns.

Attachment 9 to this letter shows these modeling results: without tunnel intakes in 2040, May through November, Sacramento River flows decrease between 3 percent (in November) and 22 percent (in May) across all years. These are modeled climate change impacts. With the tunnel intakes in place in 2040, its operational effects will add to climate change effects. May through November operational effects at Hood, according to CalSIM 3 modeling, would be modest, from zero to 3 percent on top of climate change. DWR's statement blithely assumes that its modeling of flow changes is correct and that Tunnel alternatives will have little, if any, impact on future HAB formulation.

The project alternatives would have negligible, if any, effect on the probability with which any given 15-minute absolute velocity would occur at the assessment locations during the June through November period, relative to existing conditions (Appendix 9E, Figures

---

<sup>126</sup> *Tunnel DEIR*, Chapter 9, p. 9-121, lines 26 to 34.

<sup>127</sup> *Tunnel DEIR*, Chapter 9, p. 9-154, lines 38 to 39.

9E-2-1-1 through 9E-2-11-6). Therefore, the project alternatives would not cause lower velocities, or reduce the frequency with which any given velocity would occur when velocities are low during the months of June through November, relative to the existing conditions.<sup>128</sup>

Exporting water from the Delta would contribute to reverse flows, which would impact in-Delta flows, making residence time of water more stagnant each year. The graphs in Appendix 9E referenced are not explained, but they show modeled results that there are no changes to flow from No Project Alternative and Alternative 5. Considering CalSim 3 is developed for smooth operational modeling conditions, we are skeptical that there will be no altering of conditions since the modeling fails to account generally for heat and storm extremes.

...[C]hanges in nutrient concentrations would not cause increases in the frequency or magnitude of CHABs in Delta waters, relative to existing conditions. This is because (1) any increases in nutrient concentrations that would occur at some Delta locations would be small in magnitude, and (2) nutrients would continue to be in excess under the project alternatives as they are under existing conditions, even with some seasonal decreases in nutrients at Banks and Jones Pumping Plants. Consequently, the small increases in nutrients at some locations in some months would not alleviate nutrients as a limiting factor to CHAB growth because nutrients are not a limiting factor under existing conditions.<sup>129</sup>

There needs to be an update to measures that restrict nutrients and it needs to be applied in situations where the Delta is ever-changing. Exporting water will alter flows in the Delta, which will limit freshwater flow downstream, which ultimately can lead to optimal conditions for HABs to form. If nutrients will remain in excess, it stands to reason that this needs to be solved before we change Delta ecology further. Increased water exports should wait until things are stable here.

Based on the discussion and findings above, the project alternatives would not cause additional exceedance of applicable water quality criteria or objectives associated with CHABs or their toxins because none currently exist.<sup>130</sup>

There are no standards in place to control CHABs, yet they are badly needed. To reach this conclusion, DWR has denied the disruptive aspects of anticipated climate change effects and extreme heat events, as well as the lengthening of hot seasons, in particular, DWR irresponsibly assumes that voluntary regulation of excess fertilizer discharges of nutrients from upstream San Joaquin River growers will continue indefinitely, resulting in a steady supply of nutrients that HABs consume when other conditions (including slack water, hot temperatures) are right for bloom formation. The State Water Board and DWR need to do better; this is unacceptable considering the implications. -

In a legislative report on the Freshwater Estuarine Harmful Algal Bloom (FHAB) Program, the staff from the FHAB program highlighted the necessity of setting standards for HABs in the Delta. In the report, it's mentioned that a HABs standard is currently being worked on for drinking water, but not for beneficial uses (fishing, cultural uses, recreation, etc.) due to how dynamic the HABs threat is. DWR consistently uses the excuse that absent a HABs standard, they cannot truly limit HABs assessments for the Tunnel Project, which is short-sighted. The

---

<sup>128</sup> *Tunnel DEIR*, Chapter 9, p. 9-156, lines 37 to 42.

<sup>129</sup> *Tunnel DEIR*, Chapter 9, p. 9-158, lines 10 to 17.

<sup>130</sup> *Tunnel DEIR*, Chapter 9, p. 9-180, lines 21 to 23.

lack of a needed regulatory HABs standard for the beneficial uses of surface water is a convenient cover for DWR to not complete the necessary analysis for the DEIR. In relation to projects and management decisions, the lack of regulatory standards makes it difficult to solve the short and long term problems with HABs. Without objectives that protect beneficial uses from HABs, their management will be impossible. Introducing the North Delta Intakes to deplete freshwater flows in the Delta in the absence of such protection will be a travesty.

#### Appendix 9E: Cyanobacteria Harmful Algal Blooms

Microcystin concentrations continue to increase in extent and severity in the Delta and in 2020 the toxin was detected at 1,239.4 µg/L in scum in the Stockton Deep Water Ship Channel and at 138.6 µg/L in a water sample taken from Mormon Slough (State Water Resources Control Board 2021).<sup>131</sup>

For reference, the test strips used by RTD for microcystins only measure up to 10 µg/L. Levels above 20 µg/L are dangerous and require media coverage, shutting down access for public safety, etc. The numbers above are egregiously bad in recent years. and. Highlighting the issues around HABs in the Delta. Water becomes too stagnant, nutrients load the site and promote algal growth, and increases in temperature of the water all add together to create quite a toxic bloom. Add in problems with benthic mats of *Microcystis* that likely line the bottom of the Stockton Deep Water Shipping Channel and it becomes essential that protective standards must be in place before the Delta Tunnel Project disrupts flows to and within the Delta further.

Overall, in Appendix 9E, there are sections for different things being measured with no explanation for what the graphs are showing: daily average temperature, 15-minute velocities, residence times, etc. Each section has numerous graphs, and a small blurb at the beginning of each section describing what each term means seems necessary in the Appendix section. Maybe the graphs are described in the chapters more clearly, but having to cross reference back to the DEIR chapters is annoying for the reader when explanations can instead be made clearly in one document. It would clarify the graphs, which track how probability of exceedance intersects with the temperature and 15-minute velocities data.

#### **Chapter 15, Agriculture**

As shown in the Executive Summary of the DEIR, the Delta Tunnel's direct impacts to prime agricultural land, lands under Williamson Act contracts, and farmlands of statewide importance are significant and unavoidable. Over 2,150 acres of such lands will be permanently lost to crop production once construction of Delta Tunnel facilities is completed. Another 186 acres will be "temporarily" taken from production—but the DEIR fails to summarize adequately the location, duration, acreage, and reason for temporary withdrawal of such lands. Geotechnical and hydrological field studies are indicated, but the DEIR fails to indicate the location and duration of these studies. "Excavation and installation of utility infrastructure..." would also be temporary according to the DEIR, but it is acknowledged, "these areas would be unavailable for agricultural production" during the construction period—which lasts 12 to 14 years. For most farmers this would be tantamount to permanently closing their businesses.

The mitigations proposed in MM Ag-1 are appropriately deemed incapable of reducing the Tunnel Project's significant impacts to the status of "avoidable." The conversion of important farmland is generally irreversible, since soil fertility, even under temporary withdrawal from

---

<sup>131</sup> *Tunnel DEIR*, Appendix 9E, p. 9E-8, lines 13 to 16.

production and soil conservation practices, is difficult to recover once lost. A similar project has proven the negative effects on the soil composition when projects of this magnitude have been built. The study was conducted by Iowa University when the Dakota Access Pipeline was built. “Our findings show extensive soil disturbance from construction activities had adverse effects on soil physical properties, which come from mixing of topsoil and subsoil, as well as soil compaction from heavy machinery,” according to an Iowa State University soil researcher.<sup>132</sup>

The third impact from the Delta Tunnel Project to agriculture we believe should be recategorized from less-than-significant to significant and unavoidable. The CEQA conclusions for Impact Ag-3 is clear that indirect changes to groundwater elevation and surface water quality attributable to Delta Tunnel Project construction and operations could raise salinity in irrigation water whether pumped or diverted from Delta channels. DWR merely proposes to compensate farmers for ruined water supplies, when this would be a significant unavoidable impact to them and their croplands. This represents avoidance of mitigation responsibility not real environmental mitigation or full economic compensation.<sup>133</sup>

In Chapter 15 “Agriculture Resources,” we also find problems with the map used on *Figure 15-1, Crop Distribution in the Study Area*. This map does not show where any of the projects will be, including Alternative 5. The figure is a poor representation of how the land use will be affected just by the fact that none of the project alternatives are on the maps nor on the legend of the figure. There is no way to see how much land and which crops will be affected if any of the alternatives were to be built. The same problem is on *Figure 15-2, Williamson Act Parcels in the Study A*, and on *Figure 15-3, Farmland Classification in the Study Area*. These three figures need to have the project alternatives properly identified so that it is understood which crops and lands will be permanently and temporarily affected.

When looking at Table 15-1, all the crops that will potentially be affected are listed, but not without a breakdown of how much and for how long they will be affected. Why are there no specifics of how much each crop per county will be affected in the building of the project? It does not explain the potential losses for each landowner. Moreover, a grand total for each county and the Delta study area is not provided. This should be corrected in the Final EIR.

Section 15.1 states that farms within the Delta had a gross revenue of \$965 million in 2016, earned mainly from almonds, wine grapes, tomatoes, alfalfa, and wheat. There are 70 distinct crops that are grown on 415,000 farmed acres in the Delta.<sup>134</sup> Construction of the Delta Tunnel Project will affect all 70 crop types, not just the ones that produced the most because the project will affect water quality, air quality, transportation (since workers often commute to Delta islands and crops must be trucked out to distribution points).

---

<sup>132</sup> M. Tekeste and A.Y. Robinson. 2021. “Pipeline study shows soil compaction and crop yield impacts in construction right-of-way,” Iowa State University, College of Agriculture and Life Science, November, accessible at <https://www.cals.iastate.edu/news/releases/pipeline-study-shows-soil-compaction-and-crop-yield-impacts-construction-right-way>.

<sup>133</sup> Tunnel DEIR, Chapter 15, p. 15-51, lines 41-46, p. 15-52, lines 1-29.

<sup>134</sup> Delta Protection Commission, *The State of Delta Agriculture: Economic Impact, Conservation and Trends*, last modified February 3, 2020, accessible at <http://delta.ca.gov/wp-content/uploads/2020/07/Ag-ESP-update-agricultural-trends-FINAL-508.pdf>.

Table 15-2 is inconsistent with Table 15-3 and Table 15-1. For example, with 70 distinct crop types, why are these not the same or similar crops mentioned in all other tables as well? As indicated already, these crops will be affected once the project is fully functioning, so data table breakdowns should include them as well. Remaining inconsistencies need to be explained, and where erroneous, corrected. If necessary, further studies need to be done to get a better understanding of how this project will affect the outcomes in 15 years when it's fully built and after 2040.

In the “Setting” section on “Irrigation and Drainage”, the information disclosed was from a source close to thirty years old. Is there not a more current source? Or is DWR not taking the time to seek more research done on the crop tolerances and needs, types of irrigation systems, and drainage? Since 1997, there has been a great leap of technology that farmers are applying to reduce their water use. Also, the type of pesticides, fertilizers and amounts of additives have changed since 1997. Throughout this whole section all the sources used are outdated. DWR needs to find more recent sources to make sure this is viable information. Resources from 1977, 1986, and 1997 are not good enough due to how much technology has changed in the last decade; further research needs to be done. Again, this needs explanation and, if erroneous, correction.

In “General Crop Production Practices and Characteristics,” it is pointed out that the Delta has different forms of irrigation due to its “high rainfall during the winter and low rainfall during the majority of the growing season.” However, due to climate change California is bound to see longer and hotter summers<sup>135</sup> with shorter and drier winters, with less snowfall.<sup>136</sup> How will cutting the amount of flow from the Sacramento River into the Delta by down to 6,000 cfs help farmers meet their irrigation needs in a warmer climate? *Table 15-3, Applied Irrigation Requirements of Crops Grown in the Study Area by Acreage*, just 13 of the 70 crops grown in the Delta are mentioned here, that is not even a quarter of the types of crops grown in the study area. This is troublesome considering the fact that this project's effects will cut the amount of water that will be available after the project is built knowing that climate change will also have an impact on the amount of water any of the crops in the Delta will receive.

In the section on “Crop Salinity Tolerances,” DWR states, “Agricultural drainage is another major source of salinity in the Delta, particularly from the San Joaquin Valley. Because the San Joaquin River carries a higher concentration of salt load than the Sacramento River (the Sacramento River basin ultimately contributes more salt load to the Delta than the San Joaquin River basin because the total magnitude of its flows is much higher),” in addition to the above statement, in Chapter 9, DWR estimated that sea level rise will only be 0.8 feet. However, the Delta Stewardship Council mentioned that by 2050 sea level rise will be between 1.2 to 2.7 feet.<sup>137</sup> but *Table 15-5. Crop Tolerance and Yield Potential of Selected Crops as Influenced by Irrigation Water Salinity (ECw) or Soil Salinity (ECe) in DeciSiemens per Meter (dS/m)* the salinity does not reflect any changes in the future when looking at the increase of salinity from Agriculture now, or how salinity will increase just by the natural level sea rise that is expected by 2050.

---

<sup>135</sup> Becker, Rachel, “Four in a row: California drought likely to continue.” last modified, September 28, 2022, accessible at, <https://calmatters.org/environment/2022/09/california-drought-likely-to-continue/>

<sup>136</sup> Mount, Jeffrey, Escriva-Bou, Alvar, and Sencan, Gokce, “Droughts in California,” last modified, 2022, accessible at, <https://www.ppic.org/publication/droughts-in-california/>

<sup>137</sup> *Delta Adapts*, p. 5-4.

Upon looking at *Table 15-5. Crop Tolerance and Yield Potential of Selected Crops as Influenced by Irrigation Water Salinity (EC<sub>w</sub>) or Soil Salinity (EC<sub>e</sub>) in DeciSiemens per Meter (dS/m)* further adds to the disappointment. There are various reasons for this. First, the table used is dated 1985, making it 37-year-old data. Why doesn't DWR have an updated source? Second, because the table is so dated, it doesn't describe all the same crops identified in Table 15-3. *Crop patterns have changed.*

This table only points out what salinity the crops can withstand given a certain yield at a particular time 37 years ago, but it does nothing to explain what impact this project will have on crops with increased salinity levels. According to the California Department of Food and Agriculture (CDFA), it is understood that plants need a certain level of sodium and chloride for basic survival, but at a very low level. When plants take up too many ions from high salinity, they will damage tissue. In some plants that can result in leaf burn.<sup>138</sup>

DWR has failed to diligently research the topic and needs to start investigating before building the Tunnel Project. It is putting the wagon before the horse because the severity of the effects from tunnel operation on water quality for irrigation are not being taken into consideration.

With creating this project the amount of farmland will decrease due to salinity increase before it is taken over by urbanization.

In Appendix 15C, DWR states:

As described in Appendix 3C, Defining Existing Conditions, No Project Alternative, and Cumulative Impact Conditions, water agencies participating in the Delta Conveyance Project have been grouped into four geographic regions: northern coastal, northern inland, southern coastal, and southern inland. The water agencies within each geographic region would likely pursue a similar suite of water supply projects under the No Project Alternative. Desalination project would most likely be pursued in the northern and southern coastal regions.<sup>139</sup>

The discussion proceeds to explain how groundwater recovery will also be treated for higher salinity. DWR discusses how farmers south of the Delta will need surface water from the Delta to treat San Joaquin Valley groundwater salinity and without Delta water this would be a significant impact. What DWR omits or fails to recognize is that there are other solutions that reduce the burden of using water from the Delta to sustain agriculture South of the Delta. Where is the sustainable water plan for the San Joaquin Valley? By omitting this, they (DWR) is off the hook, from truly fixing San Joaquin Valley water quality, and they are setting a straw man (e.g., nine different alternative which are all relying on a tunnel and Delta water). They are not considering real alternatives independent of Delta exports to prop up agriculture that has to evolve to be sustainable.

This lack of full agricultural analysis contradicts the “policy of the state policy to reduce reliance on the Delta for California future water needs.”

---

<sup>138</sup> Jessica Fu, “Scientists trying to make plants love salt,” *The Counter*, last modified March 2, 2022, accessible at <https://plantingseedsblog.cdffa.ca.gov/wordpress/?p=20852>.

<sup>139</sup> *Tunnel DEIR*, Appendix 15 C, p. 15C-2, lines 1-5.



Taking water from Delta farmers, who have riparian water rights, and redistributing Delta water to a more powerful set of farmers in the San Joaquin Valley is not mitigation; it is an abuse and redistribution of water rights. This prejudice to favor south of Delta farmers over Delta farmers is reinforced when DWR states “This impact would be potentially significant. Mitigation Measure AG-3: Replacement or Relocation of Affected Infrastructure Supporting Agricultural Properties would require disrupted agricultural infrastructure to be relocated or replaced; otherwise, the affected landowner would be fully compensated for any financial losses. After mitigation, this impact would be less than significant.”

Just as farmers in the south need water, farms in the Delta need to be treated with the same respect and have the right to clean, fresh water as well.

Overall, DWR has relied on outdated resources to assess direct impacts on Delta agriculture. A number variables are not being accounted for: longer droughts, less rainfall, gas well complications prime Delta farmlands, farmers, sea level rise, salinity effects on water quality, and extreme flooding.

### **Chapters 17 and 29, Appendix 29A**

These two chapters are closely linked, despite the twelve chapters separating them in the content of the Tunnel DEIR. The DEIR misses a huge opportunity to examine the intersection of Delta Tunnel environmental impacts with the economic and environmental justice consequences of the proposed project.

Instead, the Tunnel DEIR employs misdirection with a narrow scope for Delta economic and environmental justice analysis to avoid finding environmental justice impacts altogether in the document. It erroneously claims that water quality impacts of the project will be less than significant, and therefore avoids modeling the manner by which impacts of increased salinity (and potentially other contaminants) would move through economic and community linkages and degrade not only water quality but economic output and social life. The DEIR considers Stockton, with about half of its population living in the secondary zone, outside of the footprint for the majority of impacts discussed elsewhere in the document despite water quality impacts on beneficial uses of water, including drinking water. In addition, construction staging which will rely heavily on the Port of Stockton, which will also increase the air pollution burden within Stockton’s AB 617 community. Ignoring the disparate impacts on urban Delta populations from the construction and operation of the project seems to ignore the civil rights of communities of color under state and federal environmental justice laws.

Chapter 17’s baseline setting description surveys broad population, housing, jobs, and economic/fiscal characteristics of county jurisdictions that would be affected by construction and operation of the Tunnel Project, but it fails completely to carry through a parallel impact analysis of many of the same characteristics resulting from the Delta Tunnel project. Data tables for population and “Income and Poverty Levels” present data for counties not just in the Delta but throughout the service area of the State Water Project—the South Bay area, San Joaquin Valley, Central Coast counties, and Southern California, another 15 counties in all in these two instances. However, all other tables (the other fifteen) present data on just Delta counties, and some include Alameda County while others do not.

We think it is highly questionable to include Alameda County, with 1.67 million people, when this county represents just a tiny sliver of land within the southwestern portion of the Legal Delta and the project study area. Its presence, particularly when it comes to representing income, poverty rates, average farm value, and government farm payments, skews grand Delta total and average statistics. Take poverty: most of Alameda County's impoverished populations are found in the west county cities from

Fremont north to Berkeley, with the highest concentrations in Oakland, Berkeley, and Hayward—all cities that are NEVER considered part of the Legal Delta. The same effect is true of per capita and median household income, and the number of persons living below the poverty line as well—their presence in Table 17-9 is fallacious when it comes to a true representation of the Delta Region as an economy. The vast majority of the legal Delta is represented by the other five counties—Contra Costa, Sacramento, San Joaquin, Solano, and Yolo counties.

To be consistent about including State Water Project service area counties in the population and income data tables, then DWR must include the service area counties everywhere else.<sup>140</sup> Moreover, we find it insulting that DWR's Tunnel DEIR would insert data on SWP service area counties when it declines to include Stockton in its socioeconomic and environmental justice analyses. By doing so, you leave readers with the strong impression that some data are included while others are excluded arbitrarily, cherry-picked—that the socioeconomic analysis presented is neither serious nor methodical, and inadequate for connecting the causal chain of physical effect to economic effect to a new environmental effect. The Tunnel DEIR at least acknowledges the long construction period that for practical purposes should be considered permanent in their effects on community character:

Construction activities would occur over a multi-year period [12 to 14 years] and could create sources of noise, air pollution, traffic, and other conditions that may affect the characteristics of some communities in the statutory Delta located near the project area. These activities, along with the long-term placement of the conveyance facilities, could also alter the character of these areas if they substantially reduce the extent of undeveloped land in proximity to communities and change the viability or desirability of important economic and social pursuits, including agricultural activities and water-based recreation.<sup>141</sup>

The magnitude of the tunnel's construction period is never contextualized throughout Chapter 17. This raises questions for us whether the Environmental Commitments and Mitigation Measures we describe above will be fulfilled timely and actually protect beneficial uses of water and land throughout the Delta. Chapter 17 also would have benefited greatly from creating connection to and analysis of the findings from Appendix 29A (about which more below) where actual input from real-live Delta residents and regional Delta users was obtained by DWR. This appendix legitimately makes some claims to meaningful representation of Delta environmental justice communities, but DWR all but ignores it, even in Chapter 29, to which Appendix 29A is attached as a supporting document (yet it is never drawn in to provide support). Characteristics of the Delta EJ population from Appendix 29A include:

---

<sup>140</sup> *Tunnel DEIR*, Chapter 17, Tables 17-1 and 17-9, pp. 17-14 and 17-24.

<sup>141</sup> *Tunnel DEIR*, Chapter 17. p. 17-44, lines 5 to 10.

- Two-thirds of survey respondents provided sufficient demographic information to make a determination as to whether they lived or worked in the region and could be considered a member of a disadvantaged community (DAC).
- Of the 2117 survey participants, 979 were categorized as living or working (or both) in the Delta region. Of those, 540 were categorized as DAC respondents, and 166 of them were further subcategorized as severely disadvantaged community (SDAC) respondents.
- Two-thirds (66%) of DAC respondents from the Delta region identify as an ethnicity other than white, and 53% of Delta-region SDAC respondents identify as other than white.
- Nearly one-fifth (19%) of Delta-region DAC respondents and 23% of those subcategorized as SDAC respondents report a primary language other than English.
- This survey was the first time participating in a public process related to a Delta tunnel-related proposal for at least 557 respondents, 230 of which were Delta-region DAC respondents. The highest increases in participation came from respondents who identify themselves as an ethnicity other than white or primarily speak a language other than English.<sup>142</sup>

Within the Setting section, baseline data are inconsistently presented, though the emphasis is on setting data for counties of the legal Delta, but undermined by including Alameda County, making it appear that the Delta is wealthier AND more impoverished than it actually would be without this county. Conversely, Table 17-17 presents information on average farm size, average farm production value, and average value of government payments for Delta counties from the crop subsidy programs but omits the same indicators for the SWP service area counties.<sup>143</sup> For the Final EIR we would prefer that DWR enlarge this table so readers may see for themselves the extent to which farms in SWP service area counties receive additional subsidies (which add value over time that is capitalized into their farm values). These would be for farms in the counties of the South Bay Area, San Joaquin Valley, Central Coast counties, and Southern California. If these counties are not added to the Final EIR, then they should be deleted from the other tables in which they appear. However, we recognize that DWR has included an impact discussion of the proposed Delta Tunnel on agricultural economics in the Legal Delta and the Project area, so in that case, we request that the setting section be made parallel with this discussion—include all the service area counties for other indicator tables relating to housing, employment, age groups, agricultural output, and crop subsidies, and then analyze the proposed project's impacts on each of these economic indicators. As it stands, Chapter 17 is sub-par.

Moreover, the Tunnel DEIR states, "Operations and maintenance activities would not directly result in effects on productive irrigated agricultural acreage and production values," a complete dismissal of potential salinity impacts on irrigation water supplies drawn from Delta channels, including numerous diversions just downstream of the North Delta Intakes from Hood at least to

---

<sup>142</sup> Tunnel DEIR, Appendix 29A, p. 10.

<sup>143</sup> *Tunnel DEIR*, Chapter 17, p. 17-36.

Isleton. The Tunnel DEIR analysis fails to take the salinity impacts, model their effects on farmer crop selection and then estimate the impact to crop economic value and return to farmers as well as employment effects of decreased value. This approach has been done in the 2011 Delta Economic Sustainability Plan conducted by the Delta Protection Commission. This study's results were also submitted to the State Water Resources Control Board as exhibits associated with the testimony of former State Senator and long-time Delta farmer Michael Machado. The analysis in Impact ECON-6 should be revised for the Final EIR to take account of this approach to assessing salinity impacts on the economics of Delta agriculture and the socioeconomics of the Delta region.<sup>144</sup>

Similar problems plague the analytic framework of Chapter 29, Environmental Justice, in which the socioeconomic impacts bear substantially on environmental justice communities (that is, also, disadvantaged and severely disadvantaged communities). Both Chapters 17 and 29 lack any substantial details of the impacts on environmental justice communities while at the same time avoiding and ignoring Appendix 29A, DWR's 2021 survey entitled *Your Delta, Your Voice*. This is consistent throughout the environmental justice analysis even when Chapter 29 mentions state of California policies on environmental justice to which the Tunnel Project and its DEIR must adhere.<sup>145</sup> This chapter does the minimum in reaching "beyond the outreach associated with the fair treatment and meaningful involvement" of environmental justice communities by narrowing down the survey to less than a page worth of environmental justice analysis. The purpose of doing environmental justice analysis gets lost among repeated sections that do not connect to the community input provided in the survey.

We focused our review of Chapter 29 on the communities around the North Delta Intakes, which will cause both construction impacts and long-term operational impacts of intake operations on Delta flows and water quality: Clarksburg, Hood, Courtland, Locke, and Walnut Grove (even Isleton could be impacted as well).

Conceptually, Chapter 29 defines the environmental justice community under analysis as confined to census tracts and blocks wholly or partially within the Legal Delta boundary—in other words, only to community members residing within the Legal Delta. This inappropriately ignores and excludes the potential environmental justice population of *the Delta Region* affected by Tunnel Project impacts on Delta landscapes and water ways from consideration in the impact analysis. People do not have to live in the Delta to experience the Delta and be impacted by changes to the Delta. The Tunnel DEIR is inadequately prepared and should be revised to include environmental justice communities in the Delta region as well.

---

<sup>144</sup> Delta Protection Commission. 2011. *Draft Delta Economic Sustainability Plan*, October, accessible at <https://delta.ca.gov/wp-content/uploads/2021/05/Delta-Economic-Sustainability-Plan-2012-508.pdf>. This plan was presented in testimony by former Delta Protection Commission executive director Michael Machado to the State Water Resources Control Board during Part 1B of the California WaterFix Change Petition Hearing in December 2016, Exhibits RTD-30 and -31, and RTD-301 through -305; available on request to Restore the Delta.

<sup>145</sup> Found at California Public Resources Code sections 71110-71118 and Government Code section 65040.12(e)(1). These policies specify that environmental justice is "the fair treatment and meaningful involvement of people of all races, cultures, incomes, and national origins, with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies."

Despite this narrow method of analysis, Chapter 29 reveals that Delta census tracts have a total “minority” population of 80,435, representing 61.2 percent of the total population—which makes the Delta a “majority minority” region.<sup>146</sup> Legal Delta communities are home to 12,456 low-income households (defined as those having household income at or below \$60,000 per year), representing 32 percent of total Delta households—nearly one-third.<sup>147</sup> From the presentation of census tract-level data in Chapter 29, we observe that the census tracts immediately around the North Delta Intakes have an even larger proportion of non-white community members, as shown in the Table below. This is clear evidence, which Chapter 29 ignores, that just the construction impacts of the North Delta Intakes will have disproportionate impacts on environmental justice disadvantaged communities in these north Delta communities. The communities in this table are located in a range from Freeport in the north Delta to Isleton in the central Delta area, the area where immediate and direct impacts of both North Delta Intakes construction and operation will be direct and pronounced. The construction impacts will directly affect what respondents in 2020 to DWR’s *Your Delta, Your Voice* (YDYV) community survey reported were

Census Tract	Description	Percent Native American and Communities of Color
104.01	Clarksburg and rural area	64%
43	North Freeport	91.1% to 94.6%
96.01	East Freeport	89.9% to 97.5%
96.35	East Hood	67.9% to 69.3%
99	Freeport to Walnut Grove to Isleton	50.9% to 74.9%

Source: *Tunnel DEIR*, Chapter 29, Figure 29-2 and Table 29-1.

heavily-used fishing locations in the north Delta and local businesses that support fishing and related recreational activity.

The construction period for these intakes will destroy fishing access along the left (east) bank of the Sacramento River between Hood and Courtland, which could generate greater congestion among anglers for remaining fishing spots, or discourage fishing all together in this area of the Delta. Chapter 29 fails to recognize these as significant environmental justice impacts, yet these are also significant environmental impacts since they involve human beings connected to their estuary through fishing as the act of predating on fish by human beings for consumption purposes. DWR misreads official environmental justice principles to accord no status to these environmental justice beneficial uses of the Delta. In the context of CEQA and NEPA analysis DWR ignores evidence of direct ecological interaction of human beings with their physical environment, the population of whom are demonstrably disproportionately represented in the Legal Delta population and beyond in the vicinity of the proposed sites for North Delta intakes. Despite this, the Tunnel DEIR states, “If the project is approved and completed, project operations are not expected to result in disproportionately adverse effects on minority and low-income communities in the environmental justice study area.”<sup>148</sup> The DEIR can only conclude

<sup>146</sup> *Tunnel DEIR*, Chapter 29, Table 29-1, pp. 29-10 to 29-12.

<sup>147</sup> *Tunnel DEIR*, Chapter 29, Table 29-2, pp. 29-15 to 29-18.

<sup>148</sup> *Tunnel DEIR*, Chapter 29, p. 29-1, lines 31 to 34.

this because no analysis is provided of disproportionate presence in the Legal Delta, as RTD does here

Census Tracts with Minority Populations:	Number of Census Tracts	This table shows further potential for disproportionate impacts of the Delta Tunnel on Delta environmental justice communities. Twenty-eight of 54 Delta census tracts have majority minority populations in them, and twenty-six of them have more than 70 percent non-white populations in them.  Now, we recognize that the above table reports on environmental justice <i>residents</i> of the North Delta from Chapter 29, and our comments have also pointed out that more environmental justice folks than just those residing in the Delta use the Delta for various purposes. Chapter 29 fails to incorporate the findings about fishing activity of its own (rather expensive) survey on Delta environmental justice communities within and beyond the Legal Delta.
<10 percent of total	4	
<20 percent of total	5	
50 percent or more of total	28	
70 percent or more of total	17	
90 percent or more of total	9	
Total Census Tracts in Legal Delta	54	
Source: <i>Tunnel DEIR</i> , Chapter 29, Table 29-1.		

RTD provided a detailed critique of the YDYV methodology and outreach approach in 2021.<sup>149</sup> We incorporate this analysis by reference and request that DWR respond in the Final EIR to its points as well as those in this letter.

Whites represent about 32 percent of the total Legal Delta population, but in the YDYV survey Whites represented 62 percent of all respondents to the survey. So, as we point out in our methodology critique in 2021, white people are overrepresented in the YDYV survey. That does not mean there is no useful information derivable from it. For disadvantaged and severely disadvantaged community members responding to YDYV, 28 and 29 percent respectively stated that they used the Delta for outdoor activities, with another 18 and 19 percent respectively also stating that they used fishing spots. Their responses reflect nearly identical responses for “all respondents” to YDYV (30 and 18 percent respectively).<sup>150</sup> In addition, the study finds that communities of color identified outdoor activities and fishing spots as 43 to 45 percent of their engagement with the Delta, while communities of “mixed heritage” and Native Americans identified these activities as representing at least half of their engagement with the Delta.<sup>151</sup> Even more to the point, Delta environmental justice (DAC) respondents disclosed that 246 of 274 respondents or **90 percent of respondents rely on Delta fish to feed their**

<sup>149</sup> Tim Stroshane, “The Window Dressing of Environmental Justice in Delta Tunnel Planning,” *Delta Flows*, 19 September 2021, accessible at <https://www.restorethedelta.org/2021/09/19/delta-flows-9-19-21-the-window-dressing-of-environmental-justice-in-delta-tunnel-planning/>.

<sup>150</sup> Ag Innovations. 2021. *Survey Findings: Your Delta, Your Voice: Environmental Justice Community Survey*, May, p. 77, “Map Markers by Type for Delta Region DAC Participants.” Hereafter cited as *YDYV Survey*.

<sup>151</sup> *YDYV Survey*, p. 79

**families on a nearly costless basis—subsistence fishing.**<sup>152</sup> Map 5 of YDYV Survey shows results of map marking by Delta environmental justice (DAC respondents) indicating that over one-fifth of that 90 percent (about 55 respondents) relied on north Delta fishing spots (55 dots).

A twelve to fourteen year construction period at North Delta fishing spots will greatly impair environmental justice communities' access to Delta fish for their diets disproportionately relative to the Delta Region and add travel costs to their fishing activities—a direct environmental effect. Given their reliance on Delta fisheries for a significant portion of weekly protein intake, this is a clear environmental justice and environmental impact (again, the latter because fishing is a direct human interaction with environmental resources—fish; and the former because the impact would be imposed by DWR's Tunnel Project construction activity in the North Delta disproportionately). The Tunnel Project DEIR gets this just plain wrong when it states:

Construction of one or more intakes on the Sacramento would obstruct access to fishing spots along the east riverbank at intake locations. However, there is ample access to the river for bank fishing from numerous other locations. Therefore, the project would not substantially affect recreational and subsistence fishing for minority or low-income populations and there would be no disproportionately adverse effect on environmental justice.<sup>153</sup>

This needs to be corrected in the Final EIR. Here DWR and its consultants engage in deliberate, blithe erasure of a beneficial use of water and fish by Delta environmental justice communities, as if it is of no consequence. It is a cruel finding and must be struck from the Tunnel DEIR.

In the operational period of the Tunnel Project, two principal water quality impacts go ignored as to their effects on Delta environmental justice communities: increased salinity downstream from North Delta Intake operations and increased risk Delta-wide of harmful algal blooms. Contrary to DWR's claim that water quality is not a significant environmental impact of the project on environmental justice communities, we include Attachment 9 to this letter addressing the effect of North Delta Intake diversions on Delta flows. These charts are drawn from Tunnel DEIR appendices and show that there will be impacts in significant portions of each year from North Delta Intake diversions. DWR is misrepresenting its flow analyses by contending there are no significant water quality impacts from Tunnel diversions. These substantial but relatively modest impacts in Attachment 9 reflect statistical averaging in DWR's hydrodynamic modeling, and fail to disclose minimum low flow conditions that will bring increased salinity with it, whether from sea level rise, tidal action, or both.

---

<sup>152</sup> YDYV Survey, p. 90. Survey authors apparently could not believe their eyes at this finding. "These map markers revealed a remarkable pattern. For 90% of the map markers placed by Delta-region DAC respondents, the respondent indicated that they or their family eat fish from the Delta four or more times per week. Because survey takers could place multiple map markers, we also ran this calculation after removing any instances in which survey takers answered this question for more than one map point. this resulted in the same 90% proportion indicating they eat fish from the Delta four or more times per week." We at Restore the Delta knew already that subsistence fishing is an important means by which Delta Region residents supplement their diets with a costless form of fish protein, but we were pleasantly surprised by the high rate of reliance environmental justice community respondents disclosed to the survey. We also think DWR is to be commended for allowing, and Ag Innovations for including, this map marker approach used in the survey to elicit such responses.

<sup>153</sup> Tunnel DEIR, Chapter 29, p. 29-26, lines 30 to 33.



Moreover, as we discussed above in our comments on Chapter 9, Water Quality, harmful algal blooms occurring in the Delta threaten to spread to areas of the Delta where flows will be lower and residence times of water longer due to diversions introduced by the North Delta Intakes. Candidate reaches of Delta channels for HAB spread could include reaches downstream of the Intakes, the Delta Cross Channel, Georgiana Slough, and other channels of the Central Delta that rely on Delta Cross Channel flows. Such spread could reach the drinking water supply intake owned and operated by the City of Stockton Municipal Utilities Department, which serves thousands of Stockton households and businesses with fresh, potable drinking water.

We are deeply disappointed that DWR resorted to ignoring its YDYV Survey as a basis for informing how and what kind of environmental, environmental justice, and community impacts the Delta Tunnel Project would impose on the Delta EJ community both of the direct Legal Delta and of the Delta Region as a whole. It is plainly obvious that 1) the Legal Delta as well as the Delta Region are *bona fide* environmental justice communities, with relatively small proportions of white and wealthy populations; 2) Delta residents AND Delta region community members rely substantially on the Delta directly, and the north Delta in particular, for subsistence fishing, and it is thus an environmental impact to have both fishing spots taken away from anglers and fish removed from the vicinity for North Delta Intakes construction activities; and 3) in the operational phase, lost flows in the Delta will increase salinity in the Delta as it reduces flows in north and central Delta channels, and thereby contributing to the spread of harmful algal blooms which will disproportionately injure Delta people who rely on fishing and broad outdoor activities to enjoy the Delta. In sum, the Delta Tunnel Project will harm such beneficial users of water as fish, outdoor water-contact recreation, and environmental justice communities.

## Attachment 2

### Weighted Average Frequency of North Delta Diversion Operations

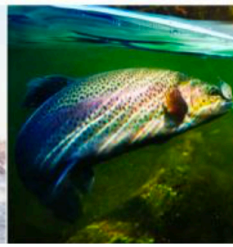
Month	Number of Days	Estimated Percent Time in Operation	Estimated Number of Days Operating in the Month
October	31	20%	6.20
November	30	43%	12.90
December	31	72%	22.32
January	31	90%	27.90
February	28.25	75%	21.19
March	31	68%	21.08
April	30	18%	5.40
May	31	25%	7.75
June	30	25%	7.50
July	31	38%	11.78
August	31	10%	3.10
September	30	23%	6.90
<b>Annual Total</b>	<b>365.25</b>		<b>154.02</b>
<b>Percent of Time in Operations</b>		<b>42%</b>	

---

Source: Delta Conveyance Project Draft EIR, Appendix 5A, Section B.3.4.2 Modeling Results for North Delta Diversions; Restore the Delta for visual interpretation of Probability Exceedance Graphs.

---

Note: Percent Time in Operation is estimated visually from probability exceedance graphs. While this introduces potential for interpretive error, the graphs also show that the alternatives are closely bunched together, which would reduce variability in interpretation.



**509 E. MAIN ST, STOCKTON, CA 95202**

**RESTORETHEDELTA.ORG**

via email: [jelena.hartman@waterboards.ca.gov](mailto:jelena.hartman@waterboards.ca.gov)

March 31, 2021

Jelena Hartman, Senior Scientist  
Division of Water Rights  
State Water Resources Control Board  
1001 "I" Street  
Sacramento, CA 95814

**Subject: Comments on Staff Report: Climate Change and Water Rights**

Dear Ms. Hartman:

Restore the Delta (RTD) is a grassroots campaign of residents and organizations committed to restoring the Sacramento-San Joaquin Delta so that fisheries, communities, and family farming can thrive there together again; so that water quality is protected for all communities, particularly environmental justice communities; and so that Delta environmental justice communities are protected from flood and drought impacts resulting from climate change while gaining improved public access to clean waterways. Ultimately our goal is to connect communities to our area rivers and to empower communities to become the guardians of the estuary through participation in government planning and waterway monitoring. RTD advocates for local Delta stakeholders to ensure that they have a direct impact on water management decisions affecting the well-being of their communities, and water sustainability policies for all Californians.

We appreciate the unique invitation to the public to comment on the Division of Water Rights' staff report, "Recommendations for an Effective Water Rights Response to Climate Change." It is a thoughtful look at how long-standing and potential new water rights will be affected by climate change, from the increasing frequency of droughts and hence junior water right curtailments, to the challenges of integrating climate change data, modeling, and realities into feasible and sustainable new water right applications.

A few of staff's recommendation bear comment, but first we observe that the staff report is written in a general, even abstract manner. One section where the report got more concrete and specific—and which piqued our interest—was Text Box 1, "Summary of Pending Water Right Applications [page 7]." There, the Division of Water Rights reports 349 total pending applications, and that 56 (about 16 percent) of them account for 99.8

percent of the total face value of all pending applications statewide. With assistance from Ms. Jelena Hartman, we queried the Division's electronic water rights information management system (eWRIMS) to learn more of how this pattern of pending applications affects both the Central Valley and the Delta.

We found that 9.65 million acre-feet of face value in the pending applications are centered in the San Joaquin Valley alone—among the counties that make up the San Joaquin River and Tulare Lake Hydrologic Basins. Controversies involving both the Kings and Kern rivers may account for much of this face value: Kern County alone is the site of applications coming to 4.1 million acre-feet (MAF) of face value, while Fresno, Kings, and Tulare counties account for another 2.62 million acre-feet of face value. When the average full natural flow for the Kern (1929-2020) is 688 TAF (or about 0.7 MAF) and for the Kings is 1.67 MAF, it is clear that these pending water rights claims are implausibly inflated—from the standpoint of current hydrology, let alone their future hydrology under climate change.

We also found that 31 applications in Central Valley counties (including the counties of the Sacramento Valley) account for 89.2 percent of all pending applications. It is apparent that most of the Division of Water Rights' biggest challenges lies in how it navigates the feasibility and sustainability of analyzing the effects of climate change on these Central Valley water rights, since the Central Valley has one of the largest shares of overall runoff annually in the state.

One other specific item is omitted, which Restore the Delta raised in the change petition proceeding for the California WaterFix tunnels project during 2015 through 2019: the State Water Project and Central Valley Project as water systems are long overdue for a finding by the Division of Water Rights that the two projects are complete and should be licensed, and that any new facilities at new locations for Delta re-diversion must be treated as a new water right. The Hearing Officers for that proceeding never made a determination on this issue, but it has been a stalemated controversy since 2009 when the two projects petitioned for time extensions and their petitions were protested by several groups. It is our understanding that these petitions are still "live," and that any water right change petition for a new Delta conveyance project would face the same water rights issues raised in the California WaterFix proceeding. This is relevant to "water rights and climate change" because any such new Delta diversions would have to take account of water availability in the Delta's Central Valley watershed, or be found an unreasonable method of diversion.

We find it heartening that the Division intends to include adaptive permit terms in new permits. We urge the Division, under its legal powers of continuing jurisdiction over water rights, to include adaptive permit terms in existing permits as well, since the water rights system to some degree conflicts with a drought ethic that "we're all in this together." Adaptive permit terms, whether for drought or flood conditions, should enable

all to share in the surpluses or deficits that occur as we move through our new climate regime.

In this spirit, we also support the Division's recommendation to revise the Fully Appropriated Stream (FAS) list consistent with emerging climate change realities. This should be done in a transparent and stakeholder-driven fashion. And to support this revision, we also support adding more permanent and temporary stream gages so that opportunities for defensible data reflecting actual conditions is employed in the process of re-evaluating the FAS list.

Finally, planning for droughts is something Restore the Delta has long sought from state agencies, including the State Water Resources Control Board. We were struck by the Division's recommendation to "conduct and utilize in stream flow analyses to further develop in stream flow recommendations for *ecologically important streams* to protect public trust values...[page 27, emphasis added]" The phrase, "ecologically important streams" suggests strongly that other streams would be "ecologically unimportant." There are no ecologically unimportant streams; it is well known that habitat for wildlife and flows for fish have long been in short supply. To suggest that annual creeks and streams may be somehow ecologically unimportant rejects the potential for restoration in such stream channels, whether seasonal or perennial. This is an environmental justice issue, since small, healthy streams provide opportunities for play, subsistence, and contemplation just as do larger ones. There are already too many examples of dry or polluted stream beds that have been treated as "ecologically unimportant." We as a society designate "ecological importance" at the risk of marginalizing anew not only restored habitats for species struggling to survive climate change, but the human communities adjacent to these stream channels too. Protection of the public trust as a matter of law and ethics makes no such distinction of which we are aware that some streams are more important than others.

Thank you for considering these comments on the staff report on water rights and climate change prepared by the Division of Water Rights.



Barbara Barrigan-Parrilla  
Executive Director



Tim Stroshane  
Policy Analyst

cc: E. Joaquin Esquivel, Chair, State Water Board  
Dorene D'Adamo, Vice-Chair, State  
Tam Doduc, Member, State Water Board  
Sean Maguire, Member, State Water Board  
Laurel Firestone, Member, State Water Board

## Attachment 4



*Little Manila* RISING



Transmitted and served via email (addresses below):

4 June 2021

State Water Resources Control Board  
% Erin Foresman or Chris Carr  
emails:  
[Erin.Foresman@waterboards.ca.gov](mailto:Erin.Foresman@waterboards.ca.gov)  
[Chris.Carr@waterboards.ca.gov](mailto:Chris.Carr@waterboards.ca.gov)  
P.O. Box 2000  
Sacramento, CA 95812-2000

California Department of Water  
Resources  
% James Mizell  
email:  
[James.Mizell@water.ca.gov](mailto:James.Mizell@water.ca.gov)  
P.O. Box 942836  
Sacramento, CA 94236-00001

Regional Solicitor's Office  
% Amy Aufdemberge  
email: [Amy.Aufdemberge@sol.doi.gov](mailto:Amy.Aufdemberge@sol.doi.gov)  
2800 Cottage Way, Room E1712  
Sacramento, CA 95825

U.S. Bureau of Reclamation  
% Kristin White  
email: [knwhite@usbr.gov](mailto:knwhite@usbr.gov)  
3310 El Camino Avenue, Room 300  
Sacramento, CA 95821

**Subject: Protest with Objections to Temporary Urgency Change Petition submitted by California Department of Water Resources and United States Bureau of Reclamation, submitted May 17, 2021; and to proposed Water Board order for conditional approval of same**

To whom it concerns:

This letter transmits our protest with objections to the above referenced temporary urgency change petition (TUCP) and related matters.<sup>1</sup>

---

<sup>1</sup> The TUCP with the State Water Resources Control Board was filed for Permits 16478, 16479, 16481, 16482 and 16483 (Applications 5630, 14443, 14445A, 17512 and 17514A, respectively) of the Department of Water Resources 'State Water Project and License 1986 and Permits 11315, 11316, 11885, 11886, 11887, 11967, 11968, 11969, 11970, 11971, 11972, 11973, 12364, 12721, 12722, 12723, 12725, 12726, 12727, 12860, 15735, 16597, 20245, and 16600 (Applications 23, 234, 1465, 5638,

Specifically, the TUCP as proposed will not best serve the public interest; it is contrary to law; and it will have an adverse environmental impact on the Delta, and to salmon fisheries on which northern California Indian Tribes rely for cultural life and nutrition. Rather than treat each of these objections separately, we see them as pieces of a whole story that must be understood as resulting from the drought and the actions of the petitioners, California Department of Water Resources and United States Bureau of Reclamation (collectively, Petitioners) as operators of facilities of the State Water Project (SWP) and Central Valley Project (CVP).

Petitioners wish to apply criteria narrowly from state water law, and as administered by the State Water Resources Control Board. At a time when California has seen below normal to critically dry conditions in seven of the last ten years, it will not suffice to apply these criteria narrowly, because the public at large is affected.<sup>2</sup>

Specifically, the Petitioner's statement that "the proposed change will not result in injury to any other legal users of water," assumes incorrectly that the only important "legal users of water" are ones with property water rights. The phrase "beneficial users of water," also has basis in state and federal water quality control law, therefore they are also legal users of water. Beneficial users may or may not possess water rights, and may be anglers, recreators, waders, scientists, artists, poets, locally drinking water-dependent, or any person drawn to waters of the Delta for any reason. Petitioners' assumption that the actions of the projects under the TUCP will not harm other legal users of water is narrow and fatuous.

Further, we show in this letter and its attachments that Petitioners' urgency justification for the State Water Board to approve the TUCP is flimsy. (See Attachment 1.) It relies on data irrelevant to evaluating whether in fact the SWP and CVP acted diligently to avoid wasting or depleting its water supplies, when in April and May they appear to have rushed water supplies to senior agricultural water right holders in the Sacramento Valley just before submitting the TUCP on May 17. Despite warnings in March 2021 from Northern California Indian Tribes and environmental non-governmental organizations (NGOs), storage levels representing better prospects for temperature management to protect endangered Chinook salmon later in the year were squandered when these deliveries were made.<sup>3</sup> Petitioners failed to act diligently to protect stored

---

13370, 13371, 5628, 15374, 15375, 15376, 16767, 16768, 17374, 17376, 5626, 9363, 9364, 9366, 9367, 9368, 15764, 22316, 14858A, 14858B, and 19304, respectively) of the United States Bureau of Reclamation's Central Valley Project.

<sup>2</sup> Since 2000, 13 of 22 years have been below normal to critically dry. See <https://cdec.water.ca.gov/reportapp/javareports?name=WSIHIST>.

<sup>3</sup> Letter to Joaquin Esquivel, Chair, State Water Resources Control Board, from the Bay Institute, California Sportfishing Protection Alliance, Natural Resources Defense Council, Defenders of Wildlife, Friends of the River, Golden State Salmon Association, Pacific Coast Federation of Fishermen's Associations, Institute for Fisheries Resources, Restore the Delta, San Francisco BayKeeper, Save



supplies needed to fulfill their lawful duties to meet temperature management and water quality objectives for the Sacramento River and Delta this year, and pre-emptively released stored water for diversion instead.

Harmful algal blooms have become recurring phenomena in the Delta since 1999. This year's drought conditions are expected to result in blooms in stagnant waters throughout the estuary. In fact, they have already begun. (See Attachment 2 to this letter.) This will harm Delta communities, including those reliant on Delta waters for subsistence fishing, water contact recreation, and all manner of other useful, domestic, recreational, economic, and artistic pursuits here.

Drinking water systems divert from the Delta, particularly by Contra Costa Water District and the City of Stockton. No consideration has been given by Petitioners to their water quality needs and rights, nor has compensation (in money or water terms) been suggested for any injury if water quality conditions at their intakes worsen under the TUCP and related drought conditions.

Petitioners now have the state over a barrel, and we concede that a TUCP should be approved—one that also protects the Delta. The State Water Board has statutory water rights and constitutional authority over what becomes of Petitioners' supplies that remain. In the service of reasonable protection of public trust resources, sacred and native fish species, and Delta communities from water-borne and aerosol toxins from harmful algal blooms, the State Water Board should revise the TUCP so that it better comports with the public interest, reasonable and beneficial use of water, the public trust, and environmental justice and civil rights policies during drought.

We urge you to adopt an order that limits exports to municipal/industrial and wildlife refuge contractors, tightens up the July Delta outflow requirement, and precludes further deliveries to settlement contractors on the Sacramento and Feather Rivers (in addition to project allocations already in place). This will free up additional water for needed temperature management and Delta water quality objective compliance later in the summer and early fall.

We, the undersigned, have carefully read the TUCP notice:



Barbara Barrigan-Parrilla  
Executive Director  
Restore the Delta  
509 E. Main Street  
Stockton, CA 95202  
email: [barbara@restorethedelta.org](mailto:barbara@restorethedelta.org)



Tim Stroshane  
Policy Analyst  
Restore the Delta  
509 E. Main Street  
Stockton, CA 95202  
email: [tim@restorethedelta.org](mailto:tim@restorethedelta.org)



Dillon Delvo  
Executive Director  
Little Manila Rising  
2154 South San Joaquin Street  
Stockton, CA 95206  
email: [dillon@littlemanila.org](mailto:dillon@littlemanila.org)



Regina Chichizola  
Policy Director  
Save California Salmon  
email: [regina@californiasalmon.org](mailto:regina@californiasalmon.org)



Tom Stokely  
Co-Director  
Save California Salmon  
email:

Attachments:

1. Facts Supporting General Allegations Against the TUCP
2. Recent Photos of Harmful Algal Blooms from Discovery Bay, Contra Costa County

cc: Bill Jennings, California Sportfishing Protection Alliance  
Doug Obegi, Natural Resources Defense Council  
Brandon Dawson, Sierra Club California

Jonathan Rosenfield, San Francisco BayKeeper

John Herrick, South Delta Water Agency

Dante Nomellini, Central Delta Water Agency

Harry Black, City Manager, City of Stockton

Stephen J. Welch, General Manager, Contra Costa Water District

Kelley Taber, Somach Simmons & Dunn

Osha Meserve, Soluri Meserve

## **Attachment 1**

### **Facts Supporting General Allegations Against the TUCP**

#### **1. The TUCP and order for conditional approval are contrary to law because Petitioners failed to perform due diligence prior to submitting their petition.**

Petitioners justify their claim of due diligence by having relied on “sound science and methods to forecast and project hydrology and water supply needs.” This is vague and unspecific. They also claim diligent behavior by having limited project allocations and agricultural water service contractor expectations this winter and spring. They further claim that by beginning Water Year 2021 “with relatively high carryover storage after the dry year of 2020,” Petitioners claim they “helped to meet D-1641 requirements through the winter and early spring,” something they now claim they can no longer do without changing the rules under which they are normally required to operate.

Water project allocations are central to Petitioners’ operations of CVP and SWP. Their claim of sound science and methods to forecast project hydrology and water supply needs apparently refers to Bulletin-120 runoff forecasts based on snow water content and precipitation analysis, as well as routine monitoring of reservoir carryover storage. This hydrology forecast includes the timing and volume of runoff from reservoir watersheds. Allocations are then based on requests from contractors, available and anticipated hydrology, and water rights—the pecking order and decision rules by which Petitioners determine how much water shall be allocated to which type of contractor, and the pro rata share of such allocations to each individual contractor. DWR and USBR undertake these actions during normal times.

But suddenly, DWR & USBR state, conditions worsened. Petitioners justify urgency of their petition by blaming their situation of low storage solely on Nature: precipitation is below 50 percent of average, they state, resulting in many reservoirs being “below average” in storage. “This was uncharacteristic,” they state, “and likely due to unpredictable dry soils soaking up snowmelt and substantially reducing runoff into CVP and SWP reservoirs.” By blaming Nature DWR and USBR avoid taking responsibility for their role in controlling flows and water quality throughout the Bay-Delta estuary watershed.

Nature was not unpredictable on this matter. Restore the Delta described these looming conditions already documented by the science community to this Board during the California WaterFix hearings in our sworn testimony. The Petitioners’ claim of “unpredictable dry soils soaking up snowmelt and substantially reducing runoff” is unsupported, baseless nonsense. Instead, the atmosphere may well have evaporated it. A warmer atmosphere is well-known by climate scientists to hold more water as water vapor. In late April and early May, the Sierra Nevada experienced an early heat wave.<sup>4</sup>

---

<sup>4</sup> For example, the Feather River city of Quincy at approximately 3,400 feet elevation experienced a high temperature of 85 degrees F on Thursday, April 29.

It is well known that snow can evaporate directly to air, bypassing water's liquid phase through a physical process known as "ablation."<sup>5</sup> Climate scientist Michael Dettinger alluded to this and related evaporative processes in a December 2020 interview with the Public Policy Institute of California in which he spoke of a "thirsty atmosphere":

The atmosphere has the capacity to draw water up from the land through evaporation. Five factors affect how much water the atmosphere can take up: how warm it is, how humid, the amount of sunshine, the amount of wind, and the available water in soils, plants, lakes, etc. Scientists often refer to the first four as the atmosphere's "thirstiness," or evaporative demand. It varies hour to hour, season to season, and year to year based on these factors.

...

A thirstier atmosphere means the same amount of precipitation leaves less water for plants, streams, reservoirs, and aquifers. We get less benefit from precipitation because a larger proportion goes back into the thirsty atmosphere. Smaller storms in particular may bring little to no water benefit at all if the atmosphere is thirsty.

The bottom line is this—as the atmosphere becomes thirstier, the land becomes drier, even if the amount of precipitation stays the same. Increased persistence and frequency of dry conditions means increased frequency and intensity of drought.<sup>6</sup>

Petitioners are pulling the Water Board's metaphorical "leg" by claiming that unpredictable dry soils soaked up snowmelt and runoff, ringing about as true as the cliché excuse of the family dog eating one's homework. We are in an age of climate change driven by a warming atmosphere that can hold more water than it used to.

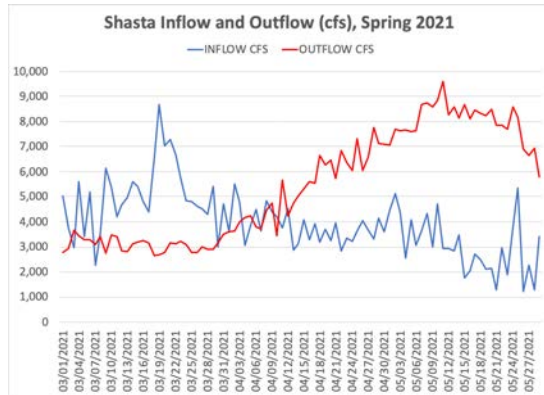
Petitioners fail to acknowledge any role that their operations this spring may play in the loss of reservoir water supply for temperature management and Delta water quality protection. Reservoir outflow at both Shasta (A) and Oroville (B) suddenly increased around April 8, 2021, as shown in these two hydrographs below. The red lines in both graphs indicate that reservoir outflow increased dramatically relative to inflow to the Sacramento and Feather Rivers—meaning that reservoir supplies were decreasing faster than they were being replaced by inflow from upstream.

---

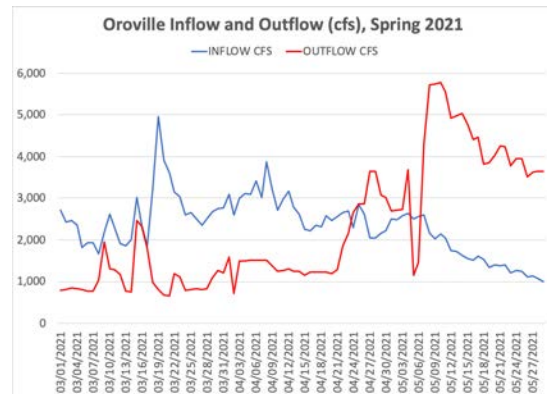
<sup>5</sup> Definition of "ablation" at <https://nsidc.org/cryosphere/glossary/term/ablation>.

<sup>6</sup> Dettinger interviewed at <https://www.ppic.org/blog/droughts-arent-just-about-water-anymore/>.

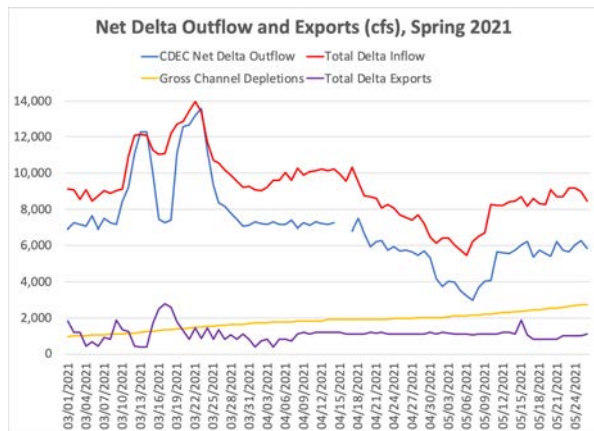
A



B



C



D

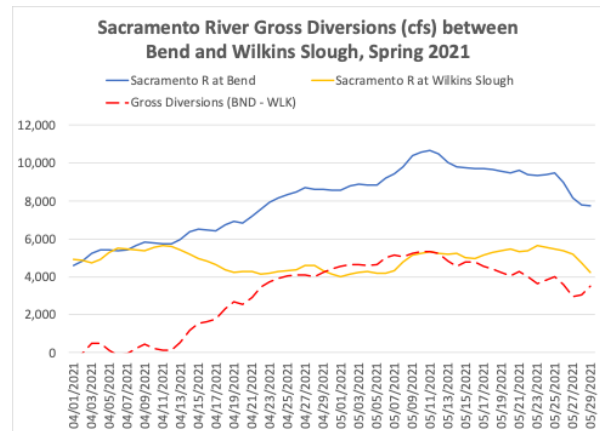


Chart C shows that the spike in reservoir outflows did not reach the Delta—in fact, total Delta inflow (in red, Chart C), net Delta outflow (blue), and total exports (purple) do not respond to the hydrologic signal emanating downstream from Shasta and Oroville outflow releases. Chart D suggests where the flows likely went on the Sacramento River. D shows the flows in the Sacramento River at Bend and at Wilkins Slough, and the dashed red line indicates the difference in flows between the two, which we call “gross diversions” from the river.<sup>7</sup> (Bend is upstream of the city of Red Bluff, and Wilkins Slough is due east of the town of Arbuckle in Colusa County.) Many senior water right holding Sacramento River Settlement Contractors are located in this reach of the Sacramento River, the largest right holders among them being Glenn-Colusa Irrigation District. We estimate the gross diversion of water between these two stations in this

<sup>7</sup> USBR delivery data for this time period for the Sacramento River Settlement Contractors was not available from the Central Valley Operations web site.

time frame at about 362 thousand acre-feet (362 TAF)—about 107 TAF between April 8 and 30, and about 254 TAF from May 1 through May 26.<sup>8</sup>

On the Feather River, Lake Oroville also saw a substantial increase in reservoir outflow relative to inflow beginning in the middle of April and increasing sharply in early May, before tapering off to the present. State Water Project operational reports showed that between May 1 and May 30, 116 TAF were delivered to Feather River Service Area (FRSA)—where senior Feather River settlement water right holders are located and who grow rice, which relies on flood irrigation techniques to grow and harvest their crops.<sup>9</sup> This delivery in May represents about 64 percent of the FRSA’s delivery request year-to-date in 2021—that is, 64 percent of their water demand occurred in the month of May alone this year. This is a large amount of water and likely accounts for much if not all of Lake Oroville releases during the April-to-May 2021 period.<sup>10</sup>

In sum, the Petitioners have neither shown nor explained to the State Water Board and the California public their operational behavior during this crucial spring period leading up to their filing of the TUCP. Our objection is that they appear to have delivered nearly 477 TAF to senior water rights holders, deliveries that reveal due diligence to senior water right holders, but not to their solemn duties under California’s Constitution Article X, Section 2, and case law to protect the public trust resources of California for the benefit of all its people, including for environmental justice communities. This is 477 TAF that could have been kept in Shasta and Oroville for release later in the year to help protect Winter-Run and Spring-Run Chinook salmon. And a large portion of that 477 TAF could have been available to help Petitioners—especially DWR—protect Delta water quality under D-1641 later in the summer and early fall this year.

Two municipal water agencies divert water directly from Delta channels, Contra Costa Water District and the City of Stockton’s Municipal Utilities Department. Petitioners have ignored the rights and water quality needs of these water agencies—who serve about 750,000 people—to have safe and good quality water to divert for their municipal and domestic customers. These agencies will likely face higher water treatment costs to protect their customers from high salt concentrations and harmful cyanobacteria, as well as other water quality risks from TUCP alteration of Delta inflows and outflows.

## **2. The TUCP and order for conditional approval would have unreasonable environmental impacts.**

---

<sup>8</sup> Estimates derived from California Data Exchange Center stations BND and WLK, daily flow sensor. The estimates provided here may be underestimates—some settlement contractors are located downstream of Wilkins Slough and may have received early deliveries as well.

<sup>9</sup> FRSA deliveries from Lake Oroville in April 2021 are not reported here because SWP operational reports are not archived online for public review. Past monthly SWP operational reports are undergoing reformatting for disabled accessibility purposes. We urge State Water Board to obtain and consider these data from DWR for a full and complete record prior to action on the TUCP.

<sup>10</sup> As with the Sacramento River Settlement Contractors, this is likely a significant underestimate for Feather River Service Area senior water rights holders, most of whom grow rice.



The proposed TUCP contains these features:

**Table 1: Summary of TUCP Operations Framework**

Timeframe	Proposed Action
June 1 through July 31, 2021	June 1 through June 30: Reduce net delta outflow index (NDOI) requirements for salinity control from 4,000 cubic feet per second (cfs) to 3,000 cfs on a 14-day running average
	July 1 through July 31: Reduce NDOI requirements for salinity control from 4,000 cfs to 3,000 cfs on a monthly average. D-1641, Table 3, footnote 8 remains applicable
	Cap the combined SWP and CVP exports at 1,500 cfs when Delta outflow is less than 4,000 cfs. SWP and CVP exports may exceed 1,500 cfs when Delta outflow meets D-1641 or for moving transfer water (after July 1)
June 1 through August 15, 2021	Relocate the Western Delta Agriculture compliance point from Emmaton to Threemile Slough

Source: DWR and USBR, Temporary Urgency Change Petition.

The environmental effects of TUCP provisions would result in less inflow to and less outflow from the Delta to San Francisco Bay. Installation of the False River barrier before the end of June will block tidal salt flows from direct access to Franks Tract, the largest in-Delta open water body. These three facets mean that Delta channel flows will slow, and residence time of water will increase within the estuary.<sup>11</sup> Moreover, the presence of estuarine habitat is directly related to Delta outflow. This means that if Delta outflows are reduced, X2<sup>12</sup> migrates further upstream, and the aquatic habitat area that the objective represents will shrink to the relatively narrow width of the Sacramento River channel between Emmaton and Rio Vista from a far greater habitat area in Suisun Bay. So, while the TUCP only proposes reduction in the Delta outflow objective, this objective functions in tandem with the X2 estuarine objective. The State Water Board should acknowledge this in making its findings and determinations about the TUCP. Less outflow and smaller estuarine habitat will result in the following conditions:

- The invasive nonnative clam *Potamocorbula amurensis* (*P. amurensis*), which thrives in saline benthic (bottom-dwelling) conditions, will invade further upstream, have greater opportunity to become established in Delta channels near and upstream of X2 where its voracious grazing rate can wreak havoc on the phytoplankton and zooplankton in the water column.<sup>13</sup> To the extent that Delta smelt still survive in the Delta, *P. amurensis* will compete strongly with smelt for the same food sources.

<sup>11</sup> Residence time is a measure of water stagnation, reflecting slow or no flow conditions. It is often measure in units of days.

<sup>12</sup> X2 is a measure of the physical position of low salinity (about 2 ppt salinity) where historical estuarine habitat is most productive. This “isohaline” measure is best found in Suisun Bay where the area of estuarine habitat will be at its largest. This isohaline migrates back and forth with the tides and the seasons each year, and is closely correlated with Delta outflow to San Francisco Bay.

<sup>13</sup> This clam also is a prodigious bioaccumulator of selenium in organic forms, as well. This means that its tissues will tolerably hold high concentrations of selenium, but at toxic levels to predators like diving birds (like surf scoters) and bottom-grazing fish (like white sturgeon). Selenium more readily partitions to become bio-available at low flows and long residence times.

- Less inflow to the Delta will mean that flows will be slow to near zero in places. Coupled with rising summertime air and water temperatures, nutrient inputs of nitrates and phosphates, and abundant sunlight, cyanobacteria are expected to bloom strongly this year. Reduced flows resulting from TUCP changes will encourage further harmful algal blooms. Such blooms are already established now in the Delta. (See Attachment 2, Photos of HABs from Discovery Bay, Windmill Cove, and Downtown Stockton taken earlier this week.) Aerosols released by Harmful algal blooms are increasingly understood to contain toxins that, when humans (especially children) inhale them, can irritate lung passages and worsen asthma and other respiratory conditions. The San Joaquin Valley is already well known to have a high prevalence of children afflicted with asthma and other lung diseases. To engage in water quality changes through the TUCP is to harm not just water quality but air quality and public health in the Delta region.
- The presence of harmful algal blooms in the Delta will harm legal beneficial users of water known as “anglers”—people who fish for food routinely and frequently in Delta channels—by shrinking the number of safe fishing pools and potentially the number of surviving fish in Delta channels (since such blooms can be toxic to fish and other vertebrate organisms). This group of legal beneficial users of water and fish is estimated to be in the tens of thousands of people. To the extent they bring family dogs, these family members face risk of harm from aquatic cyanotoxins. A recent environmental justice community survey concerning the Delta Conveyance Project by the California Department of Water Resources shows that members of Delta environmental justice communities consume fish from the Delta as often as four times a month.
- The presence of harmful algal blooms in the Delta will harm legal beneficial users of water known as “recreators”—people who would normally seek out river channels and sloughs to play near, in, and on water during the summer. From Stockton alone, there are potentially tens of thousands of people as well, who enjoy proximity to Delta river channels within a short drive. And many also bring their dogs as well, facing similar risks as with anglers. Furthermore, people throughout the region have endured pandemic restrictions for over a year, may have to endure another difficult wildfire smoke season, which could be complicated by planned or unplanned electric power outages, and will have an understandable desire to escape into Nature and cool off by swimming, boating, water-skiing, and other water contact recreation. Be aware that water skiing spray action could further mobilize cyanotoxins as aerosols from Delta water ways as a result.

The TUCP as proposed by Petitioners lifts not a finger of concern to address this looming nightmare. Moreover, when blooms start to die back, other bacteria come in to decompose the biomass and respire, which decreases the oxygen and can create hypoxic events. Such events can suffocate fish and other aquatic oxygen-consuming organisms. If this happens in the fall, it could be catastrophic for Fall-Run Chinook salmon escapement to Central Valley rivers, and compound the risk to the state of

California of committing cultural genocide against Northern California Indian Tribes. By preventing HABs with flushing flows, the State Water Board can protect public health near to and away from Delta channels and reduce the risk of cultural genocide to the Tribes.

In sum, the TUCP, combined with the False River Barrier (for that's how it will be in reality), represents the privileging of powerful agricultural interests in the Sacramento and San Joaquin Valley, who have their "call" on CVP and SWP reservoirs (Shasta, Oroville, and Friant, especially) for water deliveries without having to share in the costs the rest of California and especially Delta residents, farms, and ecosystems must bear during the drought. Some of the stored water will be used for temperature management later in the summer and early fall in an attempt to stave off disaster for Chinook salmon runs, which are sacred to Northern California Indian Tribes and have long been vital to commercial fishing operations. The Tribes and the commercial fishing operations are not merely self-interested in this advocacy however—they speak for the fish and they speak for the rest of the California and American public who enjoy eating salmon. Salmon is food, salmon is life.

But some of the stored water presently in Shasta, Oroville, and Friant is not for temperature management but for fulfillment of senior water rights during the rest of the irrigation season. The Petitioners, prior to filing their TUCP on May 17, betrayed this public trust by delivering at least 477 TAF of water from their reservoirs to private rice-growing interests in the Sacramento Valley. These propertied agencies and their customers count on the CVP and SWP treating them as first in line before Nature in the allocation of drought-period water supplies. Their selfishness will be remembered as a betrayal that threatens to contribute to cultural genocide of the Northern California Indian Tribes whose ways of life and cultural identities revolve around Chinook salmon.

### **3. The TUCP as Proposed and Order for Conditional Approval Are Not in the Public Interest.**

Petitioners appear to have betrayed their solemn obligations under the California Constitution's reasonable use policies, their duties to protect public trust resources for benefit of the California public, and state policies to prevent environmental injustices and civil rights, including the state's policy recognizing and protecting the human right to water. None of these fundamental policies in law were suspended by Governor Newsom's drought emergency declarations. Moreover, it remains state policy during this drought crisis to balance co-equal goals of water supply reliability and ecosystem restoration and reduce Delta reliance to meet California's water needs—policies contained in the Delta Reform Act of 2009. Like the other fundamental policies of California's water law framework, these also were not suspended by Governor Newsom's emergency drought declaration; they continue in full legal force. The TUCP, as proposed and if approved, would be contrary to all of these policies.

The State Water Board, as a state agency charged with public trust stewardship, must still use its authority to seek justice in its deliberations on this TUCP. Approving the TUCP as proposed would fail to correct this injustice of irresponsible water operations by Petitioners in April and May this year, threatening Northern California Indian Tribes with cultural genocide and Delta environmental justice communities with aquatic aerosol toxins and public health impacts from harmful algal blooms.

Therefore, approving the TUCP as proposed would fail to serve the public and right this injustice, and would not be in the public interest.

#### **4. Recommended Conditions Under Which This Protest/Objection May be Disregarded and Dismissed to Resolve Our Objections.**

To resolve our objections the State Water Board should condition its approval of an order in this matter as follows:

- Limit total exports to no more than 750 cfs per day, on a three-day average from June 1 through August 15. This translates to nearly 1,500 acre-feet per day<sup>14</sup> that should be prioritized for municipal and industrial contractors (CVP and SWP), and wildlife refuges south of the Delta.
- The State Water Board should limit San Joaquin River Exchange Contractors' "call" on Friant to facilitate release of flows to the San Joaquin River that will supplement releases from New Melones to a total of 50,000 acre-feet between June 1 and August 15, while the rest of the contractors' "call" should be released into the mainstem San Joaquin River. Released from Friant Dam to the San Joaquin, these flows will protect against spread of harmful algal blooms and protect public health along the San Joaquin River, including in Stockton-area water ways.
- Similarly, the State Water Board should curtail further deliveries to Sacramento and Feather river settlement contractors as unavailable due to water quality (including temperature management) concerns along the Sacramento and Feather Rivers, before, but especially, once the Board curtails junior water right holders throughout the Delta watershed this summer. This condition will reduce pressure on and extend the availability of the reservoirs' cold water pools for later use.
- Maintain the 14-day average proposed in June for July as well. Requiring more flows to the Delta from the San Joaquin, from curtailed Sacramento Basin settlement contractor diversions, and less total Delta exports will help Shasta and Oroville reservoirs "afford" to provide the extra flow needed during July and August to help

---

<sup>14</sup> 1 cubic foot per second (cfs) translates into 1.98 acre-feet per day by multiplying the 1 cfs by 3600 seconds in an hour and by 24 hours in a day, then dividing that result by 43,560, the number of square feet in an acre. (750 cfs average exports ==>(3600 x 24)/43560 = 1,485 acre-feet per day.

prevent both harmful algal blooms and reduce losses of Chinook salmon later in the season.

- Incorporate the CSPA/Save California Salmon/California Water Impact Network Proposed Temperature Management Plan for Central Valley Project Shasta-Trinity Division<sup>15</sup>, to improve survival of winter-run, spring-run, and fall-run salmon, and green and white sturgeon in the Sacramento River, as well as to improve survival of spring-run and fall-run salmon in the Klamath/Trinity watershed. Steelhead trout would also benefit. A prime rationale for this plan is to reduce significantly the introduction of warmer Trinity Lake water to the Sacramento River basin, which would compromise the cold water pool still available in Shasta Lake at present.<sup>16</sup> This plan would:
  - Limit June-through-October releases from Shasta-Keswick dams to 5,000 cfs, using primarily cold-water pool, to maintain Keswick release at less than 54°F.
  - Eliminate June-through-October use of the Spring Creek power tunnel between Whiskeytown and Keswick reservoirs.
  - Maintain June-through-October flow of 300 cfs to Whiskeytown Reservoir through the Carr powerhouse, increase June-October releases to Clear Creek

---

<sup>15</sup> Complete temperature management plan was sent as a letter from California Sportfishing Protection Alliance, Save California Salmon, and California Water Impact Network to Joaquin Esquivel, Chair, State Water Resources Control Board, *Proposed 2021 Temperature Management Plan for Central Valley Project Shasta-Trinity Division*, May 23, 2021.

<sup>16</sup> The CSPA/SCS/C-WIN temperature management plan (TMP) states: “The CSPA TMP will meet its purpose by making more effective use of cold-water pools in Shasta and Trinity reservoirs. “The CSPA TMP will severely reduce the export of Trinity River water to Whiskeytown Reservoir. In addition, the CSPA TMP proposes to release all Trinity exports down Clear Creek, rather moving water from Whiskeytown through the Spring Creek Powerhouse into Keswick Reservoir. Thus, summer water from the Trinity will enter the Sacramento River 10 miles downstream of Keswick Reservoir. Water released to Clear Creek from Whiskeytown Reservoir is also colder than water released from Whiskeytown to the Spring Creek Powerhouse, because releases to Clear Creek are drawn from deeper in Whiskeytown Reservoir. Colder releases from Keswick Reservoir, no longer mixed with warmer releases through the Spring Creek Powerhouse, will improve survival of winter-run salmon eggs this summer in the prime 10-mile spawning reach of the Sacramento River downstream of Keswick Dam.

“The CSPA TMP proposes to hold in Trinity Reservoir a substantial portion of the water not exported to the Sacramento. In addition, the CSPA TMP proposes to increase summer and fall releases from Trinity and Lewiston reservoirs to the Trinity River. This will improve habitat conditions for Trinity River and lower Klamath River salmon in this critically dry year.

“The proposed changes in operation would save total storage and cold-water pool volume in both the Shasta and Trinity reservoirs for the coming summer and fall, and for next year. The proposal would substantially reduce power production and irrigation deliveries.

to 300 cfs, and increase June-October releases from Trinity-Lewiston dams to the lower Trinity River to 800-870 cfs.

## Attachment 2

### Photos of Harmful Algal Blooms in Discovery Bay, Contra Costa County, Late May 2021













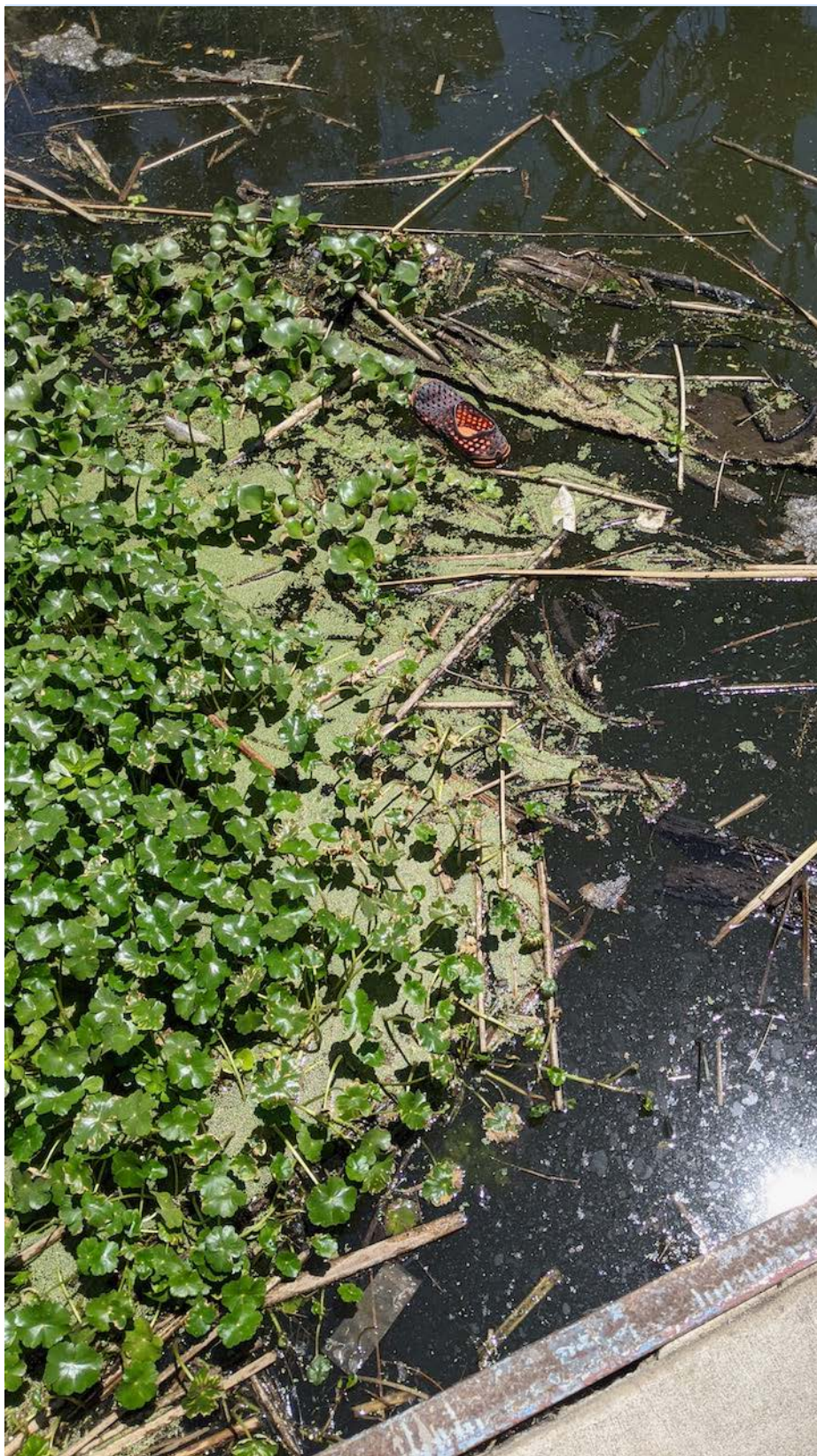


**Photos of Harmful Algal Blooms forming at Windmill Cove**

by Gloria Alonso Cruz, Restore the Delta Climate Water Team







## **Photos of Harmful Algal Blooms forming at University Waterfront Hotel, Downtown Stockton**

by Gloria Alonso Cruz, Restore the Delta Climate Water Team



















## Attachment 5



515 E MAIN ST, STOCKTON, CA 95202

RESTORETHEDELTA.ORG

Transmitted via email addresses also included below: [Bay-Delta@waterboards.ca.gov](mailto:Bay-Delta@waterboards.ca.gov)

April 4, 2022

State Water Resources Control Board  
% Scott Frazier  
[scott.Frazier@waterboards.ca.gov](mailto:scott.Frazier@waterboards.ca.gov)  
P.O. Box 2000  
Sacramento, CA 95812-2000

California Department of Water Resources  
% James Mizell  
[james.Mizell@water.ca.gov](mailto:james.Mizell@water.ca.gov)  
P.O. Box 942836  
Sacramento, CA 94236-0001

U.S. Bureau of Reclamation  
Regional Solicitor's Office  
% Amy Aufdemberge  
[amy.Aufdemberge@sol.doi.gov](mailto:amy.Aufdemberge@sol.doi.gov)  
2800 Cottage Way, Room E-1712  
Sacramento, CA 95825

**Subject: Protest: Temporary Urgency Change Petition filed by the California Department of Water Resources (DWR) and the United States Bureau of Reclamation (Bureau) Regarding Permits and a License of the State Water Project and the Central Valley Project**

To whom it concerns:

Restore the Delta once again protests the latest Temporary Urgency Change Petition (TUCP), as so referenced in the Subject of this letter above.<sup>1</sup>

We, the undersigned, have carefully read the TUCP notice and the TUCP, and state our understanding that the TUCP:

---

<sup>1</sup> Specifically, our protest is filed against the petition filed for Permits 16478, 16479, 16481, 16482 and 16483 (Applications 5630, 14443, 14445A, 17512 and 17514A, respectively) of the Department of Water Resources 'State Water Project and License 1986 and Permits 11315, 11316, 11885, 11886, 11887, 11967, 11968, 11969, 11970, 11971, 11972, 11973, 12364, 12721, 12722, 12723, 12725, 12726, 12727, 12860, 15735, 16597, 20245, and 16600 (Applications 23, 234, 1465, 5638, 13370, 13371, 5628, 15374, 15375, 15376, 16767, 16768, 17374, 17376, 5626, 9363, 9364, 9366, 9367, 9368, 15764, 22316, 14858A, 14858B, and 19304, respectively) of the United States Bureau of Reclamation's Central Valley Project.

- Suspends X2, the estuarine portion of the Delta outflow standard during April through June, replacing it with a flat 4,000 cubic-foot-per-second (cfs) outflow objective (based on a 14-day running average), and apparently disconnects outflow from connection with any estuarine salinity objective, regardless also of high runoff from earlier in the water year.
- Expands duration of the Vernalis critically dry year flow objective of 710 cfs on a monthly average) from May 16 through June 30 to the three full months of April 1 through June 30, a reduction in the flow objective of at least 50 percent or more for this time of year.
- Leaves Sherman Island in the western Delta short of fresher water supplies by moving the Emmaton salinity objective of 2.78 mmhos/cm (on a 14-day running average) from Emmaton to Three Mile Slough three miles further upstream along the Sacramento River. This reduces the amount of water that would be needed from storage to push tidal salt water further downstream. It is a moving of compliance “goal posts.”
- Sets a maximum combined export limit of 1,500 cfs between April 1 and June 30 applied to the Jones (Central Valley Project) and Banks (State Water Project) pumping plants. This is justified to meet Byron-Bethany Irrigation District and State Water Project South Bay Aqueduct municipal and industrial water supply needs.<sup>2</sup>

In its March 18 cover letter for the latest TUCP, Petitioners state that modifications to their permit conditions (which are also simultaneously part of water right decision [D-1641] provisions and the regulatory water quality objectives and beneficial uses of the 1995-2006 Bay-Delta Plan) are urgently needed because of “extraordinarily dry conditions” of the previous two water years (WYs 2020 and 2021), plus record dry conditions during January through March (to date) 2022 and “in combination with the potential for low precipitation and associated low reservoir storage in the future....”

Specifically, the TUCP *as proposed* will not best serve the public interest; it is contrary to law and the principle of due diligence; and it will have an adverse environmental impact on the Delta, and to salmon fisheries on which northern California Indian Tribes rely for cultural life and nutrition. We recognize that storage conditions are dire this year. We protest the petition so that the State Water Resources Control Board considers our position that the order the Board approves places conditions that will curtail unreasonable deliveries of water to senior water right appropriators. Meeting their claims for water supplies this year would render available supplies insufficient to protect all other vital needs of Delta environmental justice communities and Northern California Indian Tribes and their cultural resources for water this coming summer, and to provide far greater assurance than is found in the TUCP that loss of salinity control in the Delta will be avoided—loss of which would impact drinking water not just for Delta environmental justice communities and cities, but communities and cities throughout the length

---

<sup>2</sup> California Department of Water Resources and United States Bureau of Reclamation, *Temporary Urgency Change Petition Regarding Delta Water Quality*, March 18, 2022, p. 2-3. Accessible 18 March 2022, at [https://www.waterboards.ca.gov/waterrights/water\\_issues/programs/applications/transfers\\_tu\\_notices/2022/20220318\\_tucp.pdf](https://www.waterboards.ca.gov/waterrights/water_issues/programs/applications/transfers_tu_notices/2022/20220318_tucp.pdf).



of state and federal water systems. Petitioner DWR is fond of stating that its system serves clean water to 27 million people in California—yet loss of salinity control would completely undermine that claim for potentially years to come.<sup>3</sup> Petitioner DWR needs to behave like this is the water emergency it really is. And the State Water Board can assist them to do so by conditioning the TUCP with robust limits on, if not zero, deliveries to senior water right holders. At a time when California has seen below normal to critically dry conditions in seven of the last ten years, it will not suffice to apply these criteria narrowly, because the public at large is affected. Since 2000, 13 of 22 years have been below normal to critically dry.<sup>4</sup> The cumulative environmental effects of such persistent drought is having enormous impacts on the public, and water-related impacts figure prominently in these impacts.

Rather than treat each of these objections separately, we see them as elements of a coherent story that must be understood as resulting from the drought and response actions of the California Department of Water Resources and United States Bureau of Reclamation (hereafter Petitioners) as operators of facilities of the State Water Project (SWP) and Central Valley Project (CVP). As we stated in our letter of 7 January 2022 to the Water Board on the previous Draft Reconsideration Order, repetition of good intentions followed by destructive water management decisions strongly indicates that Petitioners and the Water Board engage in behavioral pattern and practice failures to protect public trust resources of California in the Delta and upholding reasonable water uses, methods of water use, and reasonable methods of diversion.<sup>5</sup>

The Board has long-used the unique water rights of the federal Central Valley Project and the State Water Project to implement water quality objectives in **both** temporary urgency change petitions as well as D-1641 and the Bay-Delta Plan. The projects' water rights are unique for two reasons: First, the scale and coordinated operation of their facilities have Delta and watershed-wide hydrologic, ecologic, economic, and environmental justice impacts. Second, because of the projects' coordinated scale of impact, the Board has historically conditioned Petitioners' water rights with water quality objectives from the Bay-Delta Plan and D-1641 and maintained continuing jurisdiction accordingly. This means that much of D-1641 implementation and compliance is achieved via SWP and CVP operations, including those located in the Delta. Thus, these particular water rights play a dual role: they not only govern operations of the projects, those operations must achieve full compliance with the Bay-Delta Plan and D-1641 on behalf of all water right holders in the Delta watershed. Water right change petitions concerning the CVP and SWP must of necessity address not only injury to other water right holders, but also violations of water quality objectives that *harm beneficial users of water*.

---

<sup>3</sup> "The Sacramento-San Joaquin Delta plays a major role in California's prosperity by supplying drinking water to almost 27 million residents and fueling a \$32 billion agricultural industry," at <https://water.ca.gov/Programs/Bay-Delta>; and "The California State Water Project (SWP) is a multi-purpose water storage and delivery system that extends more than 705 miles—two-thirds the length of California. A collection of canals, pipelines, reservoirs, and hydroelectric power facilities delivers clean water to 27 million Californians, 750,000 acres of farmland, and businesses throughout our state," at <https://water.ca.gov/Programs/State-Water-Project>.

<sup>4</sup> See <https://cdec.water.ca.gov/reportapp/javareports?name=WSIHIST>.

<sup>5</sup> Letter of Barbara Barrigan-Parrilla and Tim Stroshane to State Water Resources Control Board Chair E. Joaquin Esquivel, "Comment Letter: 2021 TUCP-TMP Reconsideration," 7 January 2022, p. 2.

In this instance, waiving or relaxing water quality objectives under TUCPs will by definition undo protections for non-propertied beneficial users and therefore harm them; this is what TUCPs pertaining to these particular water rights propose to cause, and therefore exclusion of harms (i.e., injuries) to beneficial users by the Water Board is unreasonable and an abuse of agency and Petitioners' discretion.

Because of the dual role of these water rights, it is logical and reasonable that the phrase "legal [or "lawful"] users of water" include both propertied and non-propertied water users and their protection from harms stemming from any type of change petition. This was applied by the hearing officers during the 2016-2018 California WaterFix water right change petition proceeding. Board rejection of this understanding on page 40 of the Reconsideration Order<sup>6</sup> is improper sophistry, and does not make realities of waiving water quality objectives go away, realities like spreading harmful algal blooms, threatening extinction of native fish, and increasing Delta salinity. By defining away non-propertied beneficial users of water like environmental justice communities, your recent racial diversity, equity, and inclusion resolution becomes empty words when the Board addresses water rights of the CVP and SWP.<sup>7</sup>

The larger issue then is to what degree deliveries to all water contractors becomes an obstacle to the constitutional issue posed by Article X, Section 2 of the California Constitution: In short, is continued application of the priority water rights system in the watersheds of the Delta an unreasonable use, unreasonable method of use, and an unreasonable method of diversion of water and therefore unlawful in California during drought of this magnitude?

We contend that it is. At the January 5, 2022 workshop, Gary Bobker of the Bay Institute correctly reasoned that the allocations of water permitted under last year's TUCP allocated the burden of the drought from the Settlement and Exchange Contractors of the CVP and SWP to the rivers and fisheries of the Bay-Delta watershed. That choice represented allocation of over 2.5 MAF of water to growers irrigating export crops like rice and almonds, according to Table 1 of the Water Board's Draft Reconsideration Order, while a mere 289 TAF accumulated in Shasta Reservoir by the end of the 2021 water year. This is a moral as well as an ecological catastrophe when we treat natural systems that sustain all life so poorly. It is incorrect to treat the 289 TAF that was saved at Shasta some kind of victory, when so much more could have been done with more equitable allocation priorities in water management. These two catastrophes are unreasonable and should be ended for the duration of each drought that strikes the Bay-Delta watershed, and cannot reasonably be construed as acting with due diligence, without significant environmental impact, and consistent with the public interest, certainly not with respect to environmental justice concerns and the public trust doctrine.

For the native fish of the Delta watershed, two species stand out as bearing the brunt of moral and ecological catastrophe. First, it was reported by the California Department of Fish and Wildlife (CDFW) that zero Delta smelt were found in the department's fall midwater trawl survey. There were just 49 captured the year before. This record of decline comes about because of a pattern and practice in Petitioners' operations based on Board regulatory management that has

---

6

[https://www.waterboards.ca.gov/waterrights/board\\_decisions/adopted\\_orders/orders/2022/wro2022\\_0095.pdf](https://www.waterboards.ca.gov/waterrights/board_decisions/adopted_orders/orders/2022/wro2022_0095.pdf)

<sup>7</sup> [https://www.waterboards.ca.gov/board\\_decisions/adopted\\_orders/resolutions/2021/rs2021\\_0050.pdf](https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2021/rs2021_0050.pdf)

failed to protect Delta smelt. There is widespread belief in the environmental and scientific communities that Delta smelt is now extinct in the wild.<sup>8</sup> Second, during the previous 2012-2016 drought, the Bureau of Reclamation failed to properly measure temperature conditions in Shasta Reservoir, which later contributed to low production of juvenile Chinook salmon from heavy temperature-dependent mortality. Then this past year, Bureau operations in 2020 left Shasta Lake with such low supplies that once again the Bureau's releases were too warm for baby and juvenile salmon in the Sacramento River. This resulted in egg-to-fry survival of winter-run Chinook salmon (2.56 percent) in 2021, which was the lowest recorded such survival rate in the last quarter-century. Let us remember at this point that according to Table 1 of the Draft Reconsideration Order, the Bureau delivered 1.375 MAF to Settlement Contractors with senior water rights holders.<sup>9</sup> Restore the Delta noted in our June 4, 2021, protest that the Bureau delivered an estimated 362 TAF in the vicinity of Settlement Contractors along the Sacramento River between April 8 and May 26.

What if that water had remained in Shasta Lake at depth where a portion of it could have cooled for the summer months?

The pain of drought would have been more equitably endured in the agricultural community and salmon species likely would have fared better—since fish do need flowing water to complete their life histories. But as it happened, winter-run Chinook salmon edges closer to extinction, rushed along by decisions driven by a priority water rights system applied in the Central Valley Project and the State Water Project. This threat hangs like a sword of Damocles over Northern California Indian Tribes dependent on Chinook salmon, sportfishing anglers, the commercial fishing industry, and their public customers who enjoy salmon in their diets. In this scenario, the water rights system unreasonably allowed diversion and use of water at a time when a searing drought required more equitable sacrifice to protect all life, not unfair and inequitable protections for almond and rice exports.

Finally, there are less well-recognized beneficial uses (that is, ones not officially designated by the State Water Board) not yet accounted for by any TUCP work done by either Petitioners or the Water Board. Despite being unrecognized, they deserve protection as a matter of human rights. As inequality has increased in our society, the Delta is not exempt from the epidemic not only of the coronavirus but of people losing their stable jobs and homes in recent years. In 2019, the San Joaquin County Point in Time count identified 921 unhoused residents. Since then, due to events like the pandemic and affordable housing crisis, that number has grown tremendously to approximately 5,000, a dramatic increase. A more exact figure awaits completion of this year's Point in Time count conducted by our local colleagues, and is currently underway. Whole communities of unhoused residents are forced to move from encampment to encampment. More and more, they migrate toward Delta water ways to set up camp. Living along the

---

<sup>8</sup> Tom Cannon, "Delta Smelt Status," *California Fisheries Blog*, November 15, 2021, accessible at <https://calsport.org/fisheriesblog/?p=3978>. A refuge population of Delta smelt is maintained at the University of California at Davis, in the hope that someday Delta conditions will be more suited to their reintroduction into their original geographic habitat.

<sup>9</sup> State Water Resources Control Board, *Draft Reconsideration Order*, released December 15, 2021, Table 1, p. 11; accessible at <https://www.waterboards.ca.gov/drought/tucp/docs/2021/2021-12-15-draft-order-on-reconsideration.pdf>.



waterways puts these individuals at a higher danger of being exposed to HABs than others in our community and this must not be overlooked by the DWR, USBR, or the Water Boards.

### **Facts Supporting General Allegations Against the TUCP**

- 1. The proposed TUCP is contrary to law because Petitioners failed to perform due diligence prior to submitting their petition. Due diligence now demands suspending nonessential deliveries to state and federal senior water rights contractors because otherwise they would threaten to collapse the hydraulic salinity barrier in the Delta.**

For the June 2021 TUCP, Petitioners justified their claim of due diligence by having relied on “sound science and methods to forecast and project hydrology and water supply needs.” They claimed diligent behavior by having limited project allocations and agricultural water service contractor expectations during the winter and early spring. They further claimed that by beginning Water Year 2021 “with relatively high carryover storage after the dry year of 2020,” Petitioners “helped to meet D-1641 requirements through the winter and early spring,” something they claimed in May 2021 they could no longer do without changing the rules under which they are normally required to operate.

Water project allocations are central to Petitioners’ operations of CVP and SWP. Their claim of sound science and methods to forecast project hydrology and water supply needs referred to Bulletin-120 runoff forecasts based on snow water content and precipitation analysis, as well as routine monitoring of reservoir carryover storage. ***This hydrology forecast included the timing and volume of runoff from reservoir watersheds.*** Allocations are then based on requests from contractors, available and anticipated hydrology, and water rights—the pecking order and decision rules by which Petitioners determine how much water shall be allocated to which type of contractor, and the pro rata share of such allocations to each individual contractor. DWR and USBR undertake these actions during normal times.

But suddenly in April 2021, DWR & USBR state, conditions worsened. Petitioners justified urgency of their petition by blaming low storage solely on Nature: precipitation is below 50 percent of average, they state, resulting in many reservoirs being “below average” in storage. “This was uncharacteristic,” they state, “and likely due to unpredictable dry soils soaking up snowmelt and substantially reducing runoff into CVP and SWP reservoirs.” By blaming Nature, Petitioners sought to avoid taking responsibility for their role in controlling flows and water quality throughout the Bay-Delta estuary watershed, their own lack of diligence in protecting stored water supplies.

That was last year. State climatologist Michael Anderson of Petitioner DWR told the State Water Board’s January 5th workshop that the state endured record heat since 2019, that Petitioner DWR staff had “difficulty” measuring the lack of expected runoff in April 2021, and that Petitioner DWR lost “numerous” monitoring stations due to wildfires in 2020 and 2021. His colleague, D. Rizzardo of Petitioner DWR acknowledged these difficulties make runoff forecasting harder, particularly in the Feather River Basin.

We are now midway through Water Year 2022. The first quarter ending December 31 showed major California snow-sheds reporting 157 percent of normal snow water content, consistently

so from north to south in the Sierra and Cascade regions, as Table 1 shows.<sup>10</sup> However, rain and snow all but ceased from the end of December through the end of March this year. Snow water equivalents fell steadily. As a result, the snowpack dwindled rapidly, and lacking storms, was not replaced. Table 1 shows its rapid fall to 93 percent of normal at the end of January, 64 percent of normal by the end of February, and just 39 percent of normal statewide by the end of March this week.

A few California Data Exchange temperature sensors (see Table 2) indicate that between the end of December and the end of March, there were 52 days in Quincy where average daily temperatures exceeded 32 degrees F, and of those 20 days were above 40 degrees F. At Blue Canyon, there were 80 days at or above 32 degrees F and 61 of those were above 40 degrees F. Table 1 also indicates that the north snow-shed region has the lowest snow water content.

This lack of water in the north is confirmed by Table 3, showing Trinity, Shasta, and New Melones with volumes below 40 percent of their storage capacity and well below normal storage levels for this time of year. Table 3 also compares these reservoirs' levels to their 2021 levels as of March 29, and shows Trinity, Shasta, and New Melones well below last year's levels—just before last year's April runoff infamously disappeared.

Conditions in Table 3 appear to validate the Petitioners' expectations of using Oroville and Folsom to manage compliance with Delta water quality objectives this year.<sup>11</sup> Their storage levels exceeded their respective volumes at this time last year, fortunately. The problem is that Petitioners' Central Valley Project and State Water Project still expect they should deliver substantial amounts of water supplies to senior water rights contractors, as well as a questionable and unclear volume of "health and safety" exports to junior contractors from the Delta. Senior water rights contractor and export demands are undisclosed in the TUCP.

First, proposed "health and safety" exports are mentioned as such about sixteen times in the TUCP document. However, these references to "health and safety" are all only in passing; there is no list of which entities are associated with these references. The term "health and safety" is also defined only in passing as "minimum demands of water contractors for domestic supply, fire protection, or sanitation during the year." In two other places, however, we find discussion in the TUCP of "export limits" in parts 1 and 2 which differ from these references. The purpose of these exports are to supply Byron-Bethany Irrigation District and unspecified SWP South Bay Aqueduct contractors to serve municipal and industrial uses. Domestic uses and "health and safety" uses are omitted from key descriptions. We respectfully remind the Water Board that domestic uses are still prioritized over irrigation in the California Water Code.<sup>12</sup> The State Water Board needs to gain clarity from Petitioners on the recipients and purposes of these proposed exports. The water cost of these exports could be as much as 270,000 acre-feet over the ninety-one days covered by this TUCP.<sup>13</sup> Which is it, or is it both?

---

<sup>10</sup> Tables 1 through 6 are found in Attachment 2 to this letter.

<sup>11</sup> TUCP, *op. cit.*, p. 1-2 and 1-9.

<sup>12</sup> California Water Code section 106, verified 4 April 2022 at [https://leginfo.ca.gov/faces/codes\\_displaySection.xhtml?sectionNum=106&lawCode=WAT](https://leginfo.ca.gov/faces/codes_displaySection.xhtml?sectionNum=106&lawCode=WAT).

<sup>13</sup> Estimated as follows: 1500 cfs x 3600 seconds per hour x 24 hours per day x 91 days (for the TUCP period) divided by 43,560 cubic feet per acre-foot = 270,744 acre-feet.

As shown in Table 4 below, a year ago, the four largest federal reservoirs had 5.58 million acre-feet in storage; this year they have just 4.06 million acre-feet, just 72 percent of last year's levels.<sup>14</sup>

Second, and likely larger, are deliveries Petitioners made the last two years to senior water rights contractors<sup>15</sup> of the CVP and SWP. Table 5 shows that CVP settlement and exchange contractors received 2.2 million acre-feet (MAF) in 2020 deliveries and 1.6 MAF in 2021. SWP Feather River settlement contractors<sup>16</sup> received 590 thousand acre-feet (TAF) from January through September 2021.

Combined in 2021, these CVP senior water right contractors received 40 percent of total stored supplies from the four reservoirs depicted in Table 4 above as of last March prior to the disappearance of expected runoff in April.<sup>17</sup> Of the seniors' deliveries been held for carryover to this year, these five major reservoirs might have had nearly 27 percent more stored volume than at present and the projects would be better positioned to avoid the most severe drought impacts possible this year.<sup>18</sup> But no. This was storage lost due to Petitioners' decisions, not caused by Nature. This was not diligent management of water storage.

Just six Sacramento River settlement contractors received 82.4 percent of senior water contractor deliveries in 2020, and the same six received 84.1 percent in 2021, as Table 6 shows. By far the largest senior water contractor is Glenn-Colusa Irrigation District, receiving 671 TAF in 2020 and 505 TAF<sup>19</sup> in 2021, about 46 percent of total Sacramento River settlement contractors' deliveries that latter year.<sup>20</sup>

The TUCP fails to disclose Petitioners' plans for senior water rights contractor deliveries. It vaguely acknowledges "critical water supply needs" (p. 1-2) and "Shasta operations would focus on managing temperature requirements and *senior water rights and riparian demands* along the upper Sacramento River." (p. 1-9) Shasta has about three-fourths the storage it had one year ago, and things went poorly for hatching winter-run Chinook salmon last year in the upper Sacramento. With less water fears of things being even worse for winter-run Chinook salmon are entirely reasonable. Things, however, went well for deliveries to senior water contractors, as we just pointed out. This pattern of poorly managed water storage reflects a lack of diligence on behalf of all state and federal water users and all concerned beneficial users. The State Water Board must condition the TUCP to require adequate cold water supplies from Shasta be sufficient to protect the fish this year. Such a priority condition to will help stave off further

---

<sup>14</sup> These federal reservoirs targeted during the Trump administration to find ways to deliver more water to their agricultural customers.

<sup>15</sup> We use "senior water right contractors and "settlement contractors" interchangeably. Note also that "settlement contractors" within the CVP also include San Joaquin River exchange contractors who are located south of the Delta.

<sup>16</sup> Feather River settlement contractors are synonymous with the Feather River Service Area of the State Water Project, and are also senior water rights contractors within the SWP's service area.

<sup>17</sup> We estimate this percentage as follows: 2.2 MAF/5.5 MAF for storage x 100% = 40%.

<sup>18</sup> We estimate this as 1.09 MAF/4.06 MAF in storage this year 100% = 26.8%.

<sup>19</sup> 505 TAF is approximately 164 billion gallons of water based on a conversion factor of about 325,581 gallons per acre-foot. It is enough water to serve about 1.1 million households with water supplies for one year. (Two households use approximately 1 acre-foot of water annually.)

<sup>20</sup> This 46 percent estimate is obtained by dividing 2021 total by total for 2021 in Table 5 above.

destruction of the salmon, a central cultural resource for Northern California Indian Tribes, and a tribal environmental justice and cultural genocide<sup>21</sup> issue of the first order.

There is another crucial diligence problem with this TUCP.

Since the 1930s it has been long established knowledge and practice that a fresh-water hydraulic barrier to incoming tidal salt water is necessary to divert water and facilitate exports of surplus supplies from the Delta.<sup>22</sup> This barrier volume is factored into how much water is released to meet Delta export contractor water demands with acceptable salinity levels during normal operations of both CVP and SWP. It is sometimes referred to as “carriage water” since it “carries” water for export from the Delta Cross Channel (when it is open) to the central Delta to the San Joaquin River. In dry years, when water transfer markets form, a factor for carriage water must be incorporated into each transfer to ensure each water deal is consummated to the satisfaction of the receiving party (in terms of quantity of acceptable-quality water).

This year, the storage situation is so dire there may not be enough water in the coordinated CVP/SWP system to maintain this hydraulic barrier, according to Petitioners’ TUCP:

If the requested April 1 through June 30, 2022 modifications to D-1641 Table 3 are not granted, the Projects may have to supplement inflows, through reservoir releases, into the Delta in order to meet the outflow requirements specified in D-1641. Granting this petition will help delay the depletion of much-needed storage throughout the spring in order to provide for fish and wildlife habitat, Delta water quality, and exports for critical needs later in the year. Estimated reservoir storage impacts include the likelihood of substantial decreases in storage due to the extremely dry conditions as well as reduction in adequate cold-water reserves that would have been available to meet regulatory requirements protecting salmon and other cold-water fish species in the summer and fall of 2022. ***Further impacts could even result in a “loss of control” over salinity encroachment in the Delta in 2022 and into 2023 in a continued drought scenario. “Loss of control” describes a condition in which very low storages in the major Project reservoirs will not allow sufficient release capability to control intrusion of ocean water into the Delta, which would make the Delta water quality incompatible with in-Delta beneficial uses. This condition would persist until Northern California receives rainfall that produces sufficient runoff to flush the Delta of ocean water, which would once again allow for these in-Delta beneficial uses. Failure to sufficiently control Delta salinity would jeopardize the ability to provide for minimum health and safety supplies for communities both within the Delta and those who rely upon the Delta for water supply.***<sup>23</sup>

***Deliveries to senior water right contractors at quantities at all close to those in 2020 and 2021 would contribute greatly to further depletion of reservoir storage, though this is omitted from this frightening discussion of loss of salinity control in Delta waters. This***

<sup>21</sup> “Cultural genocide” is “the systematic, deliberate destruction of a culture.” Benjamin Madley, *An American Genocide: The United States and the California Indian Catastrophe*, New Haven, CT: Yale University Press, 2016.

<sup>22</sup> California Department of Public Works, *Bulletin 27, Variability and Control of Salinity in the Sacramento-San Joaquin Delta*, 1931, pp. 44-45.

<sup>23</sup> TUCP, pages 1-17 to 1-18. Emphasis added.

**scenario must be avoided at all costs.** The senior water rights contractors share in a significant portion of these costs, since, after all, they received beneficial deliveries while many other contractors and the rivers' ecosystems received little or no supplies during this drought. They were dealt winning hands from the CVP and SWP in 2020 and 2021 and in so doing, contributed greatly to the predicament where Petitioners' operating staff could lose salinity control in the Delta. This is Exhibit A of what we mean when we say that continuing prior appropriation applied to CVP and SWP allocations and operations under such dire storage and weather conditions would be madness, and therefore an unreasonable use and diversion (from storage) of water.

Environmental justice communities and wealthier communities reliant on Delta supplies for drinking water would be harmed if insufficient water is devoted to protecting the hydraulic barrier in the Delta. The above quote so much as agrees one that loss of salinity control would "jeopardize the ability to provide for minimum health and safety supplies for communities both within the Delta and those who rely upon the Delta for water supply."

Three municipal water agencies diverting water directly from Delta channels: Contra Costa Water District, the City of Antioch, and the City of Stockton's Municipal Utilities Department would also be harmed. Petitioners have ignored the rights and water quality needs of these water agencies—who serve about 750,000 people—to have safe and good quality drinking water to divert for their municipal and domestic customers. These agencies will likely face higher water treatment costs to protect their customers from high salt concentrations and harmful cyanobacteria, as well as other water quality risks from TUCP alteration of Delta inflows and outflows.

In addition, nearly 80 Delta-based small community water systems could be harmed, if not immediately, not long after loss of salinity control occurs.<sup>24</sup> There are numerous CVP and SWP municipal and industrial contractors that rely on imported water in the San Joaquin Valley, San Luis Obispo and Santa Barbara counties, and the service area of the Metropolitan Water District of Southern California.<sup>25</sup> Cities like Tracy, Fresno, Bakersfield and others would be affected. National wildlife refuges rely on imported supplies from the Delta in the San Joaquin River and Tulare Lake basins. Loss of salinity control would worsen drought conditions for native and introduced fish and wildlife species dependent on these water ways, as well as migratory waterbird populations.

San Joaquin River exchange contractors normally import Delta flows that derive from Shasta reservoir. On April 1, the Bureau announced that these senior water rights contractors would start receiving deliveries from releases at Friant Dam (Millerton Lake), already "calling" on their basic, original water rights transmuted under drought conditions to what storage is available at

---

<sup>24</sup> California Department of Water Resources, *Small Water Suppliers and Rural Communities at Risk of Drought and Water Shortage Vulnerability and Recommendations and Guidance to Address the Planning Needs of These Communities*, Report pursuant to Section 10609.42 of the California Water Code, Draft, March 2020, prepared by Water Use Efficiency Branch, supplemental Excel database file containing SWS Risk Scores. Accessed 17 April 2020, but found not accessible. DWR has at least temporarily taken down the mapping tool and report links that supported this report. In the meantime, this report and associated data and infographics are available from Restore the Delta on request.

<sup>25</sup> Metropolitan's service comprises urbanized portions of Ventura, Los Angeles, Orange, San Bernardino, Riverside, and San Diego counties.



Millerton Lake behind Friant Dam.<sup>26</sup> Such early deliveries to senior water rights contractors are exactly the kind of action the Bureau took with releases last year from Shasta Lake. The strategy is to send along deliveries while there are still supplies in the lakes; pay little heed to what is left for meeting other water supply or compliance requirements. The April 1 announcement by the Bureau will affect municipal and domestic supplies for the cities of Fresno, Bakersfield, Lindsay, Orange Cove, and Strathmore, all of whom contract for water service from the Friant-Kern Canal. These communities and the agricultural districts throughout the Friant-Kern Canal service area will likely be forced to pump more groundwater to maintain service to their customers.

We merely respond to a disaster scenario that Petitioners have raised as a possibility in their TUCP request. It will be up to the Water Board to ensure that all actions are taken that would head off such a preventable catastrophe from occurring in California. The implications we outline are of course partial, but it is highly suggestive of drastic stakes. If the TUCP is truly going to protect storage this year, the Water Board must condition it to forego deliveries to senior water right contractors north and south of the Delta. This will enable more water kept in storage to protect young salmon, stave off cultural genocide against Northern California Indian Tribes, protect not only Delta environmental justice communities but also the “27 million Californians” that Petitioner DWR so proudly boasts of serving with clean water at two of its web pages.<sup>27</sup>

## **2. Failure to condition approval of the TUCP on suspension of deliveries of water to senior water rights contractors would have unreasonable environmental impacts.**

The environmental effects of TUCP provisions would result in less inflow to and less outflow from the Delta to San Francisco Bay. Installation of the False River barrier before the end of June will block tidal salt flows from direct access to Franks Tract, the largest in-Delta open water body. These three facets mean that Delta channel flows will slow, and residence time of water will increase within the estuary.<sup>28</sup> Moreover, the presence of estuarine habitat is directly related to Delta outflow. This means that if Delta outflows are reduced, X2<sup>29</sup> migrates further upstream, and the aquatic habitat area that the objective represents will shrink to the relatively narrow width of the Sacramento River channel between Emmaton and Rio Vista from a far greater habitat area in Suisun Bay. So, while the TUCP only proposes reduction in the Delta outflow objective, this objective functions under more normal conditions in tandem with the X2 estuarine objective. The State Water Board should acknowledge this in making its findings and

---

<sup>26</sup> Email announcement from Mary Lee Knecht, United States Bureau of Reclamation, “Reclamation adjusts operations from Friant Dam,” 1 April 2022 at 1:00 p.m. “San Joaquin River releases from Friant Dam will increase today from about 680 cubic-feet-per-second to 930 cfs. Releases will increase incrementally throughout the spring with sustained releases over the summer of more than 1,700 cfs depending on system conditions and downstream structural safety requirements. Restoration flows pursuant to the San Joaquin River Restoration Program will be reduced or ceased during these releases.”

<sup>27</sup> See footnote 3 above for quotations and URLs.

<sup>28</sup> Residence time is a measure of water stagnation, reflecting slow or no flow conditions. It is often measure in units of days.

<sup>29</sup> X2 is a measure of the physical position of low salinity (about 2 ppt salinity) where historical estuarine habitat is most productive. This “isohaline” measure is best found in Suisun Bay where the area of estuarine habitat will be at its largest. This isohaline migrates back and forth with the tides and the seasons each year, and is closely correlated with Delta outflow to San Francisco Bay.

determinations about the TUCP. Less outflow and smaller estuarine habitat will result in the following conditions:

- The invasive nonnative clam *Potamocorbula amurensis* (*P. amurensis*), which thrives in saline benthic (bottom-dwelling) conditions, will invade further upstream, have greater opportunity to become established in Delta channels near and upstream of X2 where its voracious grazing rate can wreak havoc on the phytoplankton and zooplankton in the water column.<sup>30</sup> To the extent that Delta smelt still survive in the Delta, *P. amurensis* will compete strongly with smelt for the same food sources.
- Less inflow to the Delta will mean that flows will be slow to near zero in places. Coupled with rising summertime air and water temperatures, nutrient inputs of nitrates and phosphates, and abundant sunlight, cyanobacteria are expected to bloom strongly this year. Reduced flows resulting from TUCP changes will encourage further harmful algal blooms. Such blooms are already established now in the Delta. Aerosols released by Harmful algal blooms are increasingly understood to contain toxins that, when humans (especially children) inhale them, can irritate lung passages and worsen asthma and other respiratory conditions. The San Joaquin Valley is already well known to have a high prevalence of children afflicted with asthma and other lung diseases. To engage in water quality changes through the TUCP is to harm not just water quality but air quality and public health in the Delta region.
- The presence of harmful algal blooms in the Delta will harm legal beneficial users of water known as “anglers”—often low-income people who fish for subsistence routinely and frequently in Delta channels—by shrinking the number of safe fishing pools and potentially the number of surviving fish in Delta channels (since such blooms can be toxic to fish and other vertebrate organisms). This group of legal beneficial users of water and fish we estimate in the tens of thousands. To the extent they bring family dogs, these family members face risk of harm from aquatic cyanotoxins. A recent environmental justice community survey concerning the Delta Conveyance Project by the California Department of Water Resources shows that members of Delta environmental justice communities consume fish from the Delta as often as four times a month.
- The presence of harmful algal blooms in the Delta will harm legal beneficial users of water known as “recreators”—people who would normally seek out river channels and sloughs to play near, in, and on water during the summer. From Stockton alone, there are potentially tens of thousands of people as well, who enjoy proximity to Delta river channels within a short drive. And many also bring their dogs as well, facing similar risks as with anglers. Furthermore, people throughout the region have endured pandemic restrictions for two years, may have to endure another difficult wildfire smoke season, which could be complicated by planned or unplanned electric power outages, and will have an understandable desire to escape into Nature and cool off by swimming, boating, water-skiing, and other water contact

---

<sup>30</sup> This clam also is a prodigious bio-accumulator of selenium in organic forms, as well. This means that its tissues will tolerably hold high concentrations of selenium, but at toxic levels to predators like diving birds (like surf scoters, a species of diving duck) and bottom-grazing fish (like white sturgeon). Selenium more readily partitions in the water column to become bio-available at low flows and long residence times.

recreation. Be aware that water skiing spray action could further mobilize cyanotoxins as aerosols from Delta water ways as a result.

The TUCP as proposed by Petitioners lifts not a finger of concern to address this looming nightmare. Moreover, when blooms start to die back, other bacteria come in to decompose the biomass and respire, which decreases the oxygen and can create hypoxic events, suffocating fish and other aquatic oxygen-consuming organisms. If this happens in the fall, it could be catastrophic for Fall-Run Chinook salmon escapement to Central Valley rivers, and compound the risk to the state of California of committing cultural genocide against Northern California Indian Tribes. By preventing HABs with flushing flows, the State Water Board can protect public health near to and away from Delta channels and reduce the risk of cultural genocide to the Tribes.

In sum, the TUCP, combined with the False River Barrier (for that's how it will be in reality), represents the privileging of powerful agricultural interests in the Sacramento and San Joaquin Valley, who have their "call" on CVP and SWP reservoirs (Shasta, Oroville, and Friant, especially) for water deliveries without having to share in the costs the rest of California and especially Delta residents, farms, and ecosystems must bear during the drought. Some of the stored water will be used for temperature management later in the summer and early fall in an attempt to stave off disaster for Chinook salmon runs, which are sacred to Northern California Indian Tribes and have long been vital to commercial fishing operations. The Tribes and the commercial fishing operations are not merely self-interested in this advocacy however—they speak for the fish and they speak for the rest of the California and American public who enjoy eating salmon. Salmon is food, salmon is life.

Loss of salinity control, as discussed above, would fundamentally alter the aquatic chemistry of the Delta for several years. It is unknown how long the loss of control would last because it will take ample supplies of fresh water to push tidal salt waters out to San Francisco Bay and the Pacific Ocean and keep them long enough to enable Delta fresher-water ecosystems to recover.

### **3. Failure to condition approval of the TUCP on suspension of deliveries of water to senior water rights contractors is not in the Public Interest.**

Petitioners appear to have betrayed their solemn obligations under the California Constitution's reasonable use policies, their duties to protect public trust resources for benefit of the California public, and state policies to prevent environmental injustices and civil rights, including the state's policy recognizing and protecting the human right to water. None of these fundamental policies in law were suspended by Governor Newsom's drought emergency declarations. Moreover, it remains state policy during this drought crisis to balance co-equal goals of water supply reliability and ecosystem restoration and reduce Delta reliance to meet California's water needs—policies contained in the Delta Reform Act of 2009. Like the other fundamental policies of California's water law framework, these also were not suspended by Governor Newsom's emergency drought declaration; they continue in full legal force. The TUCP, as proposed and if approved, would be contrary to all of these policies.

The State Water Board, as a state agency charged with public trust stewardship, must still use its authority to seek justice in its deliberations on this TUCP. Approving the TUCP as proposed



would fail to correct this injustice of irresponsible deliveries of water to senior water contractors by Petitioners in April and May this year, threatening Northern California Indian Tribes with cultural genocide and Delta environmental justice communities with aquatic aerosol toxins and public health impacts from harmful algal blooms. The Water Board must condition its temporary urgency change order to suspend such deliveries to prevent loss of salinity control in the Delta this year. Otherwise, the State Water Board will be complicit in a preventable self-inflicted water catastrophe, which will not, to say the least, be in the public interest.

Therefore, approving the TUCP as proposed would fail to serve the public and right this injustice, and would not be in the public interest.

#### **4. Recommended Conditions Under Which This Protest/Objection May be Disregarded and Dismissed to Resolve Our Objections.**

To resolve our objections the State Water Board should condition its approval of an order in this matter as follows:

- Limit total exports to no more than 750 cfs per day, on a three-day average from June 1 through August 15. This translates to nearly 1,500 acre-feet per day<sup>31</sup> that should be prioritized for municipal and industrial contractors (CVP and SWP), and wildlife refuges south of the Delta.
- The State Water Board should limit San Joaquin River Exchange Contractors' "call" on Friant to facilitate release of flows to the San Joaquin River that will supplement releases from New Melones to a total of 50,000 acre-feet between April 1 and June 30, while the rest of the contractors' "call" should be released into the mainstem San Joaquin River. Released from Friant Dam to the San Joaquin, these flows will protect against spread of harmful algal blooms and protect public health along the San Joaquin River, including in Stockton-area water ways.
- Similarly, the State Water Board should curtail further deliveries to Sacramento and Feather river settlement contractors as unavailable due to water quality (including temperature management) concerns along the Sacramento and Feather Rivers, before, but especially, once the Board curtails junior water right holders throughout the Delta watershed this summer. This condition will reduce pressure on and extend the availability of the reservoirs' cold water pools for later use.

#### **Conclusion**

Restore the Delta has repeatedly stated our case for why the TUCPs since 2014 (including the one before us now dated March 18, 2022) are contrary to law for lack of due diligence by Petitioners, are not in the public interest, and have unreasonable impacts on fish and wildlife. To our protest in January 2022, we attached each of our previous protests from 2014 to 2021 to illustrate the pattern and practice of TUCP decisions, and incorporate them by reference into this protest.

---

<sup>31</sup> 1 cubic foot per second (cfs) translates into 1.98 acre-feet per day by multiplying the 1 cfs by 3600 seconds in an hour and by 24 hours in a day, then dividing that result by 43,560, the number of cubic feet in an acre-foot.  $(750 \text{ cfs} \times (3600 \times 24))/43560 = 1,485 \text{ acre-feet per day.}$

*Protest: Temporary Urgency Change Petition filed by the California Department of Water Resources (DWR) and the United States Bureau of Reclamation (Bureau) Regarding Permits and a License of the State Water Project and the Central Valley Project*

We urge you to condition the TUCP as we recommend under Item 4 to avoid unreasonable impacts to fish and wildlife; its basis as proposed lacks due diligence by Petitioners on behalf of equitable allocation of stored supplies in their reservoirs and fails to avoid salinity control failure of the Delta's hydraulic barrier. They would stubbornly fail to hew diligently to their public trust obligations to protect natural systems with flow releases and cold water pool management while favoring claims of senior Settlement and Exchange Contractors); and consequently continuing the practice and pattern of denying water to riverine and estuarine ecosystems in the Bay-Delta watershed during drought, all contrary to the public interest.

We appreciate the opportunity to comment on this proposed TUCP. Our contact information is below.



Barbara Barrigan-Parrilla  
Executive Director  
[barbara@restorethedelta.org](mailto:barbara@restorethedelta.org)



Tim Stroshane  
Policy Analyst  
[tim@restorethedelta.org](mailto:tim@restorethedelta.org)

Attachments:

1. Official Protest Form Accompanying this Protest Letter
2. Tables 1 through 6 Accompanying Protest Letter

cc: Dillon Delvo, Little Manila Rising  
Matt Holmes, Little Manila Rising  
Irene Calimlim, Greenlining the Hood  
Jasmine Leek, Third City Coalition  
Tama Brisbane, With Our Words, Inc.  
Regina Chichizola, Save California Salmon  
Tom Stokely, Save California Salmon  
Chief Caleen Sisk, Winnemem Wintu Tribe  
Gary Mulcahy, Government Liaison, Winnemem Wintu Tribe  
Doug Obegi, Natural Resources Defense Council  
Kate Poole, Natural Resources Defense Council  
Brandon Dawson, Sierra Club California  
Jonathan Rosenfield, San Francisco BayKeeper  
John Herrick, South Delta Water Agency  
Dante Nomellini, Central Delta Water Agency  
Harry Black, City Manager, City of Stockton  
Thomas Keeling, Freeman Firm  
Stephen J. Welch, General Manager, Contra Costa Water District  
Kelley Taber, Somach Simmons & Dunn  
Osha Meserve Soluri Meserve

**Attachment 1: SWRCB Protest Petition Form**

State of California  
State Water Resources Control Board

**DIVISION OF WATER RIGHTS**

**P.O. Box 2000, Sacramento, CA 95812-2000**

Info: (916) 341-5300, FAX: (916) 341-5400, Web:  
<http://www.waterboards.ca.gov/waterrights>

**PROTEST– PETITION**

**This form may also be used for objections**

**PETITION FOR TIME EXTENSION, CHANGE, TEMPORARY URGENT CHANGE**

**OR TRANSFER ON**

**APPLICATION** See attached letter **PERMIT** See attached letter **LICENSE** See attached letter  
**OF California Department of Water Resources and United States Bureau of Reclamation**

I (We) have carefully read the notice (state name): See attached letter.

Address, email address and phone number of protestant or authorized agent:

---

*See attached letter.*

Attach supplemental sheets as needed. To simplify this form, all references herein are to protests and protestants although the form may be used to file comments on temporary urgent changes and transfers.

**Protest based on ENVIRONMENTAL OR PUBLIC INTEREST CONSIDERATIONS**

**(Prior right protests should be completed in the section below):**

- the proposed action will not be within the State Water Resources Control Board's jurisdiction
- not best serve the public interest X
- be contrary to law X
- have an adverse environmental impact X

State facts which support the foregoing allegations

---

*See attached letter.*

*Protest: Temporary Urgency Change Petition filed by the California Department of Water Resources (DWR) and the United States Bureau of Reclamation (Bureau) Regarding Permits and a License of the State Water Project and the Central Valley Project*

Under what conditions may this protest be disregarded and dismissed? (Conditions should be of a nature that the petitioner can address and may include mitigation measures.)

*See attached letter and attachments.*

**Protest based on INJURY TO PRIOR RIGHTS:**

To the best of my (our) information and belief the proposed change or transfer will result in injury as follows: Members of our organization and community colleagues consider ourselves legal users of Delta water. See attached letter.

Protestant claims a right to the use of water from the source from which petitioner is diverting, or proposes to divert, which right is based on (identify type of right protestant claims, such as permit, license, pre-1914 appropriative or riparian right):: NA

List permit or license or statement of diversion and use numbers, which cover your use of water (if adjudicated right, list decree).

Where is your diversion point located? 1/4 of \_\_\_\_\_ 1/4 of Section \_\_\_\_\_, T\_\_\_\_, R\_\_\_\_,  
\_\_\_\_\_ B&M

If new point of diversion is being requested, is your point of diversion downstream from petitioner's proposed point of diversion?

The extent of present and past use of water by protestant or his predecessors in interest is as follows:

- a. Source
- b. Approximate date first use made
- c. Amount used (list units)
- d. Diversion season
- e. Purpose(s) of use

Signed: See attached letter. Date: See attached letter.

**All protests must be served on the petitioner.** Provide the date served and method of service used: **April 6, 2022**, via email. No other proof of service required by State Water Resources Control Board.

## Attachment 2

### Tables 1 through 6 Accompanying Text of the Protest Letter

<b>Table 1</b> <b>California Snow Water Equivalents, End of December 2021</b> <b>through End of March 2022</b> <b>(Percent of Normal)</b>				
<b>As of Date</b>	<b>North</b>	<b>Central</b>	<b>South</b>	<b>Statewide</b>
December 31, 2021	144%	158%	172%	157%
January 31, 2022	92%	92%	97%	93%
February 28, 2022	60%	68%	65%	64%
March 30, 2022	30%	43%	44%	39%
Source: California Data Exchange Center, interactive data on snow water equivalents, accessed 30 March 2022; Restore the Delta.				

<b>Table 2</b> <b>Average Temperature Days in Northern Sierra</b> <b>Communities, December 30, 2021 to March 29,</b> <b>2022</b>			
<b>Temperature Sensor at:</b>	<b>Elevation (feet)</b>	<b>Days at or above 32° F</b>	<b>Days at or above 40°F</b>
Quincy	3,400	52	20
Blue Canyon	5,280	80	61
Chester	4,525	62	23
Source: Sensor TEMP (30) for Stations QCY, BLC, and CHS, California Data Exchange Center, accessed 30 March 2022; Restore the Delta.			

<b>Table 3</b> <b>Storage Levels in Central Valley Project and State Water Project Reservoirs as of March 29, 2022</b>					
<b>As of March 29, 2022</b>	<b>Trinity (CVP)</b>	<b>Shasta (CVP)</b>	<b>Oroville</b>	<b>Folsom (CVP)</b>	<b>New Melones (CVP)</b>
Storage (AF)	807,817	1,732,319	1,676,429	578,328	937,318
% of capacity	33%	38%	47%	59%	39%
% of average this date (normal)	45%	48%	67%	95%	63%
% of storage level last year this date	63%	72%	117%	161%	61%
Source: California Data Exchange Center, Daily Reservoir Storage Summary Report, generated 30 March 2022; Restore the Delta.					

<b>Table 4</b> <b>2021 and 2022 Central Valley Project Reservoir Storage as of March 29</b>		
<b>Reservoir</b>	<b>Storage 2021</b>	<b>Storage 2022</b>
Trinity	1,290,157	807,817
Shasta	2,390,143	1,732,319
Folsom	358,155	578,328
New Melones	1,541,230	937,318
<b>Total Storage Volume as of March 29</b>	<b>5,579,685</b>	<b>4,055,782</b>
Source: California Data Exchange Center Reservoir Storage Summary Report, generated 30 March 2022; Restore the Delta.		

<b>Table 5</b> <b>2020 and Expected 2021 Deliveries to State and Federal Senior Water Rights Contractors</b>		
<b>Senior Water Rights Contractor Group</b>	<b>2020</b>	<b>Expected 2021 (through September 2021)</b>
San Joaquin River Exchange Contractors (CVP - San Joaquin/Mendota Pool)	554,679	393,337
San Joaquin River Exchange Contractors (CVP - Delta Mendota Canal)	131,531	108,701
Sacramento River Settlement Contractors (CVP)	1,528,579	1,087,913
Feather River Settlement Contractors (SWP)	NA	590,000
<b>Total Deliveries</b>	<b>2,214,789</b>	<b>2,179,951</b>
Sources: Tables 22, 24, 25, 27, and 28 from Central Valley Project Operations, U.S. Bureau of Reclamation, accessed 19 March 2022 for delivery years 2020 and 2021 from <a href="https://www.usbr.gov/mp/cvo/deliv.html">https://www.usbr.gov/mp/cvo/deliv.html</a> ; California Department of Water Resources, "Summary of SWP Water Operations for the Week of 05/24/21 through 05/30/31," accessed online 31 May 2021; and DWR Compliance Report, "2021 Observed Data & Operations Outlook," accessed 31 March 2022 at <a href="https://www.waterboards.ca.gov/drought/tucp/docs/2021/20210714_dwremail_cond5.pdf">https://www.waterboards.ca.gov/drought/tucp/docs/2021/20210714_dwremail_cond5.pdf</a> ; Restore the Delta.		

*Protest: Temporary Urgency Change Petition filed by the California Department of Water Resources (DWR) and the United States Bureau of Reclamation (Bureau) Regarding Permits and a License of the State Water Project and the Central Valley Project*

<b>Table 6</b> <b>Major Sacramento River Settlement Contractors with Greater Than 50 TAF in 2021 CVP Water Deliveries (Acre-feet)</b>		
<b>Senior Water Rights Contractor</b>	<b>2020</b>	<b>2021 (through September 2021)</b>
Anderson-Cottonwood Irrigation District	107,438	84,159
Glenn-Colusa Irrigation District	670,849	505,010
Natomas Mutual Water Company	80,594	74,450
Reclamation District #1004	50,907	25,336
Reclamation District #108	175,773	101,154
Sutter Mutual Water Company	173,577	124,747
<b>Total CVP Senior Water Contractor Deliveries</b>	<b>1,259,138</b>	<b>914,856</b>
Sources: Tables 22, 24, 25, 27, and 28 from Central Valley Project Operations, U.S. Bureau of Reclamation, accessed 19 March 2022 for delivery years 2020 and 2021 from <a href="https://www.usbr.gov/mp/cvo/deliv.html">https://www.usbr.gov/mp/cvo/deliv.html</a> ; Restore the Delta.		



## Attachment 6



515 E MAIN ST, STOCKTON, CA 95202

RESTORETHEDELTA.ORG

Transmitted via email: [zachary.M.Simmons@usace.army.mil](mailto:zachary.M.Simmons@usace.army.mil)

18 July 2022

Zachary Simmons, Project Manager  
US Army Corps of Engineers  
Sacramento District, Regulatory Division  
1325 J Street, Room 1350  
Sacramento, California 95814-2922

Subject: **Dredge and Fill (404) Application from California Department of Water Resources (DWR) to construct North Delta Drought Salinity Barriers Project (Public Notice SPK #2021-00763)**

Dear Mr. Simmons:

This letter originates from lands of the Lisjan Ohlones in the East Bay, of Yokut lands in the Stockton area, and Miwok lands of the Delta further north. These lands represent the great connections of the San Francisco Bay with the Delta estuary.

Restore the Delta (RTD) is a grassroots campaign of residents and organizations committed to restoring the Sacramento-San Joaquin Delta so that fisheries, communities, and family farming can thrive there together again; so that water quality is protected for all communities, particularly environmental justice communities; and so that Delta environmental justice communities are protected from flood and drought impacts resulting from climate change while gaining improved public access to clean waterways. Ultimately our goal is to connect communities to our area rivers and to empower communities to become the guardians of the estuary through participation in government planning and waterway monitoring. RTD advocates for local Delta stakeholders to ensure that they have a direct impact on water management decisions affecting the well-being of their communities, and water sustainability policies for all Californians.

### Proposed Project

RTD appreciated receiving notice from your office on June 21, 2022. We understand from the notice that DWR proposes to add two more temporary rock fill barriers along Steamboat and Miner sloughs in the North Delta intending to prevent intrusion of high-salinity tidal waters into the Sacramento-San Joaquin Delta should critical drought conditions persist into 2023 and beyond. The two barriers, states the notice, would include culverts installed within the barriers to allow fish passage and manage water quality. A small-boat portage would be provided at the Steamboat Slough barrier, as is shown in drawings attached to the notice. Both barriers,

continues the notice, would be installed annually, as needed, starting as early as June 1 and removed (we presume) each year no later than November 15.

The notice goes on to state as the project's purpose: "Based on the available information, the overall project purpose is to protect beneficial uses of water in the Delta during drought periods, including reducing the intrusion of saltwater in the Delta, while minimizing reservoir releases. The applicant believes there is a need to protect water supplies used by people who live in the Delta and in Contra Costa, Alameda, and Santa Clara counties, as well as those who rely on the Delta-based federal and state water projects for at least some of their supplies."

We further understand that this is essentially a notice for the public, governmental agencies, and other interested parties to comment on these proposed activities for purposes of the Corps' preparing either an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act (NEPA). As you have stated in the notice, "Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity." As such, the comments we offer in this letter are intended to help the Corps decide on the content of an Environmental Assessment and make a determination as to whether it will prepare an EIS on the proposed barriers.

In this light, we submit these comments:

### Comments

Alternatives: Under NEPA, the Corps will be obligated to examine a No Action Alternative that would assume the situation of existing allocation practices by the DWR and the Bureau of Reclamation. The No Action Alternative should foreground the serious salinity intrusion impacts to Delta agriculture and small community drinking water systems that could result if the barriers were NOT installed. Delta agriculture could face crop losses, and Delta communities who draw their water directly from Delta channels or groundwater wells adjacent to salinizing Delta channels would lose their capacity to deliver clean, safe, and good-tasting fresh drinking water. These are impacts of No Action that are not to be taken lightly. DWR's compliance with its water quality contract with the North Delta Agency and its agricultural customers is another example of such impacts from excessive salinity intrusion. In this light, RTD recognizes that the barriers have local and pragmatic purposes in addition to potential benefits they would provide to pumped exports and the meeting of in-Delta water quality objectives.

Overall, ***alternatives analysis should address the potential for changes in water allocation and delivery by DWR and the United States Bureau of Reclamation, despite drought conditions, to avoid use of any further Delta barriers beyond the West False River Barrier.*** The Corps' analysis should build on scenarios that involve curtailing the three major groups of senior water contractors—the San Joaquin River Exchange Contractors, the Sacramento River Settlement Contractors (both of the CVP system), and the Feather River Service Area (of the State Water Project system). In other words, if each junior agricultural water contractor is cut to X percent of their contract amount, regardless of project, then the senior water contractors we have just listed would also receive reductions in their deliveries to X percent of their contract amounts. The alternatives in the Environmental Assessment and/or EIS could proceed iteratively:

- Curtail deliveries to all three sets of senior water contractors (San Joaquin River Exchange, Sacramento River Settlement, and Feather River settlement).
- Curtail deliveries to just Sacramento Valley senior contractors (Sacramento River Settlement and Feather River Settlement contractors).
- Curtail deliveries to just San Joaquin River Exchange and Sacramento Valley senior contractors.
- Curtail deliveries to just San Joaquin River Exchange contractors.
- Curtail deliveries to just Sacramento River Settlement contractors.
- Curtail deliveries to just Feather River Settlement contractors.

Such an alternatives analysis would model the extent to which curtailing deliveries to these contractors and applying the savings to carryover storage for meeting Delta water quality objectives may avoid the need for additional installation of north Delta barriers—assuming the West False River barrier continues in place. In other words, this analysis addresses the question: are there non-obstructive alternatives that may serve to maintain the hydraulic barrier against tidal salinity intrusion in North Delta channels? The alternatives analysis of these scenario alternatives should examine the equity and environmental justice issues that arise and how they may be mitigated. These are reasonable and feasible alternatives to the proposed action from DWR

Separate from this application, DWR is proposing a 10-year program in which the West False River Barrier would be emplaced for some few years out of ten to provide relief to the interior Delta from risk of salinity intrusion. Given that climate change with its expected sea level rise impacts to the Delta and precipitation impacts to northern California reservoirs, it is reasonable, feasible, and prudent to consider alternatives to the status quo methods of allocating water within the two large water systems. What if California's water systems allocated water equitably so that all contractors got at least some water, and Delta water quality standards were still complied with? The Corps could take the lead in examining this question and help stimulate California to begin its long-postponed planning for extended drought conditions and how the system could cope with the effects.

Such a comprehensive alternatives analysis could enable the Corps to find either that some combination of upstream curtailments would be sufficient to obviate the proposed barriers, and avoid the significant environmental effects of the two proposed barriers, or could help inform conditioning of mitigations on installation of barriers on compliance with specified curtailment requirements. We are well aware that the Corps cannot impose conditions directly onto property water rights; but the curtailment requirements should be specified as **performance measures** by which DWR as applicant would have to meet prior to installation of new barriers and would be responsible to seek adjustments to operations and deliveries under its coordinated operations pathways with the Bureau of Reclamation. The Bureau would have incentive to participate because installation of north Delta barriers would also benefit their operations and export water quality; yet if they can meet their water quality objectives by other non-barrier means, they should be able and willing to abide by DWR's permit conditions as well.

Restore the Delta proposes such an alternatives analysis for the north Delta Barriers because we and others have observed during the temporary urgency change petition process before the

State Water Resources Control Board earlier this year that the water rights priority system is obstructing equitable solutions for all farmers who need water to irrigate crops and cities and rural communities who serve their customers with good quality water. These alternatives to the proposed project would help the Corps and other policy makers and water agencies to begin design of alternative approaches to how California allocates water under climate change conditions.

*Endangered Species and Essential Fish Habitat:* Steamboat Slough and Miner Slough are distributaries of the Sacramento River. The Corps' EA on this project must address the effects that emplacement of barriers in these sloughs at these locations would result in for endangered fish species, including any Chinook salmon and Central Valley steelhead runs that would be attempting to return to natal streams in the Sacramento River basin upstream, as well as to the summer time habitat needs of longfin smelt and Delta smelt, resident fish that are both listed species. Among the effects the Corps must consider will be straying of anadromous fish. The culverts and their flaps on both barriers are likely to become predation hotspots where small fish passing through (if they even find the culverts along these barriers) could be ambushed by predatory fish (such as various bass species that are piscivorous) at the other end of these otherwise blind passages. At a minimum, the Corps must require seasonal "notching" of the barriers by Applicant DWR of these barriers to permit fish traversing Miner and Steamboat sloughs more than one alternative to get past these barriers once they are in place.

*Water Quality and Harmful Algal Blooms:* The Corps' environmental document should acknowledge the growing problem of high residence time of water in the Delta from further emplacement of channel barriers and the spread of environmental conditions favorable to harmful algal blooms (HABs). Applicant DWR recently completed a study of harmful algal blooms in the area of Franks Tract resulting from their West False River barrier, installed in the spring of 2021 and kept over winter. The study found that the False River barrier did have some effect on the residence time of water in Franks Tract and that harmful algal blooms occurred where in previous years with the barrier, they were either non-existent or were smaller than occurred in 2021. Restore the Delta has commenced its own water quality testing program to track aquatic conditions and presence of cyanobacteria and cyanotoxins in channels relatively close to and within the City of Stockton. The Corps should be aware that HABs occurring in stagnant waters can emit airborne cyanotoxins up to several miles beyond their original source bloom when mobilized by air currents and wind. By introducing yet more barriers into Delta channels like Miner and Steamboat sloughs, the Corps must take account of and mitigate potential airborne release of cyanotoxins to neighboring communities upwind of these channels. Moreover, when conditions cool and harmful algal blooms subside and degrade, they consume dissolved oxygen, and so the Corps should also examine the potential seasonal effects of HAB decomposition's effects on dissolved oxygen—all of which would stem from an original cause of installation of the north Delta barriers in Miner and Steamboat sloughs.

*Environmental Justice:* Because north Delta barriers' installation would likely increase the spread of HABs with their attendant air quality impacts, the Corps' environmental document should also describe potential air quality impacts of HABs on environmental justice communities and neighborhoods within the interior Delta. It will not be correct or reality-based to claim that EJ issues are not present because environmental justice communities may be under-reported in the U.S. Census for 2020. These disadvantaged communities still exist in interior Delta communities like Isleton, Clarksburg, Courtland, and elsewhere as well as in surrounding neighborhoods in south Sacramento, Elk Grove, Hood, Galt, Lodi, and Stockton. We urge the

Corps to include environmental justice issues as part of the scope of their eventual environmental document on the north Delta barriers proposed by DWR.

In all, we urge that the Corps of Engineers prepare an Environmental Impact Statement on the proposed north Delta Barriers project. There is sufficient time to complete the EIS process and it would render to the public a real service, especially to the extent that its alternatives analysis considers non-barrier ways of boosting the hydraulic barrier in the Delta through water allocation scenarios, and to the extent it fairly and fully addresses the water quality and air quality impacts of HABs.

Thank you for the opportunity to comment on this notice for DWR's proposed north Delta barriers on Steamboat and Miner sloughs. If we may be of service with additional information or to answer questions you may have about our letter, please do not hesitate to contact Tim Stroshane at 510.847.7556 or [tim@restorethedelta.org](mailto:tim@restorethedelta.org)

Sincerely,



Barbara Barrigan-Parrilla  
Executive Director



Tim Stroshane  
Policy Analyst

cc: E. Joaquin Esquivel, Chair, State Water Resources Control Board  
Dorene D'Adamo, Vice-Chair, State Water Resources Control Board  
Nichole Morgan, Member, State Water Resources Control Board  
Sean Maguire, Member, State Water Resources Control Board  
Laurel Firestone, Member, State Water Resources Control Board  
Michael George, Delta Watermaster  
Dillon Delvo, Little Manila Rising  
Matt Holmes, Little Manila Rising  
Irene Calimlim, Greenlining the Hood  
Jasmine Leek, Third City Coalition  
Tama Brisbane, With Our Words, Inc.  
Regina Chichizola, Save Our Salmon  
Tom Stokely, Save Our Salmon  
Kasil Willie, Save Our Salmon  
Malissa Tayaba, Shingle Springs Band of Miwok Indians  
Krystal Moreno, Shingle Springs Band of Miwok Indians  
James Sarmento, Shingle Springs Band of Miwok Indians  
Chief Caleen Sisk, Winnemem Wintu Tribe  
Gary Mulcahy, Government Liaison, Winnemem Wintu Tribe  
Doug Obegi, Natural Resources Defense Council  
Kate Poole, Natural Resources Defense Council  
Brandon Dawson, Sierra Club California  
Jonathan Rosenfield, San Francisco BayKeeper  
John Herrick, South Delta Water Agency

Melinda Terry, North Delta Water Agency  
Dante Nomellini, Central Delta Water Agency  
Harry Black, City Manager, City of Stockton  
Thomas Keeling, Freeman Firm  
Stephen J. Welch, General Manager, Contra Costa Water District  
Kelley Taber, Somach Simmons & Dunn  
Osha Meserve, Soluri Meserve  
Stephanie Safdi, Stanford Mills Environmental Law Clinic  
Deborah Sivas, Stanford Mills Environmental Law Clinic



## Attachment 7



515 E MAIN ST, STOCKTON, CA 95202

RESTORETHEDELTA.ORG

Transmitted via email: [wfrdsb\\_ceqa@water.ca.gov](mailto:wfrdsb_ceqa@water.ca.gov),

August 22, 2022

Robert Trang, Manager  
WPPM Delta Planning Section  
Division of Operations and Maintenance  
California Department of Water Resources  
1516 9th Street, 2nd Floor  
Sacramento, CA 95814

**Subject: Comments—Draft EIR on West False River Drought Salinity Barrier**

Dear Mr. Trang,

This letter originates from lands of the Lisjan Ohlones in the East Bay, of Yokut lands in the Stockton area, and Miwok lands of the Delta further north. These lands represent the great connections of the San Francisco Bay with the Delta estuary.

Restore the Delta (RTD) is a grassroots campaign of residents and organizations committed to restoring the Sacramento-San Joaquin Delta so that fisheries, communities, and family farming can thrive there together again; so that water quality is protected for all communities, particularly environmental justice communities; and so that Delta environmental justice communities are protected from flood and drought impacts resulting from climate change while gaining improved public access to clean waterways. Ultimately our goal is to connect communities to our area rivers and to empower communities to become the guardians of the estuary through participation in government planning and waterway monitoring. RTD advocates for local Delta stakeholders to ensure that they have a direct impact on water management decisions affecting the well-being of their communities, and water sustainability policies for all Californians.

We appreciated the opportunity to provide oral comments on the proposed project at the public meeting sponsored by the California Department of Water Resources (DWR) on July 27, 2022. We appreciate DWR preparing an environmental impact report on this modest, medium term approach to drought salinity barrier emplacement in West False River between 2023 and 2032, and that DWR did not attempt to comply with CEQA using a mitigated negative declaration. This has given DWR the opportunity to explore in some depth the potential effects of its approach to ten-year emplacement and operation of such a barrier at this western-central Delta location.

However, this Draft EIR is deeply flawed and inadequate. It piecemeals the West False River Barrier while ignoring completely, and surprisingly, that DWR has simultaneously proposed two similar barriers for North Delta channels to the U.S. Army Corps of Engineers that are intended to complement the West False River barrier, especially if this coming winter is as bereft of rain and snow as the last two. Piecemealing of environmental reviews is contrary to the California Environmental Quality Act, and if litigated will render this EIR inadequate. Consequently, we recommend that DWR expedite this process by preparing a supplemental Draft EIR as soon as

possible<sup>4</sup> that corrects the problems with the initial draft that we identify through our comments in this letter.

### General Comments

- 1) RTD's comment letter here incorporates by reference the letter dated August 17, 2022, submitted by Natural Resources Defense Council, The Bay Institute, California Sportfishing Protection Alliance, Restore the Delta, Pacific Coast Federation of Fishermen's Associations/Institute for Fisheries Resources, and Sierra Club California. This letter contends that:
  - The DEIR violates CEQA for failing to consider the whole of the action in relation to DWR's and the Bureau of Reclamation's temporary urgency change petition, submitted to the State Water Resources Control Board in March 2022;
  - Significant environmental impacts result from this failure through violation of water quality objectives in the Bay-Delta Plan;
  - Increasingly harmful algal blooms from reduced outflow and increased residence time of water will result; and
  - Significant impacts to fish and wildlife from the whole project will result;
  - The DEIR fails adequately to analyze environmental impacts of the drought salinity barrier;
  - The DEIR demonstrates that DWR plans to use temporary urgency change petitions to repeatedly violate water quality objectives in future droughts, contrary to State Law; and
  - The DEIR fails to consider a reasonable range of alternatives.
- 2) This Draft EIR is fatally inadequate, and DWR will need to prepare a supplemental Draft EIR. DWR has failed to adequately describe the project and how its various components interact with the drought conditions it is intended to address, what rules it will operate by, and whether it poses obstacles to, rather than opportunities for climate resiliency in the Delta.

While we are attaching letters that were initiated in response to temporary urgency change petitions and to other public notices of DWR-related water actions, we would appreciate the consultants preparing the Final EIR treating them as reflective of comments applicable to the West False River Barrier Draft EIR and respond to these comments accordingly as well. Thank you for the opportunity to comment on this Draft EIR. If you have questions about our comments and viewpoint, our contact information is available below.



Barbara Barrigan-Parrilla  
Executive Director  
[barbara@restorethedelta.org](mailto:barbara@restorethedelta.org)



Tim Strohane  
Policy Analyst  
[tim@restorethedelta.org](mailto:tim@restorethedelta.org)

### Attachments:

1. Specific Comments on the West False River Drought Salinity Barrier Draft EIR.
2. Restore the Delta Protest to State Water Resources Control Board concerning DWR/Bureau TUCP, June 4, 2021.
3. Restore the Delta Protest to State Water Resources Control Board concerning DWR/Bureau, April 4, 2022.
4. Restore the Delta Comment Letter to U.S. Army Corps of Engineers concerning North Delta Barriers notice of intent, July 18, 2022.

cc: E. Joaquin Esquivel, Chair, State Water Resources Control Board  
Dorene D'Adamo, Vice-Chair, State Water Resources Control Board  
Nichole Morgan, Member, State Water Resources Control Board  
Sean Maguire, Member, State Water Resources Control Board  
Laurel Firestone, Member, State Water Resources Control Board  
Michael George, Delta Watermaster  
Dillon Delvo, Little Manila Rising  
Matt Holmes, Little Manila Rising  
Irene Calimlim, Greenlining the Hood  
Jasmine Leek, Third City Coalition  
Tama Brisbane, With Our Words, Inc.  
Regina Chichizola, Save Our Salmon  
Tom Stokely, Save Our Salmon  
Kasil Willie, Save Our Salmon  
Malissa Tayaba, Shingle Springs Band of Miwok Indians  
Krystal Moreno, Shingle Springs Band of Miwok Indians  
James Sarmiento, Shingle Springs Band of Miwok Indians  
Chief Caleen Sisk, Winnemem Wintu Tribe  
Gary Mulcahy, Government Liaison, Winnemem Wintu Tribe  
Doug Obegi, Natural Resources Defense Council  
Kate Poole, Natural Resources Defense Council  
Brandon Dawson, Sierra Club California  
Jonathan Rosenfield, San Francisco BayKeeper  
John Herrick, South Delta Water Agency  
Melinda Terry, North Delta Water Agency  
Dante Nomellini, Central Delta Water Agency  
Harry Black, City Manager, City of Stockton  
Thomas Keeling, Freeman Firm  
Stephen J. Welch, General Manager, Contra Costa Water District  
Kelley Taber, Somach Simmons & Dunn  
Osha Meserve, Soluri Meserve  
Stephanie Safdi, Stanford Mills Environmental Law Clinic  
Deborah Sivas, Stanford Mills Environmental Law Clinic

**Attachment 1**  
**Specific Comments by Restore the Delta on**  
**West False River Drought Salinity Barrier Draft EIR**

**Project Objectives**

The first objective states that the project is to install “a drought salinity barrier to protect water quality...based on need demonstrated by drought conditions and low upstream reservoir storage.”

The second objective states the project is to “install a salinity barrier in the Central or South Delta up to two times over 10 years, including consecutive years, should a drought occur during the period from 2023 to 2032.” The final objective is to “minimize the impacts of salinity intrusion” on beneficial uses of interior Delta water during persistent drought conditions through “installation of a drought salinity barrier in the Central or South Delta.”<sup>1</sup>

Succinctly stated, the first objective is to protect water quality; the second is to install a barrier if a drought occurs in the next ten years, and the third is to minimize salinity intrusion into the Delta via a barrier. These “objectives” are largely redundant with respect to each other except in a few details. Protecting water quality in the Delta has long meant minimizing salinity intrusion. These objectives then are simply different ways of saying the same thing. The historically chosen method (dating to the 1930s) is use of an hydraulic barrier—a continuous feed of fresh water from upstream that pushes back on salty tides that flow into and ebb out of the Delta on a twice daily cycle.<sup>2</sup>

The project objectives on page 2-1 obscure the fact that drought conditions do not simply result from a lack of rainfall, but reflect operational decisions made by both the Bureau and DWR. Put another way, it is not just “drought conditions” as a deficit of Nature, but deficits contributed by human water management by these agencies that contribute to “low upstream reservoir storage.” As the Bureau’s operational presentation contained in the NRDC et al letter (dated 17 August 2022) indicates, reservoir operations entail a “fill season” and a “management season.” The fill season is the period of the year when a reservoir fills with runoff from rainfall and snowmelt. The management season is the period of the year when continuing runoff into the reservoir is offset by releases of water for downstream uses that deplete net storage. In the Sacramento Valley, most water uses are for agricultural irrigation. One goal of reservoir operation is to complete the “management season” with carryover storage adequate to fill the reservoir as much as possible during the ensuing “fill season.”

Carryover storage, the Bureau’s presentation describes (on slide 24), is affected by final flood control actions (whether filling or releasing water to maintain adequate space), water quality and endangered species act storage requirements, senior water rights, and project deliveries and exports.

Trouble comes for Delta hydraulic management of tidal flows when DWR and the Bureau release too much water from upstream reservoirs for deliveries to senior water rights, as has occurred the last two water years. We documented these deliveries in 2021 and again in 2022. (See Attachments 2 and 3.) Literally hundreds of thousands of acre-feet of water were expended from Shasta and Oroville to meet irrigation demand of senior water right holders: the Sacramento River Settlement Contractors (2021), the San Joaquin River Exchange Contractors (2021 and 2022) by the Bureau, and the Feather River Service Area Contractors (2021 and 2022) by DWR. All other deliveries and exports of water to other project contractors were limited to “health and safety” amounts. Only some

---

<sup>1</sup> Draft EIR, p. 2-1.

<sup>2</sup> The fresh water barrier is fed by releases from upstream reservoirs. Historically, such a feed drained several natural basins in the Sacramento Valley (now called the Butte, Sutter, Colusa, and Yolo basins). Extensive wetlands of this region prior to European contact held runoff from northern Sierra and southern Cascade Range snowmelt and drained over the course of the summer and fall into the Delta. Similar extensive wetlands held water and drained the central and northern San Joaquin Valley as well.

of the Sacramento River Settlement Contractors took deep cuts in 2022. As of August 14, 2022, for example, the Feather River Service Area Contractors had received 442,877 acre-feet in deliveries in the 2022 year-to-date.<sup>3</sup> Sacramento River Settlement Contractors through the end of May had received just 74,421 acre-feet in deliveries from the Bureau.<sup>4</sup> Meanwhile, the Exchange Contractors in the San Joaquin Valley through June received about 229,000 acre-feet from the Mendota Pool (originating from Millerton Lake) and about 41,000 acre-feet from the Delta Mendota Canal (presumably originating from Shasta Lake).<sup>5</sup>

Had DWR and the Bureau opted instead to curtail deliveries to these senior water right holders by some amount, that much more water would have been available on one hand for meeting Delta water quality objectives and any endangered species regulations and potentially for greater carryover storage for the upcoming fill season beginning in October. The same is true for 2021—had DWR and the Bureau opted instead for greater curtailments of senior water right holders mentioned above that year, there would have been more available for carryover storage into this year, when California experienced the worst January through March period in over 100 years.

“Low upstream reservoir storage” is a socially created volume of water resulting from the Bureau and DWR’s willingness to gamble that each winter of the fill season will be somehow normal. Drought is not strictly a natural condition; “low upstream reservoir storage” is influenced by both natural conditions and socio-economic demands for water from those same reservoirs. Those socio-economic demands originated in California’s historical system of water rights which themselves originated from the removal of California Indian tribes from the landscape in the last half of the nineteenth century.

The DEIR’s project objectives fail to acknowledge this reality and narrowly seek to focus its analysis on the technical aspects of barrier installation and operation. DWR must issue a supplemental EIR that addresses the underlying role of continuing to deliver unreasonable quantities of water to senior water right holders simply because their ancestors pioneered California before others arrive to claim water. This system of water rights allocations stands in the way of better outcomes for more “junior” water users within these two coordinated water systems as well as for Delta water quality and its environmental justice communities.

### **Project Description**

The core of the project description for the West False River barrier reads:

The barrier may be installed up to two times over 10 years, including consecutive years, if a drought occurs during the 2023–2032 period and drought conditions and low upstream reservoir storage indicate that a barrier in West False River would be an effective tool to reduce saltwater intrusion into the Delta. The proposed project calls for up to two consecutive barrier installations over 10 years primarily because the project’s potential effects on the physical environment after 10 years are speculative, and because some

---

<sup>3</sup> DWR Operations and Delta Status, “Summary of SWP Water Operations,” accessed 15 August 2022, <https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/State-Water-Project/Operations-And-Maintenance/Files/Operations-Control-Office/Project-Wide-Operations/Summary-of-Water-Operations.html>

<sup>4</sup> Bureau of Reclamation, Central Valley Operations Office, Table 28, Monthly Deliveries in [Acre-feet], accessed 15 August 2022, [https://www.usbr.gov/mp/cvo/vungvari/table\\_28\\_2022.pdf](https://www.usbr.gov/mp/cvo/vungvari/table_28_2022.pdf).

<sup>5</sup> Bureau of Reclamation, Central Valley Operations Office, Tables 24 and 25, Monthly Deliveries in [Acre-feet], accessed 15 August 2022, [https://www.usbr.gov/mp/cvo/vungvari/table\\_24\\_2022.pdf](https://www.usbr.gov/mp/cvo/vungvari/table_24_2022.pdf) and [https://www.usbr.gov/mp/cvo/vungvari/table\\_25\\_2022.pdf](https://www.usbr.gov/mp/cvo/vungvari/table_25_2022.pdf).



drought response—including the need to install a barrier—is anticipated within the next 10 years, given the cyclical nature of drought.<sup>6</sup>

We find this description confusing, probably because drought in California has in historical memory lasted up to eight years (1987-1994, with 1993 being a wet year towards the end of the drought), and probably because the description is highly conditional (“The barrier may be installed up to two times over 10 years...”). The description fails to answer several questions we have about the proposed project:

First, would the “period of 2023-2032” start in April 1 or December 1 (the day after barrier removal completion)? Or would it begin October 1, 2023 to September 30, 2032? Or, would it go longer than 10 years (e.g., April 1, 2023 to November 30, 2032)?

Second, if the barrier can be installed for no more than 19 months at a time, how does this work if drought extends for much of the 120-month period and after about 40 months the approval under this Draft EIR is used up? Or is it, since DWR has coyly stated, that “the barrier may be installed up to two times over 10 years” while drought reality may actually necessitate its installation three or more times in that ten-year period? Would DWR really tie its own hands and not extend the barrier’s life, or reinstall it if they had removed it and yet a drought is continuing?

Third, DWR needs to explain further what it means by stating, “...the project’s potential effects on the physical environment after 10 years are speculative, and because some drought response...is anticipated within the next 10 years...” Does “potential effects on the physical environment” mean that the porous nature of the rock barrier limits the extent to which salt water is repelled over time, that over time salinity will still get in to the Delta anyway? Or is DWR signaling some other type(s) of environmental effect(s) that become(s) speculative?

Fourth, and this goes to the piecemealing character of this Draft EIR, it strikes us that DWR must increase its carryover storage at Oroville (and the Bureau’s at Shasta and Folsom) if the “speculative” character of the West False River barrier is to be reduced. It relies on some amount of hydraulic barrier secondary to emplacement of the rock barrier in False River, if a rock barrier’s useful life is to be extended.

Fifth, the Barrier Installation Schedule section sheds little light on our questions.<sup>7</sup> It reiterates that “the installation schedule would be determined based on hydrologic conditions, and the barrier would be installed only when drought conditions necessitate its installation.” The project description in this section acknowledges “project runoff is based on historical hydrology” but fails completely to state DWR’s long-announced problems modeling and estimating runoff since spring of 2021 when the department could not account for a loss of 800,000 acre-feet it anticipated.<sup>8</sup> This section should acknowledge and update DWR’s efforts to recover and improve the accuracy and resiliency of its hydrologic station network and thereby its ability to accurately justify installation of the West False River barrier at appropriate times.

---

<sup>6</sup> Draft EIR, p 2-7 to 2-8.

<sup>7</sup> Draft EIR, p. 2-9 to 2-10.

<sup>8</sup> At a State Water Board workshop, 5 January 2022, state climatologist Michael Anderson and colleagues reported that they had difficulty measuring the lack of runoff from April 2020. Due partly to effects of wildfire, DWR lost numerous monitoring stations from its Sierra network during 2020 and 2021. Anderson acknowledged that water year 2021 was the driest on record since 1924. Dry soil conditions were also important factors, when DWR hydrologists observed that the runoff response from rains ceased once the rains stopped in some watersheds. These factors made runoff forecasting difficult, and Anderson and colleagues acknowledged that “the Feather River is a particularly difficult basin to forecast this year.” Source: Tim Stroshane’s workshop notes.



## Hydrology and Water Quality

**Flooding.** This setting section of the Draft EIR gives context only for existing 100-year flood stages at various points along the Sacramento River while failing to acknowledge anticipated flood risks detailed in the Fourth California Climate Assessment as well as recent scientific study of “mega-flood” risk in California in which atmospheric rivers bombard California’s Central Valley watersheds for weeks at a time. The latter flooding scenarios must be disclosed and examined in the supplemental EIR we seek by DWR so that the public and DWR decision makers better understand the risks of keeping a rock dam in West False River during a major flood event.

While we read that the levees of both Jersey and Bradford Islands have been recently strengthened, emplacement of the barrier in West False River channel increases flow to Fishermen’s Cut and other channels in the vicinity.<sup>9</sup> Having the barrier in place during a major flood event would likely prove catastrophic to levees of Jersey and Bradford Islands as well as Webb Tract (as this tract’s west levee is the east bank of Fishermen’s Cut).

These velocity measurements, coupled with heightened flood risk due to advancing effects of climate change, indicate that West False River barrier contribution to flood risks are sudden and significant. The Draft EIR’s finding of “less than significant” (for both Impacts 3.5-3 and 3.5-6) for the proposed project’s alteration of existing drainage patterns to the site or area could improperly and inappropriately redirect wave energy from increased velocities to levees of adjacent islands, as noted above. The “LTS” findings for both of these impact discussions need to be corrected in the supplemental Draft EIR we recommend DWR prepare and narrative provided to give context for the increased likelihood of catastrophic flooding and altered drainage associated with the barrier being in place during such a lengthy and dangerous storm event.

**Water Quality.** Table 3.5-1 (p. 3.5-11) omits beneficial uses under consideration for adoption by the Central Valley Regional Water Quality Control Board (Tribal Cultural Uses, Tribal Subsistence Uses, and Subsistence Uses) in September 2022. These soon-to-be-included beneficial uses for the Central Valley Basin Plan represent new and reasonably foreseeable regulatory baseline conditions that should be evaluated in a supplemental EIR that DWR should issue on this proposed project.

**Biological Resources.** The project description fails to include any contingency plan for how DWR intends to address outbreaks of harmful algal blooms (HABs). This needs to be rectified in the supplemental EIR. HABs require several physical and hydrological conditions to form: slack water (high residence time of water at times of low or stagnant flow), high air and water temperatures, access to sunlight, and presence of nutrients like nitrates and phosphates. In recent years, HABs have spread throughout the Delta and to many other water bodies—including state and federal reservoirs and mountain lakes statewide—to curtail human recreational activity and, in the worst cases, contribute to fish kills. A recent environmental justice community survey concerning the Delta Conveyance Project by DWR shows that members of Delta environmental justice communities consume fish from the Delta as often as four times a month.<sup>10</sup>

---

<sup>9</sup> Closure of the barrier in June 2015 resulted in dramatic increases in velocities with tidal influence of over -3 feet per second to +3 feet per second in Fisherman’s Cut. When the barrier was breached just four months later, flow velocities decreased to less than one foot per second in both directions. California Department of Water Resources, Bay-Delta Office *Efficacy Report: 2015 Emergency Drought Barrier Project*, June 2019, Figure 3-7, p. 59; similar channel velocity increases from barrier closure were observed at Old River at Franks Tract (OSJ; Figure 3-8, p. 60) and at Dutch Slough at Jersey Island (DJS, Figure 3-9, p. 61). Accessible at [https://water.ca.gov/-/media/DWR-Website/Web-Pages/Water-Basics/Drought/Files/Publications-And-Reports/EDB-Efficacy-Report\\_June-2019\\_ay11.pdf](https://water.ca.gov/-/media/DWR-Website/Web-Pages/Water-Basics/Drought/Files/Publications-And-Reports/EDB-Efficacy-Report_June-2019_ay11.pdf)

<sup>10</sup> See Attachment 3, p. 12, this letter.

HABs represent a potential project impact that crosses impact boundaries. Some species generate neurotoxins that can sicken human beings and are known to kill dogs. In the presence of strong winds, the bodies and neurotoxins of HABs can become airborne aerosols and greatly extend the impact of HABs outbreaks on sensitive receptor communities.

Barrier installation will generate turbidity in the short term, which would decrease HABs' access to light. Mitigation Measures Bio-8, Bio-9, Bio-10, and Bio-11 fail to recognize the use of turbidity in tamping down potential HABs in False River and east to Franks Tract. Turbidity can also help to control invasive aquatic vegetation as well. Turbidity, however, generally requires sufficient flow that has mobilized sediments and other particulate matter to float in the water column over a span of time.

Air Quality. We note that the Air Quality section of Chapter 3 also fails to acknowledge the potential for HABs and their neurotoxins to become airborne and aerosolized. This should be corrected in the supplemental EIR.

### **Climate Change and Resiliency**

Chapter 4 centers on the proposed project's performance with respect to climate change and resiliency, specifically on three broad topics: whether the proposed project represents **climate change mitigation** (it does not go directly to reduce climate change effects such as lowering greenhouse gas emissions or sequestering carbon from the atmosphere); **climate change adaptation** (only somewhat), or whether it makes other systems with which it functions better able to recover from and rebound from climate shocks (**climate resiliency**).

This chapter ignores DWR's problems projecting spring runoff due to loss of monitoring stations and dry soil conditions. This is important for determining water supply conditions and State Water Project and Central Valley Project allocations to contractors, which in turn affects upstream reservoir storage needed for meeting project obligations such as complying with Delta water quality objectives in D-1641 and the Bay-Delta Plan. Like the project description, this chapter also fails to acknowledge the social components (that is, continuing high, if reduced, deliveries to senior water right holders) determining whether upstream reservoir storage is low or not.

The Draft EIR in this chapter continues to treat barrier installation decisions as an outcome of mere upstream reservoir storage conditions. As we indicated above, those conditions depend not just on natural hydrologic conditions but on water management decisions to allocate water to senior water rights holders, which in turn affect the base of carryover storage going into the fill season. Like the project description and other impact discussions of this Draft EIR, this chapter also fails to acknowledge the role of water management decision making.

This chapter confuses climate mitigation with climate adaptation. On one hand, it does define climate mitigation as actual reductions in the conditions that cause climate change—principally reductions in the rate and volume of greenhouse gas emissions and actions that sequester carbon from the atmosphere. It recognizes that climate adaptation describes actions that must be taken to protect and sustain social, ecological, economic communities from the effects of climate change already baked into the atmosphere and rising global temperatures in the next few decades. Climate resiliency, then, represents actions taken to improve society's ability to recover and rebound from climate change damage and shocks.

As a pile of rocks, it cannot be considered a climate mitigation project since it neither prevents greenhouse gas emissions (during its installation and removal phases) nor removes carbon and other heat-trapping gases from the atmosphere. Any "mitigation" the proposed project provides for

water quality impacts of drought is rooted in its adaptation role, not in emission prevention or removal of carbon from the atmosphere.

RTD agrees with the Draft EIR characterizing the proposed project as a climate change adaptation project. Whichever alternative barrier is selected will serve to limit salt water intrusion into interior Delta channels from the position of West False River. “Without the protection of the drought salinity barrier, salt water intrusions could affect more than 27 million Californians who rely on the Delta for at least a portion of their water supply, render Delta water unusable for agricultural needs, and reduce habitat value for aquatic species.”<sup>11</sup> We also agree that the Barge-Mounted Operable Barrier and Single-Tube Inflatable Rubber Dam alternatives are examples of climate adaptation as well.

DWR really really wants the barrier to be also seen as a climate resilience project. RTD sees this as fiction within this document. The Draft EIR suggests that the barrier “may provide ecological adaptive capacity or resilience...,” and “may provide flood protection benefits against large floods,” yet “may increase or decrease local project flood impacts from small...floods.” This language reflects a realistic lack of certainty about the project’s climate resiliency, especially climate resiliency impacts on Delta islands, levees, channels, and ecosystems. DWR is spinning, minimizing real uncertainties, and is stretching this climate adaptation to salinity intrusion into having ecological and flood resiliency effects while ignoring challenges around HABs, fisheries, increased residence time of pollutants, and local floods.

We also learned from this passage that, harking back to our sequence of five questions and concerns about the project description above, “persistent drought conditions under climate change may alter the timing of barrier installation and removal, requiring more frequent installations and leaving the barrier in place for a longer duration.”<sup>12</sup> This statement undoes the vague certainty of the project description that the project entailed up to two installations over a ten year period in the Delta. To us this represents a “loophole” for the project description to leave the West False River barrier in place for years to come if it appears that California has entered an extended dry period. This “loophole,” in our view, should be acknowledged in the project description of the Supplemental EIR. Just place it up front in Chapter 2. What is now in the Project Description was never credible to us.

The Supplemental EIR must resolve this statement acknowledging the relationship of climate change to future drought years that the project description fails utterly to acknowledge. DWR must resolve this by acknowledging in more detail how, when, and under what hydrologic and allocation conditions the proposed drought salinity barrier is to be installed and maintained in operation.

DWR also needs to clarify its project description statement that the barrier’s environmental effects are speculative after ten years, as we also indicated above. This also relates to whether the proposed project is sustainable beyond ten years, and threatens to undermine completely the possibility that under certain flood conditions the barrier would create obstacles to climate resiliency in the Delta, such as a scenario when a mega flood with the barrier in place causes flow velocities and stages in adjacent channels that undermine or overtop levees of adjacent islands, which could open wide the path for salty tidal flows to enter Franks Tract and the other central and south Delta channels—resulting in the very loss of salinity control that the barrier is nominally intended to protect.

It may help establish climate resiliency for the State Water Project and the Central Valley Project and for their various urban and agricultural water contractors, and for local drinking water treatment systems in Contra Costa County and the City of Stockton. But DWR improperly cleaves such climate resilience for drought from climate resilience for flooding. We are doubtful that any of the proposed

---

<sup>11</sup> Draft EIR, p. 4-13, Section 4.4.3.

<sup>12</sup> *Ibid.*, last bullet at bottom of the page.

alternatives qualify as examples of climate resilience for flooding. The Draft EIR states rather cockily, “Because the proposed project is inherently a climate adaptation project, construction and operations are anticipated to increase the project area’s resiliency to the effects of climate change.” We would remind DWR, however, that the proposed project’s environmental effects are described as “speculative” the further one goes into the future, and DWR needs to clearly spell out what it means by that statement. DWR also is not accounting adequately for flooding impacts on the barrier and its hydrodynamic (flow velocity and stage) effects on adjacent channels, some of which are quite narrow relative to West False River’s width (e.g., Fisherman’s Cut). We look forward to seeing how DWR resolves these problems in the supplemental EIR it will need to release.

Another scenario that is possibly a subset of the “mega-flood” scenario but must be analyzed is the “perfect storm” in which an atmospheric river-type storm occurs during a king tide—the recurring highest of high tides that reach California’s coast and appear in Delta channels over the course of the Moon-tidal cycle. We look forward as well to seeing DWR analyze such a scenario in the supplemental EIR it will need to release.

The Barge-Mounted Operable Barrier alternative may provide a better resiliency solution since its upper portion can merely be swiveled out of the way of flood flows to relieve pressure on adjacent narrow channels. But the Draft EIR has failed to adequately diagnose the climate resiliency problems posed by False River barriers, and until it does we cannot agree that any of the alternatives exemplify climate resiliency.<sup>13</sup>

Furthermore, an option involving an operable gate should be analyzed further as an alternative for the future. We understand that federal agencies are concerned about footings for operable gates and impacts to fisheries. However, Restore the Delta has also listened to numerous presentations about ways to track fish migration with bubble systems, and other technology that could potentially make an operable gate system fish friendly. Moreover, an operable gate system would allow the opportunity to move water through the system when needed to mitigate any HABs that develop in dead pools on either side of the barrier. In summary, if a barrier system is to be used as part of a climate adaptation system, then it must be designed to protect fisheries and communities from pollution and circulation problems that create HABs, and it should be easy to operate for emergency response for floods. The environmentally superior Barge-Mounted Operable Barrier should be considered a temporary fix if the true intent is for a barrier system to become a permanent fixture for climate adaptation. Phasing in bad temporary fixes is unjust for Delta communities and tribes dependent on healthy waterways.

### **Cumulative Impacts**

The Draft EIR completely omits mention of North Delta Barriers proposed by DWR in late June to the U.S. Army Corps of Engineers in a separate process under the National Environmental Policy Act. This is yet another reason that DWR must prepare a supplemental Draft EIR as soon as possible to incorporate the North Delta Barriers and their operations as a cumulative project with which the West False River barrier would generate hydrodynamic interactions. We have attached our comments (Attachment 4) on the notice and DWR application to the Corps which we provided on July 18, 2022.

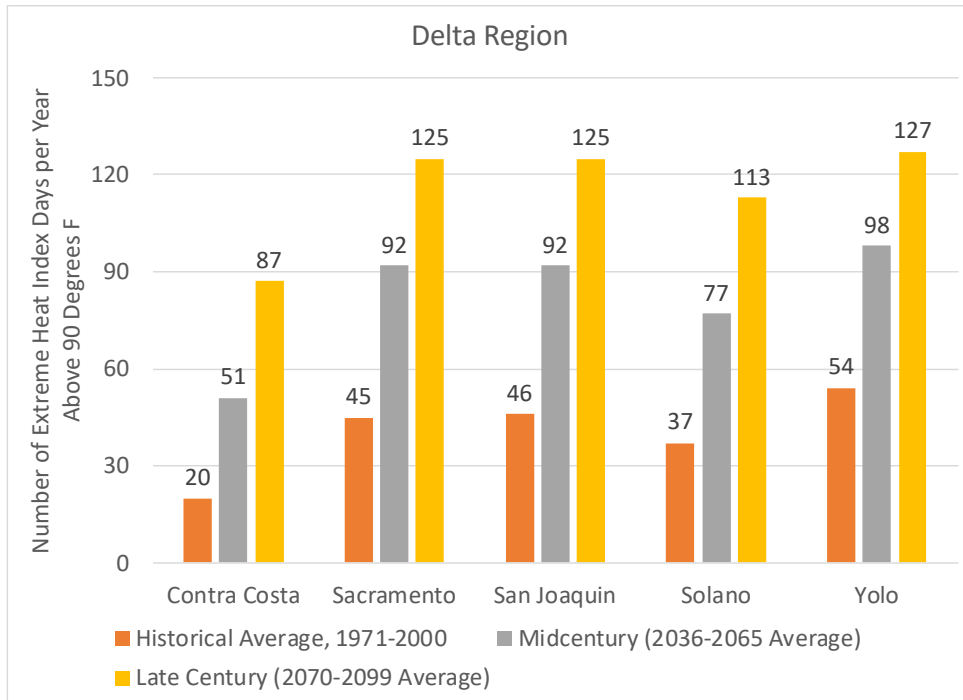
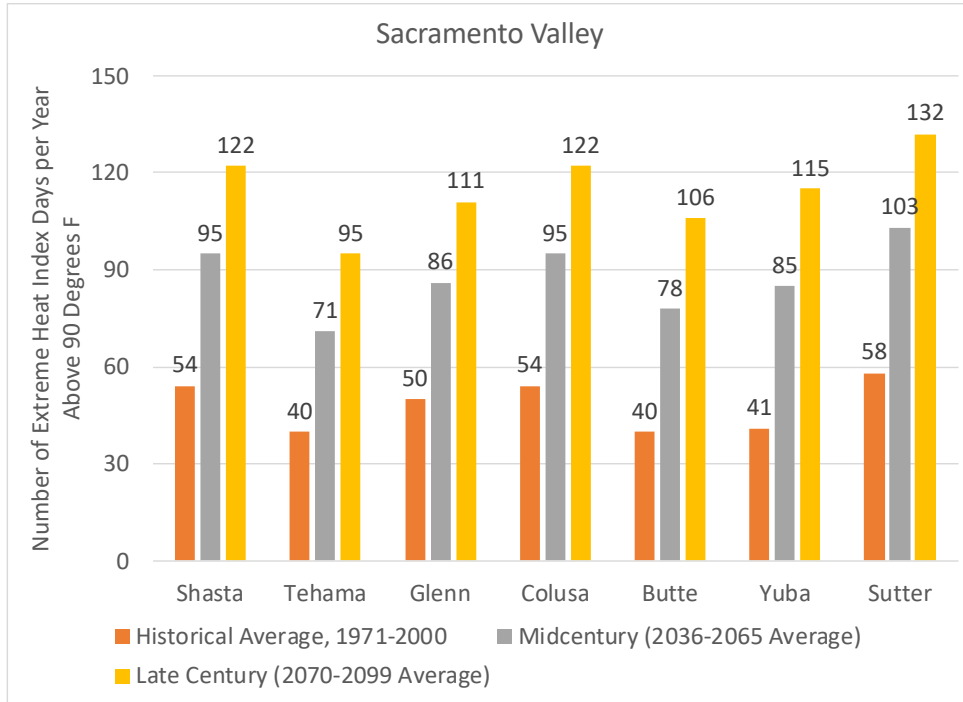
### **Environmentally Superior Alternative**

We agree with the Draft EIR’s finding that the Barge-Mounted Operable Barrier (BMOB) Alternative is the environmentally superior alternative. As best we glean from its description, it appears to us that the operability of the upper portion of the structure makes it even superior to the rock-fill barrier described in Chapter 2 of the Draft EIR (the proposed project). We look forward to the supplemental EIR analyzing whether BMOB would perform better—with greater climate resiliency—during flood scenarios, as compared with the existing rock-fill barrier design.

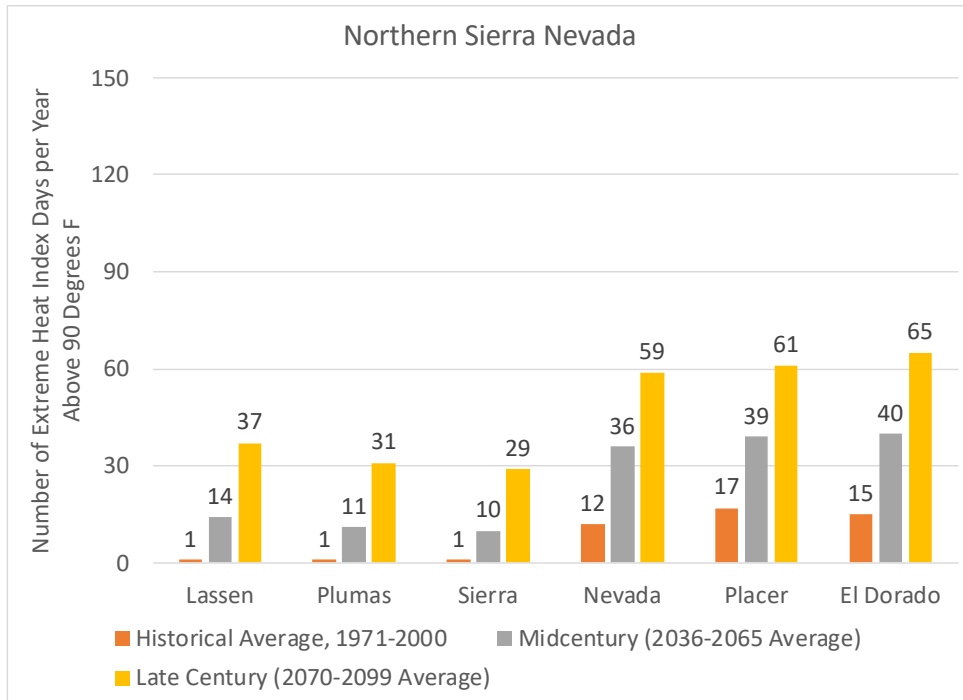
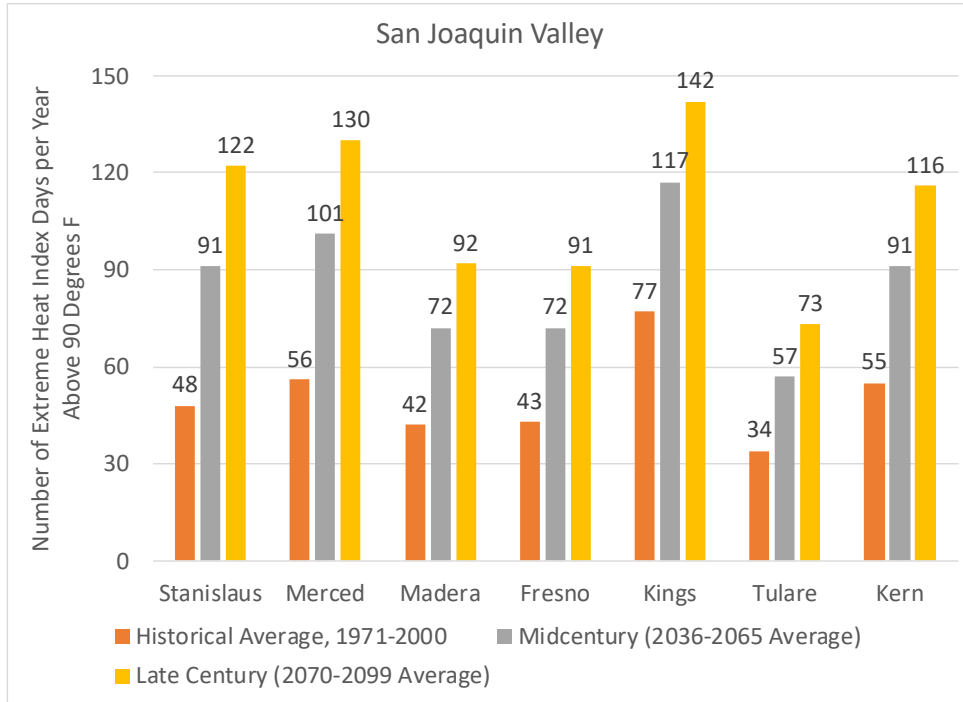
---

<sup>13</sup> Draft EIR, p. 4-16 to 4-17.

# **Attachment 8** **Extreme Heat Index Days for** **Sacramento Valley, Delta, and San Joaquin Valley Counties** **During 21st Century**

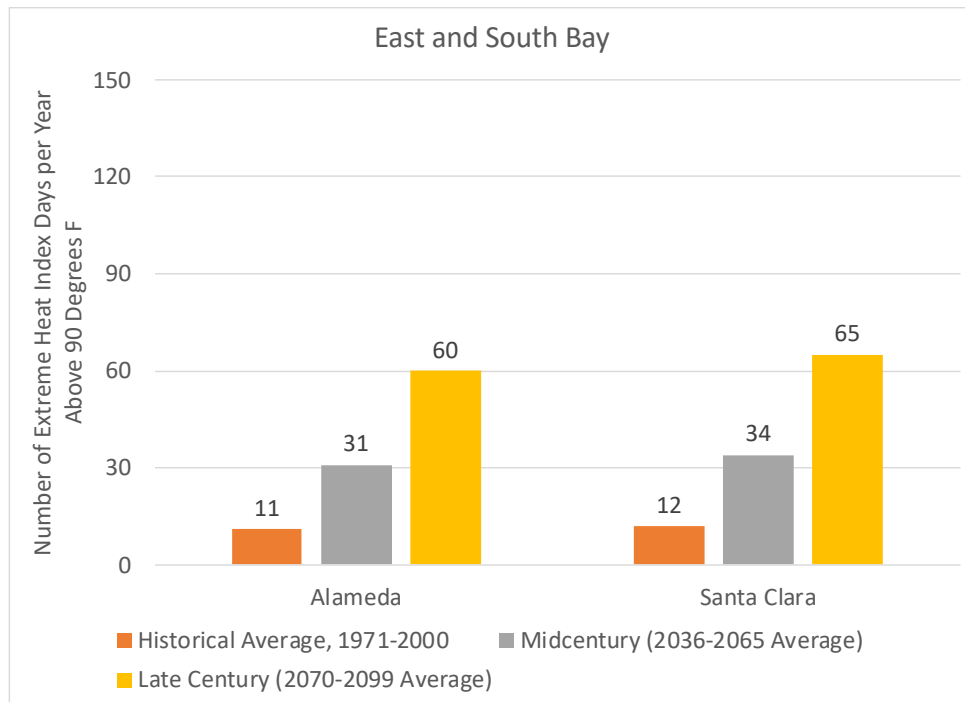
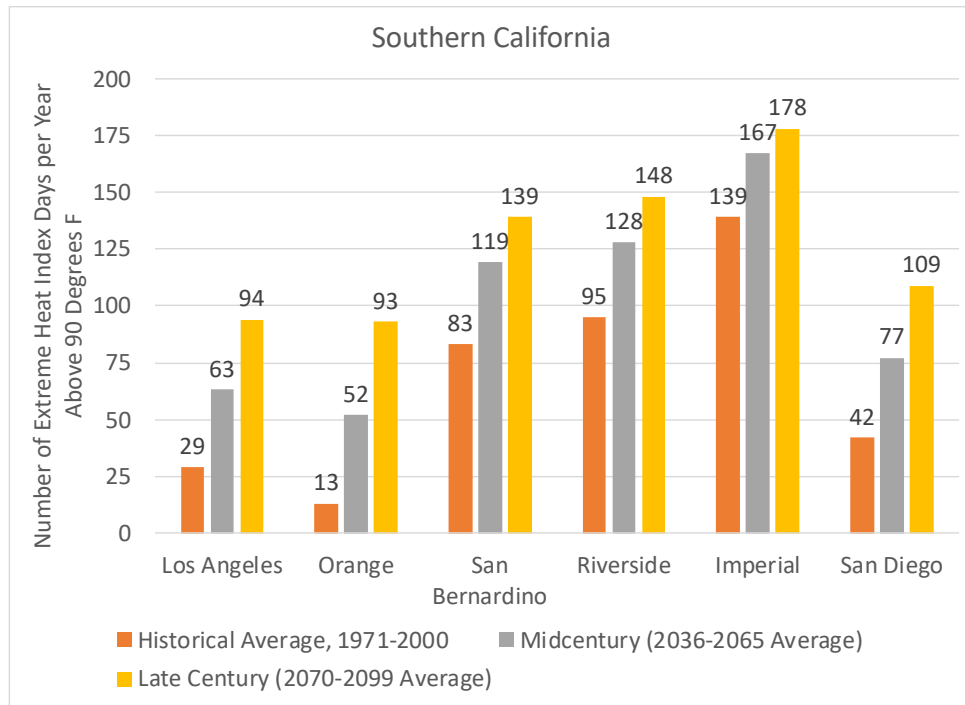


# **Attachment 8** **Extreme Heat Index Days for** **Sacramento Valley, Delta, and San Joaquin Valley Counties** **During 21st Century**





# **Attachment 8** **Extreme Heat Index Days for** **Sacramento Valley, Delta, and San Joaquin Valley Counties** **During 21st Century**

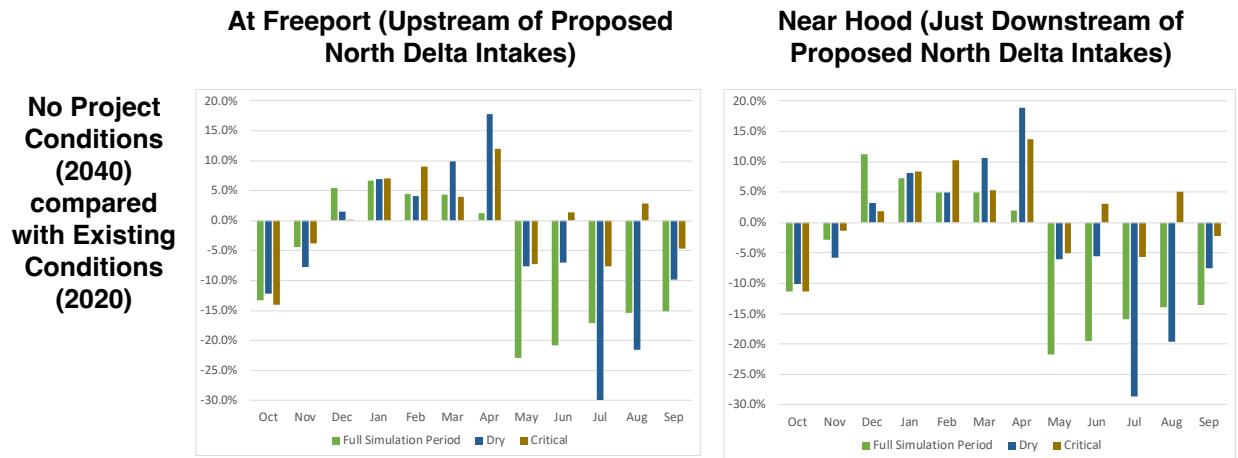


Source: Dahl, et al 2019.

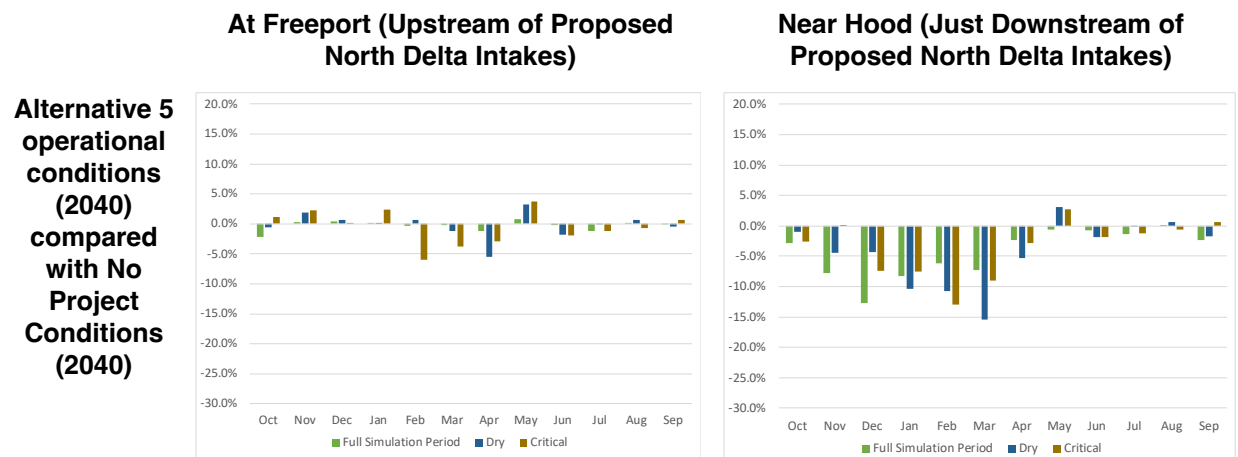
Note: Model results presented are for historical average, mid-century, no action, and and late century, no action.

## Attachment 9

### Sacramento River Flows Upstream and Downstream of North Delta Intakes Percentage Change in Monthly Average Flows



This row of charts above illustrates changes in Sacramento River flow at Freeport and near Hood to be expected just from climate change impacts on operations of SWP and CVP relying on through-Delta conveyance (that is, using existing Delta facilities). Y-axis ranges are identical to facilitate ready comparison.

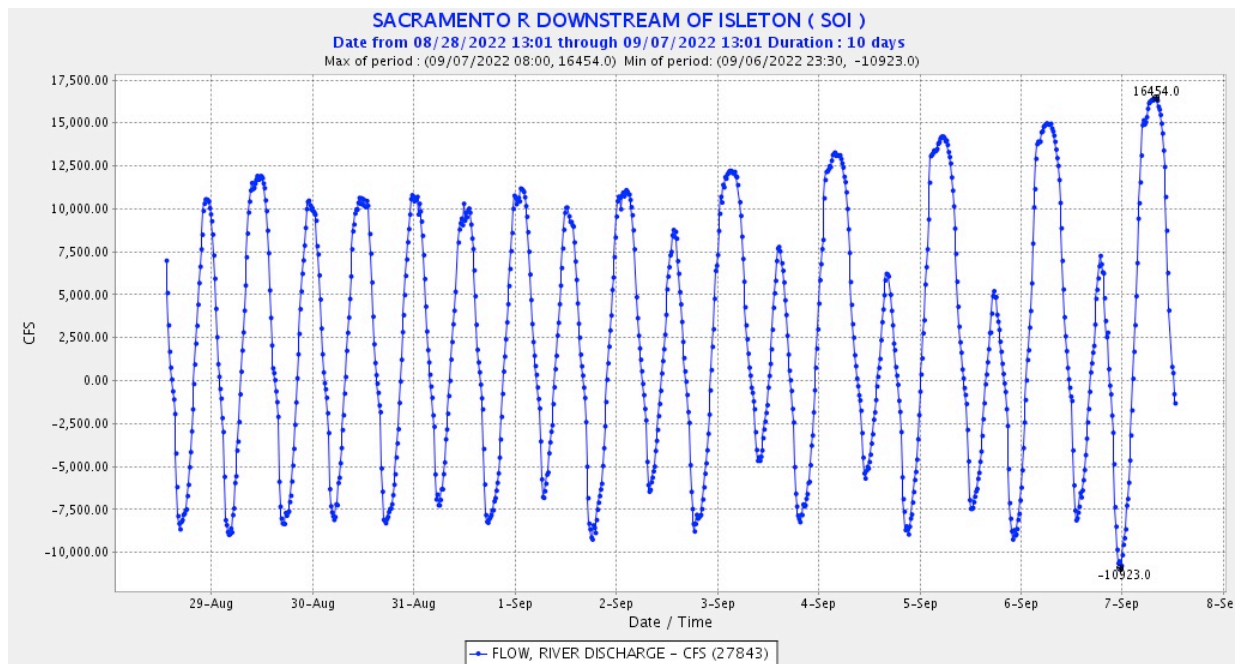
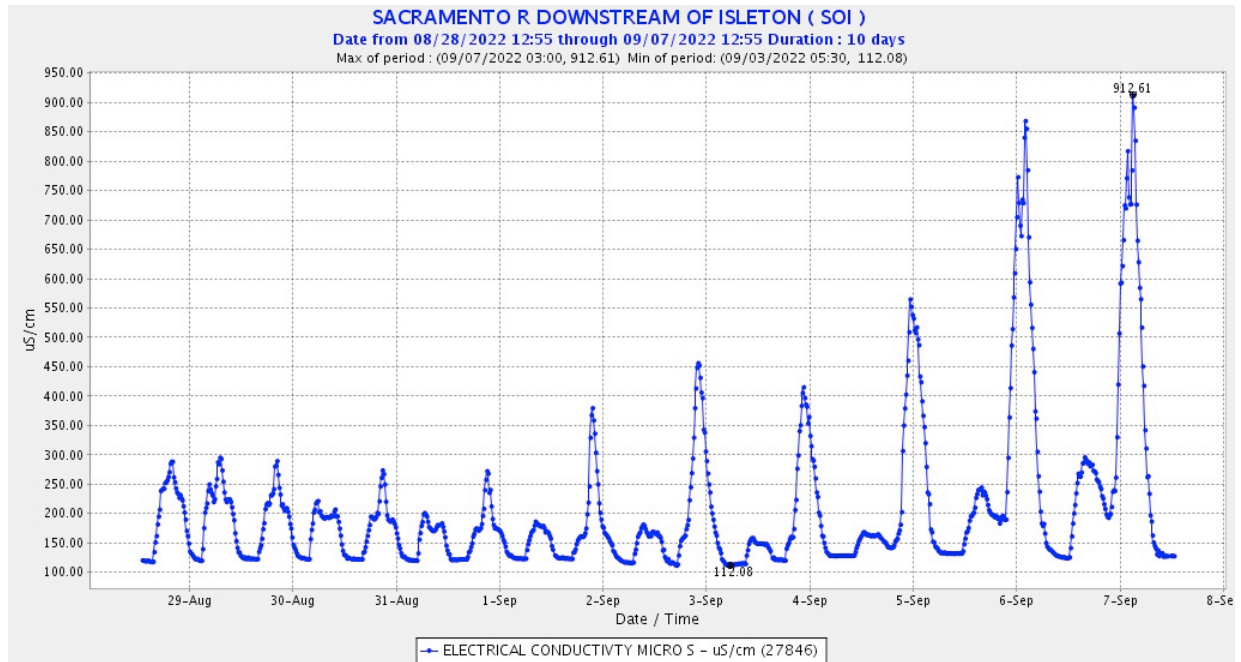


This row of charts above illustrates the increment of impact Alternative 5 Delta Tunnel conveyance and operational changes upstream would have on Delta flows at Freeport and near Hood in 2040. Decreases in flow due to Alternative 5 Delta Tunnel operations would come on top of, in addition to climate change impacts on the Delta. Y-axis ranges are identical to facilitate ready comparison.

Sources: Appendix 5A, Section B, Modeling Technical Appendix—Hydrology and Operations Modeling, Attachments 3 and 5.

# Attachment 10

## Early September 2022 Sacramento River Flow and Salinity Conditions at Isleton with West False River Barrier in Place



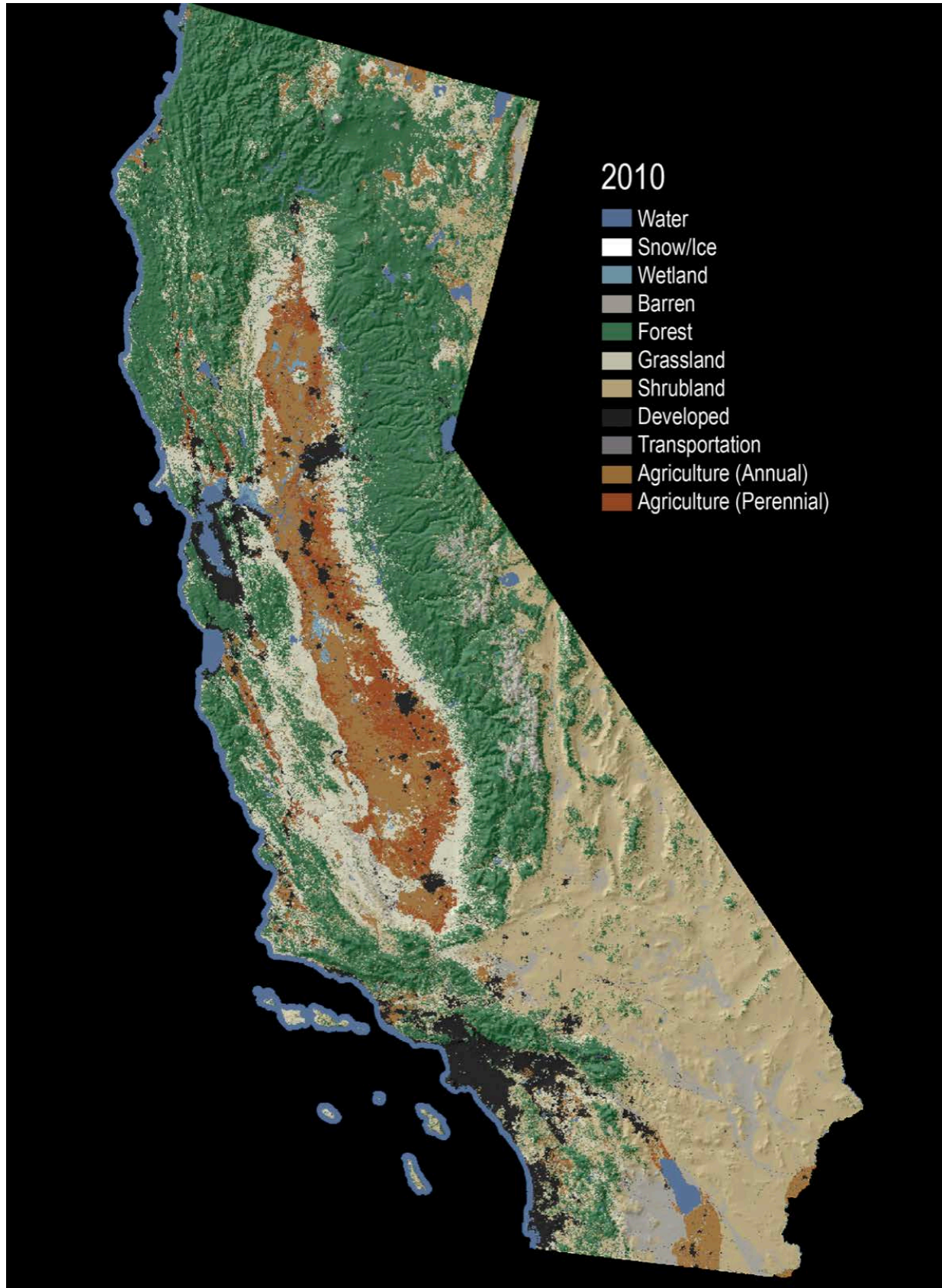
Source: California Data Exchange Center.

**Attachment 11**  
**Comparison of Monthly Average Sacramento River near Freeport Flows**  
**in Appendix 4B and Appendix 5A**

<b>Month</b>	<b>“Full Simulation Period” Monthly Flow (cfs) Appendix 5A</b>	<b>“Existing Conditions” Monthly Flow (cfs) Appendix 4B</b>	<b>Percentage Change from Appendix 5A to 4B</b>
October	11,293	30,647	171%
November	13,562	37,093	174%
December	22,637	62,686	177%
January	30,220	22,956	-24%
February	36,637	20,901	-43%
March	32,330	17,205	-47%
April	22,617	18,378	-19%
May	20,606	15,004	-27%
June	16,907	14,602	-14%
July	18,089	11,598	-36%
August	14,716	13,913	-5%
September	14,303	23,039	61%

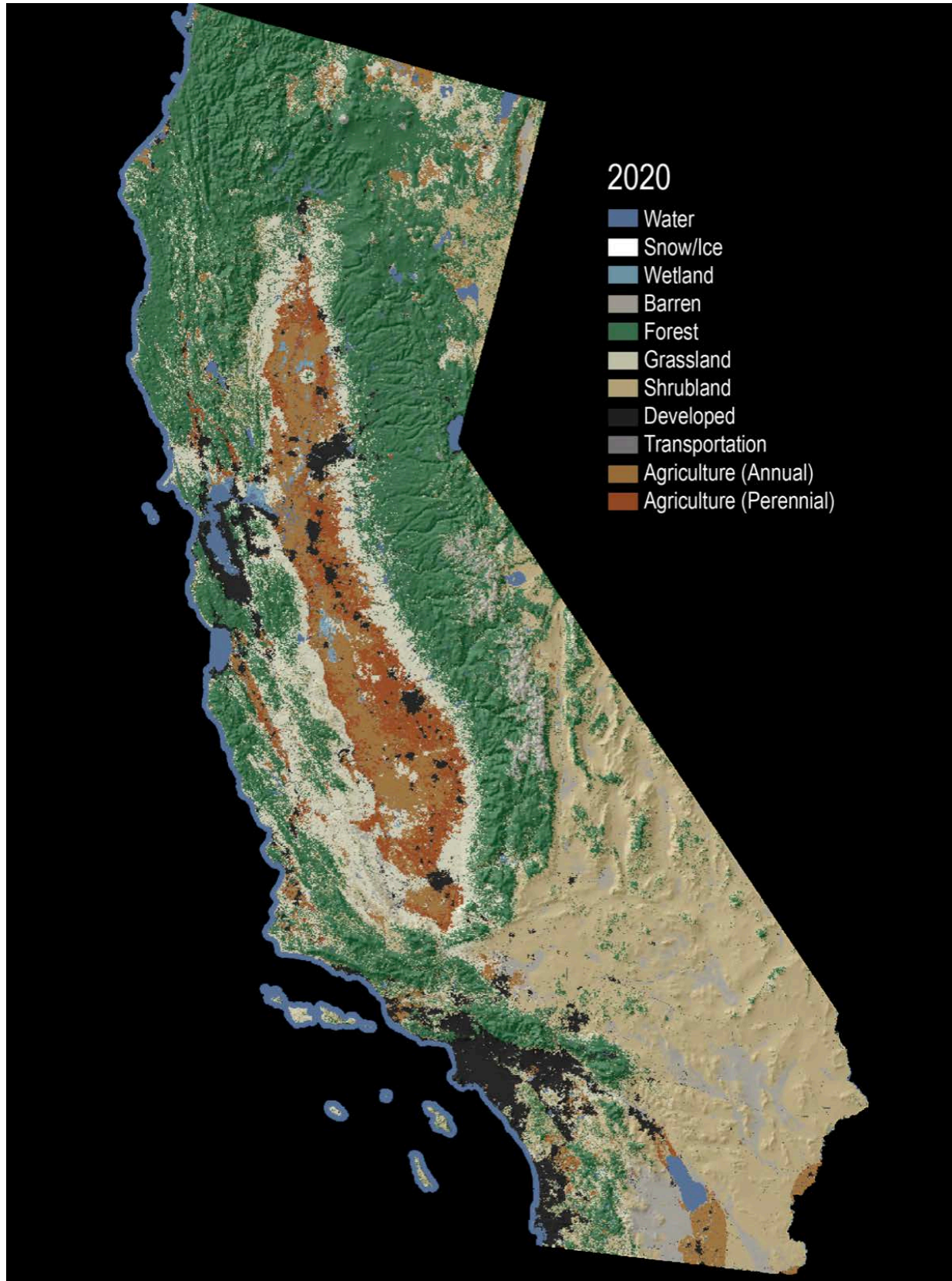
Sources: Draft Tunnel Project EIR, Appendix 5A, Section B, Table 5A-B3.2.7.1-B, p. B-137; Appendix 4B, p. 4B-4, Table 4B-2.

## Attachment 12



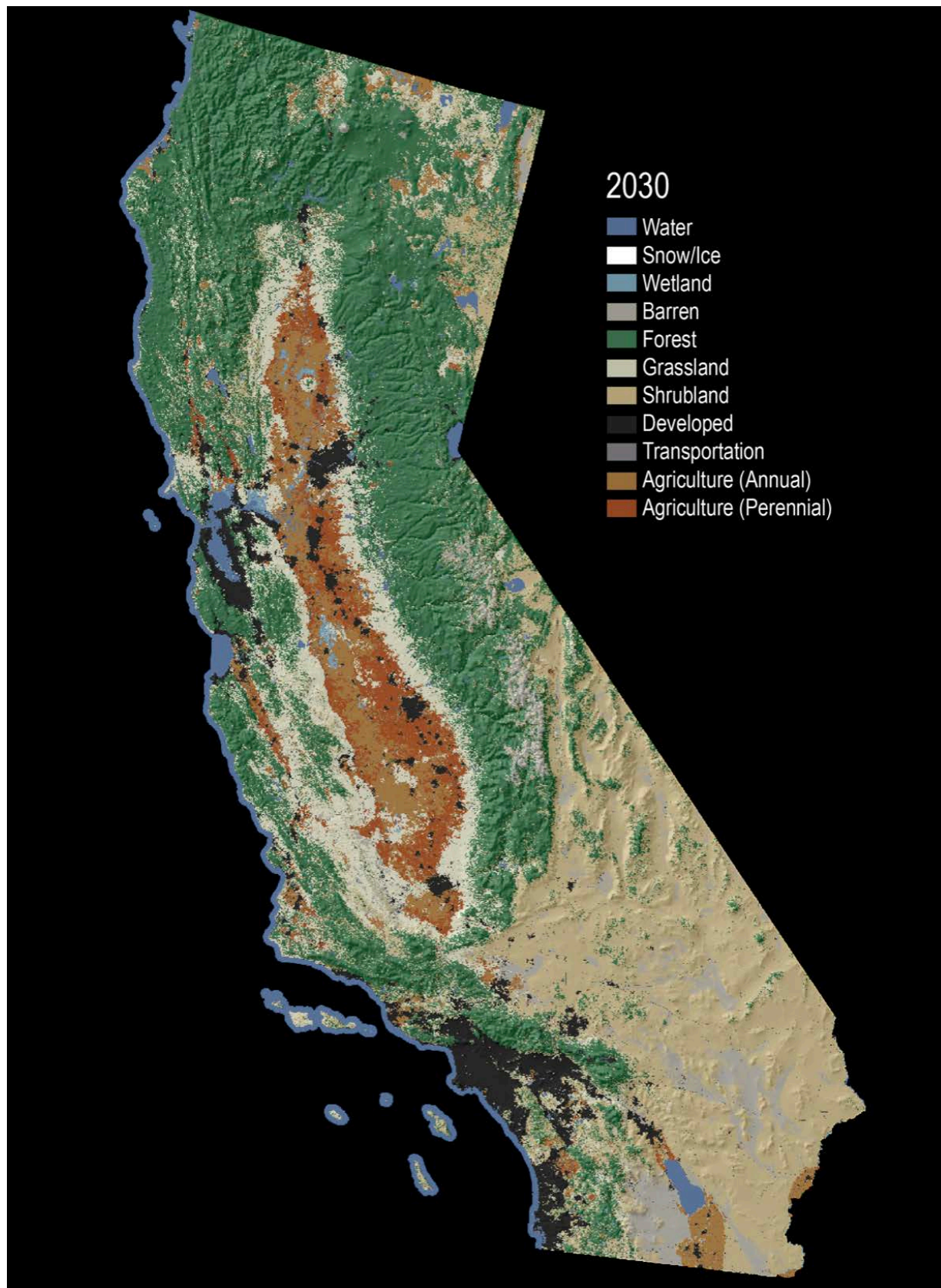


## Attachment 12

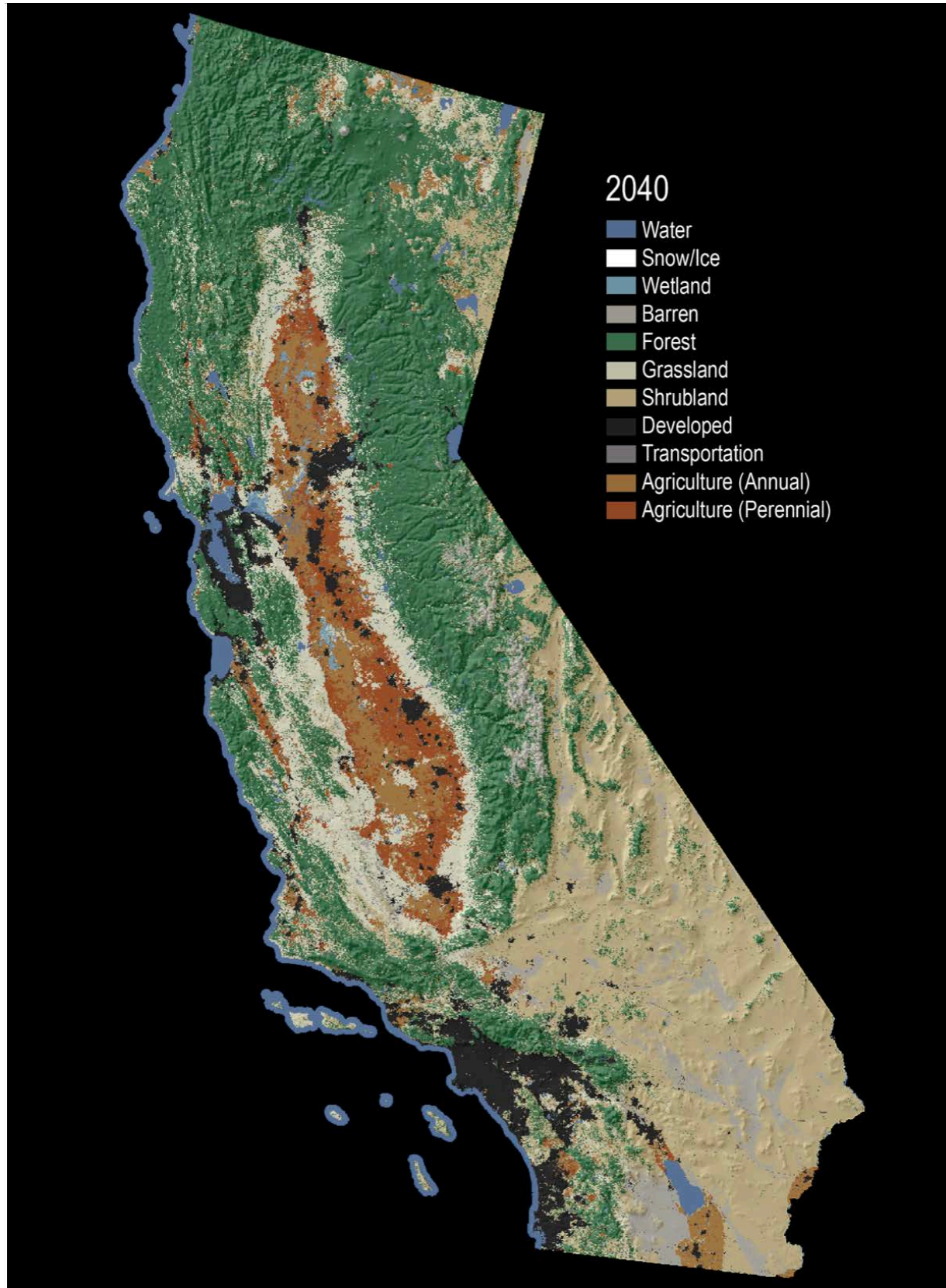




## Attachment 12

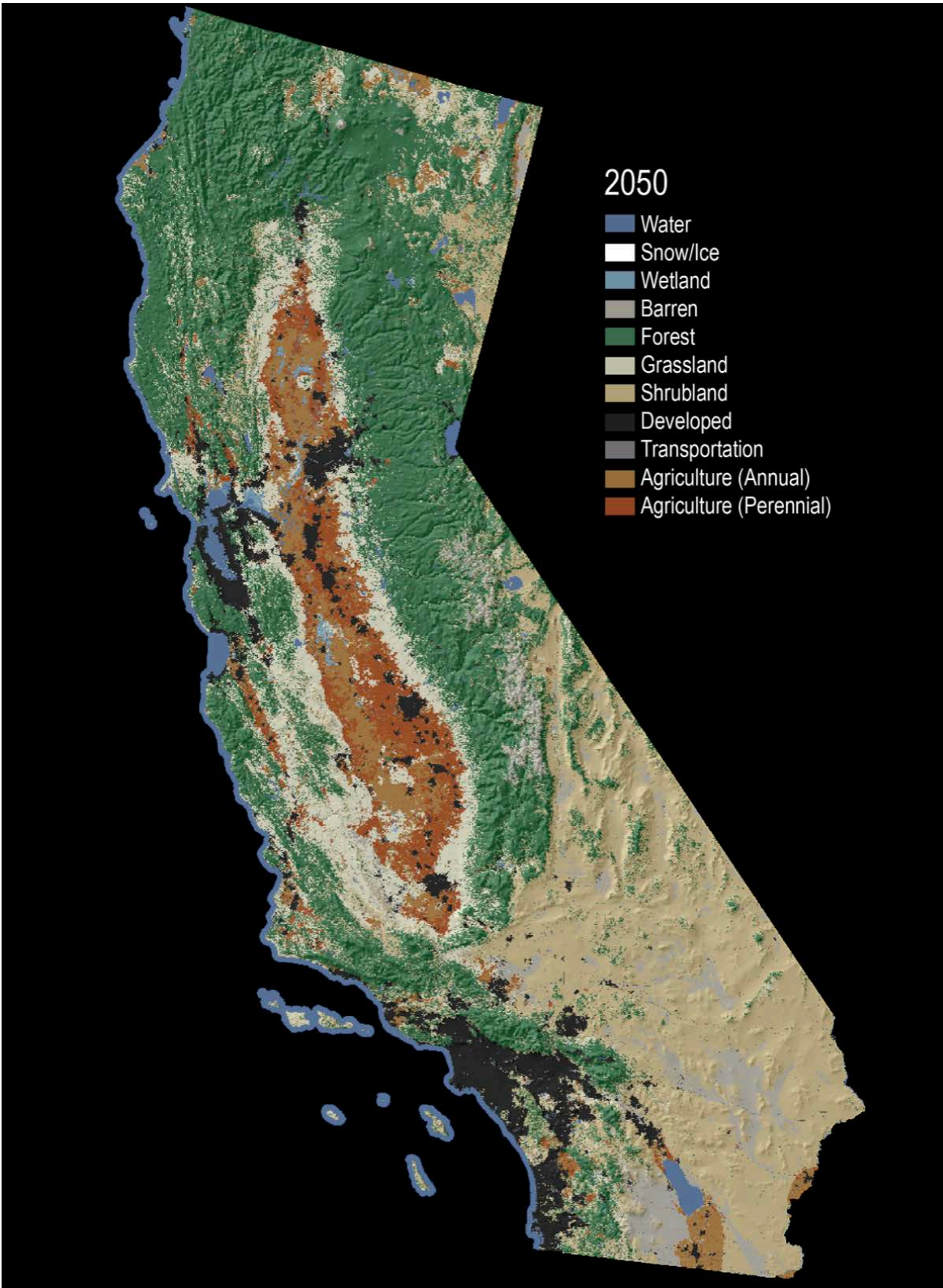


## Attachment 12

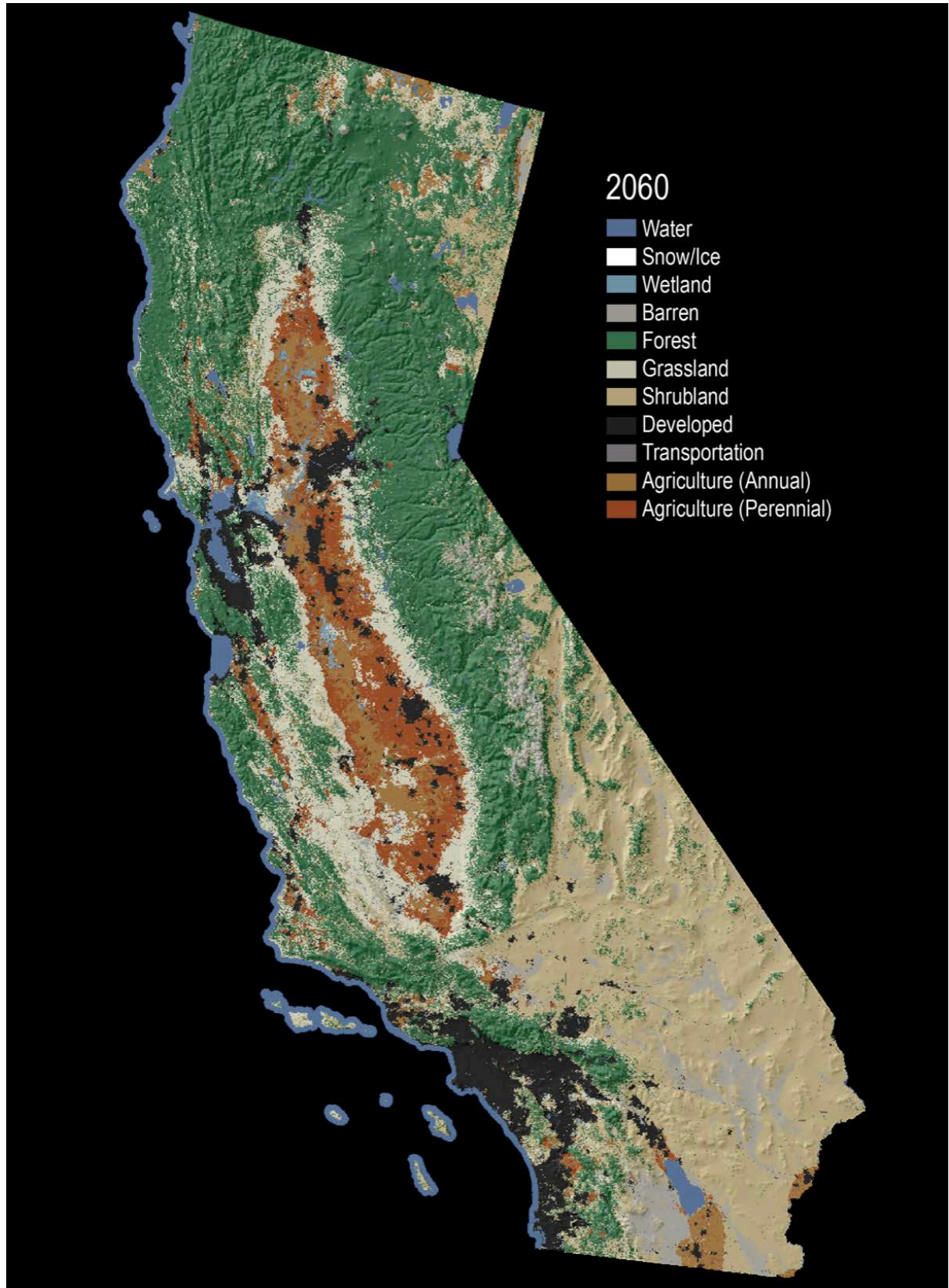




## Attachment 12

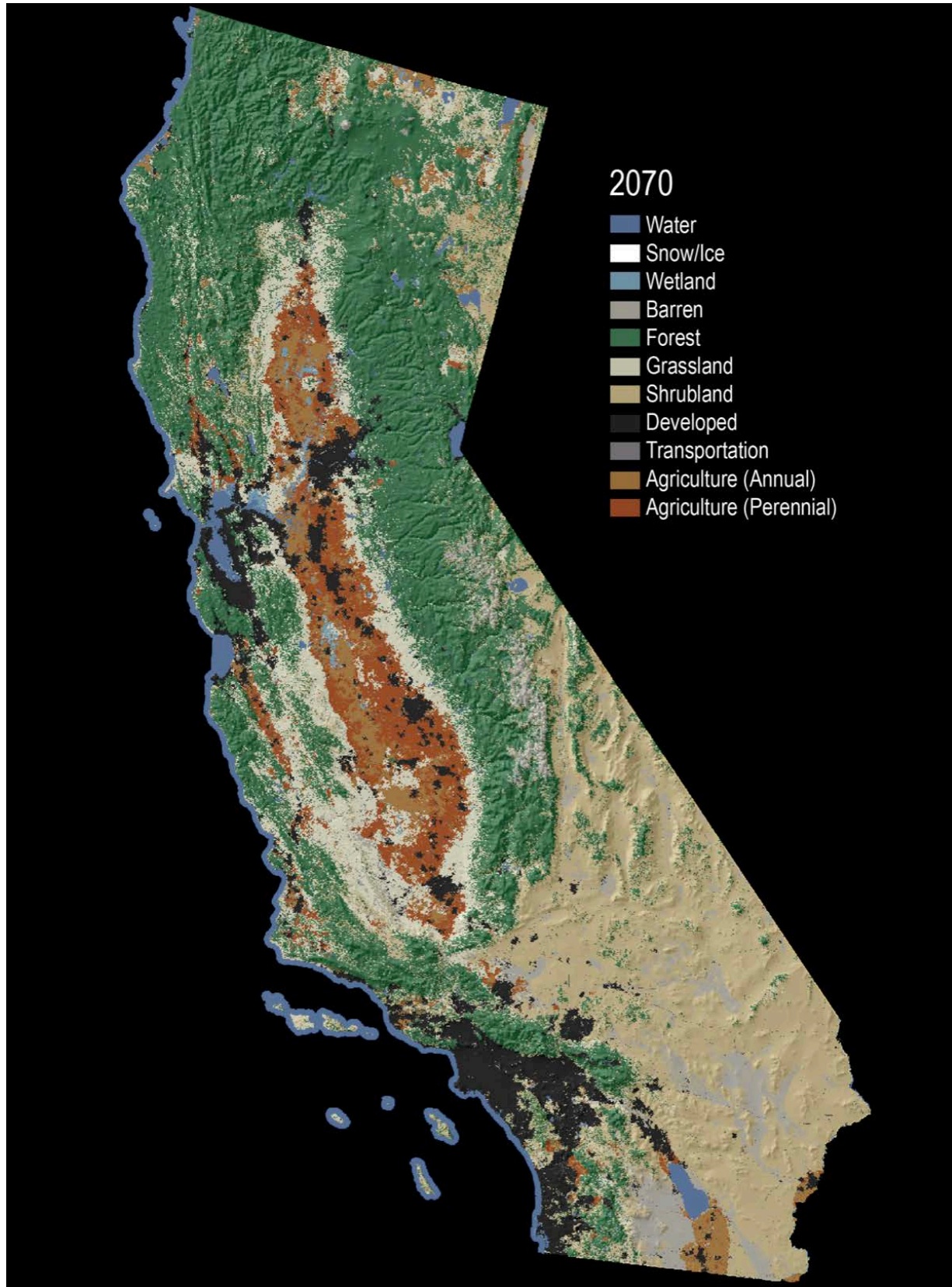


## Attachment 12

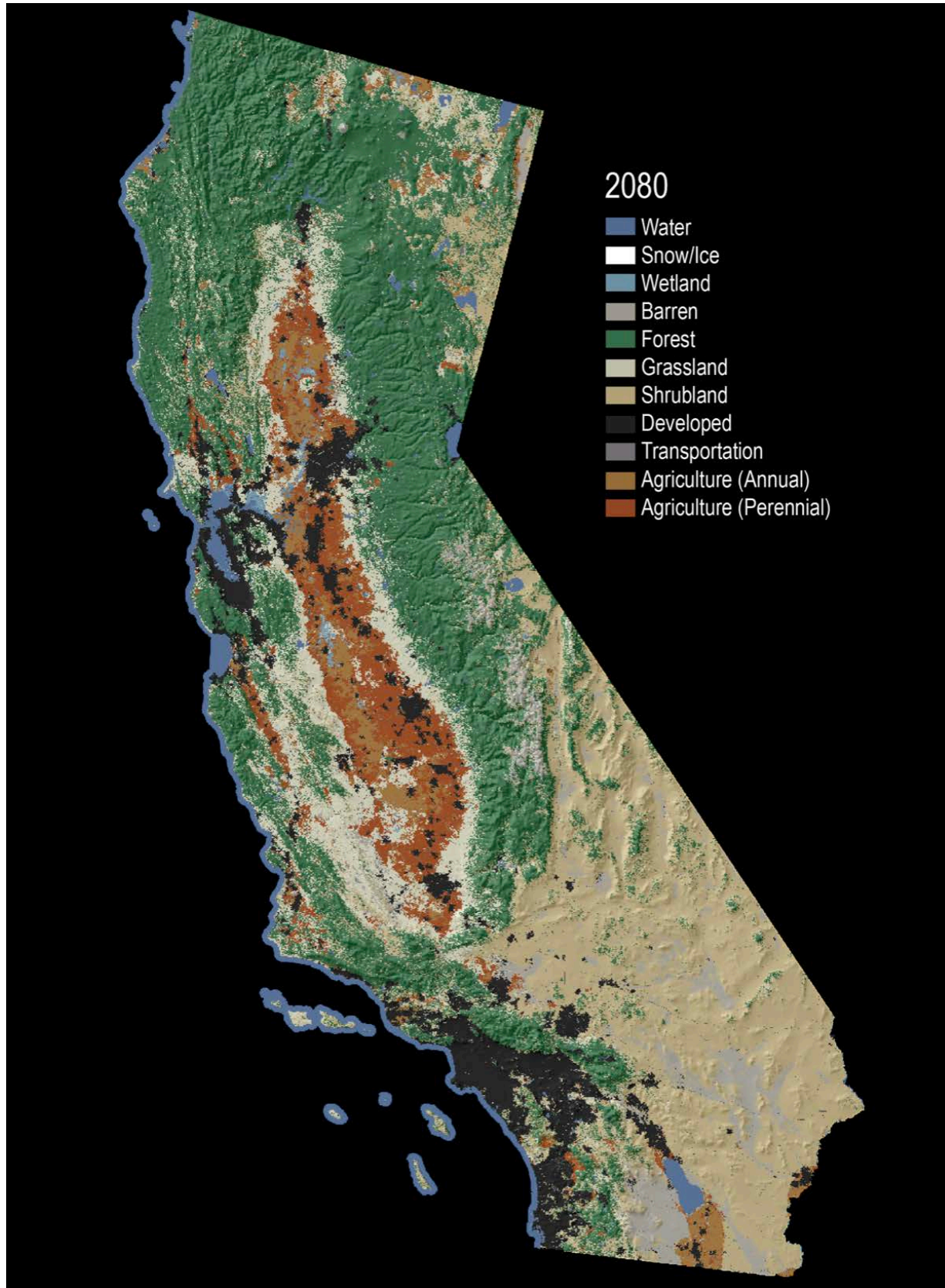




## Attachment 12

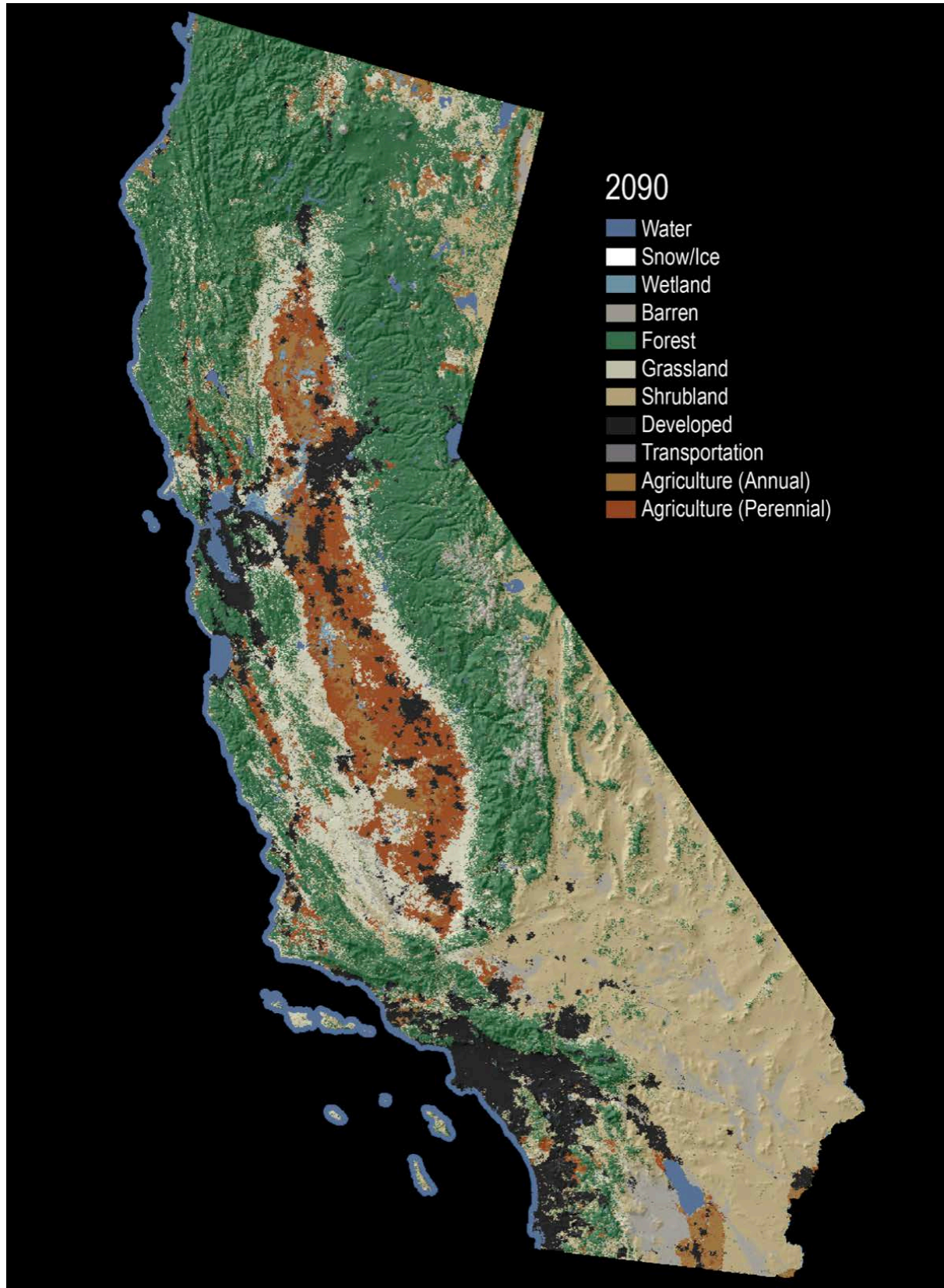


## Attachment 12

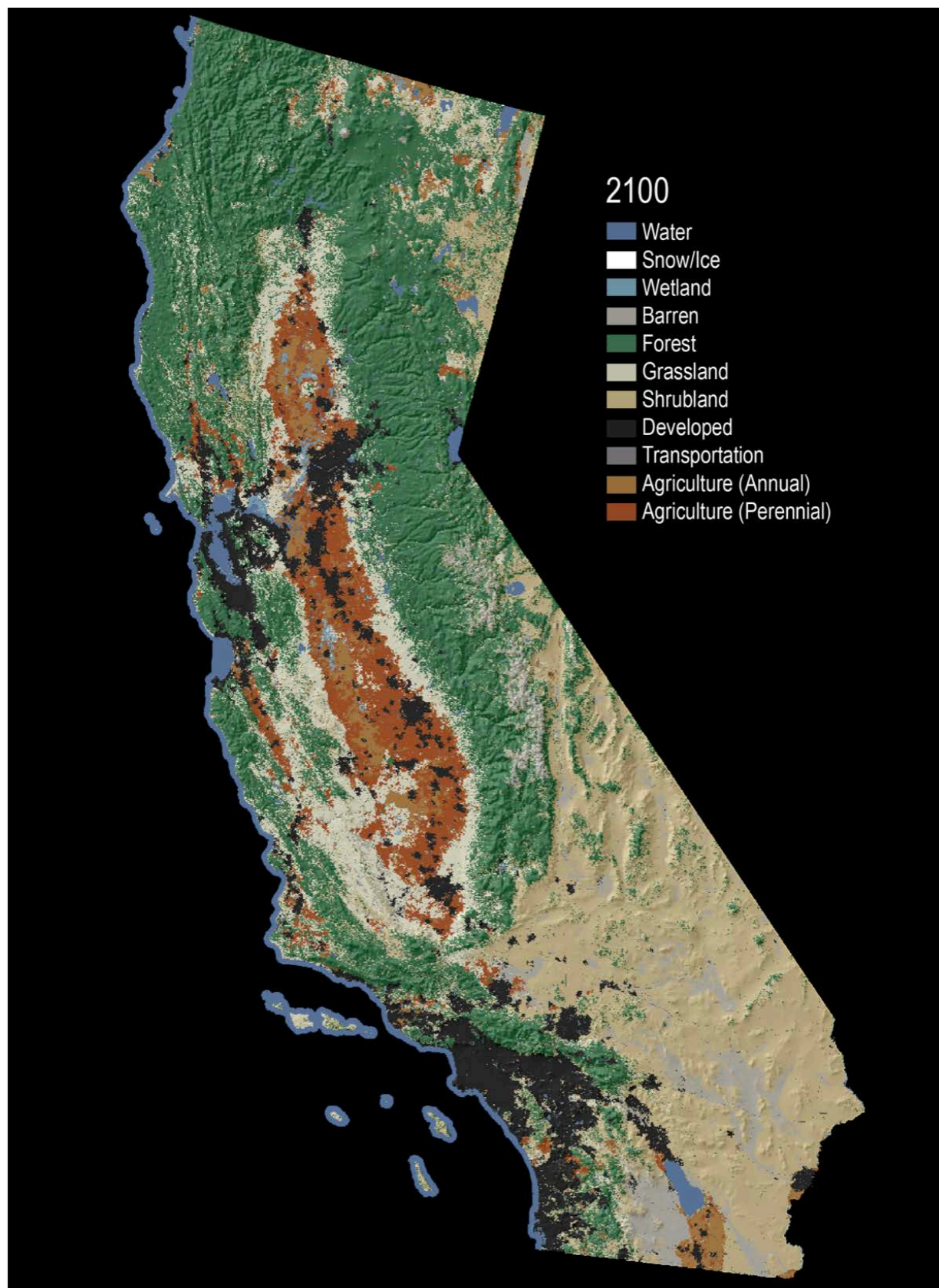




## Attachment 12



## Attachment 12



## Attachment 12

Source: Western Geographical Science Center, United States Geological Survey, accessible 22 November 2022 at <https://www.usgs.gov/centers/western-geographic-science-center/science/california-land-change-projections#overview>.

## Attachment 13

List of Restore the Delta Commenters		
Name	Title	Tunnel DEIR Section(s) Reviewed:
Gloria Alonso	Senior Intern and Climate Water Advocate	Socioeconomics, Environmental Justice, Climate Change
Barbara Barrigan-Parrilla	Executive Director	Environmental Justice, Community Benefits, Climate Change
Spencer Fern	Delta Science Coordinator	Water Quality
Sara Medina	Sustainable Agriculture Coordinator	Agricultural Resources
Tim Stroshane	Policy Analyst	Purpose, Project Description, Framework of EIR, Surface Water, Water Supply, Water Quality, Climate Change, Environmental Justice, Cumulative Impacts
Artie Valencia	Community Organizer and Government Liaison	Flood Protection