THE FATE OF THE DELTA:

Impacts of Proposed Water Projects and Plans on Delta Environmental Justice Communities

Restore the Delta

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We dedicate this report to Dr. Dawn Bohulano Mabalon, author, historian, and social justice advocate. She charted the history of the Filipino community in Stockton with equal amounts of factual rigor and emotional presence. The Little Manila Foundation, we know, will carry her work forward for our region.

This report is also dedicated to our friends and colleagues from Northern California's Indian Tribes. They are the first guardians of California's rivers and waterways.

“What are the American ideals? They are the development of the individual for his own and the common good; the development of the individual through liberty; and the attainment of the common good through democracy and social justice.”

LOUIS D. BRANDEIS

“Thousands have lived without love, not one without water.”

W.H. AUDEN

“We are very fond of blaming the poor for destroying the environment. But often it is the powerful, including governments, that are responsible.”

WANGARI MAATHAI

Acknowledgments

The staff of Restore the Delta wish to acknowledge our many friends who have supported our efforts since RTD was founded in 2006.

Our campaign would not exist without the support and advocacy of Restore the Delta's Board of Directors. We are thankful for years of work by Joan Buchanan, Mike Machado, Michael Frost, Roger Mammon, Bob Ferguson, Natalia Orfanos, Bill Jennings, Tom Keeling, Larry Ruhstaller, Bob Wright, and Mike Robinson. They, and prior board members, have enabled us to stay focused on advocacy for the Delta. We cannot express our gratitude enough for their help and sage advice in this struggle.

We are grateful to Ponti Tewis, also known to many as Gary Mulcahy, of the Winnemem Wintu Tribe for joining our case-in-chief before the State Water Resources Control Board in the change petition proceeding on the Delta Tunnels Project, and for granting our request to include important elements of his testimony in this report.

We thank the numerous Delta environmental justice groups who co-signed the May 2014 letter to the California Department of Water Resources protesting the failed environmental justice outreach by the state concerning the Bay Delta Conservation Plan. As we note in the report's Introduction, this was the starting point for RTD's decision to include environmental justice for Delta residents as a plank in our platform opposing the tunnels project.

Our gratitude also extends to the Environmental Justice Coalition for Water, whose executive director Colin Bailey early on helped RTD staff articulate the state's legislated policies and principles of anti-discrimination, environmental justice, and the human right to water, and helped us apply them in the context of the Delta region residents and their concerns.

Former Restore the Delta staff members left us physical, policy, and spiritual legacies on which our current team relies, and to whom we are grateful: Stina Va, for her stalwart presence and skill with social media, information technology, meme preparation, contacts in the environmental justice community, and her affection for animals of all classes, families, and genera; Esperanza Vielma, for her contributions about Stockton business and economic development to RTD's Part 1B case-in-chief against the tunnels, and her good cheer; Jane Wagner-Tyack, for her policy work, and her writing skills that brought the Delta's history and struggles to the screenplay and big screen in RTD's award-winning documentary, *Over Troubled Waters*; and Jessica Iniguez for her numerous contributions in the early days when RTD was run from a kitchen and a spare bedroom.

Restore the Delta has many members in the Santa Clara Valley region, where Delta water is imported by the Santa Clara Valley Water District. Two of these allies are Meg Giberson and Swanee Edwards, who were indefatigable in challenging the District's board members about the tunnels project, and to them we are especially grateful.

In connection with both the Santa Clara Valley Water District and the Water Board hearings on the tunnels project, we are profoundly grateful to Deirdre Des Jardins of California Water Research, for her tireless research, uninterrupted and dogged challenging of the tunnels project, her command of facts (those sturdy structures of reality that she has keen affection for), and her lively mind finding connections among facts to construct arguments.

We also thank numerous allies and friends in Southern California, including Brenna Norton, Adam Scow and others with Food and Water Watch; Conner Everts with the Southern California Water Alliance and the Environmental Water Caucus; Charming Evelyn head of the Sierra Club Los Angeles Chapter; Martha Camacho-Rodriguez, Gerald Cerda and Sara Huezo of S.E.E.; Bruce Reznik of LA Waterkeeper; and the

hundreds of other activists from every walk of life who stood shoulder-to-shoulder with us at MWD meetings advocating for Delta protections. Brenna Norton especially stands out as a true partner and friend.

Former Earthjustice attorneys Trent Orr and Yana Garcia have a special place in our hearts. They played key roles editing drafts all of our case-in-chief testimonies in Part 1B of the tunnels hearings before the State Water Resources Control Board, including deft treatment of our environmental justice evidence and critique of the tunnels project. They represented our panel thoughtfully before the Board, and we are grateful for their unfailing enthusiasm and support in these roles.

Dr. Jeffrey Michael, Director of the Center for Business and Policy Research for the University of the Pacific, has been a constant independent voice, and an effective and reality-based expert about Delta economic sustainability and about the questionable economics of the tunnels project in each of its forms. His well-crafted analyses have shown that the tunnels project is (metaphorically speaking) under water financially and economically, and that the project is not an economic benefit to California and society as a whole.

Four long-time Delta attorneys need thanks too. Osha Meserve of Soluri Meserve LLC in Sacramento and Thomas Keeling of Freeman, D'Aiuto, Pierce, Gurey, Keeling and Wolf, looked out for our interests with collegial information-sharing, detailed understanding of tunnels project impacts, and insights into the politics and procedures of the California Environmental Quality Act and the law generally. And both Dante Nomellini of the Central Delta Water Agency and John Herrick of South Delta Water Agency generously provided expert support and advice about water law and specific realities in Delta channels and islands to us while understanding our purpose in fighting to protect the Delta's public trust resources at the same time. The Delta has persistent, fierce, and knowledgeable legal representation in Ms. Meserve, Mr. Keeling, Mr. Nomellini, and Mr. Herrick.

Many thanks to Tom Zuckerman for his years of guidance, support, and encouragement.

Bob Wright, Senior Counsel at Friends of the River, has not only represented Restore the Delta in several legal challenges, he has also looked out for our best interests as an organization, and for the entire coalition with which we work, through strong documentation of problems found in agency processes. Mr. Wright is a key member of our team, and we are grateful for his support.

Patricia Schifferle of Pacific Advocates deserves our gratitude as well, for she has timely provided critical information, analysis, intellectual and logistical connections, and legislative/lobbying support at critical times to RTD and many other environmental water advocates for many years now and has enabled us to be more effective in fighting bad legislation than we may have otherwise been.

We are also grateful for the encouragement and support of our friends and colleagues in the California environmental water movement: Nina Robertson and Michelle Ghafar with Earthjustice (who assumed Orr and Garcia's roles with us for Part 2 of the tunnels hearings); Kathryn Phillips and Kyle Jones with Sierra Club California; Noah Oppenheim and Tom Stokely of the Pacific Coast Fishermen's Federations Association; Regina Chichizola and Morning Star Gali with Save Our Salmon; Doug Obegi and Kate Poole with the Natural Resources Defense Council; Jon Rosenfield and Gary Bobker with The Bay Institute; Michael Jackson and Carolee Krieger with the California Water Impact Network; Bill Jennings with California Sportfishing Protection Alliance; and Barbara Vlamis with AquAlliance in Chico; Chief Caleen Sisk of the Winnemem Wintu Tribe; Jonas Minton and Johnnie Carlson with the Planning and Conservation League; John Hooper and our San Francisco friends; Ron Stork, Steve Evans, and Eric Wesselman with Friends of the River; John Buse with Center for Biological Diversity; Adam Keats with Center for Food Safety; Ben Eichenberg with San Francisco Baykeeper; and attorney Roger Moore. It never ends, but at least we have some of California's best water thinkers helping us along the way.

Restore the Delta also owes a huge debt of gratitude to Steve and Janice Hopcraft, and Brian Smith for their years of intense campaign work on our behalf.

We miss Zeke Grader and Jerry Cadagan. They were integral parts of this effort for so long. We hear their voices and try to manifest them in our work.

Finally, the families of RTD staffers must be thanked profusely, because they know, more than most, what a commitment to protecting the Delta from further exploitation from outside forces means to us — the warriors they love, nourish, and support. Without them the barricades would surely have breached by now; but they have not.

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Executive Summary

Everyone who lives in the Delta understands that all boats rise together at high tide. Restore the Delta states the environmental concerns and needs of those who will be harmed first by the Delta tunnels project (including what we refer to in this report as Delta environmental justice communities), and advocates for water quality and quantity policies that will serve the entire Delta community.

Delta environmental justice (EJ) communities have a rich historical legacy of reclaiming Delta islands, farming, and aiding landowners through generations of labor to build the wealth of this region. They have their own stories to tell and their own needs to represent regarding Delta water quality, and public access to urban Delta waterways. While half our staff lives and works within the environmental justice community in San Joaquin County, we ourselves are not, by definition, members of Delta EJ communities. But as we represent the Delta in water policy forums, RTD would be remiss were we to ignore the enormous contributions of the Delta's EJ communities to Delta and California life and history.

Our goal in producing this report is to create a solid base of Delta EJ research and related tools to empower local social and environmental justice groups to advocate for themselves in our state's water management processes, as well as help document concerns of Northern California Indian Tribes about Delta water mismanagement. We look forward to various Delta community groups using their own stories to address their own groups' concerns in a manner that connects Delta history, water management science, environmentalism, and economics in the years to come.

What does Restore the Delta mean when we say "Delta environmental justice" communities? What and who are Delta EJ communities? Chapter 1 briefly describes the Delta region and its role in California's water resource development history and geography. Then this chapter defines and describes what environmental justice is. We then use this definition to describe Delta EJ communities throughout the Delta region. (Appendix 1 provides more detailed supporting data.) In short, they are peoples of the Delta who include non-white populations, those who are impoverished of any age, gender, race, or ethnicity in the region, and people who face language barriers. The Delta region is also beset by serious economic and nutritional disparities, including unemployment, low educational attainment rates, and food deserts, all described in Chapter 1.

The Sacramento-San Joaquin River Delta, including the San Francisco Bay-Delta estuary, is one of the most environmentally significant ecosystems on the West Coast of the Americas. Yet, despite its undeniable connection to the preservation of iconic fish and wildlife species, its impact on billion dollar West Coast economies from farming to fishing and tourism, and its integral role in preserving the public health of San Joaquin and Contra Costa Counties, California's political and entrepreneurial elites have spent over half a century pursuing ownership of the Bay-Delta, not only to acquire wealth, but to grasp political and economic power that comes from controlling our state's most indispensable public trust resource: clean water. The latest iteration of this powerplay is the California WaterFix, formerly titled the Bay Delta Conservation Plan (BDCP—more commonly known today as the Delta tunnels project). Its history and effects are described in Chapter 2.

Chapter 2 describes three broad areas of tunnels' impacts on the Delta: first, how the project is essentially illegal for failing to reduce reliance of other regions on the Delta for their future water needs; second, the project has direct impacts to flows and water quality in the Delta; and third, it will impact human uses of water for farms, subsistence fishing, urban drinking water supplies, and urban water rates, each of which will place disproportionate, undue burdens on Delta EJ communities.

BDCP, began in late 2006, gained political support when Jerry Brown was re-elected governor in 2010 and he again took an active interest in state water issues. In 2012, he announced a project consisting of two tunnels attached to three diversion points in the lower Sacramento River—at Clarksburg, near Hood,

and at Courtland. Water diverted from these new diversion points would flow in two tunnels thirty-five miles south to Clifton Court Forebay near Byron where it would be lifted to either Central Valley Project (CVP) or State Water Project (SWP) aqueducts. Since 2015, the tunnels project has been trimmed of ecosystem restoration pretenses of the BDCP. Its goal is to increase SWP and CVP exports and "water supply reliability" to their customers.

We at Restore the Delta have regarded this project with horror and malice because of its likely ecological effects, but especially in recent years because of its likely human toll from its water quality impacts on the Delta's struggling regional economy. Restore the Delta's advocacy against the tunnels is about all Delta communities' just claim to sustainable wealth, contentment, and environmental health.

For RTD, environmental groups, Northern California Tribes, and the commercial and sport fishing industries, water reliability for California looks like a system of diverse water supply sources that offsets reduced reliance on the Delta (including local self-sufficiency and efficiency projects), while meeting long-legislated salmon-doubling population goals, ridding the Delta of invasive species and toxic stressors (like pesticides and selenium), and ensuring that reduced exports become increased inflows to and through the Delta to San Francisco Bay. In our view, water supply reliability is to be sought elsewhere than at the Delta's expense, even though we recognize the Delta will always be a water supply donor.

Specifically, the extensive impacts of the Delta tunnels project would devastate Delta EJ communities by reducing through-Delta freshwater flows from the Sacramento River, allowing for increased residence time of polluted and salty San Joaquin River water, and intruding salt water from the San Francisco Bay. Tunnels construction and operation would result in degraded water quality for Delta farms, Delta subsistence anglers, providers of urban drinking water (including Stockton, Antioch, and other cities), residents playing and swimming in Delta channels, and an increase in deadly toxic algal blooms. These disproportionate effects would make the Delta less desirable as a beloved place, and add to economic distress already prevalent in Delta EJ communities, and would undermine long-term growth in jobs, economic output, and sustainable economic development in the Stockton region.

This report—based on research and analysis provided in testimony to the State Water Resources Control Board (SWRCB) concerning the Delta tunnels project (also known as "California WaterFix")—seeks to document the size and array of populations that fit established policy criteria defining members of "environmental justice communities." For example, Restore the Delta's home-base of Stockton is the state's most economically distressed city, and the sixth most distressed city in the nation in 2016, with 70.2 percent of Stockton residents living in distressed neighborhoods.

Environmental justice communities have been blatantly disregarded during the state's tunnels project deliberations and during the water quality control planning processes. More interested in the project's brand than its environmental justice impacts, the state and federal water agencies undertook a shallow "astroturf" survey in 2010 claiming to represent input from California environmental justice communities statewide. Then they did minimal outreach to actual Delta EJ communities about how the tunnels' impacts would affect them directly. Moreover, many of their "outreach" documents were not translated into other languages until Delta EJ community groups and Restore the Delta got involved. Chapter 2 also identifies injustices that loom for Northern California Indian tribes, whose cultural reliance on salmon will be destroyed by the tunnels project if it is built and operated.

Water quality planning is another area where Delta EJ concerns must be addressed now and in the future. In Restore the Delta's experience, the State Water Resources Control Board (SWRCB) has been the state agency most responsive and sensitive to environmental justice issues, including those experienced by Delta residents. While responsive and sensitive, SWRCB is also cautious. They take ample time to evaluate new policies and courses of action before committing to them. This outlook at least partially explains why SWRCB has taken at least twenty-three years to complete a thorough review and revision

of the latest Bay-Delta Plan governing water quality.

As discussed in Chapter 3, the recent Bay-Delta Plan amendments process, and that process's implications for Delta EJ communities, reveal how SWRCB has gotten some things right, and where water quality improvements may still be made. All in all, the SWRCB acknowledges that action must be taken to improve flows and protect Delta water quality, but continues to delay, until at least this November, decisions that would benefit Delta EJ communities. The question we are left with is can the environmental justice community afford these delays?

Chapter 3 describes what the Bay-Delta Water Quality Plan would do, and its strengths and weaknesses. In short, SWRCB seems committed to improving flow conditions for fish, which could have other positive benefits for raising hopes and prospects for fish and people in the Delta. But we express in this chapter lingering concerns in light of the fact that SWRCB proposes the plan simultaneous with its consideration of water rights changes that would also benefit the Delta tunnels project. It remains unclear at this writing whether SWRCB will protect Delta flows for fish and people or allow outside interests vastly increased power and control over Delta water resources at the expense of Delta EJ communities.

The significance of SWRCB's upcoming decisions is magnified by the fact that the Metropolitan Water District of Southern California (MWD) looms large in the Delta's future and the future of Delta EJ communities. MWD now owns five Delta islands (Chipps, Webb, Holland, Bouldin, and Bacon), and is the controlling entity on two new "joint powers authorities" launched recently to govern design, construction, and financing of the tunnels project. This means that the most Delta-interested Southern California water agency is now an immediate neighbor, quite probably our largest Delta landowner, and wields considerable power over looming water diversions here. Delta residents—including especially our environmental justice communities—will be confronted with this distant and largely indifferent power in their midst whether MWD is a good or a bad neighbor.

Chapter 4 of this report reviews what we understand to date about MWD's presence here. We ask what we think are crucial questions as Delta water planning and projects move forward. How does the Delta as a region respond to its new neighbor? Particularly, how do Delta EJ communities respond to its new neighbor? Who will keep eyes on our new neighbor so Delta residents know what is coming their way?

We conclude that the Delta is not a problem for Delta people. The Delta is our home, where our hearts lie and our livelihoods are made. But the water problems of the rest of California are frequently laid at our doorstep, problems the distant powers demand we solve. Whether communicating with the general public, media, government agencies, water districts, agriculture organizations, tech advocates, or elected officials, Delta-region city and county governments, water agencies, and non-profit groups are almost always expected to address our proposed solution for the Delta. Unwilling to solve their internal watershed problems, Californians from elsewhere prefer to burden Delta ecosystems and economies to solve their problems through water exports, and then criticize Delta interests for daring to question the efficacy of their and the state's management of the Delta and California water. More often than not, our concerns are met with statements like: "If Delta interests oppose the tunnels, they must have a plan for how importing cities like Silicon Valley and Los Angeles will get water without the project," or "If Delta interests insist that more freshwater flows are needed for restoration of the estuary, they must also solve the water needs of agri-businesses upstream."

This burden needs to shift. Sacrifice for the good of California water supply and environmental health needs to be shared. The Delta has borne most of the sacrifice with the exploitative exports and collapsing native ecosystems and fish species it has endured over the last half-century. Our report details how proposals to increase water exports and revamp water quality regulation will likely affect the residents and citizens of the Delta's future—including its environmental justice communities—extending into the next half-century.

Restore the Delta maintains that DWR needs to scrap the tunnels project for the reasons listed page-by-page in this report—from construction impacts to water quality degradation; from project costs to looming privatization of the state's primary water delivery system; from destruction of habitat for greater sandhill cranes and the failure to double salmon populations to significant rate and property tax increases for water users to loss of jobs for Delta EJ communities.

All Delta people as Americans have rights: rights to beneficially use water for drinking, fishing, farming, swimming, and to protect the public trust. And we fight to continue exercising these rights every day of our lives.

It is the state's responsibility to lead water management planning for all Californians, including Delta residents and Delta EJ communities. DWR has a responsibility to manage water, a public trust resource for all Californians, but instead it has functioned as a wholly-owned subsidiary of the Metropolitan Water District as described in Chapter 4 with the creation of the Delta Conveyance Finance Authority. We believe that the cure going forward for the state's planning failure as exemplified by California WaterFix and the complete dismissal of Delta EJ communities is inclusion, transparency, and accurate analysis that considers multiple solutions to the water crisis within the Delta and throughout California.

We believe that the cure going forward is a radical embracing of the 2009 Delta Reform Act by political and water agency leaders, as well as the State Water Resources Control Board, in all planning processes. This established body of laws requires reduced reliance on the export of Delta water. Actions to prepare for California's future water needs follow from this official state policy. The Delta Reform Act requires restoring the Delta's waterways and ecosystem, in addition to protecting Delta economies and communities as places of cultural and historical significance.


CALIFORNIA WATER FIX
BIG LIE
HERE'S AN IDEA: LET'S HAVE CALIFORNIA TAX PAYERS PAY $67 BILLION FOR CORPORATE AG + OIL TO PRIVATIZE AND CONTROL OUR WATER?
#STOP THE TUNNELS
NO TUNNELS!
STOP THE TUNNELS
NORTHERN CALIFORNIA
SOUTHERN CALIFORNIA
CALIFORNIA VS. CORPORATIONS


TUNNELS
SALT WATER
RUINED
RESNICK GETS THE LOOT
RESTORE THE DELTA
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NO TO
DISTRUCTION OF ENVIROMENT 4 WATER Agency Brokers 4 GREED
WATER IS SACRED
WATER IS LIFE FOR ALL
NO CONSENT FROM CA. TRIBES = NO CANAL TUNNELS
NO
BAD

Introduction

Delta environmental justice (Delta EJ) communities have been all but ignored in the state's deliberations on whether to construct a massive new tunnels project and during the water quality control planning processes. This report—based on research and analysis provided in testimony to the State Water Resources Control Board concerning the Delta tunnels project (also known as "California WaterFix")—seeks to correct that, at least by documenting the size and array of populations that fit established policy criteria for who counts as members of "environmental justice communities."

In April 2014, Restore the Delta (RTD) and several other Delta-focused groups began a public campaign to reveal that the California Department of Water Resources (DWR) and the committees of the Bay Delta Conservation Plan (BDCP) had done little if any public outreach to Delta EJ communities. Our work at that time centered on questioning: "Why hadn't DWR reached out to Delta EJ communities to inform them and take their comments and suggestions concerning the BDCP?"

After all, the project had been in the planning stages since November 2006 when a "planning agreement" had been executed among various state, federal, and local water agencies, as well as a handful of environmental non-governmental organizations (NGOs). Eight years was ample time to conceive and implement appropriate outreach to Delta EJ communities, but so little had been done. For a brief period, we internalized this failure as a weakness in the breadth and depth of our Delta coalition building. However, we quickly realized that our small group of 3.5 employees was not a substitute for the resources and power of the State of California and powerful water contractors. The responsibility for performing the needed Delta environmental justice outreach to understand the impacts of the Delta tunnels on regional EJ communities belonged to the Department of Water Resources. From that point forward, we made it part of our outreach strategy to ensure that as many Delta environmental justice groups within the Delta knew about the project, the water quality control planning processes, and the need to protect Delta water quality for their communities.

The Draft BDCP environmental document mentioned that in 2010 DWR had commissioned an environmental justice survey of people in many parts of California that would be affected by the tunnels' service areas. The survey failed to document from U.S. Census data the extent of potential environmental justice populations that resided in or near the Delta and would be affected by construction and operation of the tunnels. Its methodology sought responses from business or political officials, rather than local people intimately familiar with what it meant to work, live, and play in the Delta and be members of Delta EJ communities.

This was a huge failure on the part of DWR. Never known to care much for the views of Delta water rights holders, DWR was demonstrating its institutional apathy toward the Delta by failing to document and engage with Delta EJ communities. Yet as a lead agency under the California Environmental Quality Act (CEQA), and a state agency charged with incorporating an analysis of the human right to water into its plans and actions under the Water Code, DWR had compounded its indifference by ignoring its responsibilities toward the Delta's most vulnerable residents. RTD joined a broad coalition including the Environmental Water Caucus, the Environmental Justice Coalition for Water, Puentes, Braceros Del Delta, the African American Chamber of Commerce, Black Urban Farmers, Café Coop, APSRA, the Asian American Chamber, Lao Empowerment, El Concilio and other small social and environmental justice groups that called out the department for its survey error, and convened meetings to plan next steps. Representatives from several of these groups also attended numerous meetings to advocate for needed Delta inflows during Phase I of the water quality plan update DWR used this incomplete and inadequate survey in messaging to exacerbate regional conflicts regarding California water management. Northern California Tribes dependent on healthy rivers and salmon runs; Delta EJ community members who live, work, play, and drink the waters of the Delta; San Joaquin Valley and coastal communities without access to clean drinking water; and EJ community water ratepayers in Southern California had been divided

within the survey and in subsequent messaging by DWR so as to diminish solidarity within the environmental justice water community throughout California. This is the same strategy used by the State to pit region against region in water management decisions centered on Delta exports, rather than working on unifying water management strategies that will lead to water sustainability and system resilience.

In April 2015, DWR announced a dramatic change. BDCP would be split up into two initiatives: What had been a tunnels project within BDCP would become "California WaterFix" a stand-alone tunnels project, and the habitat conservation plan components of the old BDCP would become "EcoRestore." The latter program would become a hodgepodge of various restoration actions in the Delta, many of which were already required by other habitat conservation plans and the biological opinions associated with operation of the California State Water Project and the federal Central Valley Project. (Both of these projects divert up to about 30 percent of all Delta water directly from the southwestern Delta near Tracy and Byron.)

RTD, EJCW, and EWC continued to incorporate an environmental justice critique of WaterFix into their commentary on the California WaterFix environmental documents. On October 30, 2015, the State Water Resources Control Board (SWRCB) released a notice of petition and hearing for California WaterFix. DWR and the U.S. Bureau of Reclamation had filed a petition with SWRCB in August 2015 to change their Delta-related water rights to incorporate construction and operation of the California WaterFix tunnels project.

SWRCB's notice indicated that the first part of the hearing would address issues posed by the project with "legal users of water", a term that SWRCB had often used to describe a relatively narrow interest group of people and agencies that hold propertied water rights. The trouble with this term, however, is that the California Water Code nowhere defines the phrase "legal user of water" except in very narrow circumstances that are unrelated to change petitions or other water rights-related applications. Moreover, SWRCB is charged with regulating water quality under both state and federal clean water acts, and in those spheres of law, "legal users of water" generally include "designated uses" or "beneficial users" of water—which may include people who have property rights in water, and those that do not.

In January 2016 at a pre-hearing conference convened by the SWRCB concerning the change petition for California WaterFix, the SWRCB received arguments from EJCW and RTD that the Board's phrase "legal users of water" should also include environmental justice communities, especially since at least some of their members are likely to be beneficial users of water in the Delta. SWRCB eventually accepted this reasoning and allowed testimony in the change petition hearing that addressed environmental justice communities as "legal users of water" in the Delta.

SWRCB's decision enabled Restore the Delta to research and prepare a case-in-chief on the WaterFix change petition that included demographic documentation of Delta EJ communities, an effort to make visible what DWR had failed to do. Our case-in-chief laid the groundwork to begin a public awareness campaign that the needs of Delta EJ communities were equal to the needs of other environmental justice communities in California. Our case-in-chief also gave us a platform from which to build a solidarity campaign with other environmental justice water groups throughout the state.

Restore the Delta is a unique organization. We are a community organization that focuses on local economic and environmental water needs related to agriculture, a traditional environmental organization, a member of a broad statewide coalition, and part of the water environmental justice movement within California. Yet we don't occupy one of these positions wholly. In fact, when we identify with one segment of our supporters too strongly, we tend to hear of discomfort from another segment. Consequently, some of our supporters do not understand our concern with environmental justice issues and see it as a threat to the traditional order of how Delta communities should function in regard to managing local water institutions. Our response to these concerns is simple: Everyone who lives in the Delta understands that all

boats rise together at high tide. If we represent the environmental concerns and needs of those who will be harmed first by the Delta tunnels project (Delta EJ communities), we are advocating for water quality and quantity policies that will serve the entire community.

This is not to say that Delta environmental justice communities, which have a rich historical legacy of reclaiming Delta islands, farming, and aiding landowners through generations of labor to build the wealth of this region do not have their own stories to tell and their own needs to represent regarding Delta water quality, and public access to urban Delta waterways. While half our staff lives and works within the environmental justice community in San Joaquin County, we ourselves are not members of the Delta EJ community. Thus, our goal in producing this report is to create a solid base of Delta EJ research and related tools to empower local social and environmental justice groups to advocate for themselves in our state's water management processes, as well as help document some concerns of Delta mismanagement by Northern California Indian Tribes. We look forward to seeing various Delta community groups using their own stories to address their own groups' concerns in a manner that connects Delta history, water management science, environmentalism, and economics in the years to come.

Chapter 1:
The Delta Environmental Justice Community

What does Restore the Delta mean when we describe "Delta environmental justice" communities? What and who are the Delta environmental justice (Delta EJ) communities?

This chapter briefly describes the Delta region and its role in California's water resource development history and geography. Then this chapter defines and describes what environmental justice is. We then use this definition to delineate and describe Delta EJ communities throughout the Delta region. In short, they are peoples of the Delta who include non-white populations, those who are impoverished of any age, gender, race, or ethnicity in the region, and people who face language barriers.

Data from the American Community Survey of 2014 supporting these descriptions are summarized in Appendices 1A through 1C and 2 through 4.

Where is the Delta? Who uses it?

Generally, the Delta is a roughly triangular region of central California about 60 miles east of San Francisco, with Pittsburg and Antioch in Contra Costa County on the west, Tracy to the southeast, and the community of Clarksburg to the north. It includes about 1,100 miles of waterways and levees protecting some 60 distinct islands and tracts of land. These islands and tracts are devoted to agriculture—orchards and vineyards, grain fields, truck crops (like berries, vegetables, and herbs) and some grazing lands—with some smaller towns and communities having long histories in the area, such as Walnut Grove, Isleton, Clarksburg, Rio Vista, and Antioch, among others. The Delta is the Central Valley's lowest elevation, formed by the water ways through which the valley's two major rivers (the Sacramento and the San Joaquin) join and flow to San Francisco Bay. Because of its low elevation, the Delta and its upstream watersheds are the easiest places (from an engineering standpoint) from which to export Northern California water to the south. It is shown in red in Map 1.

Major Diversions from the Delta (in and upstream):

Delta-Mendota Canal (USBR)
California Aqueduct (DWR)
Friant-Kern Canal (USBR)
South Bay Aqueduct (DWR)
North Bay Aqueduct (DWR)
Hetch Hetchy Aqueduct (San Francisco PUC)
Mokelumne Aqueduct (EBMUD)
Contra Costa Canal (CCWD/USBR)
Folsom South Canal (EBMUD/Sacramento County)

(Diversions in bold typically exceed 1 to 2 million-acre-feet annually. Other diversions are generally less than 400,000 acre-feet per year on average, while North Bay, Contra Costa, and Folsom South are typically less than 100,000 acre-feet per year.)

This system places the Delta at the center of these transfers. In fact, the Delta is also the site of several east to west water transfers, not just north to south. There are many straws in the milkshake of Delta exports—water extracted from the Delta by other regions of California. The users shown in bold here account for most of the volume of water diverted for export from the Delta by the State Water Project and the federal Central Valley Project to San Joaquin Valley, Silicon Valley and Southern California water customers. In this century, average annual exports by these three sources has been about 5.3 million acre-feet (MAF).[1]

The large state and federal water projects are shown in Map 2. The U.S. Bureau of Reclamation's Central Valley Project (CVP, built largely between the 1930s and the 1960s) stores water in the Bureau's upstream Trinity, Shasta, and Folsom reservoirs on Trinity, Sacramento, and American Rivers. From these lakes, the Bureau releases water to the Delta where the Jones Pumping Plant near Tracy lifts this water into the Delta-Mendota Canal for delivery to San Joaquin

Valley growers (including Westlands Water District) and to the Santa Clara Valley Water District.

In 1960, California voters narrowly approved a bond issue to construct and operate a State Water Project (SWP). Completed originally in 1973, this project stores most of its water in Lake Oroville on the Feather River, releases it to the Delta where it is lifted at the Banks Pumping Plant near Byron into the California Aqueduct for delivery to the southeastern Alameda County, Santa Clara Valley Water District, upper San Joaquin Valley and Kern County agricultural customers, San Luis Obispo and Santa Barbara counties,

Map courtesy of Delta Stewardship Council.

Map 2

Map courtesy of Delta Stewardship Council.

and the six-county service area of the Metropolitan Water District of Southern California, stretching from Ventura to San Diego counties.

Creation and operation of these two water systems gave rise since the 1970s to a vast and powerful San Joaquin Valley constituency dependent on continuing and expanding Delta exports. This constituency we will refer to at times as "state and federal water contractors," "the water industry," or as specific, dominant water agencies among the contractors that are large or economically important. Such agencies include the 600,000-acre Westlands Water District (a CVP contractor stretching from Mendota to Kettleman City along both sides of Interstate 5); the Santa Clara Valley Water District (the major direct Delta exporter for Silicon Valley); the Metropolitan Water District of Southern California (buying water from the SWP for its service area stretching from Ventura to San Diego counties); and Kern County Water Agency (centered in Bakersfield, whose customers are deeply involved in conduct of cross-Delta and other water transfers and allied with billionaire agribusiness power couple Stewart and Lynda Resnick).

SWP owner DWR and its water contractors are especially frustrated that the system is unable to export Delta water at a level that matches contractual demand. Every two years DWR publishes a report on SWP delivery capability or reliability, which generally shows that actual long-term average SWP deliveries are just 2.5 million acre-feet while contractual demand seeks 4.1 million acre-feet for the 29 state water contractors. DWR's most recent report states that this level of delivery can occur about 62 percent of the time or about six in every ten years on average. Setting its sights lower, the report estimates that the SWP could deliver 2 million acre-feet or more in a year in about 77 percent of the time, a little over three of every four years on average.[2] That is less than half contractual demand. This motivates the SWP contractors to try to increase water supply as well as water supply reliability and given the design of the SWP, they feel at least some of that water must come from the Delta.

The trouble is that the Delta estuary's ecosystem has been severely damaged by the combined Delta exports from both the CVP and SWP since the 1970s. Native fish like Delta smelt, winter-run, spring-run, and late-fall run Chinook salmon have been listed under state and federal endangered species laws, and food web contamination is at risk with increased exports, which could in turn affect what fish are available for local residents' subsistence fishing in Delta channels. The state legislature in 2009 called for reduced reliance on the Delta for California's future water needs, a mandate that the water industry and state water agencies have largely ignored or implemented only faint-heartedly.

The Delta ecosystem is in crisis, but far less recognized by the public and water officials is the crisis that further exports could pose for Delta residents who depend on Delta water quality and ecology as a place where they eat, play, work, and live. Reduced reliance on the Delta for California's future water needs would not only benefit the region's fisheries and ecosystems, it would yield profound benefits to Delta EJ communities for current and future generations.

What is Environmental Justice? How are EJ Communities Defined?

Environmental justice is the potential for public decisions to avoid or mitigate disproportionate or discriminatory environmental impacts (including water-related impacts) to minority and low-income people and populations. State and federal agencies must simultaneously consider environmental justice concerns as they affect the public interest, "the greatest public benefits," and protection of public trust resources.

The California Water Code provides that the people of California have a paramount interest in the use of all the water of the State and that the State shall determine what water, either surface or groundwater, can be converted to public use or controlled for public protection.[3] All the water within the State is the property of the people of the State, but the right to the use of water may be acquired by appropriation

in the manner provided by law. This section of the California Water Code does not qualify or modify the phrase "in the manner provided by law" and suggests strongly that statutes beyond the Water Code can, may, and should affect how water is acquired for beneficial use in California, such as environmental justice and anti-discrimination statutes. The right to appropriate water, which is being sought by DWR and the Bureau through a petition for a permit for a change in the point of diversion before the SWRCB, should be scrutinized sufficiently to ensure that anti-discrimination and environmental justice concerns are taken into account in decisions about water diversion, including the reasonableness of the method of diversion, the amount of diversion, actual water use, and export in relation to area of origin needs. In layperson's terms, Restore the Delta maintains that the SWRCB should rule that anti-discrimination and environmental justice concerns must be adequately addressed with a detailed plan for impact mitigation by DWR and the Bureau before the SWRCB will grant a permit to begin construction of the Delta tunnels.

In California's Water Code, protection of the public interest is of vital concern in the development of the water resources of the State, and the State is authorized to determine in what way all the water of the State should be developed for the greatest public benefit.[4]

While neither "public interest" nor "the greatest public benefit" are defined in the water code, the code designates domestic use of water for drinking, bathing, cooking and cleaning as the highest use of water in California.[5] Recently, a "human right to water" was added to the water code, stating that "every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes."[6]

Beyond the state water code, federal and state laws require their agencies to consider environmental justice and to prohibit discrimination in their decision-making processes. Title VI of the federal Civil Rights Act of 1964 and related statutes require that there be no discrimination in federally-assisted programs on the basis of race, color, national origin, age, sex, or disability (religion is a protected category under the Fair Housing Act of 1968), and that, "No person in the United States shall, on the ground of race, color, or national origin, be excluded from participating in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance."[7]

Presidential Executive Order (EO) 12898 (1994) requires federal agencies (including the United States Bureau of Reclamation) to make environmental justice part of their mission and to develop environmental justice strategies.[8] This Order further requires that each federal agency may, whenever possible and appropriate, translate crucial public documents, notices, and hearings relating to human health or the environment for limited English-speaking populations.[9] As important, the Order also states, "Each Federal agency shall work to ensure that public documents, notices, and hearings relating to human health or the environment are concise, understandable, and readily accessible to the public." [10]

The Bureau of Reclamation adopts U.S. Department of the Interior goals as its own. The Interior Department's 1995 Goal 1 states that "The Department will involve minority and low-income communities as we make environmental decisions and assure public access to our environmental information."[11]

For its 2012-2017 Environmental Justice Strategic Plan, the Interior Department added a new goal to its environmental justice commitments that it will "identify and address environmental impacts that may result in disproportionately high and adverse human health or environmental effects on minority, low-income, or tribal populations."[12]

California Anti-Discrimination and Environmental Justice Policy

The State of California defines "environmental justice" as: "the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of

cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies."[13] The State Attorney General's office states that "fairness in this context means that the benefits of a healthy environment should be available to everyone, and the burdens of pollution should not be focused on sensitive populations or on communities that already are experiencing its adverse effects." The State Attorney General adds, "environmental justice requires an ongoing commitment to identifying existing and potential problems, and to finding and applying solutions, both in approving specific projects and planning for future development."[14]

California's anti-discrimination policy states:

> *No person in the State of California shall, on the basis of race, national origin, ethnic group identification, religion, age, sex, sexual orientation, color, genetic information, or disability, be unlawfully denied full and equal access to the benefits of, or be unlawfully subjected to discrimination under, any program or activity that is conducted, operated, or administered by the state or by any state agency, is funded directly by the state, or receives any financial assistance from the state.*[15]

The State Attorney General's office states that this policy does not expressly include the phrase "environmental justice," but in certain circumstances it can require agencies to undertake the same consideration of fairness in the distribution of environmental benefits and burdens called for in the state's definition of environmental justice. In addition, the State Attorney General's office notes that agencies "should evaluate whether regulations governing 'equal opportunity to participate' and requiring 'alternative communication services' (e.g., translations) apply."[16] Given federal involvement with the California WaterFix project, they do.

Disproportionate impacts to minority, low-income, and tribal communities—as well as communities facing language barriers—should be fully mitigated or avoided. "Addressing" impacts on human health and environmental effects on environmental justice communities must be substantive and not simply window dressing.

Who and where are Delta EJ communities?

This was the question we answered as part of Restore the Delta's case against the tunnels project before the SWRCB in 2016. The analysis here is based on the 2014 American Community Survey (ACS). While there have been slight or small changes since 2014, our review of 2016 ACS data this summer confirms that overall demographic, economic, and language patterns continue to hold true for the same communities and counties.[17] (See Appendices 1A through 1C for detailed data.)

A. Many of the Delta region's residents are people of color.[18]

Low-income communities and communities of color comprise a significant number of residents throughout Contra Costa, Sacramento, San Joaquin, Solano, and Yolo counties. Although distributed throughout the Delta, many of these communities are more densely represented in northern, eastern and southern census blocks.[19] Within these counties, the most significant concentrations of non-white populations occur in Antioch, Pittsburg, Fairfield, Suisun City, Lathrop, Manteca, Sacramento, Stockton, Tracy, and West Sacramento.

Even in smaller communities throughout the Delta region, non-white residents make up substantial portions of the rural populations of Freeport, Hood, Courtland, and Isleton.

The presence of Black or African-American residents, for example, is significant in some notable Delta cities, like Antioch, Pittsburg, Sacramento, Stockton, Fairfield, and Suisun City; exceeding both county-wide and national population levels.

Delta-area residents self-identify as "Some Other Race" in census tract data at rates higher than the national average in Antioch, Pittsburg, Brentwood, Oakley, Sacramento, Freeport, Courtland, Hood, Isleton, Lathrop, Manteca, Stockton, Fairfield, Suisun City, and West Sacramento.

Finally, the Hispanic or Latino community, comprised of residents of any race, is significantly higher than the corresponding county or national averages in Antioch, Pittsburg, Brentwood, Byron, Oakley, Sacramento, Freeport, Courtland, Hood, Walnut Grove, Isleton, Lathrop, Manteca, Stockton, Fairfield, Suisun City, Clarksburg, and West Sacramento.

B. Many of the Delta region's population are low-income and impoverished communities, particularly in San Joaquin County.[20]

The western, northern, central, and southern parts of the Delta in particular are home to high concentrations of low-income residents.[21] The most significant concentrations of people and families whose incomes in 2014 were below the federally-recognized poverty level occur in Antioch, Pittsburg, Clarksburg, Sacramento, Stockton, and West Sacramento.

In Contra Costa County, the poverty rates for families, children (persons under 18 years), adults (18 years and over), and seniors (65 and over) are below the national rate. The poverty rate among all people in the county is 10.7 percent, about two-thirds the 15.6 poverty rate for the U.S. In Antioch, about 10.5 percent of all families, 21 percent of those under 18 years, and 12.4 percent of those 18 years and over are considered impoverished. Poverty rates among Antioch seniors 65 years and over was 7.9 percent, exceeding the County's senior poverty rate of 6.5 percent. In Pittsburg, about 14.6 percent of all families, 26.9 percent of all children, and 15 percent of all adults 18 years and over were considered impoverished. Poverty among Pittsburg seniors was 9.4 percent, also exceeding the County's senior poverty rate and equaling the nation's. In Oakley, about 10.1 percent of all adults and 13 percent of all seniors are considered impoverished.

In Sacramento County, poverty rates for families, children, adults, and seniors exceed the national poverty rate. The County's poverty rate among all people in the county is 19.4 percent, compared with 15.6 percent for the U.S. In the city of Sacramento, about 17.7 percent of all families, 31.7 percent of all children, 19.3 percent of all adults, and 11.7 percent of all seniors are considered impoverished. In Courtland, 30.3 percent of all adults, and 52.7 percent of all seniors are considered impoverished. In Isleton, 17.9 percent of all families, 48 percent of children, and 18.7 percent of adults are considered impoverished. In Walnut Grove, 14.1 percent of adults and 13.6 of seniors are considered impoverished.

In San Joaquin County, poverty rates for families, children, adults, and seniors exceed the nation's. County-wide, poverty is concentrated in the city of Stockton, where about 21.4 percent of families, 35.3 percent of children, 21.8 percent of adults, and 12.9 percent of seniors are considered impoverished.

In Solano County, poverty rates for families, children, adults, and seniors are below the nation's. In Rio Vista, poverty rates exceed county and national levels for related children under 5 years of age, and adults 18 to 64 years. In Suisun City, 19.4 percent of children under 18 years are considered impoverished, exceeding both the county's and nation's poverty rates.

In Yolo County, poverty rates for families and children under 18 are below the national poverty rates. However, Yolo County's poverty rates for adults 18 years and over and seniors exceed the nation's. In West Sacramento, 15.6 percent of all families, 29.1 percent of children under 18, 17.8 percent of adults, and 14 percent of seniors are considered impoverished. In Clarksburg, 11.5 percent of families, nearly half (49.2 percent) of children under 18, 13.8 percent of adults and 11.2 percent of seniors are considered impoverished.

C. Many residents of the Delta region face isolating language barriers.[22]

There is a significant concentration of linguistically-isolated residents who experience daily language barriers in Antioch, Pittsburg, Lathrop, Fairfield, Tracy, Stockton, Sacramento, and West Sacramento.

In Contra Costa County, the 33.5 percent of the population 5 years and older that speaks languages other than English (categorized in the American Community Survey as Spanish; other Indo-European; Asian and Pacific Islander; and "other" languages), exceeds that of the nation's population (20.1 percent). Of the non-English language speakers in the county, the share of those people 5 years or older speaking English less than "very well" exceeds the national average of 8.7 percent. Delta region populations of those speaking a language other than English and that speak English less than "very well" that exceed the national rate occur in Antioch, Pittsburg, Byron, and Oakley. Delta region populations of those speaking English less than "very well" that exceed both the national and county rates occur only in Byron.

In Sacramento County, 31.3 percent of the population 5 years and up speak languages other than English, exceeding the national average. Of the non-English language speakers in the county, the share of those people 5 years or older speaking English less than "very well" exceeds that of the nation by more than 50 percent (13.6 to 8.7 percent). Residents of the cities of Hood, Isleton, Sacramento, and Walnut Grove, in particular, report speaking a language other than English, and indicate that they speak English less than "very well," in numbers that also significantly exceed national and county average rates. *(Appendix 1C [showing that residents in Hood report at a rate of 33.3 percent; residents of Isleton report at a rate of 22.8 percent; and Sacramento and Walnut Grove residents report at a rate of 16.1 percent and 16 percent respectively].)*

In San Joaquin County, 40 percent of the population 5 years and older speak languages other than English, exceeding the national rate. Of the non-English language speakers in the county, the share of those people 5 years or older speaking English less than "very well" exceeds that of the nation by nearly 200 percent (40 to 20.1 percent). Delta region residents that speak a language other than English, that speak English less than "very well," and that exceed the national rate occur in Manteca and Tracy. Delta region populations of those speaking a language other than English and that speak English less than "very well" and meet or exceed the national and county rates occur in Lathrop (18.1 percent) and Stockton (21.5 percent).

In Solano County, 29.5 percent of its population 5 years and up speak languages other than English, exceeding the national rate. Of the non-English language speakers in the county, the share of those people 5 years or older speaking English less than "very well" exceeds that of the nation (11.2 to 8.7 percent). Delta region populations that speak a language other than English, that speak English less than "very well," and that exceed the national rate occur in Suisun City (9.8 percent). Delta region residents of those speaking a language other than English and that speak English less than "very well" and meet or exceed the national and county rates occur in Fairfield (13.2 percent).

In Yolo County, 35 percent of its population 5 years and older speak languages other than English, exceeding the national rate. Of the non-English language speakers in the county, the share of those people 5 years or older speaking English less than "very well" exceeds that of the nation by nearly double (15.1 to 8.7 percent). Delta region populations of those that speak a language other than English, that speak English less than "very well," and that meet or exceed the national and county rates occur in West Sacramento (18.2 percent) and Clarksburg (16.4 percent).

Within specific language categories of the American Community Survey, there are numerous Delta region cities and communities where the percentage of non-English speakers that speak English less than "very well" exceeds the national and county rates.

Delta region residents of color and low-income residents, including those with language barriers, live in quantifiably distressed areas.

The mere presence of environmental justice communities does not tell the full story of the economic and public health challenges some of the most vulnerable Delta-area residents face. To help describe what these populations are up against, recent studies use a "Distressed Communities Index" (DCI) to suggest the difficulties Delta EJ communities face.[23]

1. Distress Scores

Distress scores are calculated, according to an Economic Innovation Group study, "based on a geography's rank on each of the seven equally weighted variables. The ranks are then averaged and normalized to be equivalent to percentiles, resulting in distress scores between 0 and 100. The higher the distress score, the greater the distress."[24]

Among Delta region counties, Contra Costa County has the lowest distress score of 8.1, while San Joaquin County has the highest distress score at 58.5 (out of a possible 100). The study estimated that 43 percent of San Joaquin County's population resides in distressed zip codes.[25] The City of Stockton was ranked sixth nationally (and first state-wide) among the most distressed large cities with a distress score of 95.2; 70.2 percent of the city's population lives in distressed zip codes.[26] Four of Stockton's zip codes had distress scores exceeding 90 (95202, 95203, 95205, and 95210), and three more had distress scores exceeding 80 (95204, 95206, and 95207). The zip code for French Camp, adjacent to Stockton, had a distress score of 95.4. (Appendix 2, p. 2, Distress Score Column.)

Of the Delta cities measured in the study, Stockton had the highest distress score (95.2), while Sacramento had a distress score of 77.5. The study also included Antioch (distress score of 77.0) and Pittsburg (67.6). (Appendix 2, p. 2.)

2. Adults with no high school degree

California's overall rate of adults without a high school degree is 19 percent. San Joaquin County exceeds this rate, at 22 percent, and a number of Delta communities significantly exceed, or at best, match the state-wide rate. Twenty-five percent of Stockton's adult population has no high school degree, compared with 23 percent in Pittsburg (zip code 94565), 17 percent in Sacramento, and 16 percent in Antioch (94509). Stockton-related zip codes have much higher rates: 47 percent in East Stockton (95205), 39 percent in the South Delta (95206), 37 percent in downtown Stockton (95202), 29 percent in East Hammer (95210), 28 percent in the Port/West Downtown (95203), 19 percent in the Country Club area (95204), and 43 percent in more rural French Camp (95231). (Appendix 2, p. 3, No High School column.)

Zip code communities of central and southern Sacramento that also have very high rates of adults without high school degrees include: 40 percent in Parkway-South Sacramento (95824), 32 percent in Discovery Park area (95815), 27 percent in Florin (95828), 26 percent in Parkway (95823), 21 percent in the Sacramento City College area (95822), 18 percent in North Oak Park (95817), and 17 percent in downtown Sacramento (95814). (Appendix 2, p. 3.)

Other Delta zip codes have high rates of adults with no high school degree, including 31 percent in Freeport/Meadowview (95832), 24 percent in Northwest Sacramento (95605), and 20 percent in the Isleton area (95641). (Appendix 2, p. 3.)

3. Housing vacancy rates

California had a 2014 housing vacancy rate of 6 percent state-wide, while Delta counties had vacancy rates ranging between 5 (Contra Costa) and 7 percent (Sacramento, San Joaquin, and Solano) overall,

with many Delta region zip codes far exceeding these state- and county-wide rates. In 2014, downtown Stockton's housing vacancy rate was 31 percent (zip code 95202). The Locke/Walnut Grove area experienced a housing vacancy rate of 22 percent in the same year; (zip code 95690), while Courtland experienced a 21 percent vacancy rate (zip code 95615). Downtown Sacramento had a housing vacancy rate of 15 percent (zip code 95814), and the Isleton area also had 15 percent vacancy rate (zip code 95641). (Appendix 2, p. 4, Housing Vacancy Rate column.)

4. Adults not working

Forty-four (44) percent of California adults were not working in 2014. Except for Contra Costa County at 41 percent, the other Delta counties ranged from the state's rate (Yolo County), up to 48 percent of adults not working in San Joaquin County. Forty-nine (49) percent of adults were not working in Stockton, while 45 percent were not working in Sacramento, 46 percent in Antioch, and 43 percent in Pittsburg. Zip code communities with the largest shares of adults not working include French Camp (73 percent), downtown Stockton (69), east Stockton (53), south Delta, Port/West Downtown Stockton, Lincoln Village, East Hammer (each 52), and Country Club area (49). (Appendix 2, p. 5, Adults Not Working column.)

Among Sacramento zip code distressed communities, all exceeded 50 percent of adults not working, ranging from 51 percent (Florin and Parkway) to 56 percent (Parkway-South Sacramento). (Appendix 2, p. 5.)

Other Delta zip code communities exceeded the state's rate of non-working adults, ranging from 47 percent (Courtland) to 56 percent (Isleton area) of their adult populations, except for the Locke/Walnut Grove area (42 percent). (Appendix 2, p. 5.)

5. Median income ratio

Among Delta counties, Contra Costa had the highest median income ratio (county median income:state median income) at 130 percent while San Joaquin had the lowest median income ratio at 87 percent. Among Delta cities, Stockton had the lowest median income ratio at 74 percent, followed by Sacramento (81 percent), Antioch (88 percent), and Pittsburg (91 percent). Among zip code communities, downtown Stockton had the lowest median income ratio at 24 percent, followed by seventeen zip code communities whose median income ratios ranged from 46 percent (Parkway-South Sacramento) to 74 percent (Florin). Only two interior Delta zip codes exceeded 90 percent of the state median income: Locke/Walnut Grove (91 percent) and the Courtland area (96 percent). (Appendix 2, p. 7, Median Income Ratio column.) area (96 percent). (Appendix 2, p. 7, Median Income Ratio column.)

6. Employment growth

California saw growth in employment of 6.8 percent between 2010 and 2013. Among Delta counties, only Contra Costa exceeded this rate at 6.9 percent, while Sacramento saw 6 percent, Solano and Yolo each 5.6 percent, and San Joaquin just 3.5 percent growth in employment among its residents. (Appendix 2.) Among Delta region cities, employment growth was negative for Pittsburg (-4.7 percent) and Antioch (-3.4), and only slightly positive for Stockton (2.7 percent) and Sacramento (2.4 percent). (Appendix 2, p. 8, Percent Change in Employment column.) Among Delta zip code communities, three saw double-digit decreases in employment among their residents (Isleton area [-13.6 percent], East Hammer [-12.6] and Port/West Downtown [-11] in Stockton). Another seven zip codes saw single-digit employment declines or no employment growth, ranging from 0 percent for Courtland area to -8 percent for French Camp, with northwest Sacramento, downtown Sacramento, Country Club in Stockton, Locke/Walnut Grove, and Parkway-South Sacramento areas seeing intermediate declines. (Appendix 2, p. 8.) Zip code communities with positive employment growth ranged from 2.8 percent (Sacramento City College area) to 16.4 percent (downtown Stockton) with eight other zip code communities filling out this range. (Appendix 2, p. 8.)

7. Growth in business establishments

California saw a 2.9 percent growth in business establishments between 2010 and 2013. (Appendix 2, PDF page 9, Percent Change in Businesses column.) Among Delta counties, Contra Costa, Yolo, and Sacramento saw positive growth below the California rate (2 percent, 1.9 percent and 1.4 percent respectively), while Solano and San Joaquin counties lost businesses (-1 percent and -1.5 percent respectively). Among Delta cities, only Sacramento saw positive growth in business establishments of 1.3 percent during this period, while Antioch (-7.5 percent), Stockton (-4.3 percent), and Pittsburg (-0.1 percent) all saw declines. (Appendix 2.) Among Delta zip code communities, only one zip code nearest the legal Delta saw positive growth of businesses, Freeport/Meadowview (95832, 21.2 percent). (Appendix 2.) Generally, most Delta zip code communities saw declines in business establishments. Stockton zip codes were among those hardest hit, ranging from a -10.1 percent decrease for downtown Stockton to -2.9 percent for the south Delta area (95206). Sacramento area zip codes saw decreases in business establishment of -9.3 percent for downtown Sacramento to -0.2 percent for the Sacramento City College area. Hardest hit among Delta zip codes included Locke/Walnut Grove (-14.1 percent) and the Isleton area (-13.6 percent). (Appendix 2, p. 8.)

Food deserts add to economic distress and unhealthy outcomes in the Delta region, including the Stockton Area.

The economic distress faced by environmental justice communities in the Stockton region includes food insecurity and "food deserts," where entire districts and neighborhoods are no longer served by grocery stores that make healthy, fresh food choices available to residents at easily accessible locations.

Low income neighborhoods are at high risk of low access to grocery stores selling fresh, healthful foods. United States Department of Agriculture Economic Research Service maps illustrate the presence of census tract neighborhoods in the Delta region that face low access to healthy food options. The standard "food desert" definition is the absence of a grocery store within a 1-mile radius of residents in an urban census tract and a 10-mile radius for rural census tracts.

Many of the neighborhoods overlap with zip code neighborhoods that exhibit economic distress (Appendix 2.) Significant portions of Stockton, Manteca, Lodi, Pittsburg, Antioch, Delta islands in Contra Costa County (south side of the San Joaquin River), Suisun City, Fairfield, Vacaville, Davis, and south Sacramento have low income census tracts whose residents have low access to grocery stores.[27] (Appendix 3.)

Fifty-four percent of the five Delta counties' census tracts are low income and have low access to grocery stores serving healthful fresh food. (Appendix 4.) Over half of Sacramento and San Joaquin counties' census tracts are low income and low access. (Appendix 4.) Solano County has the highest share (17.1 percent) of census tracts in the Delta region meeting these characteristics, followed by Contra Costa and Sacramento counties. (Appendix 4.) However, urban census tracts in Delta counties face a severe shortage of grocery stores, to the point where there are fewer and fewer within even a half mile of residents, which is measured in US Department of Agriculture food access data. In the Delta, 58 percent of low income and low access census tracts lack grocery stores within one-half of a mile in urban census tracts and 10 miles in rural, led by Yolo County (74 percent), San Joaquin County (65 percent), and Sacramento County (57 percent). (Appendix 4.) Across the Delta, about one-sixth of census tracts have sizable low-income and low-food access populations without vehicle access to facilitate grocery shopping. (Appendix 4.)

The lack of affordable healthy food choices that are also accessible can contribute to poor health outcomes in low-income environmental justice communities. A 2013 San Joaquin County health assessment found that 10 county zip codes had obesity rates exceeding the state average (24.8 percent). Three zip codes

were found to have food deserts meeting the federal definition in which at least 500 people and/or 33 percent.

Three zip codes were found to have food deserts meeting the federal definition in which at least 500 people and/or 33 percent of the population live more than one mile (urban) or 10 miles (rural) from a supermarket or large grocery store. None of the 10 zip codes had a farmers' market located within the zip code boundary at the time.[28] The County-wide adult obesity rate in 2016 was 29.1 percent, compared with the state average of 22.3 percent.[29]

These environmental justice communities beneficially use water in ways both recognized and yet-to-be recognized by the State Water Resources Control Board in the Bay-Delta Estuary.

Most of the Delta region's environmental justice communities are concentrated in its largest cities: Antioch and Pittsburg in the western Delta; Fairfield, Suisun City, West Sacramento, and Sacramento in the northern Delta; and Stockton in the southern Delta, where the most distressed environmental justice communities reside. Environmental justice residents of these cities drink water from the Delta and use it for food preparation and sanitation. Some have jobs that rely on Delta water to grow crops or process raw materials into finished commodities, some for sale to environmental justice communities in the Delta region. Some fish the Delta for sustenance. Relative to their respective counties and to the United States, environmental justice communities are disproportionately represented in the Delta region's population.

1. Established Beneficial Uses Pertain to Environmental Justice Communities

Beginning with the 1978 Bay-Delta Water Quality Control Plan, SWRCB established numerous beneficial uses to be protected by water quality objectives. These beneficial uses directly pertain to and reflect common linkages of environmental justice communities with employment, business, non-profit, and leisure pursuits. These beneficial uses include municipal and domestic supply; agricultural supply; groundwater recharge; navigation; contact water recreation; non-contact water recreation; shellfish harvesting; commercial and sport fishing; warm freshwater habitat; cold freshwater habitat; migration of aquatic organisms; spawning, reproduction, and/or early development of aquatic organisms; estuarine habitat; wildlife habitat; and rare, threatened, or endangered species.[30]

2. Beneficial Uses Now Under Consideration by the Board

The Board is also presently considering designation of beneficial uses for tribal traditional and cultural purposes, tribal subsistence fishing, and subsistence fishing uses of water. In so doing, the State Water Board acknowledges that "tribes have cultural practices and ways of life that they wish to preserve and pass on to future generations." Degradation of state waters, along with new sources of contamination and pollution to those waters, creates "distinctive changes to the tribes and their members….Providing beneficial use categories and descriptions designed to protect Native American uses of waters is an important step in ensuring that tribes have the opportunity to continue to practice their culture."[31]

DWR and the Bureau have failed to conduct quantitative or qualitative surveys of subsistence fishing within the Delta. Subsistence fishing, the Board also acknowledges, is practiced by California Indians and other cultures and individuals throughout California. For many non-native cultural communities, subsistence fishing is also an integral cultural tradition preserved when these communities emigrated to the United States. Many, though not all, are from Southeast Asia. They and other individuals and families may engage in subsistence fishing to provide food when low incomes make buying fish unaffordable.

Many such subsistence fishers may also face language barriers, as the American Community Survey suggests. (See Appendix 1C.) The Board acknowledges that "in areas where bioaccumulatives have built up in fish tissue to unsafe levels to support subsistence fishing, most of the public is unaware of the dangers associated with consuming large amounts of fish and steps are not being taken to either reduce the contaminants in the fish or to educate the public."[32]

Cultural resource beneficial uses of water are vital to cultural identity, development, and survival. Ponti Tewis, government liaison for the Winnemem Wintu Tribe from Northern California, testified to SWRCB in March 2018 about his tribe's cultural beneficial use of water and fish since time immemorial:

> The Winnemem Wintu are a spiritual people. We believe in a Creator who gave life and breath to all things. In our creation story we were brought forth from a sacred spring on Mt. Shasta. We were pretty helpless, couldn't speak, pretty insignificant. But the Salmon, the Nur, took pity on us and gave us their voice, and in return we promised to always speak for them. Side by side, the Winnemem Wintu and the Nur have depended on each other for thousands of years—the Winnemem speaking, caring, and trying to protect the salmon, and the salmon giving of themselves to the Winnemem to provide sustenance throughout the year. Ceremonies, songs, dances, and prayers of the relationship between the salmon and the Winnemem Wintu are intricately woven into the very fabric of Winnemem Wintu culture and spirituality.[33]

In this way, the tribal, cultural meaning of fish is intertwined with the importance of fish to the Winnemem Wintu's diet.

In 1851 and 1852, the Winnemem Wintu Tribe and 17 other California Indian tribes executed treaties with the United States Government that provided permanent homelands for the tribes even as the tribes ceded large areas of California for settlement.[34] In July 1852, however, the U.S. Senate refused to ratify the treaties, yet the State of California treated the Indians as if the lands had been ceded.[35] These betrayals and land cessions also reduced the tribes' (including the Winnemem Wintu tribe) access to surface water resources and the benefits of water use to their cultures and livelihoods.

Fish culture, through the development of a fish commission and hatcheries, began in the 1870s in California, including one on the McCloud River in 1872. The hatchery's objective was to procure Pacific salmon eggs for planting in eastern U.S. rivers where Atlantic salmon populations had been developed by overfishing and industrialization of their habitats. The hatchery eventually exported its eggs to places like New Zealand, where salmon eggs from the McCloud River established salmon runs in that country's rivers. Ironically, the winter-run and spring-run salmon used to spawn New Zealand's salmon fishery are themselves listed as endangered or threatened under state and federal endangered species acts. Tewis testified to SWRCB that:

> *We believe that the salmon sent to New Zealand from the McCloud River to establish the New Zealand runs, if brought back home to the McCloud River from whence they came, could be the salvation from the probable extinction of the winter-run Chinook salmon.*[36]

The story of salmon's decline in and through Delta fisheries is as much an environmental justice issue as it is an endangered species issue. The risk of extinction to salmon is palpable for tribal peoples like the Winnemem Wintu.

Chapter 1 End Notes

1 An acre-foot is about 325,829 gallons, or an acre of land covered with water to a depth of 1-foot (or 43,560 cubic feet. It is about the amount of water two California family households consume in a year.

2 California Department of Water Resources, 2017 State Water Project Delivery Capability Report, p. 25, Figure 5-4, and p.23, Figure 5-2. Accessible at http://baydeltaoffice.water.ca.gov/swpreliability/.

3 California Water Code section 104.

4 California Water Code section 105.

5 California Water Code section 106.

6 California Water Code section 106.3(a).

7 Title VI accessible July 19, 2018 at https://www.epa.gov/ogc/epas-title-vi-policies-guidance-settlements-laws-and-regulations.

8 Executive Order 12898, Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations, *Federal Register* 59(32): February 16, 1994, Sec. 2-2, op. cit., Chapter 1. Accessible July 30, 2018 at https://www.epa.gov/sites/production/files/2015-02/documents/exec_order_12898.pdf.

9 *Ibid.*, Sec. 5-5(b).

10 *Ibid*., Sec. 5-5(c).

11 U.S. Department of the Interior, *Environmental Justice Strategic Plan,* 2012-2017, p. 13. Accessible July 19, 2018, at https://www.doi.gov/sites/doi.gov/files/uploads/Final-DOI-EJ-SP-March-27-2012.pdf; and at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_203.pdf.

12 *Ibid*., pp. 18-21.

13 Cal. Gov. Code Sec. 65040.12, subd. (e).

14 California Department of Justice, *Fact Sheet: Environmental Justice at the Local and Regional Level, Legal Background*, updated 7/10/2012, p. 1. Accessible July 19, 2018 at https://oag.ca.gov/sites/all/files/agweb/pdfs/environment/ej_fact_sheet.pdf.

16 *Ibid*., p. 2. See Cal.Code Regs., tit.22, secs. 9801, 98211.

17 *Ibid*., p. 2. See Cal.Code Regs., tit.22, secs. 9801, 98211.

18 For summaries of data on people of color, see Appendix 1A.

19 2013 Public Draft Environmental Impact Report/Environmental Impact Statement Bay Delta Conservation Plan, Chapter 28, Figure 28-1. Accessible at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/exhibit4/index.shtml. *Hereafter BDCP Draft EIR/EIS.*

20 For data on poverty rates, see Appendix 1B.

20 For data on poverty rates, see Appendix 1B.

21 *BDCP Draft EIR/EIS*, Chapter 28, Figure 28-2.

22 For data on language barriers see Appendix 1C.

23 The DCI combines indicators of educational attainment (i.e., no high school degree), housing vacancy rate, adults not working, poverty rate, median income ratio (i.e., the ratio of community median income to that of the state), and changes in employment and business establishments between 2010 and 2013. The DCI draws from seven indices of social and economic conditions using currently available data from the American Community Survey of the United States Census Bureau and other government data. They were chosen, according to this study, because:

> Distress manifests itself in a lack of residential investment, in shuttering businesses, and in disappearing job opportunities; prosperity the inverse. A high school diploma is the entry-level ticket to opportunity in the economy, and they remain scarce in many struggling neighborhoods.
>
> Low rates of adult employment identify communities where connections to the labor market have frayed; prospering communities, on the other hand, draw people back into the labor market with job opportunities. Poverty rates differentiate well-off from struggling communities too. And neighborhood median income relative to state median income sizes [i.e., measures] earnings differentials while controlling for differences in cost of living across the country.
>
> The DCI does not surmount inherent challenges [of the indicators used], but the index approach does mitigate their individual biases.

(Economic Innovations Group, *The 2016 Distressed Communities Index: An Analysis of Community Well-Being Across the United States.* Accessible at http://eig.org/dci, including mapped data on cities, counties, and zip codes., pp. 5-7.) Hereafter EIG 2016 Report.

24 *Ibid*., p. 7.

25 Summary of Delta Region Distressed Community Index Scores, with supporting data from Economic Innovations Group. Provided in this report as Appendix 2.

26 *EIG 2016 Report*, p. 26, Figure 16.

27 United States Department of Agriculture, Economic Research Service, Food Access Maps and documentation, accessible at https://www.ers.usda.gov/data-products/food-access-research-atlas/documentation/. Mapping results from July 24, 2016 provided in Appendix 3 to this report.

28 Valley Vision, Inc., A Community Health Needs Assessment of San Joaquin County, conducted on behalf of San Joaquin County Community Health Assessment Collaborative, March 2013, pp. 34-35. Accessible July 19, 2018 at https://valleyvision.org/projects/community-health-needs-assessments-2013/ or at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_240.pdf.

29 San Joaquin County 2016 Community Health Needs Assessment, p. 15. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_246.pdf.

30 See Appendix 9 to this report and State Water Resources Control Board, *2006 Bay-Delta Water Quality Control Plan Update*, pp. 8-9. Accessible at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/wq_control_plans/2006wqcp/docs/2006_plan_final.pdf.

31 State Water Resources Control Board, *Beneficial Uses Development: Tribal Traditional and Cultural, Tribal Subsistence Fishing, and Subsistence Fishing Beneficial Uses, Stakeholder Outreach Document,* June 2016, pp. 3-4. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_209.pdf.

32 *Ibid*.

33 *Testimony of Gary Mulcahy*, Before the California State Water Resources Control Board, Hearing in the Matter of California Department of Water Resources and United States Bureau of Reclamation Request for a Change in Point of Diversion for California WaterFix. Accessible at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/part2/RTD_50.pdf.

34 Albert Hurtado, *Indian Survival on the California Frontier,* Yale University Press, 1995, pp. 141.

35 *Ibid*.; and *Testimony of Gary Mulcahy,* above, paragraph 9, page 2.

36 *Testimony of Gary Mulcahy, ibid.*, paragraph 16, p. 5.

Chapter 2:
The Delta EJ Case Against the Tunnels Project

Before their displacement, indigenous California Indians relied on the Delta since time immemorial to hunt deer and small mammals (for meat and hides) and fish for salmon. Many if not most of these Indians are likely ancestors of the Miwok, Yokut and Monache (Western Mono) peoples. By 500 A.D., according to historian George Harwood Phillips, Indian settlements had grown numerous while relying on acorns and salmon for much of their diet. "Villages located along the San Joaquin and Sacramento rivers and in the Delta," wrote Phillips, "contained large pit-houses and storage facilities. Indians manufactured from bones a variety of practical artifacts, such as awls, needles, and barbed harpoon heads."[1] They traded for other goods with coastal, mountain, and other Central Valley tribes.

Because of their long residence in the Delta region, they would also have relied on water from Delta channels as part of their livelihoods and cultures. Restore the Delta recognizes that Delta lands were taken by arriving European settlers before, during, and after the Gold Rush, a time when indigenous peoples were rousted from their ancestral lands to make way for new European and American colonists. Not only were they rousted, once California was a state, they became objects of a genocidal campaign that had broad societal, judicial, and political support, one result of which was the dispossession of Indians of their homelands in the Delta watersheds and the Central Valley.[2] Had these lands been instead reserved for Delta indigenous peoples, and those reserves respected, they would likely have water rights reserved for them as well, consistent with the *Winters* doctrine.[3]

How this original Delta environmental injustice is to be handled from here forward is unknown to us as authors of this report. Instead of answers, we here offer a prayer for truth and reconciliation among all the peoples of California for this most lasting and unresolved of injustices to indigenous people of Central Valley watersheds. For now, this chapter seeks to identify the injustices that loom for the region's environmental justice communities from construction and operation of the tunnels project—including Northern California Indian tribes, whose cultural reliance on salmon will be destroyed by the tunnels project if it is built and operated.

The Quality of Delta Waters

The quality of Delta waters is an environmental justice matter and has been recognized as such for at least a century. The start of rice cultivation in the Sacramento Valley led to sudden massive diversions of Sacramento River water to rice fields, depriving the lower Sacramento River in the Delta of much-needed fresh water during the 1910s. By 1920—a drought year—the encroachment of salts from San Francisco Bay due to low Delta inflow led to litigation that would not be decided until the California Supreme Court's Antioch decision of 1922.[4]

"Under natural conditions,"[5] stated civil engineer and Delta expert Thomas Means in 1928, "the boundary between salt and fresh water was Carquinez Straits. In late summer, Suisun Bay became brackish, but salt water penetrated as far as Antioch only rarely and then for but a few days' time." With "no large increase of cultivated land in the delta region," the increasingly salty waters in the Delta from upstream diversions threatened agriculture and industry in the region, reducing flow entering the Delta "to a small fraction of the flow under natural conditions." The quality of water was found crucial to the economic, agricultural, and industrial development and vitality of the San Francisco Bay estuary.[6] Means described four relationships between Delta water quality and local economic development:

> *First, [increased salinity] renders questionable the irrigation of permanent crops, particularly such crops as are sensitive to salt; second, it has a tendency through the percolation beneath the*

levees of sub-irrigating the adjoining land with saline water; third, it reduces the value of lands through the fear of salinity; and fourth, it adds expense and uncertainty to the question of domestic supply, for on most of the delta the river is a source of domestic water.[7]

To avoid salinity problems to which Delta channels are vulnerable[8] since the 1922 Antioch decision, state and federal water planners instead focused on how to improve Delta export quality—primarily by trying to move the State Water Project's diversion point (Banks pumping plant) from the south near Tracy and Byron to the north by Hood along the lower Sacramento River. Few if any state and federal planners ever considered solving Delta salinity problems with Delta interests' points of view in mind. The idea for changing the diversion location for Delta water project exports was first floated in the 1960s under governors Pat Brown and Ronald Reagan, and gained active support from Governor Jerry Brown during his first administration (1975 to 1983). A "peripheral canal" concept was passed by the Legislature and signed by Governor Brown in 1980, but opponents succeeded in qualifying a statewide referendum on the proposal for the June 1982 ballot. In that election, California voters rejected the canal by a 63 to 37 percent margin.

Despite this landslide defeat, the canal idea never went away for good. It resurfaced during the CalFED Bay-Delta planning process (1995-2004) as "isolated conveyance," but gained neither political nor financial traction. More recently, the Bay Delta Conservation Plan (BDCP) process, begun in late 2006, gained political support when Jerry Brown was re-elected governor in 2010 and he again took an active interest in state water issues.

In 2012, he announced a project consisting of two tunnels attached to three diversion points in the lower Sacramento River—at Clarksburg, near Hood, and at Courtland. Water diverted from these new diversion points would flow in two tunnels thirty-five miles south to Clifton Court Forebay near Byron where it would be lifted to either Central Valley Project (CVP) or State Water Project (SWP) aqueducts. Since 2015, the tunnels project has been trimmed of ecosystem restoration pretenses of the BDCP, as shown in Map 3.

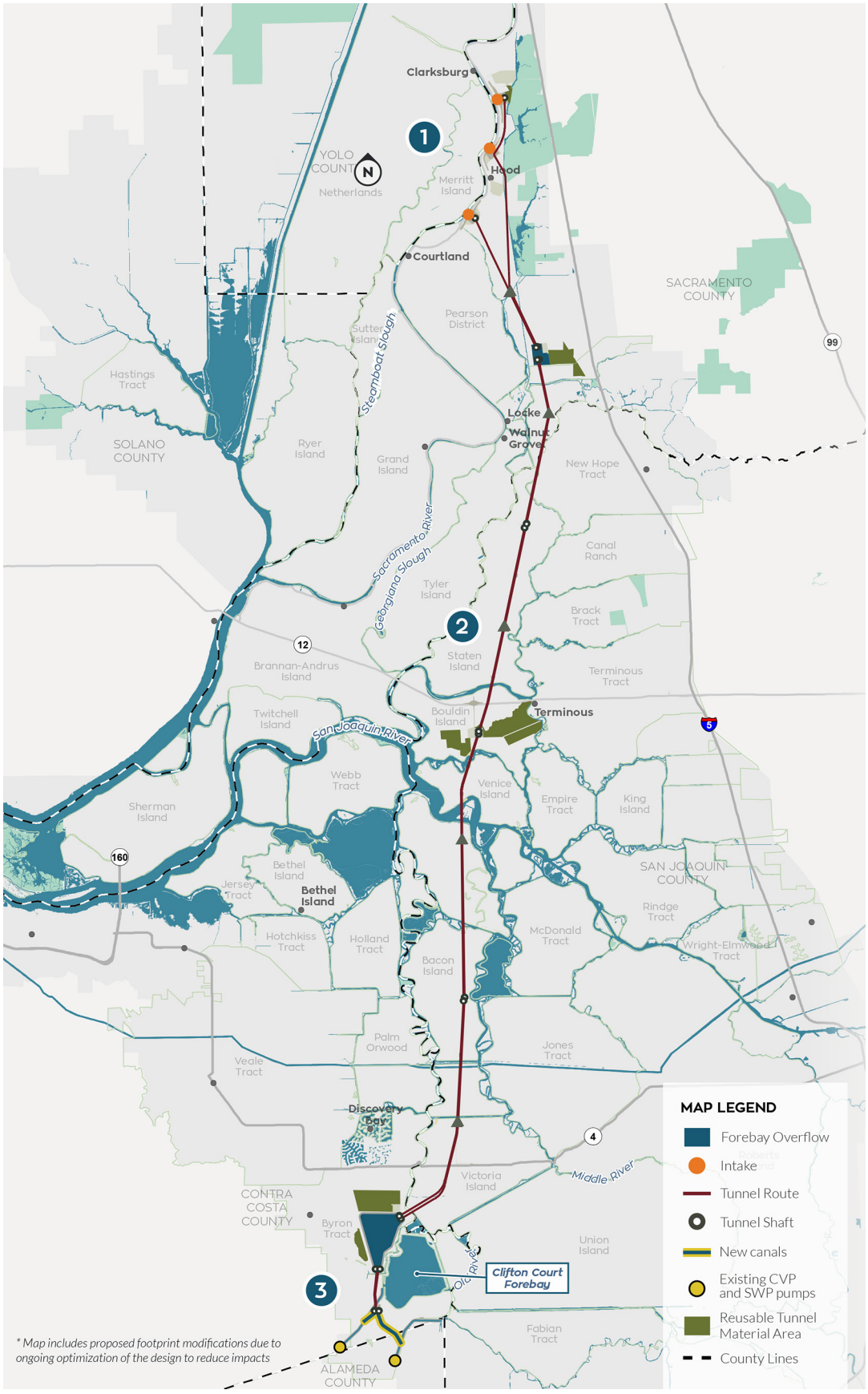
We at Restore the Delta have regarded this project with horror and malice because of its likely ecological effects, but especially in recent years because of its likely human toll from water quality impacts on the Delta's struggling regional economy.

The city of Modesto's beloved slogan honoring the Tuolumne River proclaims, "Water, Wealth, Contentment, Health." In the Delta's case, taking away more Delta water will set back Delta environmental justice communities on each of these fronts—wealth, contentment, and health, all of which are environmental justice issues—and it is against these basic but devastating impacts of the tunnels that RTD has fought since 2014. (See Introduction.)

Delta agriculture and industry must be part of the Delta's future. They provide jobs and economic stability to our region. Restoring the Delta is not about returning to some unattainably pristine, natural past of all tule marshes from West Sacramento to Manteca and Antioch, up and down the Central Valley. RTD has never, nor will we ever advocate that. It is about restoring the Delta's natural environment and diverse cultures, protecting economic dignity for Delta residents, and securing a future rooted in a healthier estuary and economy than we have today, or would ever have with a massive tunnels project diverting the Delta's freshest river.

Restore the Delta's advocacy is about Delta communities' just claim to sustainable wealth, contentment, and environmental health.

Map 3: Delta Tunnels Project Alignment



Map courtesy of californiawaterfix.com

Today's Delta Crises

The crisis of the Delta is NOT a conflict of fish versus people. It's a power struggle between people who want to export more Delta water, and Delta people wanting to keep their fair share of Delta water.

The Delta's water supply and ecological crises reduce to this: the state's water industry sees the crisis as one of increasing Delta exports to boost the reliability of receiving imported water in regions south of the Delta (including Silicon Valley), while merely preventing fish extinction.

For RTD, environmental groups, Northern California Indian Tribes, and the commercial and sport fishing industries, water reliability for California looks like a system of diverse water supply sources that offsets reduced reliance on the Delta (including local self-sufficiency and efficiency projects), while meeting long-legislated salmon-doubling population goals[9], ridding the Delta of invasive species and toxic stressors (like pesticides and selenium), and ensuring that reduced exports become increased inflows to and through the Delta to San Francisco Bay. In our view, water supply reliability is to be sought elsewhere than at the Delta's expense, even though we recognize the Delta will always be a water supply donor.

Improved water quality and flows through the Delta will be good for Delta farms, farm workers, tourism and recreation, and the other industries that depend on this economy. And it would be good for fish and ecosystems as well.

This chapter describes three broad areas of tunnels' impacts on the Delta: first, the project is essentially illegal; second, it has direct impacts to flows and water quality in the Delta; and third, it will impact human uses of water for farms, subsistence fishing, urban drinking water supplies, and urban water rates.

The Tunnels Project is Illegal[10]

The tunnels project is illegal because it is directly opposed to state policy to reduce reliance on the Delta for California's future water needs. The Delta Reform Act of 2009 (Act) mandates that: "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." Restore the Delta amassed voluminous evidence for the State Water Resources Control Board (SWRCB) showing that the project would increase conveyance capacity and north Delta diversions, raising expectations that increased SWP allocations and water transfers will be forthcoming on its completion.[11] This would continue and expand the water contractors' reliance on Delta exports for California's future water needs, not reduce it.

The tunnels' environmental documents provide no concrete analysis of their compliance with this policy of the Act. That is because there has been no meaningful compliance or enforcement. In the project's final environmental report, DWR rejected their own responsibility for enforcing the Legislature's command in Water Code section 85021 to reduce reliance on the Delta for California's future water needs. Yet, as a state agency, it is responsible for enforcing reduced Delta reliance by aligning its water service contracts and allocations of the SWP with Water Code Section 85021. The Bureau of Reclamation (the Bureau) has similar responsibility with respect to its owning and operating the CVP and administering contracts for water service within that project's service area. The Bureau also has a duty under the National Reclamation Act of 1902 to comply with the water laws of states in which the Bureau operates, including reducing Delta reliance.[12]

The Role of Water Transfers

Water in streams is mostly spoken for as an object of property—water rights. A water right is a right to take and use water. There are two main types of surface water rights in California: riparian and appropriative. Riparian rights to water (which are part and parcel of owning land immediately adjacent to rivers or streams) are, after Indian reserved water rights where they exist, the most paramount rights to use water in California. They are followed in seniority by appropriative rights claimed before 1914 and then by appropriative rights permitted and licensed by the state of California after 1914. Appropriative rights are enforced by the adages, "first in time, first in right" and "use it or lose it." The earlier in time a claim is dated, the more senior; rights claimed later in time are considered "junior." And if you don't use your water right, someone else could challenge it and you could lose it—the appropriative principle of "due diligence." In contrast, riparian right holders cannot lose their rights as long as they remain attached to their land next to a stream.

Cross-Delta water transfers are trades of water from senior water right holders in the Sacramento Valley region for compensation from south-of-Delta SWP or CVP contractors that must presently flow through Delta channels before they are lifted into CVP or SWP aqueducts.[13]

DWR and the Bureau have operated water purchase programs, the Environmental Water Account, and Yuba River Accord Transfers for many years now.[14] Between 2008 and 2012, current facilities conveyed over 700 thousand acre-feet[15] (TAF) for the Lower Yuba River Accord program.[16] Between 2001 and 2007, the Environmental Water Account Program saw 1,351 TAF of sales and exchange activity.[17] Overall, statewide cross-Delta water transfers totaled 25,842 TAF between 1982 and 2011, of which 15,351 TAF were for short-term flows.[18]

Water transfers may be "wheeled" at times when one project's pumping capacity (that is, at Banks or Jones pumping plants) is insufficient to meet south-of-Delta water demand.[19]

The tunnels project would also provide a longer window of time than is currently allowed during which transfers could occur under current biological opinion and water quality restrictions.[20] The tunnels project's Final EIR/EIS similarly states:

> Due to the location of the new north Delta facilities, some of the restrictions relating to export of transfer water, including those related to Delta reverse flows or south Delta water levels and potential fisheries impacts (the basis for the current July through September transfer window) would not apply to the new facilities. Thus, transfer water could potentially be moved at any time of the year that capacity exists in the new cross-Delta facility and the export pumps, depending on operational and regulatory constraints. If the new north Delta facilities are not restricted to the current July through September transfer export window, crop idling or crop shifting-based transfers may become a more viable source of transfer water for much of the Sacramento Valley.[21]

State and federal water contractors are excited about this. A Westlands Water District (WWD) staff report in September 2017 endorsed the merits of financial participation in the tunnels project, partly because it would increase the value of water transfers. Participating financially in the tunnels project would eliminate a "water loss of approximately 20 to 30%" to what is called carriage water—fresh water typically from the Sacramento River that creates a hydraulic barrier against tidal salt water entering the western Delta as water passes from the Delta Cross Channel into the central Delta to the south Delta pumps. The significance of reducing carriage water losses would be to increase potential water transfer supplies crossing the Delta through the tunnels project.[22]

While the WWD Board chose not to participate financially, their staff analysis of and continued support for the tunnels project's yield indicates expectation of increased exported water to south-of-Delta for the tunnels project's yield indicates expectation of increased exported water to south-of-Delta

contractors—an expectation contrary to the State Legislature's command to reduce reliance on the Delta for California's future water needs.

The predominantly agricultural Kern County Water Agency (KCWA) clearly expects to participate in the tunnels project as well. KCWA's "overall share of California WaterFix" was projected to be 13.33 percent, yet KCWA committed funding to reflect about half of the projected 13.33 percent.

The Metropolitan Water District of Southern California (MWD) is a state water contractor with the largest contract amount among SWP contractors. Like Westlands and Kern County, MWD informed its board that the tunnels project "would significantly increase the amount of available capacity to accommodate the movement of water transfers across the Delta and the SWP and CVP system" and that "California WaterFix would provide much greater capability to manage transfers."[23]

To back up this assessment, MWD and other SWP contractors (including KCWA) in June 2018 completed four months of negotiations to amend SWP contracts to make it easier than ever to conduct water transfers and exchanges in the SWP and to allocate tunnels project costs at the same time. On July 10, 2018, the MWD Board committed to fund nearly two-thirds of the tunnels project as well as the other third, assuming that potential CVP agricultural water contractors would pay a share of protect costs sometime in the future.

Simply put: The Delta tunnels project violates the Delta Reform Act's requirement that exporters reduce reliance on the Delta for California's future water needs.

The Reduction of Freshwater Flows and Worsening of Delta Water Quality

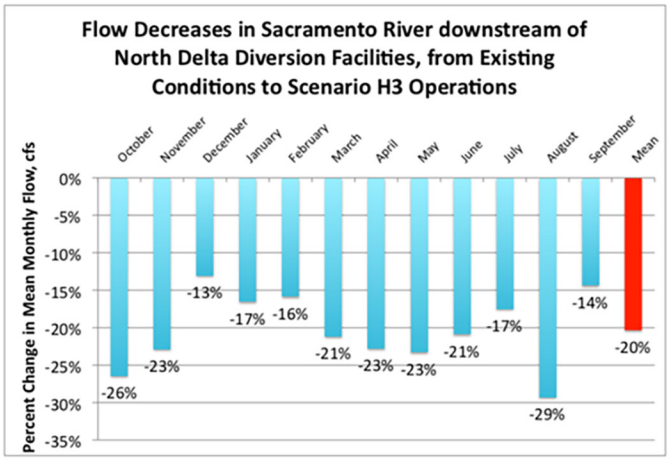
There are four principal ways in which operation of the tunnels project will alter Delta flows: 1) Removal of flow via diversion; 2) Occurrence of reverse flows in the north Delta; 3) Increased residence time of water (that is, flows slow down or grow slack); and 4) Source composition of Delta waters will shift to more polluted San Joaquin River flows in Delta channels.

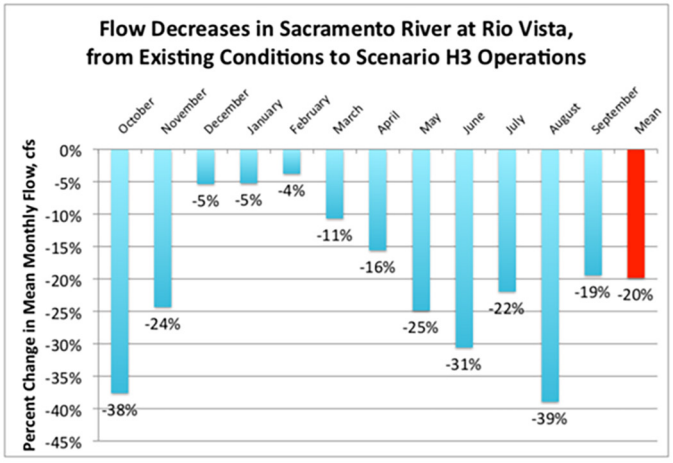
1. The tunnels project will remove fresh water flows from the Sacramento River

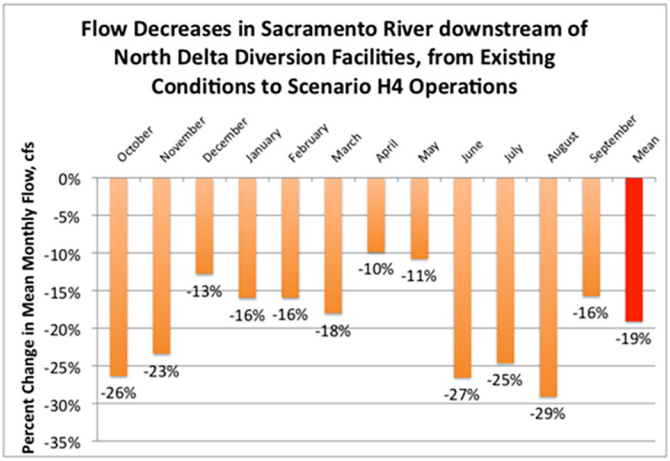
Flows in the Sacramento River downstream of the tunnels project's three north Delta diversions would decrease in every month on average, according to DWR and Bureau data.[24] The following charts show flows in the Sacramento River at two locations: just downstream of the tunnels' north Delta diversion facilities and at Rio Vista (21 miles downstream); these charts also show these river flows for two different operational scenarios, one in which exports are emphasized over Delta outflow and fish-protective flows at certain times of year (H3), and one in which Delta outflow and fish-protective flows are emphasized over Delta exports (H4).[25]

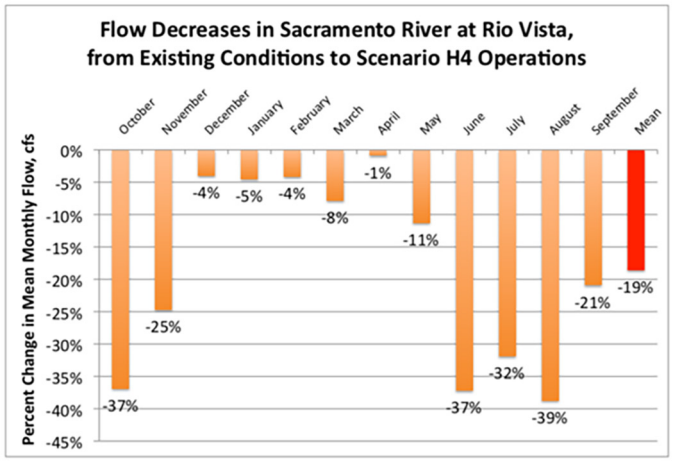
Not only would flows immediately downstream of the tunnels project be reduced substantially, flows in the Sacramento River at Rio Vista, 21 miles downstream from Courtland (a town in the vicinity of the project 's farthest-downstream intake) would also be reduced substantially under nearly every operational scenario, every month, and nearly every water year type by tunnels' operations. (Appendices 5 and 6.)

The data on the next page shows that Sacramento River flow alterations from tunnels project operation would have regional scale effects, since flow reductions are identified in these results at specific locations 21 miles apart. Flow reductions on such a scale would injure municipal, industrial, and agriculture uses in between, as well as along various distributaries near to and downstream of the north Delta diversions, such as Elk Slough near Clarksburg, Sutter Slough at Courtland, and Steamboat Slough just south of Courtland. Fresh water diversions at the City of Stockton's Delta Water Supply Project (DWSP) on Empire Tract would decrease as well due to increased salinity.









2. With the tunnels operating, reverse flows, or "upstream transport" would occur at times of reduced Delta inflow

The Sacramento River normally supplies flows to the Delta Cross Channel (when its gates are open) and to Georgiana Slough just below Walnut Grove. Reduced Sacramento River flow would result in less flow distributed to upstream and downstream distributaries. During dry years and seasons, reduced inflows to the northern Delta would allow more salty tidal penetration upstream into Delta channels. At very low Delta inflow from the Sacramento, north Delta diversions could result in reverse flow along the Sacramento River, as far upstream as Freeport.[26] East Bay Municipal Utilities District (EBMUD) and Sacramento County Water Agency (SCWA) jointly operate the Freeport Regional Diversion Facility. EBMUD and SCWA have voiced concerns about reverse flows in the absence of habitat restoration undertaken downstream.[27]

Between the Freeport Bridge and the Freeport Regional Diversion Facility (FRDF) is the discharge point for the Sacramento Regional County Sanitation District (SRCSD) wastewater treatment plant. While SRCSD has improved the quality of its discharge waste in recent years, reverse flows toward the FRDF can force costly shutdowns to avoid risk of contamination of both SCWA's and EBMUD's water systems. EBMUD in particular testified to the SWRCB that, with tunnels operating at Clarksburg downstream of SRCSD's outfall, significant reverse flow events in the Freeport reach of the Sacramento River would increase depending on how bypass flows in the area are handled.

Reverse flows in the vicinity of the tunnels' north Delta intakes during low flow periods could also risk entrainment of fish brought upstream to intake fish screens. The effectiveness of fish screens for actually protecting fish is unproven at this time.[28]

3. Residence time of water would increase from operation of tunnels project

"Residence time" represents the length of time a given parcel of water "resides" in a channel or other water body. A fast-moving flow usually means a low or short residence time of water, and vice-versa. This is important to water quality because, in shallow slow-moving water bodies, water temperatures can rise in the summer, perhaps past lethal thresholds for some resident fish species, or triggering harmful algal blooms if certain other preconditions exist. Lengthened residence time of water in both the Delta and Suisun Marsh can also result in increased bioavailability of potentially toxic levels of selenium entering benthic food webs.

Residence time of water is an estimate of the length of time that the same water molecules remain in a water body before flow, evaporation, or plant evapotranspiration removes them from that water body. Residence time is critical because the longer contaminated water remains in the same general place, the greater the potential for toxic interactions with organisms in that water.

Human and ecosystem impacts resulting from residence time contamination include: 1) water contact recreation; 2) native fish that feed on shellfish and other benthic invertebrates bioaccumulating selenium and other toxins; and 3) commercial, recreational, and tribal and subsistence fishing and hunting uses, especially those that involve fish and wildlife predator species such as sturgeon and a number of diving ducks.

Residence times of water in the south Delta and the North Bay can last from 16 days to three months during low flow, depending on levels of through-Delta flow and mixing activity. In Suisun Bay, they may range from half a day during high flow to 35 days in low flow conditions.[29] Removal of Sacramento River flows from the north Delta will result in less overall fresh water reaching western and central Delta channels, including through Georgiana Slough or via the Delta Cross Channel.

Reduced mainstem flow of Sacramento River water—as engineer Thomas Means pointed out ninety years ago—may also affect seepage to local groundwater sources, and poorer Delta water quality could also affect subsurface groundwater sources of irrigation and drinking water.

In the north, central, south, and west Delta areas, and in the Cache Slough region, deprivation of 20 percent or more of mainstem Sacramento River flow by tunnels operation would increase the residence time of water relative to not building the tunnels or improving current operations. (See Appendices 5 and 6.) In the north Delta, average seasonal residence time of water is expected to increase from 38 to 41 days; in the west Delta, from 22 to 25 days; in the eastern Delta from 36 to 45 days; in the south Delta from 16 to 25 days; and in the Cache Slough region from 29 to 35 days on average.[30] Similar increases in residence times of water were reported in modeling results from Bay Delta Conservation Plan effects analyses.[31]

4. With tunnels project operations, the mix of water sources at various locations in the Delta will add more San Joaquin River water, worsening water quality generally

To summarize, the Bay-Delta Estuary is a complex body of water with many sources. These sources enter as Delta inflow from the Sacramento and San Joaquin rivers as well as numerous smaller rivers, creeks, and sloughs; and tidal flow reaching Delta channels from San Francisco Bay. Each of the three north Delta diversions would remove and isolate Sacramento River water from the estuary for direct conveyance to SWP and CVP export pumps.[32]

As more Sacramento River water is removed, more tidal salt water and flows from the saltier and more polluted San Joaquin River will fill the void thus created. Of necessity, Delta water quality will degrade.

The San Joaquin River is known to have a worse water quality profile for salinity and other pollutant concentrations than the Sacramento.[33] They acknowledge that "the operation of CWF [the tunnels project] has the potential to change flow and water quality at some locations in the Delta…"[34] Generally, SWRCB acknowledges that water quality of the lower San Joaquin River (SJR) "has decreased markedly in recent decades and has generally coincided with SJR flow reductions, population growth, and expanded agricultural production. There are numerous water quality constituents in the SJR basin which can negatively impact fish and wildlife beneficial uses including: dissolved oxygen, salinity and boron, nutrients, trace metals, and pesticides [citations]."[35] Parts of the San Joaquin Valley are also naturally contaminated with salts, selenium, total dissolved solids, and high levels of other toxic elements like arsenic and molybdenum.[36]

The tunnels project would degrade agricultural irrigation and drinking water uses in the Delta to the point of injury as fresh, clean Sacramento River water would be replaced with polluted San Joaquin River water. Removal of fresh water at the north Delta intakes would reduce fresh flows passing through the Delta Cross Channel at Walnut Grove, and less good quality fresh water would pass through the intervening Delta channels reaching Delta communities. The major water quality improvements of this isolation of flows into the tunnels project are reserved for supplies reaching Banks and Jones Pumping Plants which export that water south of the Delta. [37]

MWD eagerly awaits the water quality benefits of the north Delta intakes, stating that the tunnels project water supplies would be "generally lower in salinity, organic carbon, and nitrates as compared to the San Joaquin River and south Delta." Compared to not building the tunnels or improving current operating conditions, tunnels operations would reduce salinity in export water by 18 to 22 percent; total dissolved solids by 17 to 22 percent; bromide by 31 to 43 percent; of organic carbon by 2 to 11 percent; and nitrates by 5 to 27 percent.[38] Water quality is important to MWD for blending to improve its poorer quality Colorado River Aqueduct supplies. According to MWD:

> To meet these blending goals, on average Metropolitan needs 950,000 acre-feet of SWP supplies Without the water supply reliability improvements provided by the California WaterFix, Metropolitan will be less likely to meet this salinity goal.[39]

MWD's report ignored salinity impacts of tunnels diversions to the Delta.

Additionally, DWR and the Bureau acknowledge that water quality degradation would result in more Delta concentrations of boron, bromide, chloride, nitrates, dissolved organic carbon, methyl mercury (from construction and habitat restoration disturbance), harmful algal blooms, and selenium.[40]

The tunnels project will degrade flows and water quality to the point of harming human uses of Delta waters and resources.

Environmental justice is about protecting vulnerable populations' access to nature where they eat, play, work, and live. For Restore the Delta, this means keeping the Delta and its waters fishable, swimmable, drinkable, and farmable for Delta communities.

Agriculture is the Delta's economic base, producing crops on area islands and tracts for direct sale and as inputs to regional food processing industries (such as processing tomatoes). Delta farms depend on irrigation water drawn directly from Delta channels during the growing season.

Cities and towns throughout the Delta provide labor and markets for agriculture, and the region's rail, port, and highway systems help get Delta products to markets elsewhere. These population centers in turn also draw from Delta river channels for drinking and municipal water use for their residents and usinesses. This portion of the report focuses on impacts to populations centers resulting from the tunnels.

In spring, summer, and fall it is common to see Delta residents swimming, playing, boating, and fishing in and along Delta channels. To cope with ongoing poverty and food deserts plaguing the region, many Delta EJ residents use fishing as a low-cost supplement to their diets—subsistence fishing. Additionally, California Indian tribes rely on the Delta as their sacred salmon's migration corridors, enabling the large meaty fish to return to natal streams of the upper Sacramento River watershed. Their return signifies both the wholeness of their tribal cultural world and abundant and healthful food year in and year out.

Delta Agriculture

In the north Delta, where most direct tunnels impacts will occur, major agricultural crops include pears, vineyards, and other permanent deciduous crops—all of which depend on good quality fresh water supplies. Removal of 20 percent or more of the fresh water in this region of the agricultural Delta will reduce fresh water supplies to farmers and cause injury to their water rights and crop productivity when salts build up in soil horizons, which must be leached out.[41] Increased salinity conditions in affected parts of the Delta will mean agricultural uses will be injured by having either to accept lower crop yields or shift to more salt-tolerant crops, or both. Either strategy will result in reduced farm income and reduced income and economic activity for the Delta region as a whole.

In 2010, the Delta Protection Commission retained Dr. Jeff Michael, economist with the University of the Pacific in Stockton, to prepare an "economic sustainability plan" for the Delta.[42] Dr. Michael studied factors that farmers use to make crop decisions: anticipated market demand for the crop, access to transportation routes for efficient delivery to market, soil conditions, underlying land value, potential for conversion of their land to urban or other use than agriculture, irrigation water availability, and irrigation water quality. The Delta Economic Sustainability Plan (DESP) reported that Delta farmers monitor salinity levels closely in their current operations and that some already incur costs in chemicals and drainage systems to deal with current levels of salinity.[43]

The DESP also analyzed looming salinity issues as known in 2011. On one hand, Phase 1 of SWRCB's Bay-Delta Estuary water quality control plan (WQCP) was proposing to increase allowable salinity in Old and Middle River channels by up to 41 percent in the south Delta.[44]

In 2011, there existed a conceptual proposal from the BDCP for isolated conveyance around or under the Delta. At the time the DESP was completed and adopted, neither the tunnels project of the BDCP (announced by the state in 2012) nor California WaterFix (announced in 2015) had yet been formally proposed. Consequently, the DESP considered an "isolated conveyance" proposal which, like the tunnels project, was described as dual conveyance.

In either case, however, broad salinity changes in the Delta would be similar. The Phase 1 changes to the WQCP focus on increasing San Joaquin River inflow while simultaneously relaxing salinity objectives for the River and its distributaries Old and Middle Rivers. In the case of isolated conveyance, fresh water from the Sacramento River would be subtracted during the irrigation season upstream of the Delta Cross Channel near Walnut Grove. Its absence would be filled by more flows from the San Joaquin River bypassing Banks and Jones pumping plants and more tidal flows reaching Delta channels from San Francisco Bay, as described above. While salinity concentrations in north Delta channels are also likely to increase as a result of isolated conveyance diversions, baseline salinity levels were lower there (that is, the water is fresher).[45] The modeling work done by Dr. Michael focused on south Delta channels where existing salinity conditions were already somewhat higher.

Urbanization and Delta Agriculture

Dr. Michael estimated in the long term that urbanization (independent of salinity changes) would reduce agricultural production in the Delta due to the loss of 26,625 acres of land to urban uses.[46] Another 5,404 acres of agricultural land in the Delta (1,495 acres temporarily and 3,909 acres permanently) due to

construction and alignment of the Tunnels project.[47]

While some Delta farmlands would convert to urban use, Dr. Michael also pointed out that urbanization can also offer opportunities for agricultural entrepreneurs, particularly for vineyard, fresh vegetables, and nursery products, as well as agri-tourism at the urban fringe. Such opportunities can become job opportunities for Delta EJ residents. He found that urbanization and the increased income it can bring can stimulate cultivation of high value crops in the Delta's future. With such stimulus, there would be an estimated $111 million increase in total agricultural revenue. But accounting for urban pressure, future net crop revenue growth was estimated at a net positive $68 million.[48]

Salinity and Delta Agriculture

Dr. Michael used nine years of salinity data from over 50 sites in the Delta region during the irrigation season of May through August, when sensitive crops are most vulnerable to salinity changes in irrigation supplies.[49] Conditions are generally fresher in the north Delta, with higher average salinity in the south Delta. Averaging the original data for the irrigation season has unfortunately masked spikes in the salinity data that may occur during years when the average is considerably lower. The data set also contained salinity conditions for six dry years out of nine.[50]

In addressing salinity changes, Dr. Michael found likely a large shift from high-value truck and vineyard crops to lower-value grain and pasture crops should salinity levels rise in the south Delta. These shifts would reflect choices by south Delta farmers to plant more salt-tolerant crops as salinity conditions worsened should isolated conveyance be operated and/or salinity objectives relaxed significantly.

The model estimated an 18 percent decrease in truck crop revenue for a 25 percent rise in salinity, as well as a 33.4 percent decrease in truck crop revenue for a 50 percent rise in salinity. Doubling salinity in the south Delta would result in an estimated 57.3 percent decrease in truck crop revenue, and for a 200 percent increase in salinity, an 83 percent drop in estimated truck crop revenue. Similar decreases were estimated by the model for south Delta deciduous and vineyard crops.[51]

The 25 percent salinity increase scenario on average would cost Delta counties (not including the food processing sector) an estimated $32.8 million in lost crop revenue, 389 total Delta region jobs, and over 519 jobs statewide. A 50 percent increase in salinity on average would cause crop losses valued at about $54 million, loss of about 640 total jobs in Delta counties, and 857 jobs statewide.[52] The method Dr. Michael used to generate these job loss estimates excludes impacts to the region's food processing sector, since food processors can take action to mitigate losses of direct Delta inputs to their production. In addition, the shift to grain and field crops (which are more salt-tolerant) results in production that is less labor-intensive (that is, these crops do not create as many jobs per unit output) than orchard, vineyard, or truck crops.

Should salinity concentrations double (a 100 percent rise), the DESP estimated would cost south Delta farmers nearly $89 million, more than a one-third reduction in crop values and land loss due to salinity impacts and tunnels construction and operation, exclusive of food processing. This would trigger an estimated loss of 1,053 total jobs in Delta counties and about 1,406 jobs statewide. Tripling salinity concentrations (a 200 percent increase), coupled with agricultural land losses, would shrink direct farm receipts in the south Delta by nearly $132 million. This would trigger an estimated loss of about 1,100 total jobs in Delta counties, and nearly 2,700 jobs statewide.[53]

These estimates of crop revenue and job losses from Delta salinity changes represent broadly the magnitude of economic injury to agricultural water rights holders, and the larger impact on total jobs in the Delta region and California that would result from changes to flow and water quality resulting from California WaterFix.

An independent review of the study commended Dr. Michael and the Delta Protection Commission for the DESP's analysis of salinity impacts to Delta agriculture.[54] Farm workers, an integral part of the Delta EJ community, would be the first impacted by Delta farm employment losses. It should be noted that many Delta farm workers are part of Delta urban communities and commute into the Delta daily for their employment.

Surface water quality degradation would harm Stockton's Delta water supply project intake for Delta EJ communities drinking water.

The Stockton region is poised for growth in the near future.

The Delta region, and especially metropolitan Stockton, is poised for employment and income growth in the years to come. Though Stockton filed for municipal bankruptcy in 2012, its regional economy (consisting of San Joaquin County, a portion of which makes up 40 percent of the Delta's land area) posted four straight years of over 3 percent job growth led by addition of 6,000 warehousing and trucking jobs associated with location of fulfillment centers in the Stockton area, including one by tech retail giant Amazon. Stockton, Tracy, Lathrop, and Manteca are the closest parts of the Central Valley to the Bay Area and Silicon Valley.[55] The University of the Pacific (UOP) business forecast for 2018 anticipates that Stockton's region will continue near its 3 percent pace for job growth at least through 2018. The same forecast expects per capita income for the last half of 2018 through the end of 2021 to grow from $43,000 to $48,800, a 13.5 percent rise over the next three years. Total non-farm employment in this period is expected to add another 10,700 jobs from its current 242,000 level. And the Stockton region's unemployment rate is projected by UOP to decrease slightly from 5.9 at present to 5.8 percent in 2021.[56]

Delta environmental justice communities are isolated from more mainstream levels of prosperity by racial or ethnic discrimination, language barriers, low educational attainment rates, and lack of economic opportunity. These same communities are closely linked to issues raised by the tunnels project such as drinking water quality; agricultural land use; socioeconomic issues; and fish contamination issues. Their residents are made more vulnerable by the disproportionately distressed conditions in which they live. Water quality impacts from construction and operation of tunnels project would be environmental blunt trauma to sustaining a region on the threshold of recovery and prosperity, if water quality in the Delta and underground water sources cannot be protected and improved.

It is also imperative to protect crucial beneficial uses of drinking water for predominantly low-income Stockton customer service areas and public health concerns for human use of Delta waters related to subsistence fishing, due to the current presence of long-term contaminants and the potential for increased frequency of harmful algal blooms due to operational effects of the tunnels project.

Urban Water Supplies and Demand of Stockton's Environmental Justice Communities

The two major suppliers of urban drinking water are the City of Stockton Municipal Utilities Department and California Water Service Company (CWSC). Both suppliers recently prepared urban water management plans. Total urban water supplies for Stockton delivered by these two water suppliers in 2015 came to 46,933 acre-feet.[57]

Both water suppliers disclosed how much water their low-income customer households use. These customers live in census blocks where the median income is less than 80 percent of the state median income. They comprise about 43 percent of housing stock in the City's water service areas in north and south Stockton, according to the City's recent general plan housing element.[58] Their water use in the City's service area is estimated at 10,300 acre-feet per year.[59]

Total low-income household water use for both of Stockton's water systems amounts to about 15,775 acre-feet at present in Stockton. Together, the City and CWSC project about 18,500 acre-feet of low-income household demand by 2040.

The City of Stockton Water System

The City of Stockton draws water from the Delta for domestic and municipal use[60], and is operating the diversion and treatment facility at this time to deliver water to its north and south Stockton customers.[61] The City's domestic water supply system diverts raw water at the Delta Water Supply Project (DWSP) under permit 21176 for treatment at the new Water Treatment Facility, pumps four (4) groundwater wells in south Stockton and 13 in north Stockton, and purchases treated water from Stockton East Water District and raw water from Woodbridge Irrigation District.[62]

The City of Stockton started operation of its DWSP in 2012. The City may take delivery of up to 17,500 acre-feet per year through its purchase contract with Stockton East Water District (SEWD).[63] Currently, due to drought and a reduction in SEWD's supplies, the City takes much less, about 5,634 acre-feet in 2015, and expects to receive 6,000 acre-feet in 2016 from SEWD's reservoir supplies of Stanislaus and Tuolumne River sources. The City's urban water management plan states that Stockton will use approximately 6,000 acre-feet per year from SEWD.

The City of Stockton executed an agreement in 2008 to purchase up to 6,500 acre-feet annually from nearby Woodbridge Irrigation District (WID). This water originates from the Mokelumne River. Stockton anticipates that its WID purchases will double to 13,000 acre-feet by 2025.[64] In all, the City's Municipal Utilities Department water supply portfolio supplied 24,843 acre-feet of water during 2015 to its 47,000 domestic, municipal, and industrial customers. The City claims safe yield water supplies of up to 96,480 acre-feet, nearly four times its actual 2015 deliveries.[65] The City of Stockton anticipates increasing its DWSP diversions to 50,000 acre-feet by 2035.[66]

The real impacts of tunnels operations on the City's DWSP have not been carefully studied. The City of Stockton has alleged that DWR and the Bureau have failed to use data collected near the City's Delta Water Supply Project (DWSP) for impact analysis of potential harm from the tunnels project. Instead, they relied on a DWR monitoring station at Buckley Cove, nearly ten miles southeast of the City's DWSP diversion point. The City contended that "Buckley Cove cannot be considered representative of the water quality available at the City's intake,"[67] because Buckley Cove has saltier and more polluted San Joaquin water compared with water available at Stockton's DWSP.

Stockton's other water provider, California Water Service Company (CWSC), delivered about 22,090 acre-feet to its Stockton District customers in 2015. To meet these supplies, CWSC purchased 15,350 acre-feet (69.5 percent) from Stockton East Water District (SEWD) and pumped 6,740 acre-feet (30.5 percent) from local groundwater in 2015.[68] CWSC projects that by 2040 its customers will increase demand to 30,740 acre-feet per year, a 39 percent increase over the next 25 years, an absolute increase of 8,650 acre-feet.[69] CWSC estimated water demand of lower income households based on the City's general plan housing element. The general plan indicated that 47 percent of CWSC's service area would qualify as lower income households. In 2015, lower income household customer demand was about 5,475 acre-feet of water use. By 2040, lower income household customer demand is projected to be about 8,213 acre-feet.[70]

Urban Drinking Water Quality in Stockton—Groundwater

Water in Delta channels affects groundwater, because surface water supplies in the Delta are connected. The Delta area has a large "cone of depression" that causes water from Delta channels to percolate to underground water supplies.[71]

United States Geological Survey groundwater modeling estimates that Delta surface channels lose between 100 and 500 acre-feet per year to groundwater percolation.[72] Surface water was also found to recharge groundwater from Calaveras and Stanislaus rivers and Dry Creek. On average there was a net lateral inflow to the groundwater system of 120,000 acre-feet between 1970 and 1993 (an estimated annual average of about 5,000 acre-feet per year). Generally, groundwater pumping rates in San Joaquin County in 2004 were found to exceed the sustainable yield of the groundwater basin, estimated at about 150,000 to 160,000 acre-feet. The eastern San Joaquin groundwater basin management plan assumed that "all basin inflow in west Stockton is saline" because "accretions in the western fringes of the Basin and the Lower San Joaquin River are undesirable due to elevated salinity levels. Saline groundwater intrusion has forced the closure of several wells in the CWSC's service area."[73] The City of Stockton's domestic water supply permit from the State Water Resources Control Board shows that Stockton has nine inactive wells and has destroyed another 17 wells.[74] Increased west-to-east flow is considered by San Joaquin County's groundwater basin management plan as "undesirable," as this water is typically higher in TDS and chloride levels and causes degradation of water quality in the Basin. The plan further states:

> Degradation of water quality due to TDS or chloride contamination threatens the long-term sustainability of a very important water resource for San Joaquin County, since water high in TDS and/or chloride is unusable for either urban drinking water needs or for irrigating crops. Damage to the aquifer system could for all practical purposes be irreversible due to saline water intrusion, withdrawal of groundwater from storage, and potential subsidence and aquifer consolidation.[75]

The saline front of groundwater intrusion beneath south and downtown Stockton is projected to move another 1.5 miles east by 2030, just as future urban water demand was expected to see a net increase among the cities of San Joaquin County of 146,600 acre-feet per year.[76]

Increased groundwater percolation from Delta channels containing surface water that is made more saline by operation of the tunnels project would increase the risk that poorer Delta Water Supply Project water quality would force Stockton and its other urban water supplier, California Water Service Company, to rely more on groundwater sources to supply their customers.

Each year, urban water suppliers release a summary water quality report based on samples of their treated drinking water. Both the City of Stockton and CWSC's water quality reports distinguish their reporting results by groundwater versus surface water sources. In Stockton's case, surface water quality sampling distinguishes between treated water supplies purchased from SEWD and the Delta Water Treatment Plant (which originated from the Stockton Delta Water Supply Project (DWSP)). At present, the only primary water quality standard violation Stockton experienced during 2015 concerned total trihalomethanes in surface water, which reached as high as 84 micrograms per liter (µg/L), in just one sample at Westchester Circle (the maximum contaminant standard is 80 µg/L).[77]

California Water Service Company suffered one primary water quality standard violation in 2015 when its purchased water supplier (SEWD) did not meet the total organic carbon (TOC) compliance standard. TOC provides a medium for formation of disinfection byproducts like trihalomethanes and halo-acetic acids. According to CWSC's water quality report, SEWD is now meeting the TOC standard in 2016.[78]

Both the City and CWSC water utilities report a somewhat elevated presence in their water samples of total dissolved solids (TDS), which is a secondary drinking water matter (addressing water's discoloration or odor). Stockton reports a TDS range in its groundwater of 210 to 560 milligrams per liter (mg/L) and an average of 358 mg/L, while its surface water sources have generally lower ranges and annual average concentrations of TDS.[79]

CWSC's groundwater has TDS concentrations that range higher than the City's groundwater but has a lower overall average TDS for groundwater than the City. CWSC's surface water TDS averages 160

mg/L, while Stockton's Delta water averages about 216 mg/L, and its purchased Stockton East water averages about 151 mg/L.[80]

To address water quality changes resulting from tunnels project operations, the City of Stockton would likely have to raise water rates on top of those increases it identified in its 2016 water rate study, in order to ensure treatment, distribution, and delivery of safe, clean, and affordable drinking water in its service area for the long term. Water rate increases have the most impact on Delta EJ households.

City of Stockton's Efforts to Protect Its Drinking Water Supplies and Its Protest of the Tunnels Project

The City of Stockton—a minority majority city—has received little if any consideration from DWR in its tunnels project planning. The City informed the State Water Resources Control Board in January 2016 that it sought to develop the DWSP to protect regional groundwater from increasing overdraft and to reduce its draw on groundwater because of that source's higher TDS content.

The City stated:

> Groundwater levels improved over the past few decades in the Stockton vicinity, but if groundwater must be relied upon more extensively as a result of the proposed action [the tunnels project], groundwater levels will be expected to decline, and TDS levels in potable supplies and wastewater discharges will increase. Indirect groundwater-related effects of this nature would be inconsistent with the Sustainable Groundwater Management Act or its goals.

The City also stated, in protest of the tunnels project's water rights petition, that:

> …the City's economy, and the health and well-being of City residents, are dependent on the health of the Delta, including water quality and fish and wildlife resources, and Delta agriculture.[81]

Stockton's DWSP provides a sustainable surface water supply directly from the Delta, located just a few miles south of the Delta Cross Channel at Walnut Grove. The City may divert for drinking water at DWSP an amount equivalent to its cleaned wastewater discharge.[82] This benefits all Stockton EJ communities. Removal of 20 percent of freshwater flows at the tunnels' north Delta intakes beyond Walnut Grove would drastically undermine Stockton's sustainable water balance and harm its residents, businesses and EJ community members.

The City expressed grave concerns that DWR has ignored City water rights, quality, and supply during the BDCP environmental review process in 2013-2014 as well as the California WaterFix environmental review process during 2015.[83]

Protecting good Delta water quality is vital to Stockton's economic future and the future of its EJ communities, as the City has argued:

> Reduced economic activity will result in empty buildings, decreased investment, reduced tax revenues, which will further constrain the City's ability to maintain public infrastructure, and therefore physical blight through deterioration of physical and aesthetic conditions within the City.
>
> [A]griculture in the Delta will be harmed from increased levels of salinity resulting from the operation of the Delta tunnels. The DEIR/EIS water quality chapter claims that BDCP impacts on salinity will be minimal based on the BDCP's modeling, but these results are strongly disputed. Furthermore, the state has repeatedly violated current water quality standards in the Delta or relaxed standards in dry years such as 2014 [and 2015]. Given this history of weak enforcement in the current system,

> the tens of billions of dollars borrowed to build the isolated conveyance system, and the fact that this debt will be repaid from revenues of water sales from the Delta, the risk of the BDCP actually operating differently than described in the DEIR/EIS and serious degradation of Delta water quality through excessive North Delta diversions is great.[84]

In its comments on California WaterFix in October 2015, the City reminded the Petitioners that their 2014 comments "identified numerous problems with BDCP and DEIR/DEIS" and stated that "to the City's surprise and dismay, none of the problems [we] identified…were addressed by the changes to the Project or the revised environmental documents."[85] To date and to RTD's knowledge, they still have not been addressed.

Water affordability in Stockton

To cope with water quality changes to its DWSP from tunnels impacts, water rates in Stockton would likely increase—again.

The City of Stockton and its residents are under financial pressure to pay down debt incurred to develop the DWSP. The City announced in May 2016 water rate increases for 2016 and 2017 of 18 percent and 11 percent, with 3 percent increases projected for future years, according to its recent water rate study.[86] The tunnels project would have a construction period of 15 years assuming no construction delays[87]. Meanwhile, water quality impacts (including increased risk of turbidity, salinity, and mobilization of mercury or methyl mercury, and selenium from Delta channel sediments) from the construction and operation of these facilities could result in increased treatment costs beyond those contemplated in Stockton's water rate study. Such upward pressures on local water costs could further disproportionately burden Stockton's environmental justice communities' drinking water supplies with higher water rates over the next 15 years, and beyond. DWR has failed to demonstrate that Stockton's water rights at the DWSP and the City's urban drinking water customers would not be injured by construction and operation of the tunnels project.

Concerning chloride effects, the City of Stockton also alleged that DWR failed to address impacts from chloride to its DWSP intakes, preferring in the BDCP DEIR/EIS to defer impact disclosure and possible mitigation to "some later date," which the City called unacceptable.[88]

Threats to Environmental Justice Communities' Information Access, Substinence Fishing, and Public Health

Though often maligned as regulatory overreach and a brake on new development, the California Environmental Quality Act (CEQA, and its similar federal law, the National Environmental Policy Act, or NEPA) protects the public's right to know what its decision makers choose (and why) and to compel decision makers to make hopefully better decisions in the public interest while minimizing new development's impacts on our shared environment. Compliance with these laws shines the light of day on government decisions that might otherwise be taken in the shadows of night. They protect fundamental democratic rights of all people, including Delta EJ communities, to have access to reliable information about events and actions that will affect our lives.

DWR and the Bureau have abused the full disclosure processes of CEQA and NEPA to advance the tunnels project. More interested in the project's brand than its environmental justice impacts, the state and federal water agencies undertook a shallow "astroturf" survey in 2010 claiming to represent California environmental justice communities statewide. Then they did minimal outreach to actual Delta EJ communities about the tunnels' impacts that the project's environmental reports showed would affect them directly—especially subsistence fishing, drinking water, and public health.

CEQA and NEPA processes are essential for full disclosure of the environmental justice effects of new developments. Environmental justice has two key elements: a process element concerning outreach to potentially affected environmental justice communities; and a substantive element concerning the potential for disproportionate and adverse effects to EJ communities. This section addresses the poor record of outreach documented by DWR and the Bureau in the tunnels' environmental review process followed by substantive adverse effects of constructing and operating the tunnels on Delta region environmental justice communities.

Environmental Justice Outreach Efforts by Petitioners

Outreach efforts by DWR for its tunnels project began with the Bay Delta Conservation Plan (BDCP) over ten years ago. The BDCP Steering Committee Outreach Work Group in mid-2007 wrote to the BDCP Steering Committee summarizing an overall strategy "early and consistent outreach to the public on the development of the BDCP in an attempt to get broader public input on the various conservation and conveyance options that are being considered." Their scope of work included preparation of BDCP, the BDCP EIR/EIS, and public involvement and outreach. The public involvement and outreach program would become the subject of a Request for Qualifications and was to include thirteen tasks, from work plan, schedule and budget to arranging and coordinating community presentations and event participation to media relations and "collateral material….These tasks should be conducted in accordance with the adopted Environmental Justice Policy of the California Resources Agency…and other applicable policies and procedures."[89] Exhibit A of this early memorandum contained the California Resources Agency's Environmental Justice Policy (in effect at that time).[90]

The BDCP Steering Committee received a "BDCP Delta Workshop Report" concerning a series of public workshops held in September 2009 in the Delta communities of Brentwood (approximate attendance 53), Stockton (approximate attendance 133), Walnut Grove (approximate attendance 87), and West Sacramento (approximate attendance 39). The overview of this report noted that:

> Many workshop participants disagreed with the validity of the BDCP's ecosystem and water supply objectives based on what they saw as the absence of Delta community needs in the planning process and the similarity of BDCP's draft eastern conveyance alignment to earlier conveyance proposals.[91]

These workshops provided early and apparently vehement feedback to the BDCP Steering Committee Outreach Work Group about the conveyance project discussed in those workshops:

> Impacts to Delta Communities
>
> Workshop participants expressed dismay over what they saw as an imbalance of benefits to water exporters in other parts of the state with impacts borne solely by Delta communities. They had specific concerns about what they saw as lasting and irreversible impacts to the local economy, water quality, flood protection and overall multigenerational quality of life from the construction and operation of Two-Gates, new water intakes and conveyance facilities, and habitat restoration. This includes impacts to agricultural, local business, boating, and recreational fishing communities.
>
> Community Assurances and Governance
>
> Delta workshop participants identified as a key issue the need for assurances to keep Delta communities whole as unintended consequences of plan implementation become known, both now and over time. They cited past practices (such as past failures to meet water quality standards, lack of consistent funding, and lack of intergovernmental coordination) in combination with the adaptive

> management element of the BDCP as reasons to increase the transparency and enforceability of commitments made to Delta communities during the planning process, environmental review, and over the course of the plan's implementation. Many workshop participants expressed the desire for the state to commit to a willing-seller approach to habitat restoration.[92]

Specific comments from the public described in the workshop report also reflect skepticism from Delta residents of the proposed BDCP at the time. Concerning "near-term outflows," the report stated that Delta workshop participants said that "salt water intrusion is already a problem and BDCP will make the problem worse; salt water species are already moving into areas where they have never been before (e.g., up to Martinez)."[93]

Restore the Delta representatives attending the Stockton community workshop recall that the diversity of the Delta community was not reflected in the audience of attendees. Attendees were almost all English-speakers, white, and aware of Delta water issues.

Subsequent to this workshop report, DWR undertook a survey to elicit a broader and more systematic understanding of the public's attitudes on environmental justice and water issues in the Delta and in the service areas of the SWP and CVP.[94]

The survey used a qualitative method, including representatives from farm bureaus, chambers of commerce, as well as community/faith-based organizations, elected officials, and representatives of ethnic group organizations.[95] The response rate for their original sampling approach is barely acceptable for usability of results, reporting 19 percent (260 of 1400 total identified) but was actually more like 17 percent (231 of 1400) when some of those who agreed to be interviewed ultimately declined or had conflicts.[96]

DWR survey authors acknowledge early in the summary that "these interviews allow for a detailed exploration of various key topics, but do not provide data that is statistically representative of a larger population." Sometimes their sample size was just too small from which to generalize. "Instead," they continue, "the information obtained through these interviews is considered descriptive and informative only." They further state (problematically we think) that their results "should be considered as representative of the wide range of opinions that may exist among communities throughout California." Good social science methodology would indicate instead that their results should "not" be considered as representative of the wide range of opinions that may exist among environmental justice communities throughout California. For example, their survey sample response rate is relatively low at 17 percent, and their method for surveying environmental justice informants does not rely on randomized selection approaches. "Participant Identification" was accomplished as follows:

> A database was developed to serve as the foundation for identifying the target survey participants. Included in the database were a number of key environmental justice stakeholders, including public interest associations, ethnic associations, local governments and interested community members and activists. Efforts were made to ensure that the database included a broad cross-section of potentially impacted minority and low-income stakeholders so that the responses represented as broad a view as possible.
>
> The 231 survey respondents represent the environmental justice stakeholders based upon their status as community leaders, and/or their direct involvement and/or access to information about low-income and ethnic communities. Survey questions were designed to solicit unique insights into underserved communities; of particular interest was the way in which area residents use the Delta.

To clearly define concerns expressed by those interviewed, six categories of participants were identified. Each respondent was assigned to one of the following categories:

- **Agriculture:** Representatives from farm bureaus throughout the state
- **Business:** Business owners, chambers of commerce, economic development, and employment organizations
- **Community or Faith-based:** Non-profit organizations and foundations, government-funded assistance programs, school districts and churches/places of worship
- **Ethnic:** Organizations specializing in outreach to minority communities
- **Government or Elected officials:** Government employees, local and statewide elected officials
- **Public Interest or Environmental:** Water districts, environmental advocacy groups

1.3 Methodology

Telephone interviews were conducted by professional community outreach consultants. A questionnaire was used to guide discussions with interviewees; however, respondents were encouraged to explore additional non-scripted related topics that arose during the exchange of dialogue in order to examine other areas of interest not accounted for in the survey questions.[97]

There was no effort to include and contact environmental justice community residents in the field about their experiences engaged in activities discussed in the survey, such as subsistence fishing or the quality of their drinking water supplies.[98] A close reading of the survey results reveals numerous problems with the survey itself, including how and with whom it was conducted.

The survey authors made geographical errors, mis-locating several cities into incorrect counties. For example, they call Alameda County part of the "North Bay" when it and Contra Costa County are part of the East Bay. They ignore environmental justice communities north of the Delta in the Sacramento Valley or in the Sierra Nevada regions north or east of the Delta, despite the fact that water transfers facilitated by BDCP would affect these communities.

Most of the other questions reported in the summary are broadly worded, intended to elicit a general awareness from respondents about their knowledge of the Delta, what they use it for (if they use it at all), and what community events, services, and programs members of EJ communities access.[99] Very often those eating fish from the Delta do not recognize their dependence on the Delta as a food source as family members simply bring them the catch of the day.

Nearly half of those they talked to in the survey were "elected/government officials."[100] While this group may be expected to know the views of their communities to some degree, they are not reliable guides to community sentiment or activities about environmental justice issues. "Agricultural" and "business" respondents were drawn from Farm Bureau, Chamber of Commerce, or other organized business groups.[101] About 35 percent each were drawn from "community/faith-based" groups and "ethnic" groups, representatives of whom are defined as primarily representing specific ethnic groups in each region. However, the churches involved were not always those most strongly tied with worship by Delta EJ community members.

Aside from the exclusion of "areas of origin" north of the Delta (e.g., Sacramento Valley and Sierra Nevada) from the EJ survey method, it also appears to use different questions for In/Near Delta, Central

Valley (actually San Joaquin Valley without Stanislaus County) and North Bay respondents as compared with all other geographic region respondents, or "service area respondents" (e.g., urban South Bay, Southern California, and Central Coast respondents). For service area respondents, DWR's survey team asked a series of questions under the rubric of "Understanding Water Issues." These questions included: Do you believe your city has water quality, water availability, or water affordability issues? Does your city have any type of water conservation program that you know of? Do you know where your drinking water comes from? Specifically do you know where your water provider gets their water? Do you think water quality, reliability, availability are issues to your community? Would the people of your community be able to afford an increase to their water costs if it meant higher quality or a more reliable source of water?

These questions either were not asked of or were not reported for the in/near Delta, "North Bay," or "Central Valley" respondents participating in the survey. Responses to the water affordability question strongly suggested that in the service areas outside the Delta the cost of water was a concern for environmental justice informants.

"South Bay" officials: "Four of [all] six respondents did not think their communities [would be] able to afford an increase to their water bill if it meant higher quality or a more reliable source. The two respondents who feel that their communities may be able to afford it, think a small increase may be affordable, but not 10, 25, or 50 percent."[102]

"Southern California" officials: 5 of [all] 14 respondents think their communities could afford an increase to their water costs if it meant higher quality or a more reliable source of water. Three of the five thought they could afford a 10 percent increase. One of five felt their community could afford a 25 percent increase in rates. None of the five felt their community could afford a 50 percent increase in water rates.[103]

"Central Coast" officials (the wealthier region outside of Santa Clara County) had two respondents total. "One respondent said his community could afford a modest increase, but a recent ballot initiative to increase rates was recently defeated. The other respondent said his community would not be able to afford an increase, as they already pay high rates." This latter one was from the Santa Barbara area. Neither of these respondents answered the questions about 10, 25, or 50 percent rate hikes being affordable or not.[104]

Chapter 28 of the Draft BDCP EIR/EIS includes the 2010 DWR environmental justice community survey report among its references, which is how Restore the Delta learned of its existence.[105]

Later in Chapter 32 of the same document, DWR briefly described its environmental justice outreach efforts: "During the document preparation process, public outreach activities were conducted that considered minority and low-income populations." No mention is made of communities where language barriers contribute to social or media isolation. The 2010 survey sought "to assess possible impacts and identify future outreach opportunities."[106] This section stated further that DWR and the Bureau's outreach activities would include:

- Providing notification and announcements of scoping meetings in ethnic newspapers [and] on ethnic radio stations.

- Conducting scoping meetings within affected communities during evening hours in an effort to involve low-income and minority communities outside of working hours.

- Providing translators at public scoping meetings.

- Providing the BDCP Website in Spanish.

• Providing a multilingual information hotline for project information in English, Spanish, Tagalog, Vietnamese, or Chinese (Mandarin).[107]

DWR added further that:

> Prior to the release of the Draft EIR/EIS, additional public outreach efforts were targeted to minority and low-income communities to make them aware of the document availability and contents. Activities included briefings with leaders of affected communities, translation of materials, and notification of document availability in ethnic media.[108]

The Department of Water Resources and the Bureau of Reclamation, however, failed to conduct any of the environmental justice outreach for the project as outlined as necessary by the consultant, and did not even translate the most basic documents into other languages until Restore the Delta and Delta EJ groups got involved in May 2014.

DWR summarized its environmental justice outreach efforts Appendix 32A of the BDCP Draft EIR/EIS as having no entries; a title for "Environmental Justice" is included but this chapter contains no description of Environmental Justice-related outreach activities by DWR, not even the 2010 environmental justice community survey.[109] Later, this appendix presents actual promotional materials created by DWR to support broader public outreach efforts. However, none of the documents contain mentions of the phrase "environmental justice" and indicate no effort by DWR to do meaningful outreach.[110] All materials included in Appendix 32A were presented in English only. No translations of these materials, let alone the environmental impact documents, were included for other languages.[111]

A coalition of environmental justice and community groups wrote a letter to DWR in May 2014 on behalf of their communities to request a restart and extension of the public comment period for BDCP "to provide meaningful access and participation of California limited English speakers, including Delta limited English speakers attempting to engage with the Draft Bay Delta Conservation Plan and draft EIS/EIR. In particular," the letter continued, "we request that the agencies hold public hearings and provide interpreters; translate vital documents such as, at the very least, the Executive Summary of the first environmental report; and provide affordable access to documents to allow the thousands of low-income and limited English speakers to have meaningful participation in the process." This letter described that a majority of Spanish, Cambodian, and Hmong speakers have not been made aware of the 47 significant, unavoidable, and adverse impacts identified in the first environmental report's summary "that will have a direct impact on residents of the five Delta counties." The letter further noted that the interviews conducted as part of the DWR environmental justice community survey were all conducted in English. (See Appendix 8.)

The letter stated that all public open house meetings for BDCP were completed and that:

> For these most recent meetings during the public comment period no translation or interpretation services were offered to the public. Attendees of these open house meetings have noted back to us that no interpretation series were advertised at these meetings. Furthermore, a Lexus-Nexus search for Bay Delta Conservation Plan meeting notices shows only four stories in languages other than English discussing the proposed plan, with those stories appearing only between February 2010 and April 2011, with not one reporting on the public comment period for the BDCP. There is no record of media outreach to limited English speakers throughout California, let alone limited English speakers in Delta communities that will bear the brunt of the impacts for this project, or media outreach to non-English speaking communities regarding the release of the public draft of the plan and its EIS/EIR or the public meetings held in the early months of this comment period.[112]

2015 CWF Translation of Public Relations Materials into Other Languages

For two open houses held in Sacramento and Walnut Grove in July 2015, attended by Restore the Delta

staff, DWR made available short promotional materials translated into several languages, including Spanish and Asian languages. However, a search of the California WaterFix website on August 22, 2016, on the term "translation" returned "nothing found" as the search result. Similarly, searches on terms "Spanish," "Tagalog," "Vietnamese," "Chinese," "Hmong," and "Lao" each yielded the result "Nothing found" at the California WaterFix website. During 2015, non-English speakers who worked with Restore the Delta organizers did call the Spanish translation number listed on the California Water Fix website; calls were returned days later by a translator who indicated that they could "get answers" to questions, but who could not provide any written materials describing the project or the projects impacts. The California WaterFix website demonstrates DWR's lack of attention to documenting, let alone carrying out environmental justice outreach requirements, even when they actually did produce translations of promotional materials for the proposed project.

Subsistence Fishing and Delta Water Quality

The character of subsistence fishing issues ranges wide, from the reliance of Northern California Indian tribes on native salmon runs since time immemorial, to local angling by Delta residents to supplement their diets within their family budgets.

The Experience and Claims of the Winnemem Wintu Tribe of Northern California

The Winnemem Wintu Tribe of the McCloud River region in Northern California has borne a disproportionate burden of historical water resource development in the Delta's Sacramento River watershed. Shortly after California statehood in 1850, federal Indian treaty commissioners deployed in California to conclude treaties with California Indian tribes, including a "Treaty of Peace and Friendship" with the Winnemem Wintu Tribe in August 1851. This Treaty promised the tribe a 25 square-mile reservation in Northern California. It was one of seventeen other treaties the federal government executed with nearly 120 other tribes. In exchange for Indian reservations throughout the state, the tribes ceded much of the rest of their ancestral lands to the U.S. Government, mostly west of the peaks of the Sierra Nevada and peaks bordering the western edge of the Mojave Desert. Ratification of all eighteen treaties, however, was rejected by the U.S. Senate in July 1852 after California officials and newspapers lobbied against them. State and federal leaders at the time failed to establish the promised reservations to the tribes, while allowing settlement to proceed on those ancestral lands by non-Indians anyway, contributing to the California we know today.[113]

The Winnemem Wintu Tribe received some land allotments totaling nearly 4,500 acres in 1893 under the federal Indian Allotment Act of 1887 (also known as the Dawes Act), but in the early twentieth century, the State of California began planning for a major reservoir on the upper Sacramento River where these allotments were located—a project that would eventually become Shasta Lake. Tribal governmental affairs liaison Ponti Tewis testified to the SWRCB in 2018 that the Winnemem Wintu Tribe was removed from many of their allotment lands which the U.S. Government wanted for the new reservoir:

> 22. The idea of constructing a dam on the Sacramento River began to come to fruition in the 1930s. Agents were dispatched to land owners and allottees in the area that would be affected by any dam construction and the resulting inundation it would cause. Many of the Indian allottees could neither be found nor contacted, for a variety of reasons, regarding the possible sale or exchange of their land for other land that would not be inundated. This proved to be problematic and delayed the beginning of construction of the dam.
>
> 23. To remedy this problem, in 1937 Public Law 198 [S1120] was introduced and titled the Central Valley Project Indian Land Acquisition Act. This Act was signed into law in 1941, as 55 Stat. 612.

The purpose of this act specifically states:

> Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That, in aid of the construction of the Central Valley project, authorized by the Acts of April 8, 1935 (49 Stat. 115), and August 26, 1937 (50 Stat. 850), there is hereby granted to the United States, subject to the provisions of this Act, (a) all the right, title, and interest of the Indians in and to the tribal and allotted lands within the area embraced by the Central Valley project ....

24. This Act, which took all the Indian Lands within the area embraced by the Central Valley Project, also set out provisions for compensating those affected, e.g., (1) provide just compensation for the lands that would be flooded (55 Stat. 612, sec. 2); (2) acquire lands and improvements for the land taken (55 Stat. 612, sec. 3); and (3) provide a Cemetery to be held in trust for the appropriate tribe or family, as the case may be (55 Stat. 612, sec. 4).

25. 1938 brought the beginning of construction on a new dam at Kennett, CA, known first as the Kennett Dam and later to be known as Shasta Dam. When completed, the dam would capture flows from three rivers, the Sacramento, McCloud, and Pit, as well as the flow from other tributaries such as Squaw Creek. The captured water would eventually inundate thousands of acres of land, including hundreds of miles of prime salmon spawning grounds, historical tribal village sites, sacred sites, burial sites, and cultural gathering sites. The dam would also effectively extirpate all existing salmon runs in the upper Sacramento, McCloud, and Pit Rivers.

26. The removal of the Winnemem from the river began with the taking of Winnemem allotments. In 1943 the Winnemem living on traditional homelands on the lower McCloud River (Baird and surrounding areas) were removed. The Winnemem Wintu that were removed from the area were not removed by relocation, because no like land was ever provided to replace the land that would be flooded; they were removed by virtue of their homes being bulldozed down. Water would inundate these village areas and sacred sites due to the filling of Shasta Lake. The Department of Interior and its Bureau of Reclamation never fulfilled the requirements of the Central Valley Project Indian Lands Acquisition Act (55 Stat. 612). No compensation was ever provided for the over 4480 acres of allotment lands that were taken, nor were there ever any other lands acquired for the Winnemem to replace the lands that were taken. The 4480 acres of allotment lands did not include the thousands to hundreds of thousands of acres of additional Winnemem Wintu historical homeland that were also taken. Over 90% of the Winnemem Wintu's historical village sites, sacred sites, burial sites, and cultural gathering sites along the three rivers and tributaries inundated by the filling of Shasta Lake were lost.

27. The only item from 55 Stat. 612 that was somewhat completed was the creation of a cemetery in Central Valley, CA (now Shasta Lake City). But the Bureau of Reclamation failed to hold the cemetery in trust for the "appropriate tribe" as the statute specifically directed—this, in spite of the fact that ALL the Indians that were originally interred in this cemetery were members of the Winnemem Wintu Tribe either by marriage or birth. The Bureau named the cemetery the Shasta Reservoir Indian Cemetery, thereby, intentionally or negligently, denying the Winnemem Wintu listing on the Bureau of Indian Affairs list of tribes with assets held in trust.

28. Shasta Dam has since become known as the "keystone" of the Central Valley Project to both state and federal agencies, but to the Winnemem Wintu it is only known as a weapon of mass destruction—the tool to destroy a culture and the means to exterminate a species.[114]

Ponti Tewis stated to SWRCB that the tunnels project "is just a continuation of what has come before…" with the development of California's Central Valley Project and the State Water Project, including the "peripheral canal" in the 1960s through 1982.[115] He told the SWRCB in the tunnels proceeding that "you

must consider the state of our salmon fisheries, with some species, like the winter-run [Chinook salmon], on the very edge of extinction."[116] Ponti Tewis also saw the interconnections of the tunnels project with proposals that seek increases in storage north of the Delta—including enlarging Shasta Dam, which would flood more sacred sites used by the Winnemem Wintu Tribe:

> The obvious conclusion to be drawn from these actions considered collectively is that the survival of anadromous fish is secondary to increasing the amount of exportable water and only used as a "carrot" to promote projects such as the enlargement, construction, and modification of dams and other water conveyance infrastructure aimed at allowing even greater water exports.[117]

Speaking for the Winnemem Wintu Tribe, Ponti Tewis formally requested that a National Historic Preservation Act Section 106 consultation be undertaken before any decision is made to permit construction and operation of the tunnels project.

Finally, from a water rights and Indian law perspective, Ponti Tewis argued to the SWRCB that the tunnels project is illegal, and its water rights proceeding should be suspended or enjoined "until such time as the inherent rights of the Indigenous People of this state are recognized, allocated, protected, and preserved first and foremost, before and above, any and all other claims to water in the State of California."[118]

Delta Subsistence Fishing and Water Quality Issues

The California Department of Water Resources and the U.S. Bureau of Reclamation failed to carry out a robust and inclusive public outreach effort among environmental justice communities of the Delta region from the onset of BDCP to the current California WaterFix proposal before us in the present.

Yet, DWR acknowledges occurrence of subsistence fishing and risks of adverse effects to people consuming fish caught from Delta channels in the period when Tunnels project operate. There has never been a census of Delta subsistence anglers, despite the potential health risks of catching and consuming fish routinely from Delta channels. Using publicly available data from the California Department of Fish and Wildlife (DFW), Restore the Delta estimates through two distinct methodologies that there are, on any given day, between 66 and 110 licensed subsistence anglers from distressed communities fishing Delta waterways. Our methodologies rely on both an angling hours survey and county-level fishing license data from DFW. Our methods conservatively assume that each angler fishes just once a year which probably underestimates total subsistence fishing activity in the Delta. Despite this limitation of our methods, we estimate between 24,000 to 40,000 subsistence fishing visits annually in the Delta from local residents of distressed communities. We offer no estimate of the mass of fish nor the number of persons actually consuming those fish.[119]

Delta region subsistence anglers have been found to fish along both the Sacramento and San Joaquin Rivers, despite the latter being an impaired water body due to a number of contaminants. Delta region subsistence anglers are known to catch and consume a variety of native and introduced fish species, including American shad, bluegill, carp, catfish, crappie, Chinook salmon, largemouth bass, pike minnow, Sacramento split tail, Sacramento sucker, steelhead/rainbow trout, striped bass, sturgeon, and sunfish.[120]

Many fish caught and consumed by subsistence anglers consume prey from the bottom of river channels where contaminants can accumulate. Other fish consumed by subsistence anglers feed on prey consumed in open water or other parts of river channels. In the course of consuming prey, these species may also consume contaminants such as mercury, pesticides, selenium, and other chemicals that accumulate in prey tissues and that are regulated via Total Mean Daily Loads adopted by the State Water Board and Central Valley Regional Water Quality Control Board. Consequently, environmental justice communities are at risk of heightened exposure to health risks associated with consuming fish caught through subsistence angling in the Delta.[121],

In addition, such fish may be vulnerable to disease and death from exposure to toxins released by harmful algal blooms, such as microcystin, a hepatotoxin (toxic to liver tissue and skin) produced by Microcystis, a common cyanobacterium found in the Delta since 1999. Key factors believed by scientists to drive algal blooms that cause harm in open water ways include water temperature, sunlight irradiating water, water clarity, a stratified water column coupled with long residence times of water; availability of nitrogen and phosphorus; and salinity.[122]

Two of these factors would be directly affected by operation of the tunnels project: residence time of water and salinity. Increased residence time of water decreases the loss rate of cyanobacteria from a water body. Inversely, increased residence time of water also influences the stratification of the water column; the slower the flow of water the more the upper levels of a water column can warm to an optimal growth temperature range for Microcystis, between 25 and 35 degrees Centigrade (77 to 95 degrees Fahrenheit). Such conditions may occur mainly in late summer months, but climate change effects may shorten California's winter wet season and contribute to extending the season during which harmful algal blooms may occur.[123]

Operation of the tunnels project would also increase residence time of water in the Delta. When such increased residence time is combined with reduced flows and increased salinity from tunnels' operations, the period of time could increase during which environmental conditions favor algal blooms.

The Delta environmental justice effects of increased harmful algal blooms would include increased contamination of fish populations locally from microcystin uptake and accumulation and increased risk of illness and death for environmental justice community members and pet dogs they may take with them fishing, due to contact with water while engaged in subsistence fishing. These dangerous effects would be borne disproportionately by racial and ethnic minorities, people in poverty, and people challenged by language barriers. These disproportionate effects would accumulate with the economic distress already prevalent in their communities and would undermine long-term growth in jobs, economic output, and sustainable economic development in the Stockton region.

Environmental Justice Impacts Described in the Tunnels Project Environmental Reports

DWR and the Bureau bear the burden to prove that legal users of water, including members of Delta environmental justice communities, will not be harmed by the new north Delta points of diversion. While tunnels' environmental reports mostly attempt to bury, dismiss, and lessen significant water quality impacts, one such report stated:

> Alternative 4A [the California WaterFix tunnels project] would result in disproportionate effects on minority and low-income communities resulting from land use, socioeconomics, aesthetics and visual resources, cultural resources, noise, and public health effects. Mitigation and environmental commitments are available to reduce these effects; however, effects would be disproportionate and adverse.[124]

The first environmental report, issued in late 2013, found that tunnels project operations would result in disproportionate effects on minority and low-income communities resulting from land use, socioeconomics, aesthetics and visual resources, cultural resources, noise, and public health issues.[125]

Specifically, the land use effects of the project would result from construction effects to lands where members of environmental justice communities reside or work, as well as the effects of dividing communities due to the construction of the tunnels project, such as the small community of Hood.[126] Because construction activities would also convert some agricultural land temporarily and permanently, and reduce the supply of farmland in production, agricultural jobs would be lost, most of which would be

borne by farm workers of various race or ethnic ancestry.

While a net increase in employment would result during construction because of new construction jobs, these jobs would not likely be filled by displaced agricultural workers because the skills required are not comparable. This effect would, therefore, remain adverse because job losses would disproportionately accrue to a minority population.[127]

Bromide and disinfection byproduct concentrations were found to increase as a result of the operation of Alternative 4 in the first environmental report, an adverse public health effect of the project, identified primarily for the Barker Slough North Bay Aqueduct intake.[128]

The second environmental report, issued in July 2015, stated that the tunnels project would result in disproportionate effects on minority and low-income communities from land use, socioeconomics, aesthetics and visual resources, cultural resources, noise, and public health effects. Despite mitigation and environmental commitments, these effects "would remain adverse" and the effects on environmental justice communities in the Delta would be "disproportionate and adverse."[129]

Specifically, the second report stated that the extent of land use and socioeconomic changes attributable to the WaterFix tunnels project would be the same as those disclosed for the BDCP.[130] The second environmental report also stated that, distinct from the public health effects of disinfection byproducts (including increased bromide) resulting from the BDCP version, the WaterFix tunnels project would have a public health effect of mobilizing or increasing constituents "known to bioaccumulate as a result of ***construction, operation or maintenance*** of the water conveyance facilities."[131]

In the vicinity of the three north Delta intakes:

> If mercury is sequestered in sediments at water facility construction sites, it could become suspended in the water column during construction activities, opening up a new pathway into the food chain. Construction activities (e.g., pile driving and cofferdam installation) at intake sites or large landing locations would result in a localized, short-term resuspension of sediment and an increase in turbidity that may contain element or methylated forms of mercury…. [132]

The second report also addressed the potential for increased fish contamination from mercury for humans engaged in subsistence fishing, and found the effects would be adverse:

> Because some of the affected species of fish in the Delta are pursued during subsistence fishing by minority and low-income populations, this increase creates the potential for mercury-related health effects on these populations. Asian, African-American, and Hispanic subsistence fishers pursuing fish in the Delta already consume fish in quantities that exceed the US Environmental Protection Agency reference dose of 7 micrograms (µg) per day total [citation]. This reference dose is set at 1/10 of the dose associated with measurable health impacts [citation]. The highest rates of mercury intake from Delta fish occur among Lao fishers (26.5 µg per day, [citation]). Increased mercury was modeled based upon increases modeled for one species: largemouth bass. These effects are considered unmitigable (see Chapter 8, Water Quality, Mitigation Measure WQ-13).
>
> The associated increase in human consumption of mercury caused by these alternatives would depend upon the selection of the fishing location (and associated local fish body burdens), and the relative proportion of different Delta fish consumed. Different fish species would suffer bioaccumulation at different rates associated with the specific species, therefore the specific spectrum of fish consumed by a population would determine the effect of increased mercury body burdens in individual fish species. These confounding factors make demonstration of precise impacts on human populations infeasible. However, because minority populations are known to

> practice subsistence fishing and consume fish exceeding US EPA reference doses, any increase in the fish body burden of mercury may contribute to an existing adverse effect. Because subsistence fishing is specifically associated with minority populations in the Delta compared to the population at large this effect would be disproportionate on those populations for Alternative 4A. This effect would be adverse.[133]

DWR's environmental justice outreach efforts are all the more scant, disappointing, and dangerous because they have reasonably identified adverse employment, disinfection byproduct, and fish contamination effects of the proposed project.

Each of these effects are acknowledged by DWR to be adverse, significant, and unavoidable impacts of the tunnels project, yet most members of Delta environmental justice communities continue to be unaware of them.

Restore the Delta and its membership are deeply concerned that DWR has failed to demonstrate that the tunnels project operations would not increase the residence time of water, its temperature, and its salinity from tidal incursion, thus increasing the frequency of toxic algal blooms.

We are further concerned that the tunnels project will decrease flows and degrade water quality, thereby injuring Delta EJ communities. Outreach about project details to Delta EJ communities during the planning process have been scant and disappointing, to the point of dangerously negligent. While the tunnels project's environmental review documents have identified several adverse impacts of the proposed project, they have ignored or downplayed health risks to safe drinking water and subsistence fishing, including Stockton's drinking water source and the risk of increased carcinogens that can be generated from disinfection byproducts as well as harmful algal blooms. These communities depend on access to safe, good quality drinking water supplies, and on subsistence consumption of local fish. These are critical components of an accessible and healthy diet for these economically disadvantaged communities. They should not be put at risk.

Chapter 2 End Notes

1 George Harwood Phillips, 1993. *Indians and Intruders in Central California*: 1769-1849. Norman, OK: University of Oklahoma Press, p. 18.

2 Recent historical scholarship has brought us to this acknowledgement. See Benjamin Madley, A*n American Genocide: The United States and the California Indian Catastrophe*, Yale University Press, 2016. Madley addresses "the causes of the genocide, state and federal government decision-makers' roles, the organization and funding of the killing, and the vigilantes, volunteer state militiamen, and US soldiers who did the killing and how they did it. Further, it details public support for the genocide, the number of California Indians killed, the nature of indigenous resistance, the changes in genocidal patterns over time, and the end of the genocide. These topics call for meticulous analysis and consistent use of an internationally recognized definition such as that of the 1948 Genocide Convention, because the stakes are high for scholars, California Indians, and all US citizens." (p. 8.)

3 *Winters v. United States*, 207 U.S. 564 (1908). This doctrine reserves water rights to Indian tribes living on reservations and was recently affirmed for reserving groundwater rights to Indian tribes in California in *Agua Caliente Band of Cahuilla Indians v. Coachella Valley Water District et al.*, March 7, 2017, United States Court of Appeals for the Ninth Circuit, No. 15-55896, D.C. No. 5:13-cv-00883-JGB-SP. The Ninth Circuit stated: "While we conclude that the federal government envisioned water use when it established the Tribe's reservation, that does not end our inquiry. We must now determine whether the Winters doctrine, and the Tribe's reserved water right, extends to the groundwater underlying the reservation. And while we are unable to find controlling federal appellate authority explicitly holding that the Winters doctrine applies to groundwater[citation], we now expressly hold that it does."

4 *Antioch v. Williams Irrigation District* (1922) 188 Cal. 451.

5 "Natural conditions" is not a sure thing. Over the last few decades, researchers have sought to reconstruct the ecological history of the Delta. It is a search for a baseline, against which we might today measure the changes made to the Bay-Delta Estuary and its watershed. Using scientific and historical methods, they also reconstruct upstream watersheds in the Sacramento and San Joaquin valleys, and strongly suggest that fish abundance and wetland extent were much greater prior to European arrival than occur today. (The Bay Institute of San Francisco, 1998, *From the Sierra to the Sea: The Ecological History of the San Francisco Bay Watershed*. Accessible at https://bayecotarium.org/wp-content/uploads/tbi_sierra-to-the-sea-1998.pdf. See also San Francisco Estuary Institute Aquatic Science Center, 2012, *Sacramento-San Joaquin Delta Historical Ecology Investigations: Exploring Pattern and Process*, Publication #672, August. Accessible at https://www.sfei.org/documents/sacramento-san-joaquin-delta-historical-ecology-investigation-exploring-pattern-and-proces.)

California Indians are well known for their active management and intimate knowledge of many different California landscapes—for subsistence, spiritual significance, and production of raw materials they incorporated into their art and technologies of daily life (such as baskets, storage, bedding, transport devices, weapons, and more). (M. Kat Anderson, 2005. *Tending the Wild: Native American Knowledge and the Management of California's Natural Resources*, Berkeley, CA: University of California Press.) But they have not yet been integrated to what made the Central Valley watershed of the Delta what it was at European contact. Miwok, Yokut, Maidu, and Mokelumne tribes lived in and near the Delta prior to European contact. Unfortunately, to the best of our knowledge, a lingering gap in Delta historical ecology reports remains incorporation of research into what roles these tribes and others played in ecological and landscape management of the widespread tule marshes and other natural resources of the region. Their roles may challenge what some may think of as "natural."
Code Regs., tit.22, secs. 9801, 9821

6 Thomas H. Means, 1928, *Salt Water Problems: San Francisco Bay and Delta of Sacramento and San Joaquin Rivers*, April, pp. 17-21. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_213.pdf.

7 *Ibid.*

8 Even in our post-contact period, Contra Costa Water District reconstruction of Delta salinity records finds that the Delta in the first two decades of the twentieth century was fresher, despite drought years, than in later decades when upstream water resource development increased with new dams, reservoirs, and diversions. (Contra Costa Water District, Water Resources Department, 2010, *Historical Fresh Water and Salinity Conditions in the Western Sacramento-San Joaquin Delta and Suisun Bay, Exhibit CCWD-6,* Delta Flow Criteria Informational Proceeding before the State Water Resources Control Board, February. Accessible at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/docs/exhibits/ccwd/ccwd_exh6.pdf.) In yet another study of the San Joaquin River Basin under control of the U.S. Bureau of Reclamation showed increasing average salinities in south Delta channels with each succeeding decade as upstream irrigation drainage increased from saline soils in the western San Joaquin Valley. (U.S. Water and Power Resources Service and South Delta Water Agency, 1980, *Effects of the CVP Upon the Southern Delta Water Supply, Sacramento-San Joaquin River Delta, California,* June. Accessible at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/docs/cmnt081712/cwin/cwinappendix_f.pdf.)

9 Two laws mandate doubling salmon populations: the federal Central Valley Project Improvement Act of 1992 (Section 3406(b)(1)) and California Fish and Game Code section 6902.

10 See also the argument that the tunnels project is illegal from the viewpoint of the Winnemem Wintu Tribe in this chapter, pp. 52-54, below.

11 "SWP allocations" refers to the process DWR goes through each winter and spring to determine how it fulfills water demand, based on its contracts with its twenty-nine water contractors (five of whom are north of the Delta). Each contract contains "Table A" which represents the demanded amounts of water for each contractor in the SWP system. In total, Table A demand is about 4.17 million acre-feet. The two largest SWP contractors are the agricultural Kern County Water Agency (about 24 percent of total Table A demand) and the urban Metropolitan Water District of Southern California (about 47 percent). SWP allocations by DWR are typically stated as some percentage of total Table A demand. For example, the January 2018 Table A allocation by DWR was just 20 percent, while in April 2017 it was 85 percent of Table A demand. Generally, the lower the SWP Table A allocation, the more likely that south of Delta contractors will see cross-Delta water transfers, discussed below.

12 The Bureau may shirk these duties in the near future. A memorandum authored by Interior Secretary Ryan Zinke, dated August 17, 2018, directs his senior staff to develop "an initial plan of action" containing options for, among other things, "reassessing legal interpretations, which were adopted prior to the existence of significant constraints on Central Valley Project operations and those enacted since 2009;" and "preparing legislative and litigation measures that may be taken to maximize water supply deliveries to people…." This signals that the federal government may no longer wish to comply with the state's water rights system, its water quality control laws, or its endangered species and natural community protection laws.

13 Water transfers are also defined as follows:

> Water transfers involve a change in the place of water use, from the water's historic point of diversion and use, to a new location either within or outside the watershed of origin. Water may be transferred from one user to another for a variety of purposes, including agricultural, municipal and industrial uses. It may also be transferred for environmental purposes such as in-stream flow augmentation and wildlife refuges. Water transfers and exchanges can be temporary—either short-term (up to 1 year) or long-term (more than one year but not permanent) or permanent.

2015 Public Draft Bay Delta Conservation Plan/California WaterFix Partially Recirculated Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement (RDEIR/SDEIS), Appendix 1E, p. 1E-1:13-18.

14 *Id.*, pp. 1E-13 to 1E-15.

15 An acre-foot is 325,529 gallons, or an acre of ground covered with water to a depth of one foot—43,560 cubic feet.

16 *2013 Public Draft Environmental Impact Report/Environmental Impact Statement Bay Delta Conservation Plan (BDCP Draft EIR/EIS)*, Appendix 5C, p. 5C-13, Table 5C.-4.

17 *Ibid*., p. 5C-10, Table 5C-3.

18 *Ibid*., pp. 5C-4 to 5C-5, Table 5C-2.

19 "Wheeling" water occurs when one project's water is pumped by another for export—for example, a delivery by CVP may be actually pumped from the Delta by DWR's Banks pumping plant, then later exchanged through an "intertie" back to the Delta-Mendota Canal or credited back to the CVP via storage accounting at San Luis Reservoir near Los Banos (where DWR and the Bureau jointly store water south of the Delta). The "intertie" is a short canal built with a nearly flat slope that enables DWR and the Bureau to transport water supplies between the California Aqueduct and the Delta Mendota Canal.

20 *BDCP RDEIR/SDEIS,* p. 4.3.1- 9:19-23. Identical language is provided for the tunnels' other two alternatives. (Id., p. 4.4.1-9:12-19; p. 4.5.1-9:12-19.)

21 *Final Bay Delta Conservation Plan/California WaterFix Partially Recirculated Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement (Final BDCP EIR/EIS)*, p. 30-108:3-11.

22 Westlands Water District, 2017. Staff Report: Item 9, Meeting of September 19, pp. 6-10. However, the Westlands Board voted not to participate in the project. Westlands general manager Thomas Birmingham explained that their decision was largely a reaction to Reclamation's "participation approach" that simply recovered CVP contractors' costs without providing any up-front federal financing for the project—financing from U.S. taxpayer subsidies. If CVP contractors like Westlands had to shoulder costs of "incremental water supply" produced by the project, it would be too expensive, resulting in Mr. Birmingham's estimate of "an average blended cost of $565 an acre-foot." Assuming cost allocation issues facing Westlands and perhaps other CVP contractors can be resolved, Mr. Birmingham expressed confidence that "Westlands will revisit its decision." He further stressed that "the decision to not participate was not based on the merits of the project." Thomas W. Birmingham, *Statement of the Westlands Water District General Manager on California WaterFix*. October 26, 2017, p. 1, emphases in original. Accessible at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/part2/RTD_1013.pdf.

23 Metropolitan Water District of Southern California, 2017. *Modernizing the System 2: California WaterFix Operations*, July., p. 14. Accessible at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/part2/RTD_1007.pdf.

24 *RDEIR/SDEIS*, Figures 4.3.2-7 and 4.3.2-8; summarized in Mean monthly flows (cfs) for Model Scenarios for the Sacramento River Downstream of the North Delta Diversion Facility, accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_149.pdf; and in Mean monthly flows (cfs) for Model Scenarios for the Sacramento River at Rio Vista, accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_150.pdf; see also *BDCP Draft EIR/EIS*, Figures 6-14 and 6-15.

25 Scenarios H3 and H4 were intended by DWR to bracket a high-to-low export range of tunnels operations for impact analysis modeled from a large array of assumptions while factoring in climate change (in the case of the No Action Alternative charts shown here). Since these scenarios were put forward, DWR has narrowed its modeling focus on a scenario "H3+" which is modeled to show outcomes for exports, Delta inflow, and outflow to San Francisco Bay that lie between H3 and H4. However, H3+ simply reflects DWR's preferred modeling assumptions and do not incorporate potential permit conditions that could be placed on the tunnels project operations by the State Water Resources Control Board later in 2018 or early 2019.

26 North State Water Alliance, Comments on the Bay Delta Conservation Plan and its Impacts on Regional Sustainability in the North State, July 28, 2014, Exhibit D, pp. 29-32 [PDF pages 55-58]. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_142.pdf.

27 East Bay MUD, Comments on the Bay Delta Conservation Plan Partially Recirculated Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement, October 28, 2015, Attachment 4, pp. 5-7. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_143.pdf; and East Bay MUD, Protest and Notice of Intent to Appear, January 4, 2016, pp. 5-10. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_144.pdf.

28 Tom Cannon, "California Fisheries Blog: Would WaterFix Tunnel Intakes be Protective of North Delta Fish? You Judge!" August 2, 2018. Accessible at http://calsport.org/fisheriesblog/?p=2262.

29 T. Presser & S. Luoma, 2006. *Forecasting Selenium Discharges to the San Francisco Bay-Delta Estuary: Ecological Effects of a Proposed San Luis Drain Extension*, USGS Professional Paper 1646., p. 17. Accessible at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/part2/RTD_159.pdf.

30 Environmental Water Caucus, Comments on Bay Delta Conservation Plan/"California WaterFix" Tunnels Project Recirculated Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement, October 30, 2015, Figure 4, p. 59. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_130.pdf. See also *BDCP Draft EIR/EIS*, Table 8-60a, p. 8-82.

31 2013 Public Draft *Bay Delta Conservation Plan,* Chapter 5 Effects Analysis Appendix 5C, Table 5C.5.4-14, p. 5C.5.4-84. Accessible at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/exhibit5/index.html.

32 *Written Testimony—John Bednarski*, DWR-57: p. 3:27-28; 4:1-2, 6-13; 16:19-20. Accessible at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/petitioners_exhibit/dwr/dwr_57.pdf.

33 Environmental Water Caucus, C*omments on Bay Delta Conservation Plan/"California WaterFix" Tunnels Project Recirculated Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement*, October 30, 2015, p. 60, Figure 5. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_130.pdf; source data from *BDCP RDEIR/SDEIS*, Appendix B, Section B.4.2, pp. B-209 to B-212 [Charts for No Action Alternative], B-231-234 [Alternative 4A, Scenario H3], and B-253-256 [Alternative 4A, Scenario H4]; and see State Water Resources Control Board, 2012, *Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives,* updated December 2012, p., 3-52, for a narrative profile of San Joaquin River water quality. Hereafter SWRCB Scientific Basis Report. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_104.pdf.

34 California WaterFix Petition Information for Regulation, Exhibit DWR-324, p. 6. Accessible at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/petitioners_exhibit/dwr/dwr_324.pdf.

35 *SWRCB Scientific Basis Report*, p. 3-52- to 3-53, Section 3.7.6. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_104.pdf.

36 San Joaquin Valley Drainage Program, 1990. *A Management Plan for Agricultural Subsurface Drainage and Related Problems on the Westside, San Joaquin Valley* (the "Rainbow Report"), Figures 5, and 8 through 12. Accessible at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/part2/RTD_171.pdf.

37 *RDEIR/SDEIS*, Fingerprinting, Section B.4.2, pp. B-191 through B-256; RTD-130, Figure 5, pp. 60-61.

38 Metropolitan Water District of Southern California, 2017. *Modernizing the System 2: California WaterFix Operations,* July, p. 15.

39 Metropolitan Water District of Southern California, 2017.A *California WaterFix Dialogue: Questions and Answers*, September, p. 5.

40 Environmental Water Caucus, Comments on Bay Delta Conservation Plan/"California WaterFix" Tunnels Project Recirculated Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement, October 30, 2015, pp. 63-76.

41 California Department of Water Resources, *Quantity and Quality of Waters Applied to and Drained from the Delta Lowlands*, Report No. 4, July 1956. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_148.pdf.

42 The DESP was enacted by the Legislature and Governor Arnold Schwarzenegger during the same special legislative session that produced the Delta Reform Act in November 2009 and the reduced Delta reliance policy discussed above. See California Public Resources Code 29759.

43 Delta Protection Commission, *Delta Economic Sustainability Plan, Public Draft,* October 2011, p. 127. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_301.pdf.

44 More on this plan in Chapter 4 below. Salinity objectives at interior south Delta channel monitoring locations would be allowed to rise from 700 to 1000 µS/liter EC (at San Joaquin River at Brandt Bridge, Old River at Middle River, and Old River at Tracy Boulevard Bridge) as well as San Joaquin River at Vernalis during the irrigation season (April through August). The rest of the year, SWRCB proposed increasing the salinity objective from 1000 to 1400 µS/liter EC during the rest of the year at the same locations. (SWRCB has since chosen to keep the September through March objective at 1.0 µS/liter EC. This is not pertinent to the DESP salinity impact analysis, however, which focused on May through August irrigation season effects.

45 Delta Economic Sustainability Plan, Appendix G, *Crops, Salinity, and Modeling Data* (Chapter 7), Appendix G, page G-6. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_305.pdf.

46 Dr. Michael employed in the DESP a multinomial logit (MNL) model to estimate farmers' crop choice at the field level in the Delta. Such a model, and related models, has wide usage in professional economic analysis. One of the model's developers, economist Daniel McFadden at the University of California, Berkeley, was awarded the Nobel Prize for these methods in 2000. Dr. Michael notes that MNL model methods have been used previously to study irrigation technology choices and crop management practices. Delta Protection Commission, 2011, *Delta Economic Sustainability Plan,* p. 123, Table 17, and p. 124, Figure 23. The probability of urbanization was considered high or very high in western and southeastern peripheries of the Legal Delta, including Bethel Island, Bishop and Shima tracts, Stewart Tract, west of French Camp and Lathrop, and the northern periphery of the city of Tracy. A few parcels in the north Delta were also identified to have very high probability of urbanizing, but are small in size, and dispersed from each other. Hereafter DESP.

47 *RDEIR/SDEIS*, p. 4.3.10-1:22-26.

48 *DESP*, pp. 122-126, including Table 19.

49 *Ibid*., pp. 129-130, including Figure 24; and *DESP,* Appendix G, pp. G-6 to G-9.

50 *DESP*, p. 130. On average, the south Delta experiences significantly higher salinity levels and more variability than do north Delta channels. This is due in part to significant ambient differences in water quality, presence of reverse flows along Old and Middle rivers due to State Water Project pumped diversions, and flow conditions on the Sacramento and San Joaquin Rivers, as well as to climatic and hydrologic conditions.

51 *DESP*, p. 131, Table 20, and p. 132, Table 20; Restore the Delta, 2018, *Forecasted Crop Revenue and Job Loss Impacts from Increasing Delta Salinity, from Delta Economic Sustainability Plan*, p. 1. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_304.pdf. Hereafter RTD-304.

52 RTD-304, p. 2.

53 *DESP,* p. 131, columns e and j, columns f and k; RTD-304, p. 2.

54 See Appendix 7 of this report.

55 University of the Pacific Eberhardt School of Business, Center for Business and Policy Research, May 2016, *California and Metro Forecast*. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_216.pdf.

56 University of the Pacific, Eberhardt School of Business, Center for Business and Policy Research, 2018, *California and Metro Forecast,* June, pp. 52-53. Accessible at http://www.pacific.edu/Documents/school-business/BFC/Forecasts/CA-Metro-Forecast-JUNE-2018-V2.pdf.

57 Stockton Retail Water Sources, 2015. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_225.pdf.

58 City of Stockton, *Draft Urban Water Management Plan*, 2015, May 2016, p. 3-7. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_218.pdf. Hereafter *Stockton UWMP*.

59 *Stockton UWMP*, ibid.

60 The City of Stockton obtained water right permit 21176 (Application 30531A) from the State Water Resources Control Board on December 20, 2005, to divert a flow not to exceed 317 cubic feet per second and 33,600 acre-feet per year from the San Joaquin River at the southwest tip of Empire Tract. (RTD-225, p. 3, paragraph 5.) This permit required the City to complete its point of diversion, raw water and treated water transmission pipelines, and its 30 million-gallon-per-day (MGD) water treatment facility by December 31, 2015. Permit 21176 requires the City to complete application of water to its authorized uses by December 31, 2020. The City received its water supply permit (01-10-15P-001 for public water system No. 3910012) on July 21, 2015.

61 State Water Resources Control Board, Transmittal of Water Supply Permit to City of Stockton, July 21, 2015, pp. 1-10. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_220.pdf.

62 *Ibid*., p. 4, 11-12.

63 *Stockton UWMP*, p. 5-1.

64 *Stockton UWMP,* p. 5-12, Table 5-7; Projected Water Supplies for Stockton, 2020 to 2040, p. 1. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_226.pdf.

65 *Stockton UWMP*, p. 5-11, Table 5-6; Stockton Retail Water Sources, 2015, accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_225.pdf.

66 Projected Water Supplies for Stockton, 2020 to 2040, p. 1, accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_226.pdf; *Stockton UWMP*, p. 5-12, Table 5-7.

67 City of Stockton, 2014 Bay Delta Conservation Plan comments, p. 38-43. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_221.pdf. The City informed DWR and the Bureau: "The City has been collecting water quality data in the stretch of the San Joaquin River near its intake for over 30 years. Despite being on notice about the City's significant concerns about water quality effects in the area of its intake, the BDCP proponents did not obtain or use any of this data in preparing the DEIR/EIS. Moreover, DWR maintains a water quality station less than one-half mile from the City's intake. It was unreasonable for the DEIR/EIS to not have used data from that water quality station in order to more accurately evaluate impacts to the City's drinking water supply." (p. 38.)

68 California Water Service Company, 2015 Urban Water Management Plan, Stockton District, June 2016, p. 67, Table 6-8, hereafter *Cal Water UWMP*. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_219.pdf; Stockton Retail Water Sources, 2015, accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_225.pdf.

69 Stockton Retail Water Sources, 2015, ibid.

70 *Cal Water UWMP,* pp. 36-37.

71 Faunt, C.C., ed., 2009, *Groundwater Availability of the Central Valley Aquifer, California*: U.S. Geological Survey Professional Paper 1766, p. 167, column 2. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_145.pdf.

72 *Ibid*., pp. 171-172, Figure C19.

73 Northeastern San Joaquin County Groundwater Banking Authority, *Eastern San Joaquin Groundwater Basin, Groundwater Management Plan*, 2004, pp.69, Sections 2.3.4.4 and 2.3.6. *Hereafter Eastern San Joaquin Groundwater Management Plan*. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_146.pdf.

74 State Water Resources Control Board, *Transmittal of Water Supply Permit to City of Stockton*, July 21, 2015, pp. 13-14. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_220.pdf.

75 *Eastern San Joaquin Groundwater Management Plan*, p. 71, Section 2.3.7.

76 *Eastern San Joaquin Groundwater Management Plan*, p. 74, Figure 2-27, p. 75, Table 2-4; City of Stockton, 2014 Bay Delta Conservation Plan Comments, pp. 2-15 to 2-16, Figures 2-8 and 2-9, and p. 2-18, Table 2-3.

77 City of Stockton, Water Quality Report for 2015, June 2016, p. 3, 4, footnote 8. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_227.pdf. Hereafter Stockton Water Quality Report.

78 California Water Service Company, 2015 Water Quality Report, p. 15, footnote 5. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_228.pdf. Hereafter CWSC Water Quality Report.

79 Stockton Water Quality Report, p. 5.

80 CWSC Water Quality Report, p. 16; Stockton Water Quality Report, p. 5.

81 City of Stockton, Protest of California WaterFix Change Petition, January 5, 2016, Attachment 2, p. 1, 2, and Attachment 4, p. 1. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_223.pdf. Hereafter Stockton 2016 Protest.

82 The City's DWSP was developed under authority of California Water Code section 1485. It provides that a municipality discharging water into the San Joaquin River "may file an application for a permit to appropriate an equal amount of water, less diminution by seepage, evaporation, transpiration or other natural causes between the point of discharge and the point of recovery, downstream from said disposal plant and out of the San Joaquin River or the Sacramento-San Joaquin Delta."

83 Stockton 2014 BDCP Comments, p. 1, accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_221.pdf; City of Stockton, 2015 California WaterFix RDEIR Comments, accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_222.pdf.

The City's attorney, Kelley Taber, elicited from DWR's modeling panel testimony that the state's modeling team was unfamiliar with or did not recall seeing the City's comment letters, or responded to one or both of them only in the context of preparing responses to comments for the tunnels project's third environmental report. (Cross examination of Modeling Panel, August 25, 2016, morning session.) Ms. Taber also elicited testimony from DWR's modeling panel stating that the modeling team did not model Stockton's Empire Tract intake for its DWSP. This contrasts with the modeling team's inclusion of modeling results for urban drinking water intakes at Banks and Jones Pumping Plants, Contra Costa Water District's Rock Slough Intake for the Contra Costa Canal, and the City of Vallejo's municipal intake in the north Delta. The modeling team, according to this testimony, indicated that they relied upon conversion equations applied to water quality modeling results derived from water quality stations near to Stockton's wastewater treatment plant and water treatment plant intake. (*Id.*) The nearest of these water quality stations was, as DWR witness Parviz Nader-Tehrani stated, "a few miles" away from Stockton's discharges and intakes.

84 Stockton 2014 BDCP Comments, p. 50, 52.

85 Stockton 2015 BDCP Comments, p. 2.

86 City of Stockton, Municipal Utilities Department, May 2016 Water Rate Study, p. 4, 58. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_224.pdf.

87 *RDEIR/SDEIS*, p. 4.3.8-18:7, p. 4.3.8-25:20, p. 4.3.8-41:1, 37, p. 4.3.12-1:8, p. 4.3.16-1:11; cross-examination of John Bednarski, Engineering Panel, August 9, 2016.

88 Stockton 2014 BDCP Comments, p. 41.

89 BDCP Steering Committee Outreach Work Group to BDCP Steering Committee, regarding Public Outreach Process for BDCP (for Steering Committee Action), June 29, 2007, pp.1-2. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_241.pdf. Hereafter BDCP Outreach Work Group.

90 BDCP Outreach Work Group, PDF page 7.

91 BDCP Steering Committee Meeting, BDCP Delta Workshop Report, October 22, 2009, p. 1. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_242.pdf. Hereafter BDCP Delta Workshop Report.

92 Hereafter BDCP Delta Workshop Report, pp. 1-2.

93 Hereafter BDCP Delta Workshop Report, p. 5.

94 Department of Water Resources, Delta Habitat Conservation and Conveyance Program, Environmental Justice Community Survey Summary Report, 1/25/2010, Standard Agreement No. 4600008104, Task Order No. 7, Subtask 7.2, Document Number 9AA-06-13-110-001. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_243.pdf. Hereafter 2010 DWR EJ Survey.

95 Summary Table of Environmental Justice Survey Respondents to DWR's 2010 environmental justice survey. Prepared by Restore the Delta. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_244.pdf. Hereafter DWR EJ Survey Summary.

96 2010 DWR EJ Survey, p. 1-2.

972010 DWR EJ Survey, pp. 1-2 to 1-3.

98 2010 DWR EJ Survey, Appendices; DWR EJ Survey Summary.

99 2010 DWR EJ Survey, Appendix B "Survey Call Script and Questions."

100 DWR EJ Survey Summary.

101 2010 DWR EJ Survey, Appendices.

102 2010 DWR EJ Survey, p. 6-5.

103 2010 DWR EJ Survey, p. 7-28.

104 2010 DWR EJ Survey, p. 8-5.

105 *BDCP Draft EIR/EIS,* p. 28-105.

106 *BDCP Draft EIR/EIS,* p. 32-7.

107 *BDCP Draft EIR/EIS,* pp. 32-7 to 32-8.

108 *BDCP Draft EIR/EIS,* p. 32-8.

109 *BDCP Draft EIR/EIS,* p. 32A-2, Section 32A.1.2.4.

110 *BDCP Draft EIR/EIS,* Appendix 32A, PDF pages 56, 80, 174, and a glossary entry on page 184.

111 *BDCP Draft EIR/EIS,* Appendix 32A.

112 Joint letter from Restore the Delta, Environmental Justice Coalition for Water, Asian Pacific Self-Development and Residential Association, American Friends Service Committee (Proyecto Voz), Café Coop, Environmental Water Caucus, California Sportfishing Protection Alliance, California Water Impact Network, and Friends of the River, to Secretary John Laird, California Natural Resources Agency; Secretary Sally Jewell, US Department of the Interior; David Murillo, US Bureau of Reclamation; Mark Cowin, California Department of Water Resources, et al, May 28, 2014, concerning Request for Restarting and Extending Bay Delta Conservation Plan Comment Period Due to Lack of Meaningful Access for Limited English Speakers, pp. 2-4. See Appendix 8.

113 The saga of failed California Indian treaty ratification is described by several historians: George H. Phillips, *The Enduring Struggle: Indians in California History, San Francisco, CA*: Boyd & Fraser, 1981, 1990, pp. 50-51; Albert Hurtado, *Indian Survival on the California Frontier*, New Haven, CT: Yale University Press, 1995, pp. 135-141; Brendan C. Lindsay, *Murder State: California's Native American Genocide, 1846-1873*, Omaha, NE: University of Nebraska Press, 2012, pp. 272-277; and Benjamin Madley, *An American Genocide: The United States and the California Indian Catastrophe,* New Haven, CT: Yale University Press, 2016, pp. 164-169.

114 *Testimony of Gary Mulcahy*, pp. 7-8, paragraphs 22 through 28.

115 *Ibid*., p. 9, paragraph 29.

116 *Ibid*., p. 10, paragraph 34.

117 *Ibid*., p. 14, paragraph 52.

118 *Ibid*., p. 16, paragraph 58, and p. 17, paragraph 64.

119 Restore the Delta, "Methodology for Estimating Population of Delta Region Subsistence Anglers from Fishing License Data," accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_229.pdf; and Restore the Delta, "Methodology for Estimating Delta Counties Subsistence Anglers from Angling Intensity (Hours) Data," accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_230.pdf.

120 F. Shilling, A.White, L. Lippert, and M. Lubell, 2010. Contaminated fish consumption in California's Central Valley Delta. Environmental Research 110(2010): 334-344, p. 335, Figure 1 and p. 336, Table 1. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_232.pdf. Hereafter Davis et al 2008.

121 Shilling et al 2010; Davis et al 2008; Silver, E., J. Kaslow, D. Lee, S. Lee, M.L. Tan, E. Weis, and A. Ujihara, 2007. Fish consumption and advisory awareness among low-income women in California's Sacramento-San Joaquin Delta. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_235.pdf. Hereafter Silver et al 2007.

122 Berg, M. and M. Sutula, 2015. Factors affecting the growth of cyanobacteria with special emphasis on the Sacramento-San Joaquin Delta, Southern California Coastal Water Research Project Technical Report 869, August 2015, p. ii, p. 4, pp. 21-33. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_236.pdf. Hereafter Berg and Sutula 2015; and P.W. Lehman, K. Marr, G.L. Boyer, S. Acuna, and S.J. 2013. Long-term trends and causal factors associated with *Microcystis* abundance and toxicity in San Francisco Estuary and implications for climate change impacts. *Hydrobiologia* 718: 141-158. DOI 10.1007/s10750-013-1612-8, p. 142. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_237.pdf. Hereafter Lehman et al 2013.

123 Berg and Sutula 2015, p. iii, 31-33, 48, 51; Lehman et al 2013.

124 *RDEIR/SDEIS*, p. 4.3.24-8 [PDF page 1,202].

125 *BDCP Draft EIR/EIS*, pp. 28-75

126 We are aware that the latest tunnels alignment as of April 2018 from DWR would move the project east toward Stone Lakes National Wildlife Refuge to avoid potential damage to existing wells in the vicinity of Hood. Truck traffic, noise, and pollutant emissions will remain as project impacts on a small community like Hood, however—bear in mind that such impacts could go on for as much as 15 years or more, the construction period of the tunnels project. And yet the project's new proximity to Stone Lakes—a place visited and enjoyed by Delta residents, including schoolchildren, could have effects there as well.

127 *BDCP Draft EIR/EIS*, p. 28-64 to 28-66.

128 *BDCP Draft EIR/EIS,* p. 28-74.

129 *RDEIR/SDEIS*, p. 4.3.25-8:28-32.

130 *RDEIR/SDEIS*, p. 4.3.24-1:26-33, 35-39; p. 4.3.24-2:1-17.

131 *RDEIR/SDEIS*, p. 4.3.24-7:10-11, emphasis added.

132 *RDEIR/SDEIS*, p. 4.3.24-7:25-29.

133 *RDEIR/SDEIS*, p. 4.3.25-8:6-26.

Chapter 3:
The Bay Delta Plan and Delta EJ Communities

In Restore the Delta's experience, the State Water Resources Control Board (SWRCB) has been the state agency most responsive and sensitive to environmental justice issues, including when borne by Delta residents. While responsive and sensitive, SWRCB is also rather cautious. Unlike corporations or other government agencies, they take ample time to evaluate new policies and courses of action before committing to them. This outlook at least partially explains why SWRCB has taken at least twenty-three years to complete a thorough review and revision of the latest Bay-Delta Plan governing water quality here.

This chapter describes our experience of the recent Bay-Delta Plan amendments process, and that process's implications for Delta environmental justice (Delta EJ) communities, to show how SWRCB has gotten some things right, and where water quality improvements may still be made.

What is the Bay-Delta Plan? Whose plan is it?

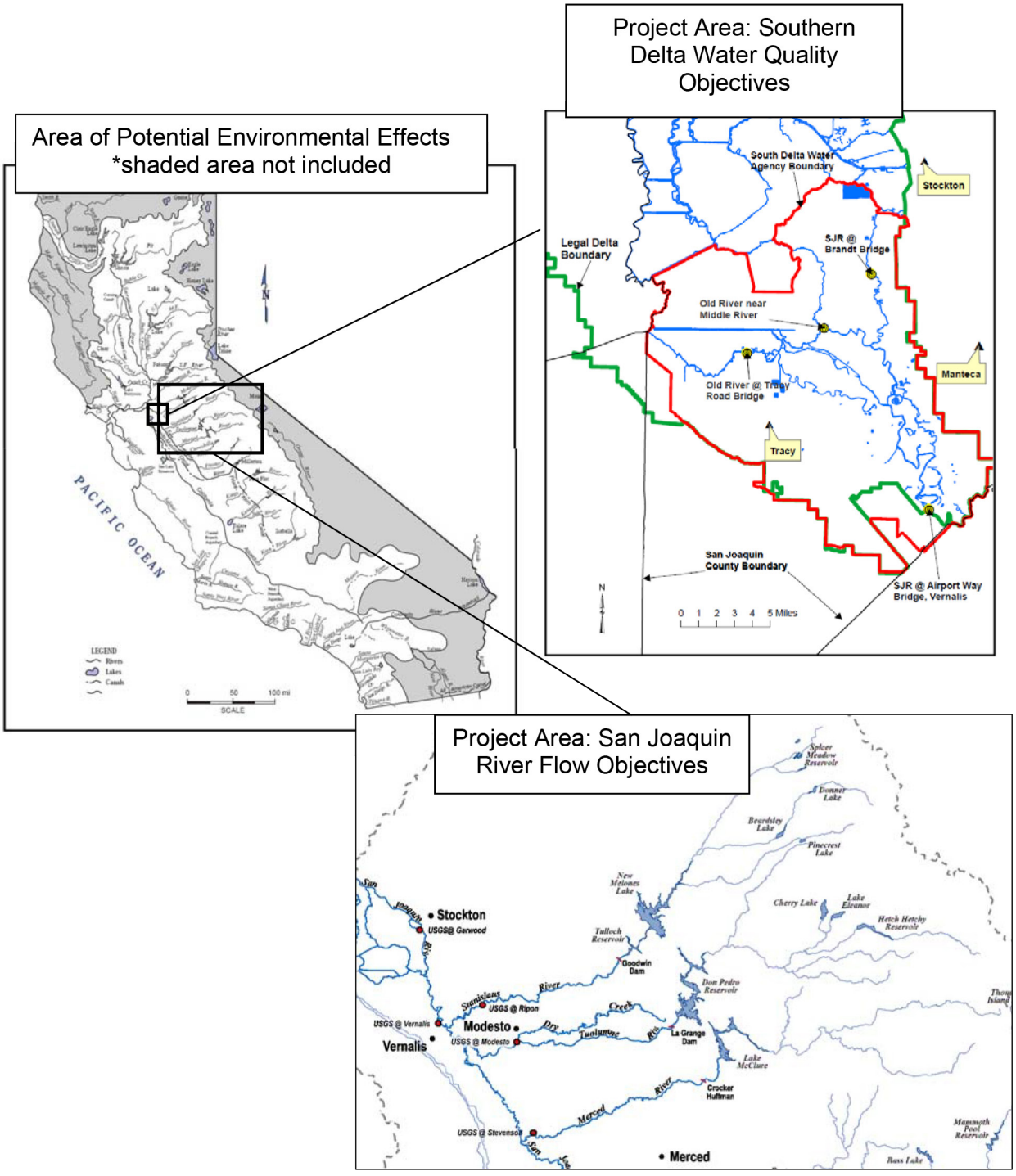
The Bay-Delta Plan is a water quality control plan for the Bay-Delta Estuary. The State Water Resources Control Board (SWRCB) is responsible for preparing and implementing it. Legal authority for SWRCB to prepare the plan lies with both the federal Clean Water Act (33 U.S.C. section 1251 *et seq.*) and the state's Porter-Cologne Water Quality Control Act (California Water Code section 13000 *et seq.*). These laws were enacted in the 1970s and remain in effect today.

A water quality control plan contains three parts: a listing of the beneficial uses of water to be protected and enhanced, the water quality objectives to protect those uses, and a program of implementation by the SWRCB. Together, the designated beneficial uses and the water quality objectives are referred to by the SWRCB as "water quality standards."[1] Because the State Water Project (SWP) and federal Central Valley Project (CVP) facilities control flows and diversions in the Delta, direct implementation by SWRCB involves monitoring SWP and CVP operations to ensure compliance with water quality standards. By virtue of its administration of state-issued water rights, SWRCB's key implementing action is a water rights decision for the plan that assigns responsibility to specific right holders for achieving the water quality standards. The most recent water right decision implementing the 1995 Bay Delta Plan is Decision 1641 (D-1641), adopted in March 2000.[2] (After a brief review, SWRCB made minor updates to that plan and adopted a 2006 Bay-Delta Plan that D-1641 continues to implement.)

The 1995 Bay-Delta Plan was itself an attempt to resolve litigation over the earlier 1978 Bay-Delta Plan and its water rights decision, D-1485. One central issue in that litigation involved whether the 1978 plan was to protect just water right holders or all beneficial users. A state appellate court determined that all beneficial uses were to be protected by SWRCB as called for in the Clean Water Act and Porter-Cologne.[3] That 1978 plan and D-1485 also ordered DWR and the Bureau to meet the water quality standards by either reducing Delta export pumping or releasing stored water from upstream reservoirs (for example, Trinity, Shasta, Oroville, Folsom, and New Melones), or both.

While this first Bay-Delta Plan was intended to protect the Delta estuary, its ecosystems and its fish, it did not. By the early 1990s, at least eight fish species' populations had declined to the point that they were listed under federal and state endangered species acts, and were the subject of a Delta-wide recovery plan.[4] They included Delta smelt, longfin smelt, Sacramento splittail, Green sturgeon, Sacramento spring-run Chinook salmon, Sacramento late fall-run Chinook salmon, San Joaquin fall-run Chinook salmon, and Sacramento perch. (Since that time, Sacramento winter-run Chinook salmon has been added to the list, and together with the spring-run Chinook salmon, is the subject of another later recovery plan.) Addition of prey and sport species like sturgeon and salmon, as well as later listing of Central Valley steelhead, raised direct environmental justice issues for subsistence fishing users of the Delta as well as

Map 4: Scope of Bay-Delta Plan



Map courtesy of State Water Resources Control Board.

for California Indian tribes many of whom depend on returning salmon as integral parts of their diets and spiritual and cultural meaning in the world. Loss of salmon would be devastating for many northern California tribes.

The 1995 Bay-Delta Plan incorporated new estuarine and fish and wildlife standards while maintaining municipal/industrial and agricultural standards, including flow and salinity standards for the channels used by south Delta farmers. These standards came from a much-hyped "Bay-Delta Accord" that represented a compromise between the water industry and some Bay-Delta environmental groups. No parties from the Delta were included in the Accord at the time.

With incorporation of the Bay-Delta Accord in the 1995 Bay-Delta Plan and D-1641, exports climbed steadily from 2000 to 2006. This increase coincided, however, with a "pelagic organism decline" in the estuary—populations of Delta smelt, longfin smelt, striped bass, and American shad crashed dramatically apparently for complex and interconnected reasons, and whose scientific evaluation took many years. Water diversions and a range of increased presence of "stressors" in the Delta (such as excess nutrients, pesticides, submerged invasive aquatic vegetation, invasive nonnative clams) seemed all to play some part. These crashes compounded the earlier rapid declines of the listed species in the 1990s.

Despite wet years in 2005 and 2006, SWRCB slapped DWR and the U.S. Bureau of Reclamation with a "cease and desist order" in 2006 to enforce interior south Delta salinity standards intended to protect agriculture in that part of the Delta from operations of the SWP and CVP, especially returning salty flows from the San Joaquin River. SWRCB gave DWR and the Bureau three years until July 2009 to bring both projects into compliance with D-1641 south Delta salinity objectives.[5]

Under Governor Arnold Schwarzenegger, a Delta Vision Blue Ribbon Task Force was convened in 2007 to study the Delta's problems and recommend future actions. One result was eventual enactment of the Sacramento-San Joaquin Delta Reform Act of 2009. Among other things, the Act directed SWRCB to conduct a "public trust" informational proceeding to develop flow objectives that represented what fish need to recover their populations in and through the Delta and its Sacramento and San Joaquin River watersheds. SWRCB found in its August 2010 report that the flows of the 1995 Bay-Delta Plan and D-1641 were insufficient to protect and recover the listed fish and estuary's ecosystems.[6] SWRCB has reiterated this conclusion twice more.[7]

Meanwhile, Delta water rights holders—the vast majority of whom are farmers—were found by the Delta Watermaster (an office created by the Delta Reform Act of 2009) to have legitimate water rights under which they lawfully diverted to irrigate their crops[8] —the basis for sustaining the Delta agricultural economy and the livelihoods of many Delta EJ community members. But beginning with SWRCB's 2008 strategic workplan, relaxation of interior south Delta salinity standards came up for reconsideration, and in 2009, SWRCB opted to bifurcate the Bay-Delta Plan update into two phases—to separate the San Joaquin flow and south Delta salinity standards review (Phase 1) from the northern Sacramento River side as well as Old and Middle River corridor for through-Delta export conveyance and operational objectives of the CVP and SWP facilities in the Delta (Phase 2).

In early 2010, SWRCB also modified the 2006 Cease and Desist Order to give DWR and the Bureau until 2015 to comply with their D-1641 interior South Delta salinity responsibilities.[9]

SWRCB action on a new Bay-Delta Plan update was complicated unexpectedly by onset of five consecutive drought and dry years from 2012 through 2016, which forced the SWRCB to closely monitor Delta and upstream watershed water quality and water users, delaying the Bay-Delta Plan amendments process. Coming out of that emergency period, SWRCB issued a draft plan for Phase 1. But at this writing, SWRCB has delayed its vote on these Phase 1 Bay Delta Plan amendments until November 7, 2018.

What the New Phase 1 Bay Delta Plan Would Do

For San Joaquin River flows objectives to benefit migrating salmon, the Phase 1 plan sets 40 percent of unimpaired flow[10], within a range of 30 to 50 percent between February 1 and June 30 of each year in hopes of improving conditions for fish. Previously SWRCB set a flow level for different times of year at Vernalis without requiring sufficient upstream contributions of flow from the San Joaquin's major tributaries. "Currently," said the SWRCB in its media release about the Phase 1 plan, "flows remaining in the rivers can run as low as 10 to 20 percent of unimpaired flow at critical times of the year and range from 21 to 40 percent on average for the three tributaries."[11] Half of the time, SWRCB stated in July 2018, "more than 60 or 70 percent of each river's flow is diverted out of the river during these months and the proposal seeks to return some portion of that diverted flow to the river."

With the new plan, SWRCB would require February through June contributions to unimpaired flow from the Stanislaus, Tuolumne, and Merced rivers; and none from the upper San Joaquin, where a salmon restoration program has been under way since 2006.

To its credit, SWRCB appears to take seriously its authority to improve flow and water quality conditions for fish using the Delta. "Scientific studies show," said the board, "that flow is a major factor in the survival of fish like salmon and that current flows are inadequate to protect many endangered and threatened species, as well as species relied upon by the commercial fisheries."[12]

Phase 1 also includes loosening of the interior South Delta salinity objectives described earlier by eliminating the more restrictive salinity objective during the irrigation (0.7 deciSiemens per meter of electrical conductivity at three locations downstream of the south Delta hamlet of Vernalis on Old, Middle, and San Joaquin rivers) between April 1 and August 31 in favor of applying the same objective year-round (1.0 deciSiemens per meter). SWRCB claims that the previous irrigation season objective between April and August "is actually lower than what is needed to reasonably protect agriculture."

Because the Bureau owns and operates New Melones Reservoir on the Stanislaus River, the SWRCB would continue to hold the Bureau responsible for meeting its salinity objective at Vernalis (which is considered an entry point of San Joaquin inflow to the south Delta) of 0.7 deciSiemens per meter of electrical conductivity. By requiring lower salinity and higher flows at Vernalis than before, SWRCB believes that the combined changes to flow and salinity objectives "would provide the same or better

conditions for agricultural uses in the Delta, as compared to existing conditions through the continuation, or improvement, of existing management actions, including maintenance of water levels."[13]

Problems with the Bay Delta Plan Phase 1 Amendments

First and foremost, the Phase 1 Bay-Delta Plan amendments[14] are dissociated from the California WaterFix tunnels project seeking approval for north Delta points of diversion for State Water Project (SWP) and Central Valley Project (CVP) water rights from SWRCB at the same time.[15] If granted these new tunnels diversions would result in fundamental changes to in-Delta hydrodynamics[16], water quality, Delta inflow, Delta outflow, and exports by DWR and the Bureau. But despite the dramatic artificial changes to the Bay-Delta Estuary that would be caused by a decision to grant the tunnels' water rights changes, the Phase 1 Bay-Delta Plan update treats the tunnels project as merely one of many "cumulative" projects relegated to its sole mention and micro-second scale analysis in the Phase 1 Bay-Delta Plan update and its environmental reports.

We were astonished by SWRCB's treatment of the tunnels project—allowing its evidentiary proceeding to proceed while carrying forward the Bay-Delta Plan amendments at the same time. We thought such

handling of the tunnels with this plan failed to fully disclose the impacts of the proposed action in this instance because it all but ignored the largest water facility planned for the Delta in at least two generations, along with the tunnels' ability to remove substantial volumes of water from the Delta.[17] We thought that the Phase 1 Bay-Delta Plan amendments and its environmental reports fail to explain the relationship between these two actions and, in so failing, render the impact analyses valueless as decision-making tools, and failed to inform the public about the relationship of the Board's proposed changes to San Joaquin River flow and south Delta salinity objectives in light of tunnels operations that would occur.

Protestants participating in Part 1 of the tunnels water rights hearings before the SWRCB tried repeatedly to assert the primacy of completing the Bay Delta Plan phases 1 and 2 before acting on the tunnels water rights, on grounds that it is just good policy and practice to plan first and have projects like the tunnels comply with the plan—otherwise, the project would unreasonably shape the plan. SWRCB hearing officers consistently rejected their requests.

A second mixed message stems from SWRCB's separation of the San Joaquin River flow and interior south Delta salinity objectives from the rest of Bay-Delta Estuary water quality control planning. This decision was made many years ago, but it was a fateful one in which SWRCB now piece-meals its own water quality control planning process for reasons that are at best hazy and unexplained and at worst fatuous. This is the first time in the SWRCB's history that it has treated planning for Delta water quality in segmented fashion; the 1978, 1995, and 2006 plans each treated the Delta as a comprehensive whole for planning purposes. The logic of separating Delta flows leaves the public—including Delta EJ communities—with a truly incomplete picture of outcomes and potential impacts on water quality. Reasons for this decision have never been adequately explained.

A third mixed message is that the Phase 1 environmental reports leave highly ambiguous just which beneficial uses the SWRCB is planning for. Exports are not now, nor have they ever been a recognized beneficial use in any Bay-Delta Plan. We fear, however, that the Phase 1 Bay-Delta Plan amendments is about benefiting exporters at the expense of senior water right holders upstream and downstream in the San Joaquin River watershed, with both increased flows and improved water quality. We are deeply suspicious that this outcome is perhaps cynically intended under the guise of improving flows for Fall-run Chinook salmon and Central Valley steelhead. At key times of year, the San Joaquin River downstream of Vernalis is almost entirely exported from the Delta by the CVP and SWP. The ecological benefits enforcing inflow criteria at Vernalis would not guarantee any contribution from the San Joaquin River to Delta outflow for that indicator's known ecological benefit. What is to stop all or much of fresher and larger San Joaquin flows from just being exported at Banks and Jones pumping plants? Put another way, there are no comparable instream flow criteria for the San Joaquin, Old, and Middle rivers that ensure that such flows would reach Antioch and Chipps Island in the western Delta. While the Phase 1 Bay-Delta Plan amendments indicates that outflow decisions will be made later in the bifurcated process, a later proposal and hearings are not a substitute presently for ensuring that needed freshwater flows put into the system will not be exported in favor of needed outflow for the estuary.

Adding to our suspicion is the SWRCB's now long-standing proposal to relax south Delta salinity objectives by about 42 percent (from 700 to 1000 dS/cm) during the irrigation season. Its environmental reports fail to justify relaxation of these objectives as either appropriate or necessary. It merely recounts a partial chronology of events describing the challenge of managing south Delta salinity before briefly outlining the proposed relaxation and the Board's proposal to regulate south Delta river segments as average values rather than continue with enforcement at compliance point locations applicable uniformly throughout river reaches. This relaxation is tantamount to permitting degradation and has not been justified as required, either as a reasonable action, or as a matter of benefits of the action exceeding costs. From another standpoint, the relaxation is akin to moving the goalposts to make it easier for a kicker to score.

The fourth mixed message we find relates to the Water Board's approach to this process. Now that the Board has bifurcated the Water Quality Control Plan, what process will the Board use to put the pieces back together in a coherent comprehensive whole? When will that occur? How will this reassembly affect EJ concerns in the Delta? Will this recombination be part of Phase 2, and, if so, at what point would interrelationships between Phases 1 and 2 not already evaluated under the California Environmental Quality Act be reviewed? Or will they be reviewed at all?

SWRCB has remained steadfast in its separation of the tunnels project from the Bay-Delta Plan process. We are coming to see this as to SWRCB's credit. After all, the tunnels' proceeding is neither finished, nor have permit conditions yet been affixed to the tunnels project. The schedule for both processes is such that SWRCB may approve Phase 1 Bay-Delta Plan amendments before tunnels project conditions are issued. In addition, we see SWRCB more and more inhabiting its legal authority to regulate flows and protect Delta beneficial uses that include uses benefiting Delta EJ communities.

The State Water Board Recognizes California's Statewide Water Policy Framework in Developing the Phase 1 Flow and Salinity Objectives

Just not where we would like to see them—nestled into the Phase 1 amendments themselves.

In general, we observe a persistent unwillingness of state water agencies to acknowledge and apply broad policy principles that the State Legislature has adopted, sitting governors have signed into law, and which make up statewide water policy. The principles informing these policies are intended to guide actions of state water agencies. Yet the agencies persist, if they acknowledge these policies at all, in applying them narrowly. Or, if they do not acknowledge them in their policy and planning documents, they interpret statutory language using narrow economic or engineering criteria. By doing so, these agencies often wind up employing methodologies or proposing and advocating actions that on their face conflict with these clear and protective statewide water policies.

SWRCB did not acknowledge these framework policies in the direct Phase 1 Bay-Delta Plan amendments for San Joaquin River flow and interior south Delta salinity objectives. But in their final environmental report accompanying and justifying the amendments, SWRCB described its authority to regulate all water rights in California; voiced its authority to regulate unreasonable uses of water and unreasonable methods of use and methods of diversion of water; and its duty to protect public trust resources, including fisheries.[18] However, SWRCB has not commented in the environmental report on its role implementing the Delta Reform Act policy to reduce reliance on the Delta. This we find disappointing, but not surprising

These statewide water policies, taken as a unified whole and guide to state agency action, provide agencies with authority to establish, implement, construct, and operate a range of solutions to California's water problems. In many cases, by applying the policies California has, at least some of these problems may yet be solved.

The Bay-Delta Estuary is an over-appropriated common pool resource plagued by California's abject failure to protect all beneficial uses of water—human and non-human alike—according to the needs of its most sensitive beneficial uses.[19] SWRCB has acknowledged this condition recently.[20]

Environmental Justice, Human Right to Water, Beneficial Uses of Water

As we showed in Chapter 3 with the tunnels project, other statewide policies to be carried out by state water agencies have been intended by the Legislature to supplement the purposes of statewide water policy, including the Human Right to Water and statewide environmental justice policies. These policies have been completely ignored in the Phase 1 Bay-Delta Plan amendments.

Additionally, a water quality control plan must establish beneficial uses, water quality objectives, and a program of implementation to achieve those objectives. (Water Code §13050(j).) The proposed amendment to the 2006 Bay-Delta Plan incorporates the 2006 Plan's beneficial uses, which were carried over from the 1978 Delta Plan, the 1991 Bay- Delta Plan, and the 1995 Bay-Delta Plan. (2006 Bay-Delta Plan, p. 8.) Further, the SWRCB is subject to Water Code section 13241, which provides in part that the SWRCB must consider "past, present, and probable future beneficial uses of water" when establishing water qualify objectives that ensure the reasonable protection of all beneficial uses.

Restore the Delta expressed its opinion to SWRCB that the Phase 1 amendments should incorporate three new beneficial uses that directly speak to environmental justice community needs in the Delta: subsistence (SUB), tribal subsistence (T-SUB), and tribal cultural use (T-CUL) in Part 2 of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California. Although these beneficial uses may be adopted statewide, they would still need to be recognized within regional or state Basin Plans, where the Regional Water Board or State Water Board may designate waters within the respective region as having one or more of the beneficial uses.[21]

Further, the new beneficial uses specifically target environmental justice communities that rely on fish populations for daily consumption, as well as long-standing cultural use. Existing State policies protect EJ communities through encouraging the identification of problems and solutions of affected communities—this update, so far, has missed an opportunity to identify and correct these disproportionate impacts.[22]

Clearly, SWRCB has responded to our concerns in the final environmental report. That said, it is our view that environmental justice concerns belong as integral parts of the Bay-Delta Plan to explain why and how the plan's objectives operate to serve these beneficial uses.[23] SWRCB feels it is not required by the Clean Water Act in California to do that, so explanations are instead buried in environmental reports where they may be either forgotten or never learned by the public.

The Phase 1 Bay-Delta Plan amendments fail to identify, adhere to, or incorporate the Human Right to Water or California environmental justice policies. Water Code Section 106.5 states that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes. The domestic use of water as the highest human beneficial use of water is linked to the Human Right to Water.

Adhering to and including these statewide policies is also directly tied to the Board's recent climate change resolution as it relates to the domestic use of water. The Board's climate change responses and actions can help all California residents adapt as smoothly as possible to inevitable impacts of climate change, including continuous provision of safe, clean, affordable, and accessible water for human uses and public health. Addition of the state's Human Right to Water Policy in the findings should result in parallel planning and policy opportunities where the State Water Board is to ensure that the human right to water applies. Such opportunities should include all water quality control plan updates (including that for the Bay-Delta Estuary), new and revised beneficial use designations, National Pollutant Discharge Elimination System programs, and any drinking water-related plans the Board works on.

These environmental justice, human right to water, and anti-discrimination laws and policies (see also the related discussion in Chapter 1 in this report) should be central to the overarching policy framework by which the SWRCB conducts its water quality control planning processes and its assessment of plan impacts and mitigation measures.

However, discussion of the Delta environmental justice community and the Human Right to Water is missing from the Phase 1 Bay-Delta Plan amendments (though not its environmental report). There is no identification of the Delta environmental justice community, discussion of potential impacts on the environmental justice community in relation to the proposed weakening of South Delta salinity standards, and no plan for mitigation of potential environmental or economic impacts.

According to the American Community Survey, 2010–2014, over 19 percent of all residents in San Joaquin County are living at the poverty level or below compared to 15 percent of the United States population. According to this same survey, 37 percent of San Joaquin County residents identify as race other than white, and 18 percent of San Joaquin County residents speak English less than well.[24] Roughly about 20 percent of San Joaquin County's population can be identified as part of the environmental justice community with pockets in or near the Delta, like zip code 95206, approaching environmental justice community percentages of nearly 50 percent. San Joaquin County's population in this period was roughly 650,000 people. Thus, roughly estimated, 120,000 San Joaquin residents could be identified as being members of the environmental justice community who would be impacted by water quality changes in the Delta as a result of implementation of proposed San Joaquin flows standards and relaxing of the South Delta salinity standards found in the Phase 1 Bay-Delta Plan amendments.

Moreover, The Phase 1 Bay-Delta Plan amendments do not directly consider, examine, or address water quality impacts for environmental justice community members who: 1) come in contact with Delta waters, such as subsistence fishers; 2) consume well water for domestic use in the Delta or from adjacent aquifers; 3) consume Stockton municipal water from the Delta supply project; 4) or lose farmworker income from decreased crop yields due to increases in South Delta water salinity as described in comments by South Delta Water Agency.

The State Water Board Fails to Justify Relaxation of the Interior South Delta Salinity Objectives

The Delta Protection Commission's 2011 Economic Sustainability Plan shows that a 25 percent increase in salinity in the Delta will result in an 11 percent decrease in crop revenue per acre, and a 50 percent increase in salinity in the Delta will result in a 25 percent decrease in crop revenue per acre.[25] The proposed 42 percent relaxation of salinity standards for the South Delta will likely result in crop revenue decreases per acre that will fall within a range from 11 percent to 25 percent. The Phase 1 Bay-Delta Plan amendments and its environmental report do not examine the relationship between decreases in revenue per acre and job numbers for farmworkers, who are part of the Delta environmental justice community. No economic analysis has been completed as to what the financial impacts would be on the poorest segment of the population in the south Delta's agricultural economy.

Appendix 9 to this report provides a detailed chronology completed by Tim Stroshane to document key passages from 40 years of SWRCB rulings (and others, including two court decisions) concerning public discussion on south Delta salinity issues. This appendix confirms what Mr. John Herrick, General Manager of the South Delta Water Agency, told the SWRCB at the December 16, 2016 public meeting in Stockton: that the SWRCB has not followed a process, or justified analytically why south Delta salinity objectives should be relaxed.

From our perspective, this lack of justification is troubling for a number of reasons. First, the Delta community at large is being told essentially to accept on blind faith that water quality will not be degraded, because a science-based justification for relaxing the standard has not been provided. But the provided environmental reports do not prove or justify that no significant degradation to south Delta water quality will occur. The lack of any scientific basis does not provide the type of transparency that constitutes good citizen-government interactions: trust with verification.

Second, the sizable south Delta environmental justice community, which has not been identified in the Phase 1 Bay-Delta Plan amendments or its environmental reports, would experience a disproportionate environmental and economic burden resulting from negative water quality impacts, as thousands of these residents fish for sustenance, work in farm-related employment, recreate in or near Delta waters, and/or drink water from groundwater wells fed by Delta waters or municipal water systems that draw water from the Delta.

Third, as a result of relaxation of south Delta salinity objectives, salinity, one of the primary growth factors for harmful algal blooms, will increase in the south Delta where such blooms became more prevalent during the recent drought.

Harmful Algal Blooms

Salinity, nutrient concentrations and ratios, light access and water clarity, temperature, and water stratification and residence time are all contributing growth factors in the production of toxic algal blooms. Health impacts from microcystis bacteria found in algal blooms range from stomach aches to pneumonia, while other toxic bacteria can lead to liver and kidney inflammation in humans, and even death in animals.

At a September 16, 2016 Delta Protection Commission meeting, Dr. Peggy Lehman, with the California Department of Fish and Wildlife, presented her more recent findings regarding harmful algal blooms in the Delta and answered audience questions regarding the recent proliferation of such blooms. During her presentation, Dr. Lehman presented research that microcystins exceeded safe levels for drinking water for children under the age of three starting in 2014 near Delta toxic algal bloom sites.[26] When asked by the audience if surface water contaminated with microcystins could percolate into groundwater, contaminating those supplies, Dr. Lehman answered that such studies had not yet been completed. Consequently, it is not known if microcystins can contaminate groundwater wells adjacent to the Delta. It is known, however, that drinking water supplies contaminated with microcystins cannot be treated for safe consumption.

Dr. Lehman also indicated that microcystins present in irrigation water can contaminate crops and that farmers in other western states have had to switch to alternative irrigation water. Switching irrigation water supplies would be impossible for South Delta farmers who pump water directly from the Delta to irrigate their crops.

Dr. Lehman also described how microcystis blooms adversely affect phytoplankton, zooplankton, fish biomass, and community composition of fish population in the Delta.

The Phase 1 Bay-Delta Plan amendments and its environmental report do not thoroughly examine the conditions for the proliferation of toxic algal blooms when Delta inflows would be at the lower 30 percent range, or when temporary urgency change petitions are used during times of extreme drought to override San Joaquin River flow standards set in the Bay Delta Plan. When flows are at their lowest, nutrient ratios, water clarity, temperature, and residence time increase, thereby contributing to the production of algal blooms. This coupled with a weakened salinity standard in the south Delta could increase the frequency of blooms of microcystis and other harmful toxic bacteria.

As with its treatment of a weakened south Delta salinity standard, SWRCB staff have failed to produce science-based documentation that during times of low inflows from the San Joaquin River and a weakened salinity standard, toxic algal blooms will not proliferate. In fact, if SWRCB wanted to ensure that enhanced ecosystem health and water supply reliability were to be met as required under Water Code Section 85054, the Phase 1 Bay-Delta Plan amendments would contain flow criteria and salinity reductions for water quality improvements so as to reduce the number of toxic algal blooms during dry periods.

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As with a weakened salinity standard for the south Delta, the sizeable south Delta environmental justice community, which has not been identified in the Phase 1 Bay-Delta Plan amendments or its environmental report, could experience a disproportionate environmental burden resulting from water quality impacts that could lead to the proliferation of toxic algal blooms. . Microcystis can create a public health threat for the thousands of these residents who fish for sustenance, work in farm related employment, recreate in or near Delta waters, or drink water from groundwater wells adjacent to Delta waters.

Bay-Delta Plan Phase 2 Amendments

The other half of the bifurcated Bay-Delta water quality planning process will become public later in the fall of 2018, SWRCB is saying. The board released a "framework" in this summer, a kind of sneak-peek at what it expects to unveil. New flow objectives for the Sacramento River and its tributaries, Delta outflow to San Francsisco Bay, and in-Delta flow objectives are part of SWRCB's new package. Many or all of existing water quality objectives may be retained in addition to these new flow standards.

The new flow standards will be in narrative form, SWRCB expects, but they will incorporate biological objectives based on a variety of species indicators. Chiefly, the inflow to Delta outflow objective for the Sacramento River states in part: "Maintain inflows from the Sacramento/Delta tributaries at 55% of unimpaired flow, within an allowed adaptive range between 45 and 65% of unimpaired flow."[27] Species indicators typically will include population abundance, where they are occurring ("spatial extent"), distribution, productivity, and genetic and life history diversity. Productive food webs are also included in the proposed new narrative flow standards.[28]

Restore the Delta sees good things ahead for Delta ecosystems from SWRCB's early proposals. Presently, however, their July 2018 Framework document contains no statements concerning the benefits of their proposals to Delta EJ communities integrated into the proposed narrative objectives. SWRCB estimates, however, that at an average of 55 percent unimpaired flows to the Delta there would be an anticipated population gain of 10 to 20 percent for affected fish species; with flood and other types of specially-timed flows population gains could reach 20 to 40 percent, while modest decreases to water supply would be anticipated.[29] However, we do not expect SWRCB to incorporate direct environmental justice community benefits into their analysis without receiving comments from the public about the importance of doing so.

SWRCB and the Tunnels Project

In its final environmental report on the Phase 1 Bay-Delta Plan amendments, SWRCB briefly acknowledged the tunnels project, including it as a "cumulative project" in its report. The board said:

> California WaterFix could affect hydrodynamics (i.e., flow paths) and water quality in the Delta, including the southern Delta. If surface water is diverted in the northern Delta, in lieu of at the SWP Clifton Court Forebay and the CVP Jones Pumping Plan in the southern Delta, it could reduce the reverse flow effect that occurs when Sacramento River and SJR flows are drawn south instead of moving west, as they would naturally, toward the San Francisco Bay. Reducing reverse flows would generally result in improved hydrologic conditions for aquatic species as both fish and food

> production would not be drawn toward the southern Delta where chanes of survival for at-risk native fish species diminish.
>
> However, drawing less Sacramento River water to the southern Delta could also result in increased salinity and generally reduced water quality in the southern Delta as Sacramento River water is less saline than the brackish waters in the southern Delta. In general increased salinity in the southern Delta could have a cumulative effect on surface hydrology and water quality, aquatic biological resources, agricultural resources, and service providers….[30]

While encouraging to see that SWRCB recognizes a fundamental impact of the tunnels project on Delta water quality, there is no indication what permit conditions the Board will place on the project at this time.

Conclusion

The Phase 1 Bay-Delta Plan amendments and its environmental reports fail to address adequately two key questions: 1) What are the Delta's needs for good water quality for its many beneficial uses, and to meet various state water policy objectives for the Delta, including environmental justice policies and mandates? 2) How should the Delta's beneficial needs be met through establishment and enforcement of water quality objectives that protect the environment, and all Delta communities, including environmental justice communities?

We continue to find that SWRCB adheres to its "mixed messages" concerning the Delta Tunnels project (known otherwise as "California WaterFix") by putting forward increased San Joaquin River flows with relaxed south Delta salinity objectives both of which would realize the future foretold in the source-water fingerprint modeling done for the tunnels project of increased San Joaquin flow lacking further control on San Joaquin pollutant discharges that make that river's water less desirable for export or for contribution to outflow. The Board has continued to separate the lower three tributaries from the upper San Joaquin, upstream of the Merced confluence.

It is much simpler and more direct to just state "the purpose of these flow objectives is to ensure that increased San Joaquin River inflow contributes drop for drop to Delta outflow, and such inflow is not available for export" but no such succinct statement appears in the final draft.

SWRCB's language for this is laden with legalese that obfuscates its seeming good intentions:

> It is the State Water Board's intention that an entity's implementation of the LSJR [Lower San Joaquin River] flow objectives, including implementation through flow requirements imposed in a [Federal Energy Regulatory Commission] process, will meet any responsibility to contribute to the LSJR inflow component of the Delta outflow objective in this Plan. The State Water Board, however, may further consider and reallocate responsibility for implementing the Delta outflow objective in any subsequent proceeding, including a water right proceeding.[31]

We continue to regard the Board's proposal on the protection of San Joaquin inflow and for Delta outflow as weak tea. In light of the present Change Petition proceeding on the tunnels project, we do not find it reassuring that the Board may further consider and reallocate responsibility for contributing to Delta outflow in a water right proceeding, since such a proceeding could go either way depending on evidence received and weighed by some future board.

We continue to find no reference to or incorporation of key water policies applicable to the Delta nor any findings by the SWRCB demonstrating that the Phase 1 final draft complies with these policies and

how-so. We find such reference in the final environmental report issued this summer, which is heartening to us, but SWRCB continues to neglect the educative role water quality control plans can play with the wider public.

We continue to find no reference to the SWRCB obligation under state law to make findings for the final draft's compliance with statewide environmental justice, human right to water, and new beneficial uses—and no definitive analysis or statement that the new water quality objectives would protect tribal cultural, tribal subsistence fishing, and general subsistence fishing beneficial uses in the Bay-Delta Plan amendments themselves. SWRCB has stated to us that these uses are at this time beyond the scope of the amendments until some unspecified future time. "The State Water Board will consider designating these uses in the Bay-Delta Plan as necessary and appropriate as part of its continuing water quality planning process."[32]

Retaining the salinity objectives of the 1995 Bay-Delta Plan would ensure protection of both the area's farms and the river path for young salmon swimming to the Pacific Ocean. Area farms provide important farm employment for many members of Delta and Stockton environmental justice communities. Salmon are a key resource for commercial and sport fishing, and a way of life for many Northern California Indian tribes. Salmon at risk of extinction now is an environmental justice issue for these tribes and for all people who fish for their subsistence in the Delta and along these rivers. The bodies of returning salmon contribute to the health of our watersheds, economies, our farms, and to environmental justice communities and connect the nutrients of the Pacific Ocean with the ecosystems of Central Valley and other watersheds.

We recognize that the SWRCB has a difficult task balancing competing needs for lower San Joaquin River flows in an oversubscribed system. However, the SWRCB decided in 2009 not to bring the upper San Joaquin River water users into this process. This action was not caused by Delta residents or resources. We urge those Stanislaus, Tuolumne, and Merced River water users who are expected to contribute tributary flows under this plan to remember how the Phase 1 Plan's distribution of sacrifice came about—and that they remember not to blame migrating salmon who long predate our all-too-human politics in this watershed.
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Chapter 3 End Notes

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2 State Water Resources Control Board, *Revised Water Right Decision 1641: In the Matter of Implementation of Water Quality Objectives for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary; A Petition to Change Points of Diversion of the Central Valley Project and the State Water Project in the Southern Delta; and A Petition to Change Places of Use and Purposes of Use of the Central Valley Project*, March 15, 2000. Accessible at https://www.waterboards.ca.gov/waterrights/board_decisions/adopted_orders/decisions/d1600_d1649/wrd1641_1999dec29.pdf.

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4 U.S. Department of the Interior, Fish and Wildlife Service, 1996, Recovery Plan for the Sacramento/San Joaquin Delta Native Fishes, November. Accessible at http://ecos.fws.gov/docs/recovery_plan/961126.pdf.

5 State Water Resources Control Board, *In the Matter of Draft Cease and Desist Order Nos. 262.31-16 and 262.31-17 Against the Department of Water Resources and the United States Bureau of Reclamation Under their Water Right Permits and License and In the Matter of Petitions for Reconsideration of the Approval of a Water Quality Response Plan Submitted by the Department of Water Resources and the United States Bureau of Reclamation for their Use of Joint Points of Diversion in the Sacramento-San Joaquin Delta.* Accessible at https://www.waterboards.ca.gov/waterrights/board_decisions/adopted_orders/orders/2006/wro2006_0006.pdf; modified order in 2010 at http://www.waterboards.ca.gov/waterrights/board_decisions/adopted_orders/orders/2010/wro2010_0002.pdf.

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7 State Water Resources Control Board, *Scientific Basis Report in Support of New and Modified Requirements for Inflows from the Sacramento River and its Tributaries and Eastside Tributaries to the Delta, Delta Outflows, Cold Water Habitat, and Interior Delta Flows, Final (2017),* p. 1-5*;* and State Water Resources Control Board*, July 2018 Framework for the Sacramento/Delta Update to the Bay-Delta Plan*, p. 6. Hereafter *July 2018 Framework*.

8 Delta Watermaster, 2012, Water Right Compliance and Enforcement in the Delta, February. Accessible at https://www.waterboards.ca.gov/board_info/agendas/2012/feb/020712_9_with%20report.pdf.

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10 SWRCB defines unimpaired flow as "the water production of a river basin, unaltered by upstream diversions, storage, or by export or import of water to or from other watersheds." State Water Resources Control Board, "Fact Sheet: Proposed Final Amendments and Final Substitute Environmental Document for Lower San Joaquin River Flow Objectives and Southern Delta Salinity Objectives," July 6, 2018, p. 3. Accessible at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/docs/sed/lsjr_sdwq_fact_sheet_070618.pdf.

11 State Water Resources Control Board, "Media Release: State Water Board Seeks Public Comment on Final Draft Bay-Delta Plan Update for the Lower San Joaquin River and Southern Delta," July 6, 2018, p. 2. Accessible at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/docs/Bay-Delta_Plan_Update_Press_Release.pdf.

12 State Water Resources Control Board, "Fact Sheet: Proposed Final Amendments and Final Substitute Environmental Document for Lower San Joaquin River Flow Objectives and Southern Delta Salinity Objectives," July 6, 2018, p. 3. Accessible at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/docs/sed/lsjr_sdwq_fact_sheet_070618.pdf.

13 *Ibid*., p. 6.

14 Unlike past Bay-Delta Plans, SWRCB split its planning activities in 2008 for the Bay-Delta Estuary into two phases: Phase 1, for amendments to San Joaquin River flow and interior south Delta salinity objectives; and Phase 2 for all other agricultural, municipal/industrial, fish and wildlife, and water system operational objectives for flow and salinity.

15 SWRCB views these as quite distinct processes. "The State Water Board's adjudicatory hearing [for the tunnels project] is being held in a process that is separate and distinct from the rulemaking process for approval of the plan amendments and certification of the SED."

16 "Hydrodynamics" is a scientific term describing the various simple and complex ways in which water flows through Delta stream channels.

17 An example of this disconnect is that current D-1641 and 1995 Bay-Delta Plan uses one definition of "export-to-inflow ratio" (E/I ratio) that divides all flows from Delta tributaries into the total export rate at CVP and SWP Delta pumps near Tracy. DWR has for the tunnels project proposed a new definition of E/I ratio that excludes north Delta diversions' contributions to inflow from the Sacramento River, a radical change that would create an incentive for DWR to divert more water in the north than directly in south Delta channels. SWRCB has yet to release its Phase 2 Bay-Delta Plan, but it is expected to contain some type of E/I ratio objective.

18 State Water Resources Control Board, *Evaluation of San Joaquin River Flow and Southern Delta Water Quality Objectives and Implementation—Responses to Comments,* July 2018, Master Response 1.1: General Comments, pp. 28-34. Hereafter Master Response.

19 State Water Resources Control Board, *Water Rights Within the Bay-Delta Watershed,* September 26, 2008, presented to Delta Vision Blue Ribbon Task Force, October 17, 2008. Accessible at http://deltavision.ca.gov/BlueRibbonTaskForce/Oct2008/Respnose_from_SWRCB.pdf; California Water Impact Network, California Sportfishing Protection Alliance, and AquAlliance, *Testimony on Water Availability Analysis for Trinity, Sacramento, and San Joaquin River Basins Tributary to the Bay-Delta Estuary,* submitted by Tim Stroshane, October 26, 2012, accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/docs/comments111312/tim_stroshane.pdf; and Theodore E. Grantham and Joshua H. Viers, "100 Years of California's water rights system: patterns, trends and uncertainty," *Environmental Research Letters, 9*(2014), accessible at https://watershed.ucdavis.edu/ciles/biblio/WaterRights_UCDavis_study.pdf.

20 *July 2018 Framework*, pp. 6-7.

21 See *City of Tracy v. California State Water Resources Control Board* (Sacramento Superior Court Case No. 34-2009-80000392.

22 Draft Staff Report, *Part 2 of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries Of California*, SWRCB Division of Water Quality, January 3, 2017.

23 We note that water quality control plans generally do little to educate the public about the bases for the water quality and flow objectives that such plans contain. The plans are treated by SWRCB as little more than vessels containing the objectives. The public must look to less obvious locations for explanations of how and why these objectives were chosen and approved.

24 American Community Survey, 2010-2014, Tables DP-02, DP-03, DP-05. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/2016_sed/docs/sfb_ssjde_bay_delta/12162016_stroshane.pdf.

25 October 10, 2011 Public Draft: Economic Sustainability Plan for the Delta. Page 131. Table 20.

26 Microcystis in the Delta. Peggy Lehman, Ph.D. Report to the Delta Protection Commission, September 2016. http://www.delta.ca.gov/files/2016/10/091516_Item_8_DrLehman.pdf.

27 *July 2018 Framework*, p. 14.

28 These and other species indicators are included in narrative cold water habitat, Delta outflow, and interior Delta flow objectives. *July 2018 Framework*, pages 16, 17, and 19-20.

29 *July 2018 Framework*, pp. 12-13, Tables 1 and 2.

30 *Master Response 1.1*: General Comments, pp. 19-20.

31 *SWRCB, Revised Water Quality Control Plan, Evaluation of San Joaquin River Flow and Southern Delta Water Quality Objectives and Implementation, Appendix K*, July 2018, p. 29. Accessible at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/2018_sed/docs/appx_k.pdf.

32 *State Water Resources Control Board, Evaluation of San Joaquin River Flow and Southern Delta Water Quality Objectives and Implementation, Comment Letter 1302* (Restore the Delta, March 2017), Comment 7 Response (no page citation available).

Chapter 4:
MWD is a Delta Neighbor Now

In the 1950s, water lawyer Walter Gleason saw dangers of unchecked development of Central Valley water resources for Delta water rights holders[1]—most of whom at the time owned Delta islands. Water rights are important because they help determine who can divert water for use, where, and when.

Gleason's career in California water law began in the early 1920s and would continue for seven decades. Then-state senator Stephen Teale requested he write a lengthy legal treatise for about the implications of the new State Water Project (SWP) that passage of Proposition 1 in November 1960 would unleash. In the treatise, Gleason posited that the Delta island water users were vulnerable to the California Department of Water Resources (DWR) and the U.S. Bureau of Reclamation (the Bureau) moving in for a "water grab." He believed that the new State Water Project (SWP) would create opportunities for litigious water grabs on an unprecedented scale aimed at the north. Southern California's cities would seek Northern California's "surplus waters" (which Gleason thought meant everything above the Tehachapi Range) in litigious invasion for water, with assistance from the state of California. He further described how passage of the 1960 water bond placed the state of California and Southern California water contractors in position to challenge Delta water users' rights on behalf of State Water Contractors, of which MWD is today the largest.

Gleason feared DWR, the Bureau, and the Metropolitan Water District of Southern California (MWD) would claim that Delta farmers' water use may be "unreasonable"—an allegation invoking the California Constitution's prohibition against waste or unreasonable use of water. Lodging such claims would be a serious threat of protracted, expensive litigation, given that these agencies were stocked with engineering and legal expertise, as well as financial capital afforded by their taxing powers,

On the eve of the November 1960 election that saw John F. Kennedy elected President and the State Water Project bonds narrowly approved by California voters, Gleason wrote, "the end result of this new Water Plan will be exactly the same as if all of Southern California were to be physically uprooted and set down at Tracy [i.e., next to the Delta]. [T]he length of the aqueduct between the Tracy Pumping Plant [at the north end of the California Aqueduct] is immaterial since the South will...be sitting next to the Delta with a right to receive water out of the Delta (through its 'water contract' with the State).

"A direct consequence of this new 'hydrology'," he continued, "is that for the first time in history the South will become directly and legally interested in the water resources of the Central Valley and the water rights (existing and prospective) in connection therewith." California's regions would be bound together as never before, and Gleason worried that technological prowess would outrun legal insight into the new system.[2]

Fast-forward to now: Walter Gleason's well-documented warnings of external political and economic powers entering the Delta region have come to pass in the Delta with the tunnels project, the recurrent relaxation of salinity objectives hurting Delta irrigators and drinking water providers, and the excessive export of Delta waters by the SWP and CVP cutting into the water needs of Delta beneficial uses—both human and non-human.

These earlier conflicts faced by Delta communities and resources have been often and largely fought through the institutions of California water law and litigation. MWD now owns five Delta islands (Chipps, Webb, Holland, Bouldin, and Bacon), and is the controlling entity on two new "joint powers authorities" launched recently to govern design, construction, and financing of the tunnels project. This means that our most Delta-interested Southern California water agency is now an immediate neighbor, quite probably our largest Delta landowner, and wields considerable power over looming water diversions here. Delta residents—including especially our environmental justice communities—will be confronted with this power in their midst whether MWD is a good or a bad neighbor.

This chapter reviews what we understand to date about MWD's presence here. Its presence will be felt through its ownership of five islands in the Delta and its outsized role on tunnels project design/construction and finance joint powers authorities. We ask what we think are crucial questions as Delta planning, projects, and government processes move forward. How does the Delta as a region respond to its new neighbor? Particularly, how do Delta EJ communities respond to its new neighbor?

MWD's Island Acquisition Strategy

MWD's acquisition of Delta islands in 2016 is part of its strategy to gain greater control over the outcome of decisions remaining for the tunnels project, and also serves as an indicator that future project management will first and foremost be driven by the needs of water exporters. The acquisition came after six years of DWR failing to gain entry rights to property owners' lands for test drilling and other tunnels project studies. Delta farmers won in the California Court of Appeal in 2014 and defeated DWR's efforts to condemn temporary and permanent easements for the purpose of geotechnical studies (drilling).[3] While the Supreme Court later reversed that decision, it also reformed the pre-condemnation entry procedure to allow land owners the right of a jury trial on the measure of damages at the proceeding. DWR has yet to complete a single right of entry condemnation for the tunnels. Undeterred, the Design Construction Enterprise (DCE) unit (housed in DWR but staffed with MWD employees either on loan or through personal recommendation) within DWR drafted a condemnation plan for over 300 properties in the Delta to move forward with construction of the tunnels in 2016.[4] This plan was drafted while Delta residents, environmentalists, local government agencies, Northern California water districts, and good-government advocates were all working on response comments on the BDCP and its supplemental environmental report. Indeed, Delta residents only learned of the confidential condemnation plan as a result of a Public Records Act request to MWD, as well as the existence of DCE planning documents, including the condemnation property list, which were not addressed in the environmental report.

A few weeks later, RTD was informed by a confidential source that MWD and Westlands Water District (Westlands) were moving to purchase five Delta islands from the owners of the Delta Wetlands Project. The islands owned in partnership by Semitropic Water Storage District and Zurich American Corporation contained several of the Delta properties on the condemnation list and several of the islands were in the direct path of the Delta tunnels alignment.[5] Two days after RTD announced its findings to the press, Westlands announced its withdrawal from the Delta islands purchase. The purchase discussion for the islands had taken place in closed sessions of MWD's Real Asset and Property Management Committee, and these meetings included discussions on pricing, negotiation, and terms of payments. While real estate negotiation details do qualify under the Brown Act as an item for closed session meetings, the lack of transparency and open public discussion regarding a major asset purchase to be funded by MWD ratepayers, and the collaboration between the DCE staff drafting the eminent domain plan and MWD management, serves as an indicator of how MWD has transformed DWR into a captive agency. DWR's mission is "[t]o manage the water resources of California in cooperation with other agencies, to benefit the State's people and to protect, restore and enhance the natural and human environments." DWR's mission is not to be a party to a hidden land acquisition strategy so as to bypass customary public interactions and regular legal processes when dealing with landowners in the path of the proposed project. DWR's mission is not to push forward a project through secret dealings to do the bidding of specific water agencies, enabling those same public agencies to hide the financial decisions they make from their ratepayers and from Delta residents who will have to live with the impacts.

But MWD went a step further and was not fully transparent with its own voting member agencies. The five Delta islands were purchased for $175 million after a slim vote to move forward with the purchase by MWD board members, despite public exposure of the purchase, and hand delivery of thousands of signatures on petitions of Delta residents opposing the sale. In October of 2016, San Diego County Water Authority (SDCWA), one of MWD's member agencies, was still trying after the vote to understand exactly what the purchase entailed and sent a Public Records Act request to MWD for all appraisals for any of the properties. In August 2017, almost a year after the initial PRA request,

SDCWA sent a follow-up letter because MWD manager Bryan Otake had informed SDCWA that no appraisal documents existed for the escrow and purchase of the Delta islands, even though, on August 8, 2017, MWD General Manager Jeff Kightlinger had told the Rincon del Diablo Municipal Water District Board of Directors regarding the island purchase, "[t]here was an appraisal that was four years on it." Mr. Kightlinger then stated during his pitch to the Rincon del Diablo Board that the MWD Board of Directors, not staff, decided another appraisal was not necessary for the islands' purchase. This was a surprise to SDCWA.[6]

If the appraisal was four years old at the time of the Delta islands purchase, it suggests MWD had been involved in a long effort to purchase Delta land where the tunnels could be built. MWD's lack of transparency about the purchase with SDCWA—one of their largest member agencies—raises the question of whether any MWD member agencies can trust MWD's proposed analysis of costs and water deliveries, as well as their analysis of construction risk impacts. Obfuscation of project details for member agencies, like the existence of appraisals, is not conducive to a transparent government process or sound financial planning that serves the public interest for MWD ratepayers, Delta residents, and all Californians. Moreover, the parallels are striking between MWD's efforts to exert control over Delta land ownership in order to facilitate WaterFix construction and the historical record of city of Los Angeles Department of Water and Power's land ownership and water transfers in Owens Valley based on historical research by author William Kahrl. After acquiring most water rights to the Owens River, the impact on the Valley's economy led the city to compensate injured land owners by purchasing ranch lands and town lots. The Valley's economy collapsed, however. Kahrl summarizes the valley-city relationship that emerged in the 1920s:

> In deciding what should be done with the Owens Valley properties, however, the city's officials faced a problem almost entirely without precedent under the United States federal system of government. The wholesale land and water acquisitions that followed the collapse of the Watterson banks had created an anomalous situation whereby one public entity, the city of Los Angeles, had become the virtual owner of another public entity, the county of Inyo. The modern history of relations between the city and the valley has consequently been shaped by Los Angeles' sometimes faltering attempts to come to terms with its responsibilities under this essentially colonial relationship.[7]

The Delta islands purchase by MWD in 2015-2016 was an orchestrated event to make MWD the largest landowner, and, thus, water rights holder, in the Delta estuary. Furthermore, this acquisition, which never underwent a normal appraisal process, was conducted in a manner that subverted required transparency for a public agency as a way to avoid internal board opposition to the purchase and external opposition from the greater Delta community. The public only learned of these activities through the power of the public records act request and from whistleblowers. As the project is moving forward with Construction and Finance joint powers authorities (JPAs) that hold meetings at inopportune times for the public, it will become nearly impossible for project management to be tracked. This business plan fails to serve the public interest.

Perhaps even more troublesome is that MWD, as the largest project proponent, has not put forward funding through the SWP Contractors for payment for this permit hearing process by the SWRCB as required under law, yet has spent hundreds of millions on securing its access to Delta water supplies and land in order to move forward with the project before having permits in hand. This serves as further evidence of MWD's strong-arm tactics to receive project benefits that are contrary to the legal mandate of reducing reliance on the Delta, while seeking public subsidies for the project.

MWD's Outsized Influence on California WaterFix Would Harm Delta Residents

The transfer of freshwater through the tunnels from the Sacramento River to the exports facilities is

contrary to the public interest of the residents of the Bay-Delta region, particularly members of the Delta environmental justice communities, as well as ratepayers and domestic water users within California's SWP and CVP service areas.

As of the writing of this report, the newly formed Delta Conveyance Finance Authority (DCFA), a JPA for tunnels finance, is seeking funding from the Federal Environmental Protection Agency (EPA) Water Infrastructure, Finance, and Innovation Act (WIFIA) loan program for 49 percent of the $11 billion committed toward the total initial project costs of $16.8 billion. The DCFA plans to issue revenue bonds (on the strength of MWD's strong credit rating) and acquire WIFIA loans to pay back DWR for bonds that DWR will issue to continue project design, planning, and construction for the tunnels.

DCFA was formed in part to expedite tunnels project financing, since DWR has filed a validation action seeking a judicial confirmation of DWR's authority to issue revenue bonds for State Water Project facilities, including the tunnels project, California WaterFix. DCFA is "plan B" should the judge rule that DWR has no such authority, since MWD is cash-rich and has perhaps the largest single property tax base among California local governments to support its revenue bond issues. Validation actions are common in agency financing matters. During the pendency of the validation action, the marketability of California WaterFix Revenue Bonds to private investors was likely to be affected. Thus, MWD as the voting member with majority control of the Delta Conveyance and Design Construction Authority (DCDCA) for the tunnels sought creation of the DCFA as an insurance measure in case funding would have to be pursued separately from DWR. Whether the DCFA pays back DWR for bonds or finances the project directly, it will exert final control over debt management for California WaterFix, with MWD having majority voting control over financial decisions. MWD's Board Chair, Randy Record, serves as Board Chair of the DCFA. Brian Thomas, the Interim Executive Director, is a former CFO of MWD, and MWD provides accounting and banking services presently for the DCFA.

At their initial July 21, 2018 meeting, the DCFA Board discussed the need for future analysis around private investor contributions toward financing the project. The DCFA's approved motion for application of WIFIA loans and discussion of looking at private investment suggests that the tunnels project will become a public-private partnership (or P3). Thus, private investors would have a direct interest in operation of the Delta tunnels, thereby having influence on water quality and quantity decisions for Delta communities.[8]

DCFA's financing rationale for the tunnels project can be found in their WIFIA Letter of Interest (LOI) submitted to the EPA July 27, 2018 to begin the WIFIA loan process. It is here that we can see stark contrasts with how the project has been represented to the public. The LOI claims impacts to environmental justice communities—but only outside of the Delta. Project construction costs have risen to $19.8 billion, due to annual interest and inflation calculations. The cost benefit analysis referred to in the letter is actually an analysis for a single tunnel project that is no longer being pursued by water contractors. The Letter of Interest claims that no federal monies have been used thus far for funding California WaterFix; however, separate state and federal audits found that over $84 million in federal funding has been spent on the planning process, despite requirements under the law specifying all costs to be paid by the water beneficiaries of the project.

The WIFIA LOI claims the tunnels project would generate 100,000 jobs during construction, which dramatically exaggerates the peak direct 2,427 construction jobs in the third year of construction reported by the project's final environmental report; moreover, the same report states that regional employment effects would peak in the twelfth year of construction with an additional 6,400 jobs (mainly in the service sector). These job figures come to less than 10 percent of the jobs claimed in the WIFIA LOI. Moreover, the California WaterFix website claims creation of 117,000 related jobs to the tunnels project, yet states that $7 billion of project costs would be allocated to employee salaries. Over a fifteen year construction period, these potential positions would average cumulative earnings per position of just

under $60,000, or $4,000 annually, appears incorrect given the cost of living in the Bay-Delta region.

MWD's influence on the DCFA is quite clear in the WIFIA LOI description of impacts to economically distressed communities. In this portion of the letter, economically distressed communities, within Southern California and Kern County are identified as being the recipients of water deliveries from CA WaterFix, but Delta environmental justice communities identified in Chapter 1 of this report are not identified in any manner, nor are the water quality or socio-economic impacts to Delta EJ communities. Delta EJ communities are essentially written out of this LOI to the federal government. Additionally, much opposition exists within the Southern California environmental justice water community which will experience higher water rates and potentially higher property taxes without being recipients of water from the tunnels project.[9]

> Economically stressed communities ranging from Los Angeles and Riverside counties in Southern California to cities throughout the Central Valley will benefit from WaterFix. In California the greatest concentration of economically stressed communities occurs in the agricultural Central Valley and Los Angeles, Riverside and San Bernardino counties. In Southern California, economically stressed communities in South Central Los Angeles, Riverside County, and San Bernardino County will see the benefits of WaterFix in terms of a more reliable water supply at lower cost than other alternatives. In the Central Valley migrant farm worker communities like Avenal and Delano will see the benefits of reliable water supplies for the farms in Tulare and Kern counties where they work.
>
> Providing safe, cost-effective water supplies is particularly important for economically stressed communities. For urban areas served by the SWP, WaterFix represents a far less expensive approach to securing future water supplies than to allow SWP reliability to deteriorate and replace this supply with local alternatives alone. WaterFix, in tandem with more conservations and new local supplies to meet the demands of population growth, is the most cost-effective urban water strategy for the affected communities in the state.[10]

Restore the Delta wholeheartedly concurs that it is essential to provide safe, cost-effective water supplies to economically distressed communities. Safe and cost-effective water supplies are a matter of good water quality as well as quantity. The WIFIA LOI fails to note, however, that the city of Stockton (the largest city in the Delta region) unfortunately ranks first in economic distress among large California cities—more distressed, alas, than San Bernardino, Riverside, Fresno, and Bakersfield, as found by the Economic Innovation Group using the Distressed Communities Index method. Yet the DCFA (led by MWD officials) has the temerity to advocate for a project that would export good quality fresh water from the Delta (that is, taking Peter's water, paraphrasing the old adage) for delivery to other California distressed communities (that is, to provide water to Paul).

Stockton is ranked first in economic distress among large California cities in 2017

Distressed Large City Rank in California	City	Distress Score (Unitless)	Large City US Rank—Prosperity	Percent in Distressed Zip Codes	Percent in Prosperous Zip Codes
1	Stockton	94.6	93	69.8	0.0
2	Fresno	87.8	87	49.2	11.3
3	San Bernardino	85.8	86	70.5	0.0
4	Sacramento	77.6	77	11.7	13.4
5	Santa Ana	72.6	70	0.0	0.0
6	Bakersfield	66.7	63	49.9	27.8
7	Long Beach	64.6	59	21.8	30.6
8	Oakland	62.8	54	37.9	18.2
9	Los Angeles	60.8	51	15.4	17.7
10	Riverside	58.3	45	6.6	10.3
11	Chula Vista	47.0	32	0.0	37.6
12	Anaheim	42.9	25	0.0	16.2
13	San Diego	38.8	22	0.0	46.6
14	San Jose	23.2	8	0.0	49.6
15	San Francisco	19.5	5	0.0	47.9
16	Irvine	7.0	3	0.0	80.7

Source: Economic Innovation Group, 2017. Accessible at https://eig.org/dci#.

Shifting control of Delta Tunnels financing authority from DWR to the DCFA in reality transfers authority and representation of the project to MWD. In turn, who benefits and who loses as a result of construction and operation of CA WaterFix becomes a narrative controlled by MWD. The organizational and legal risks—and the lack of transparency—of project administration through complex joint powers authorities and numerous agreements among varying combinations of parties will undermine the public interest of those who live within the Delta watershed, as seen in documents such as the WIFIA LOI, which was acquired by a journalist, who shared it with RTD. It was not posted for public scrutiny at the DCFA website.

Moreover, conflict among the member agencies that make up the DCFA and the DCDCA could complicate tunnels project JPA governance. For instance, are all members responsible if either of the JPAs, acting in their names, gets sued for damages?[12] How will a member agency balance its fiscal, financial, and water or land use responsibilities if it has fiduciary obligations to the JPAs?[13] For example, if a water district as part of a JPA also faces revenue shortfalls in its individual budget from its customers conserving water, yet its JPA requires a minimum payment for debt service or other financial contribution, what should that district do? To whom does it owe primary loyalty? The pitfalls can extend to whether the JPA conducts its business in public[14], as well as to conflicts of interest of its member officials under state law.[15]

MWD indicated in its September 26, 2017 Board Workshop that, in addition to the DCDCA and the DCFA, an Adaptive Management Group would be formed in which one SWP Contractor Representative and one CVP Contractor Representative would participate in adaptive management decision-making by consensus with state and federal regulators. This governance arrangement would also eliminate firewall protections for the public or arm's-length relationships between regulators and water contractors, who will have financial ties to private investors. Such arrangements would give water contractors veto power over potential regulatory enforcement actions, since they would depend on water deliveries from the tunnels for water sales, the revenues from which would repay loans and bonds.

Conflation of project beneficiaries and regulators would not serve the public interest because it would exclude Delta communities, particularly environmental justice communities, from project management oversight and subject to myriad adverse impacts of Delta flow conditions set to serve the interests of water exporters. The JPA contractor members of the adaptive management group would be self-interested to interpret implementation of flow and water quality criteria intended for Delta beneficial uses and communities to instead favor meeting water export goals for participating water contractors.Thus, adaptive management decisions would be unaccountable to the public and opaque for public redress of grievances suffered by Delta community representatives. This would not serve the public interest of Delta area residents, especially those dependent on the Delta as a source of their drinking water supplies and whose water rates could increase as a result of Waterfix operations. This would not serve the public interest of Northern California Indian Tribes dependent on healthy salmon fisheries.

In summary, MWD's outsized influence over the JPAs and the proposed adaptive management group culminates a process that failed to identify, include, and protect the interests and rights of Delta environmental justice communities. As a result of land acquisition and voting control over the tunnels project, Metropolitan Water District of Southern California has become the controlling force over Delta watershed management and over Delta environmental justice communities.

Chapter 4 End Notes

1 See Chapter 2, subsection on "The Role of Water Transfers" for a brief explanation of California water rights.

2 California Senate Interim Committee on Water Projects, Senator Stephen P. Teale, *Opinion of Attorney Walter M. Gleason Regarding Various Legal Aspects of Burns-Porter Act (SB 1106) (Proposition One)*, October 28, 1960, pages 15 and 21.

3 *Property Reserve, Inc. v. Superior Court* (2014) 224 Cal.App.4th 828, 899.

4 Metropolitan Water District of Southern California, n.d. DCE CM1 Property Acquisition Management Plan. Accessible at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/part2/RTD_274.pdf

5 Delta Water Tunnels Alt. 4A/Delta Wetlands Properties, Bacon Island Assessor Parcel Numbers, September 2015, accessible at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/part2/RTD_275.pdf; Delta Water Tunnels Alt. 4A/Delta Wetlands Properties, Bouldin Island Assessor Parcel Numbers, September 2015, accessible at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/part2/RTD_276.pdf; Delta Water Tunnels Alt. 4A/Delta Wetlands Properties, Webb Tract Assessor Parcel Numbers, September 2015, accessible at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/part2/RTD_277.pdf; and Delta Water Tunnels Alt. 4A/Delta Wetlands Properties, (Summary Map) September 2015, accessible at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/part2/RTD_278.pdf.

6 Letter dated August 9, 2017 of Mark J. Hattam, General Counsel, San Diego County Water Authority, to Marcia Scully, Esq., General Counsel, Metropolitan Water District of Southern California, regarding PRA Request of October 6, 2016, with attachments.

7 William Kahrl, 1982. Excerpt of Chapters 7 and 8 from W*ater and Power: The Conflict over Los Angeles' Water Supply in the Owens Valley*, Berkeley, CA: University of California Press, p. 350. Accessible at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/part2/RTD_281.pdf

8 See Appendix 10 to this report; and see *Central Valley Business Times'* video record by Gene Beley of the July 2018 DCFA meeting at https://vimeo.com/281025561.

9 Testimony of Barbara Barrigan-Parrilla, Hearing in the Matter of California Department of Water Resources and United States Bureau of Reclamation Request for a Change in Point of Diversion for California WaterFix, accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_20.pdf.

10 WIFIA LOI, July 27, 2018, p. 35.

11 See Chapter 1's discussion of economic distress indicators in the Delta region obtained from EIG.

12 League of California Cities. n.d. *Joint Powers Authorities: Opportunities & Challenges*. Prepared by Joan L. Cassman and Jean B. Savaree, p. 10. Accessible at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/part2/RTD_273.pdf.

13 *Ibid*., p. 12.

14 *Ibid*., p. 15

15 *Ibid*., pp. 18-22

Conclusion

The Delta is not a problem for Delta people. The Delta is our home, where our hearts lie and our livelihoods are made.

Water problems of the rest of California are laid at our doorstep, problems outside powers demand we solve. Whether communicating with the general public, media, government agencies, water districts, agriculture organizations, tech advocates, or elected officials, Delta-region city and county governments, water agencies, and non-profit groups are almost always expected to address our proposed solution for the Delta. Unwilling to solve their watershed problems within their own watersheds, Californians from elsewhere prefer to burden Delta ecosystems and economies to solve their problems through water exports, and then criticize Delta interests for daring to question the efficacy of their and the State's management of the Delta and California water. More often than not, our concerns are met with statements lik : "If Delta interests oppose the tunnels, they must have a plan for how importing cities like Silicon Valley and Los Angeles will get water without the project," or "If Delta interests insist that more freshwater flows are needed for restoration of the estuary, they must also solve the water needs of agri-businesses upstream."

This burden needs to shift. Sacrifice for the good of California water supply and environmental health needs to be shared. The Delta has borne most of the sacrifice with the exploitative exports and collapsing native ecosystems and fish species it has endured over the last half-century. Our report details how proposals to increase water exports and revamp water quality regulation will likely affect the residents and citizens of the Delta's future—including its environmental justice communities—extending into the next half-century.

Since 2006, RTD has shouldered part of the Delta's burden by offering solutions to the crisis in the Delta and alternatives to the Delta tunnels project. Since 2010, we have promoted the Environmental Water Caucus's *Responsible Water Export Plan*. Along with Food and Water Watch of California and the California Water Impact Network, we published a report produced by ECONorthwest calling for land retirement of the drainage-impaired agricultural lands on the westside of the San Joaquin Valley which use the majority of Delta water exports while returning a significant portion of polluted drainage water to the Delta. We have cited sound engineering and economic data from the Delta Protection Commission's Delta Economic Sustainability Plan regarding the logic behind upgrading Delta levees. We point to well-documented reports by The Pacific Institute and the Natural Resource Defense Council (NRDC) on sustainable, regional water management for both agriculture and urban water users. We even published our own California Sustainable Water Plan where we documented through photos in easy-to-understand terms of current-ground projects that exemplify how California can transition to sustainable water management—and reduce reliance on the Delta for California's future water needs at the same time.

We have even agreed that NRDC's Portfolio Plan, which calls for a single tunnel, and a proposed western Delta intake strategy should both be studied and evaluated along with our no tunnel alternative plan, provided that all parties that would be impacted by any new Delta systems would be able to participate in the analysis, including Delta environmental justice interests and Northern California Indian Tribes. Yet, after twelve years of planning and over a quarter of a billion dollars of state, federal, and water ratepayer spending, DWR has failed to conduct one Delta planning process not structured around a predetermined outcome—the construction of the Delta tunnels project.

Restore the Delta maintains that DWR needs to scrap the tunnels project, California WaterFix, for the reasons listed page-by-page in this report–from construction impacts to water quality degradation; from project costs to looming privatization of the state's primary water delivery system; from destruction of habitat for greater sandhill cranes and the failure to double salmon populations to significant water rate and property tax increases for water users to loss of jobs for Delta EJ communities. Tunnel projects can become regrettable boondoggles, as happened in recent years to Seattle. (See Appendix 10.)

DWR needs to embark on a new Delta planning process that includes all impacted parties and is based on transparency, sound science, and detailed economic planning from numerous perspectives, allowing the best plans to rise to the top for evaluation and recommendation.

The Delta, particularly its environmental justice communities, have been ignored, yet paradoxically required by others to articulate a statewide water management solution, while being blamed as the primary culprit behind Delta water quality degradation. Delta residents and leaders constantly defend against all the assigned roles in a classic "blame the victim" narrative: sinner, solver, and scapegoat, all rolled into one regional identity. *If only* those Delta people hadn't reclaimed Delta islands and built levees around some of the most productive prime farmland in the state and the nation; *if only* those Delta people didn't divert water from Delta rivers to grow their crops; *if only* those Delta people didn't use Delta water for all its beneficial uses; *if only* those Delta people didn't eat and spiritually rely on the fish from the Delta (including tribal fishing rights); *if only* those Delta people didn't recreate in the Delta; *if only* those Delta people didn't need and have a human right to clean drinking and sanitation water for their homes; *if only* those Delta people weren't poised to grow their economy as a way to overcome deep poverty in urban Delta communities so we could export their water to our economies (equity in local development). *If only* the people of the Delta were not in the way of the Delta tunnels and dependent on healthy and adequate freshwater flows through the estuary. *If only* those Delta people would articulate an alternative that we, the water exporters, find acceptable for a Delta tunnels replacement.

Delta people do these things because as Americans we have rights too: rights to beneficially use water for drinking, fishing, farming, swimming, and to protect the public trust. And we fight to continue exercising these rights every day of our lives.

It is the State's responsibility to lead water management planning for all Californians, including Delta residents and Delta EJ communities. DWR has a responsibility to manage water, a public trust resource for all Californians, but instead it has functioned as a wholly-owned subsidiary of the Metropolitan Water District as described in Chapter Four with the creation of the Delta Conveyance Finance Authority.

We believe that the cure going forward for the failure in planning as exemplified by California WaterFix and the complete dismissal of the Delta environmental justice community is inclusion, transparency, and accurate analysis that considers multiple solutions to the water crisis within the Delta. We believe that the cure going forward is a radical embracing of the 2009 Delta Reform Act by political and water agency leaders, as well as the State Water Resources Control Board, in all planning processes. This already established body of laws require reduced reliance on the export of Delta water. The Delta Reform Act requires restoring the Delta's waterways and ecosystem, in addition to protecting Delta economies and communities as a place of cultural and historical significance.

A radical embracing of the Delta Reform Act would begin with a true accounting of water availability within the Delta watershed to determine how much water could be safely exported from the estuary. A radical embracing of the Delta Reform Act would become policies, programs and projects that would reduce the actual amount of water taken from the Delta and that would augment Delta flows for estuary health.

We believe that the cure going forward for the Delta, and overall state water management, is for state agencies and powerful water districts to evaluate all water projects through the Human Right to Water and environmental justice lenses to ensure that environmental justice communities are being included and treated as partners in water decision making. Again, we believe that fully enforcing existing laws found in the California Water Code would lead to proper management of the Delta.

Should our recommendations continue to be ignored with the State Water Resources Control Board granting a permit for a change in the point of diversion (where water can be taken) for tunnels construction, numerous questions will need to be answered for members of the Delta environmental justice community and Northern California Indian Tribes:

1) Will I lose my home in my rural farming town as a result of fifteen years of tunnel construction? If I don't own my home, will I be compensated?

2) Will my rural water well be de-watered? Will I be compensated?

3) What will be the safety impacts from an additional 40,000 vehicles on the road during construction in the five Delta counties?

4) Will there be explosions and accidents during construction resulting from intrusion into the numerous natural gas wells and gas fields throughout the Delta? Will there be associated public health threats?

5) What happens if there are construction accidents resulting in numerous construction delays? What will be the impacts on rural and urban Delta communities?

6) Will there be an increased flood threat during construction?

7) Air quality impacts from tunnels construction will be the equivalent of 600,000 new cars on the road. How will that impact our local asthma rates?

8) What will happen to my farm-related job? Will I still work at that farm, or driving a truck, or processing food, or selling fuel, seed, fertilizer? How will I support my family? Is there a replacement economy?

9) How will we live with degraded drinking water supplies in our groundwater wells and through our urban water supply projects? What will be the impact on public health?

10) Can my urban water district ensure that our drinking water will continue to meet Clean Water Act standards?

11) How much will my water bill increase as a result of increased water treatment costs?

12) If Delta farms are taken out of production what do we do about lost property tax revenues? What will be the financial impacts on county, city, and town revenues? Will needed services for Delta EJ communities lose essential funding?

13) What will be the urban flood threat be during construction?

14) Will there be enough water left for sustainable urban development that can move urban populations out of poverty wage jobs?

15) With diminished flows from the tunnels is there any hope for improving urban Delta waterfronts to enhance public recreation opportunities?

16) Will it be safe to catch and eat any fish from the Delta?

17) Will there be any fish left to catch? What will be the impact on our culture and way of life?

18) Will the salmon doubling goal mandated by federal law ever be met?

19) Will I be able to recreate in the Delta? Go for a swim? Cross waterways with my small fishing boat?

20) What happens if toxic algal blooms proliferate? Will bacteria become airborne and a public health threat? Can my dog safely jump into the water? Can my toddler swim with me in the river?

21) Will there be a proliferation of mosquitos as a result of stagnant flows with operation of the tunnels? Could this pose yet another public health threat to Delta people?

22) What happens to Delta wildlife? Will there be a natural world for my children to observe and interact with? Is nature deficit disorder the end consequence for children in Delta EJ communities?

23) What does it mean that Metropolitan Water District is now the largest landowner in the Delta? What is their responsibility to Delta communities? Will their management of Delta lands only be for the export of Delta water? Will they push to rewrite the narrative of the Delta's geography, biology, and hydrology for their personal gain?

24) What is Metropolitan Water District's responsibility for creating public access within the Delta and ensuring the right to recreation by Delta residents?

And for all Californians, these questions must be answered regarding the financing of the Delta tunnels:

25) With the Delta Conveyance Finance Authority partnering with private investors will California's primary water delivery system be privatized, rather than an entity operating for the public good?

26) Will private investors have control over access to clean water for all its beneficial uses for Delta EJ communities? Who will protect these communities which the State of California has failed to identify?

List of Appendices

Appendix 1:

Descriptions of Delta Environmental Justice Communities' Economic and Demographic Data

Appendix 1A:

Environmental Justice Communities Relative to United States Population by Race and Hispanic or Latino Ethnicity (of any race)

Environmental Justice Communities of Contra Costa County
Relative to United States Population by Race and Hispanic or Latino Ethnicity (of any race)

	United States	Contra Costa County	City of Antioch	City of Pittsburg	City of Brentwood	Byron	Bethel Island	City of Oakley	Discovery Bay
Total Population	303,965,272	1,081,232	105,630	65,761	54,062	1,305	2,158	37,391	14,315
White	76.1%	66.7%	55%	40.4%	80.2%	96.4%	97.1%	72.4%	90.1%
Black or African American	13.4%	10.7%	**20.8%**	**21%**	6.9%	1.5%	1.2%	9.3%	4.5%
American Indian and Alaska Native	1.6%	1.7%	**2.1%**	**2.1%**	1.6%	0%	**3.3%**	**4%**	**1.9%**
Asian	5.3%	18%	**14.5%**	**19.3%**	**11.6%**	0.7%	0.9%	**10.9%**	**6.6%**
Native Hawaiian and Other Pacific Islander	0.3%	1.1%	**2.1%**	**2.9%**	**0.8%**	0%	0%	**0.8%**	**1.4%**
Some other race	6%	8.2%	**14.2%**	**21.8%**	**6.2%**	2.2%	1.4%	**9.4%**	2.8%
Hispanic or Latino (of any race)	15.7%	24.8%	**34%**	**40.2%**	**25.8%**	**41.9%**	15%	**36.9%**	11.1%

Source: U.S. Census, American Community Survey, 2010-2014, Table DP-05. Shaded cells indicate race or ethnic groups that have population shares greater than that of either the United States or Contra Costa County.

Environmental Justice Communities of Sacramento County
Relative to United States Population by Race and Hispanic or Latino Ethnicity (of any race)

	United States	Sacramento County	City of Sacramento	Freeport	Courtland	Hood	Walnut Grove	Isleton
Total Population	303,965,272	1,450,277	476,075	68	515	311	1,137	4,838
White	76.1%	64.8%	55.4%	60.3%	56.9%	67.2%	90.7%	76.2%
Black or African American	13.4%	12.5%	**16.4%**	0%	9.1%	0%	0%	1.2%
American Indian and Alaska Native	1.6%	2.4%	**2.5%**	0%	0%	**28.6%**	0%	**1.9%**
Asian	5.3%	17.5%	**21.5%**	0%	1.9%	2.6%	**8.1%**	**5.9%**
Native Hawaiian and Other Pacific Islander	0.3%	1.8%	**2.3%**	0%	0%	0%	**0.3%**	0.1%
Some other race	6%	8.3%	**9.7%**	**39.7%**	**37.1%**	**22.5%**	1%	**18.3%**
Hispanic or Latino (of any race)	15.7%	22.1%	**27.6%**	**39.7%**	**39%**	**65.3%**	**29.8%**	**34.6%**

Source: U.S. Census, American Community Survey, 2010-2014, Table DP-05. Shaded cells indicate race or ethnic groups that have population shares greater than that of either the United States or Sacramento County.

Environmental Justice Communities of San Joaquin County
Relative to United States Population by Race and Hispanic or Latino Ethnicity (of any race)

	United States	San Joaquin County	City of Lathrop	City of Manteca	City of Stockton	City of Tracy
Total Population	303,965,272	701,050	19,163	70,693	297,223	84,573
White	76.1%	63.9%	55.7%	74.8%	50.1%	66.6%
Black or African American	13.4%	9%	10.5%	4.7%	**14.1%**	8.6%
American Indian and Alaska Native	1.6%	3.8%	**3.2%**	**2.2%**	**3.3%**	**3.1%**
Asian	5.3%	17.3%	**23.3%**	**9.8%**	**24.4%**	**18.8%**
Native Hawaiian and Other Pacific Islander	0.3%	1.5%	**2.2%**	**1.5%**	**1.4%**	**2.5%**
Some other race	6%	12.8%	**14%**	**13.5%**	**14.5%**	11.5%
Hispanic or Latino (of any race)	15.7%	39.7%	**43.1%**	**39.9%**	**41.3%**	39%

Source: U.S. Census, American Community Survey, 2010-2014, Table DP-05. Shaded cells indicate race or ethnic groups that have population shares greater than that of either the United States or San Joaquin County.

Environmental Justice Communities of Solano County
Relative to United States Population by Race and Hispanic or Latino Ethnicity (of any race)

	United States	Solano County	City of Fairfield	City of Rio Vista	City of Suisun City
Total Population	303,965,272	421,624	107,983	7,646	28,627
White	76.1%	59.2%	52.9%	81.1%	41%
Black or African American	13.4%	16.6%	**17.6%**	6.8%	**24.7%**
American Indian and Alaska Native	1.6%	1.9%	**1.8%**	**2%**	**2.2%**
Asian	5.3%	18.2%	**19.4%**	**8.5%**	**24%**
Native Hawaiian and Other Pacific Islander	0.3%	1.7%	**2.3%**	0.3%	**2.9%**
Some other race	6%	10.1%	**14.3%**	5.1%	**14.2%**
Hispanic or Latino (of any race)	15.7%	24.9%	**27.3%**	11.8%	**25.1%**

Source: U.S. Census, American Community Survey, 2010-2014, Table DP-05. Shaded cells indicate race or ethnic groups that have population shares greater than that of either the United States or Solano County.

Environmental Justice Communities of Yolo County
Relative to United States Population by Race and Hispanic or Latino Ethnicity (of any race)

	United States	Yolo County	Clarksburg	City of West Sacramento
Total Population	303,965,272	204,162	406	49,946
White	76.1%	71%	97.5%	70.2%
Black or African American	13.4%	3.8%	0%	**6.5%**
American Indian and Alaska Native	1.6%	2.4%	**2.5%**	**3.4%**
Asian	5.3%	16%	0%	**13.7%**
Native Hawaiian and Other Pacific Islander	0.3%	1.3%	0%	**3.2%**
Some other race	6%	12.3%	0%	**12.9%**
Hispanic or Latino (of any race)	15.7%	31%	**18%**	**31.9%**

Source: U.S. Census, American Community Survey, 2010-2014, Table DP-05. Shaded cells indicate race or ethnic groups that have population shares greater than that of either the United States or Yolo County.

Appendix 1B:

Percentage of Families and People Whose Income in the Past 12 Months is Below the Poverty Level

PERCENTAGE OF FAMILIES AND PEOPLE WHOSE INCOME IN THE PAST 12 MONTHS IS BELOW THE POVERTY LEVEL
Contra Costa County

	United States	Contra Costa County	City of Antioch	City of Pittsburg	Bethel Island	City of Brentwood	Byron	Discovery Bay	City of Oakley
All families	11.5%	7.7%	**10.5%**	**14.6%**	0%	3.7%	2%	4.8%	7.3%
With related children under 18 years	18.1%	11.7%	**17.6%**	**22.3%**	0%	5.2%	3.5%	8.6%	7.5%
With related children under 5 years only	18.6%	11.2%	**16.5%**	**19.9%**	0%	6.3%	-	**12.3%**	1%
All people	15.6%	10.7%	**14.7%**	**18.1%**	6.2%	6.3%	1.3%	4.6%	9.4%
Under 18 years	21.9%	13.9%	**21%**	**26.9%**	0%	6.9%	3.4%	5.5%	7.4%
18 years and over	13.6%	9.6%	**12.4%**	**15.1%**	6.6%	6%	0.7%	4.3%	**10.1%**
18 to 64 years	14.6%	10.3%	**13.1%**	**16%**	8.3%	6%	0.9%	4.6%	9.7%
65 years and over	9.4%	6.5%	**7.9%**	**9.4%**	3.9%	6.1%	0%	2.8%	**13%**

Source: American Community Survey, 2010-2014, Table DP02. Shaded cells indicate categories of poverty which are greater than that of either the United States or Contra Costa County.

PERCENTAGE OF FAMILIES AND PEOPLE WHOSE INCOME IN THE PAST 12 MONTHS IS BELOW THE POVERTY LEVEL
Sacramento County

	United States	Sacramento County	Courtland	Freeport	Hood	City of Isleton	City of Sacramento	Walnut Grove
All families	11.5%	13.7%	0%	0%	0%	**17.9%**	**17.7%**	6.4%
With related children under 18 years	18.1%	20.5%	0%	0%	0%	**29%**	**26.1%**	6.5%
With related children under 5 years only	18.6%	21.1%	0%	-	0%	0%	**23.5%**	0%
All people	15.6%	18.1%	**27.4%**	0%	2.9%	**23.6%**	**22.3%**	12.7%
Under 18 years	21.9%	24.9%	0%	0%	0%	**48.1%**	**31.7%**	7.5%
18 years and over	13.6%	15.8%	**30.3%**	0%	3.4%	**18.7%**	**19.3%**	**14.1%**
18 to 64 years	14.6%	17%	**24.7%**	0%	4.1%	**22.3%**	**20.7%**	14.2%
65 years and over	9.4%	9.6%	**52.7%**	0%	0%	6.2%	**11.7%**	**13.6%**

Source: American Community Survey, 2010-2014, Table DP02. Shaded cells indicate categories of poverty which are greater than that of either the United States or Sacramento County.

PERCENTAGE OF FAMILIES AND PEOPLE WHOSE INCOME IN THE PAST 12 MONTHS IS BELOW THE POVERTY LEVEL
San Joaquin County

	United States	San Joaquin County	City of Lathrop	City of Manteca	City of Stockton	City of Tracy
All families	11.5%	15.3%	9.4%	9.2%	**21.4%**	7.2%
With related children under 18 years	18.1%	22%	10.8%	13.8%	**29.5%**	9.6%
With related children under 5 years only	18.6%	22.8%	10.8%	16.5%	**30.1%**	7.2%
All people	15.6%	19.4%	11.3%	11.6%	**25.8%**	9.7%
Under 18 years	21.9%	26.4%	13.4%	14%	**35.3%**	12.5%
18 years and over	13.6%	16.6%	10.3%	10.7%	**21.8%**	8.4%
18 to 64 years	14.6%	17.8%	10.5%	11.5%	**23.4%**	8.5%
65 years and over	9.4%	10%	8.3%	6%	**12.9%**	7.7%

Source: American Community Survey, 2010-2014, Table DP02. Shaded cells indicate categories of poverty which are greater than that of either the United States or San Joaquin County.

PERCENTAGE OF FAMILIES AND PEOPLE WHOSE INCOME IN THE PAST 12 MONTHS IS BELOW THE POVERTY LEVEL
Solano County

	United States	Solano County	City of Fairfield	City of Rio Vista	City of Suisun City
All families	11.5%	10%	9.8%	7.4%	9.4%
With related children under 18 years	18.1%	15.6%	14.6%	14.3%	14.7%
With related children under 5 years only	18.6%	19.8%	18.4%	**27%**	7.7%
All people	15.6%	13.1%	12.7%	10.1%	12.9%
Under 18 years	21.9%	18.6%	17.2%	9.1%	**19.4%**
18 years and over	13.6%	11.3%	11.2%	10.3%	10.4%
18 to 64 years	14.6%	12%	11.7%	**15.7%**	11.1%
65 years and over	9.4%	7.7%	8.2%	2.9%	4.7%

Source: American Community Survey, 2010-2014, Table DP02. Shaded cells indicate categories of poverty which are greater than that of either the United States or Solano County.

PERCENTAGE OF FAMILIES AND PEOPLE WHOSE INCOME IN THE PAST 12 MONTHS IS BELOW THE POVERTY LEVEL
Yolo County

	United States	Yolo County	Clarksburg	City of West Sacramento
All families	11.5%	10.3%	**11.5%**	**15.6%**
With related children under 18 years	18.1%	15.8%	**35.1%**	**23.7%**
With related children under 5 years only	18.6%	14.2%	0%	**16.2%**
All people	15.6%	20%	**22%**	**20.8%**
Under 18 years	21.9%	19%	**50.8%**	**29.1%**
18 years and over	13.6%	20.3%	**13.8%**	**17.8%**
18 to 64 years	14.6%	21.9%	**14.8%**	**18.5%**
65 years and over	9.4%	10.6%	**11.2%**	**14%**

Source: American Community Survey, 2010-2014, Table DP02. Shaded cells indicate categories of poverty which are greater than that of either the United States or Yolo County.

Appendix 1C:

Languages Spoken at Home

LANGUAGE SPOKEN AT HOME
Contra Costa County

	United States	Contra Costa County	City of Antioch	City of Pittsburg	Bethel Island	City of Brentwood	Byron	Discovery Bay	City of Oakley
Population 5 years and over	283,833,852	1,015,684	99,215	61,179	2,100	50,830	1,233	13,457	34,928
English only	79.9%	66.5%	67%	50.9%	92.4%	77.2%	66.7%	88.8%	68.7%
Language other than English	20.1%	33.5%	**33%**	**49.1%**	7.6%	**22.8%**	**33.3%**	11.2%	**31.3%**
Speak English less than "very well"	8.7%	13.6%	**12.1%**	**22.3%**	0%	7.7%	**10.3%**	3.4%	11.7%
Spanish	12.5%	17.5%	**20.2%**	**32.7%**	7.1%	**13.7%**	**33.3%**	5.6%	**22.9%**
Speak English less than "very well"	5.8%	7.7%	**7.8%**	**15.6%**	0%	4.7%	**10.3%**	1.9%	**9%**
Other Indo-European languages	3.7%	5.6%	**4%**	**4.4%**	0.5%	3.9%	0%	2.3%	2.3%
Speak English less than "very well"	1.2%	1.6%	1.1%	**1.5%**	0%	0.8%	0%	0.2%	0.5%
Asian and Pacific Islander languages	3.1%	9.5%	**7.4%**	**11.3%**	0%	**4.8%**	0%	1.7%	**5.4%**
Speak English less than "very well"	1.5%	4%	**2.7%**	**5.1%**	0%	**2%**	0%	0.8%	**1.9%**
Other languages	0.8%	1%	**1.5%**	**0.7%**	0%	0.4%	0%	1.6%	0.7%
Speak English less than "very well"	0.2%	0.3%	**0.5%**	**0.2%**	0%	0.1%	0%	0.5%	**0.2%**

Source: American Community Survey, 2010-2014, Table DP-03. Shaded cells indicate languages spoke at home with shares greater than that of either the United States or Contra Costa County.

LANGUAGE SPOKEN AT HOME
Sacramento County

	United States	Sacramento County	Courtland	Freeport	Hood	City of Isleton	City of Sacramento	Walnut Grove
Population 5 years and over	283,833,852	1,350,684	503	68	303	764	442,461	1,069
English only	79.9%	68.7%	71.8%	100%	56.8%	58.2%	63.1%	69.6%
Language other than English	20.1%	31.3%	**28.2%**	0%	**43.2%**	**41.8%**	**36.9%**	**30.4%**
Speak English less than "very well"	8.7%	13.6%	6.4%	0%	**33.3%**	**22.8%**	**16.1%**	**16%**
Spanish	12.5%	13.1%	**28.2%**	0%	**43.2%**	**33.1%**	**17.4%**	**21.8%**
Speak English less than "very well"	5.8%	5.3%	**6.4%**	0%	**33.3%**	**19.1%**	**7%**	**8.2%**
Other Indo-European languages	3.7%	7.5%	0%	0%	0%	1.2%	**5.8%**	0%
Speak English less than "very well"	1.2%	3.1%	0%	0%	0%	0%	**2.2%**	0%
Asian and Pacific Islander languages	3.1%	10%	0%	0%	0%	7.5%	**13.1%**	**8.6%**
Speak English less than "very well"	1.5%	5%	0%	0%	0%	3.7%	**6.7%**	**7.8%**
Other languages	0.8%	0.7%	0%	0%	0%	0%	0.6%	0%
Speak English less than "very well"	0.2%	0.3%	0%	0%	0%	0%	0.2%	0%

Source: American Community Survey, 2010-2014, Table DP-03. Shaded cells indicate languages spoke at home with shares greater than that of either the United States or Sacramento County.

LANGUAGE SPOKEN AT HOME
San Joaquin County

	United States	San Joaquin County	City of Lathrop	City of Manteca	City of Stockton	City of Tracy
Population 5 years and over	283,833,852	647,722	17,624	64,824	273,171	77,897
English only	79.9%	60%	51.7%	71.4%	54.4%	59.8%
Language other than English	20.1%	40%	**48.3%**	**28.6%**	**45.6%**	**40.2%**
Speak English less than "very well"	8.7%	18.1%	**18.1%**	**11.4%**	**21.5%**	**15.6%**
Spanish	12.5%	26.1%	**29.1%**	**20.7%**	**27%**	**23.8%**
Speak English less than "very well"	5.8%	11.8%	**10.8%**	**8%**	**12.3%**	**9.7%**
Other Indo-European languages	3.7%	4.5%	**5.6%**	**4.5%**	3.2%	**8.3%**
Speak English less than "very well"	1.2%	1.7%	**1.6%**	**2.1%**	**1.2%**	**2.7%**
Asian and Pacific Islander languages	3.1%	8.9%	**12.6%**	**3.1%**	**14.8%**	**7.3%**
Speak English less than "very well"	1.5%	4.4%	**5.5%**	1.2%	**7.9%**	**2.9%**
Other languages	0.8%	0.5%	**0.9%**	0.3%	**0.5%**	**0.8%**
Speak English less than "very well"	0.2%	0.2%	**0.2%**	0.1%	0.1%	**0.3%**

Source: American Community Survey, 2010-2014, Table DP-03. Shaded cells indicate languages spoke at home with shares greater than that of either the United States or San Joaquin County.

LANGUAGE SPOKEN AT HOME
Solano County

	United States	Solano County	City of Fairfield	City of Rio Vista	City of Suisun City
Population 5 years and over	283,833,852	395,273	100,696	7,404	26,826
English only	79.9%	70.5%	66.5%	84.3%	69%
Language other than English	20.1%	29.5%	**33.5%**	15.7%	**31%**
Speak English less than "very well"	8.7%	11.2%	**13.2%**	4%	**9.8%**
Spanish	12.5%	16.5%	**19.1%**	9.9%	**13.9%**
Speak English less than "very well"	5.8%	6.7%	**7.9%**	2.4%	3.8%
Other Indo-European languages	3.7%	2.7%	**3.8%**	2.5%	2.6%
Speak English less than "very well"	1.2%	0.7%	**1%**	0.2%	**1.1%**
Asian and Pacific Islander languages	3.1%	9.8%	**9.8%**	**3.3%**	**14%**
Speak English less than "very well"	1.5%	3.6%	**4%**	1.4%	**4.8%**
Other languages	0.8%	0.5%	**0.7%**	0%	**0.5%**
Speak English less than "very well"	0.2%	0.1%	**0.3%**	0%	0.1%

Source: American Community Survey, 2010-2014, Table DP-03. Shaded cells indicate languages spoke at home with shares greater than that of either the United States or Solano County.

LANGUAGE SPOKEN AT HOME
Yolo County

	United States	Yolo County	Clarksburg	City of West Sacramento
Population 5 years and over	283,833,852	192,020	1,097	46,179
English only	79.9%	65%	66.5%	63.6%
Language other than English	20.1%	35%	**33.5%**	**36.4%**
Speak English less than "very well"	8.7%	15.1%	**16.4%**	**18.2%**
Spanish	12.5%	21%	**32.5%**	**18.6%**
Speak English less than "very well"	5.8%	9.5%	**16.4%**	**9.4%**
Other Indo-European languages	3.7%	6%	0%	**12.3%**
Speak English less than "very well"	1.2%	2.3%	0%	**6.5%**
Asian and Pacific Islander languages	3.1%	7.3%	0.9%	**5.2%**
Speak English less than "very well"	1.5%	3.2%	0%	**2.2%**
Other languages	0.8%	0.7%	0%	0.3%
Speak English less than "very well"	0.2%	0.2%	0%	0.1%

Source: American Community Survey, 2010-2014, Table DP-03. Shaded cells indicate languages spoke at home with shares greater than that of either the United States or Yolo County.

Appendix 2:

Restore the Delta spreadsheet summaries of Delta region distressed community indicators from Economic Innovations Group

RTD-212

Community/City/Zip Code Cities	Percent of Population in Distressed Zip Codes	No High School Degree	Housing Vacancy Rate	Adults Not Working	Poverty Rate	Median Income Ratio	Percent Change in Employment	Percent Change in Businesses	Distress Score	Community/City/Zip Code Cities
Antioch (94509)		16.0%	9.0%	46.0%	18.0%	88.0%	-3.4%	-7.5%	77.0	Antioch (94509)
Pittsburg (94565)		23.0%	6.0%	43.0%	21.0%	91.0%	-4.7%	-0.1%	67.6	Pittsburg (94565)
City of Stockton	70.2%	25.0%	9.0%	49.0%	26.0%	74.0%	2.7%	-4.3%	95.2	City of Stockton
95202 (Downtown)		37.0%	31.0%	69.0%	56.0%	24.0%	16.4%	-10.1%	97.9	95202 (Downtown)
95203 (Port/West Downtown)		28.0%	10.0%	52.0%	34.0%	61.0%	-11.0%	-4.4%	96.2	95203 (Port/West Downtown)
95204 (Country Club)		19.0%	9.0%	49.0%	22.0%	71.0%	-1.9%	-5.8%	86.5	95204 (Country Club)
95205 (East Stockton)		47.0%	11.0%	53.0%	37.0%	54.0%	9.4%	-6.8%	93.3	95205 (East Stockton)
95206 (South Delta)		39.0%	9.0%	52.0%	29.0%	69.0%	3.4%	-2.9%	89.4	95206 (South Delta)
95207 (Lincoln Village)		18.0%	9.0%	52.0%	27.0%	63.0%	7.6%	-4.2%	84.2	95207 (Lincoln Village)
95210 (East Hammer)		29.0%	7.0%	52.0%	30.0%	63.0%	-12.6%	-5.2%	94.1	95210 (East Hammer)
95231 (French Camp)		43.0%	6.0%	73.0%	32.0%	59.0%	-8.0%	-5.7%	95.4	95231 (French Camp)
City of Sacramento	11.0%	17.0%	7.0%	45.0%	22.0%	81.0%	2.4%	1.3%	77.5	City of Sacramento
95814 (Downtown)		17.0%	17.0%	55.0%	33.0%	54.0%	-3.1%	-9.3%	97.1	95814 (Downtown)
95815 (Discovery Park)		32.0%	12.0%	54.0%	39.0%	48.0%	6.8%	0.5%	90.7	95815 (Discovery Park)
95817 (North Oak Park)		18.0%	9.0%	51.0%	34.0%	57.0%	9.7%	3.4%	77.1	95817 (North Oak Park)
95822 (Sacramento City College)		21.0%	7.0%	53.0%	24.0%	72.0%	2.8%	-0.2%	78.7	95822 (Sacramento City College)
95823 (Parkway)		26.0%	7.0%	51.0%	30.0%	60.0%	7.7%	1.2%	79.7	95823 (Parkway)
95824 (Parkway-South Sacramento)		40.0%	8.0%	56.0%	37.0%	46.0%	-0.1%	-4.9%	94.0	95824 (Parkway-South Sacramento)
95828 (Florin)		27.0%	6.0%	51.0%	22.0%	74.0%	13.9%	1.9%	68.4	95828 (Florin)
Other Delta Zip Codes										**Other Delta Zip Codes**
95832 (Freeport/Meadowview)		31.0%	7.0%	49.0%	29.0%	69.0%	15.4%	21.2%	65.3	95832 (Freeport/Meadowview)
95605 (N West Sacramento)		24.0%	8.0%	49.0%	31.0%	62.0%	-7.9%	12.0%	81.5	95605 (N West Sacramento)
95615 (Courtland Area)		19.0%	21.0%	47.0%	15.0%	96.0%	0.0%	0.0%	73.4	95615 (Courtland Area)
95641 (Isleton Area)		20.0%	15.0%	56.0%	15.0%	63.0%	-13.6%	-13.6%	95.9	95641 (Isleton Area)
95690 (Locke/Walnut Grove)		18.0%	22.0%	42.0%	9.0%	91.0%	-1.7%	-14.1%	75.6	95690 (Locke/Walnut Grove)
California	11.0%	19.0%	6.0%	44.0%	16.0%	100.0%	6.9%	2.9%	77.0	**California**
Contra Costa County	0.0%	11.0%	5.0%	41.0%	11.0%	130.0%	4.5%	2.0%	8.1	**Contra Costa County**
Sacramento County	8.0%	14.0%	7.0%	45.0%	18.0%	90.0%	6.0%	1.4%	32.9	**Sacramento County**
San Joaquin County	43.0%	22.0%	7.0%	48.0%	19.0%	87.0%	3.5%	-1.5%	58.5	**San Joaquin County**
Solano County	8.0%	13.0%	7.0%	45.0%	13.0%	110.0%	5.6%	-1.0%	22.1	**Solano County**
Yolo County	8.0%	15.0%	6.0%	44.0%	20.0%	90.0%	5.6%	1.9%	34.9	**Yolo County**

Source: Economic Innovations Group, accessible at http://eig.org/dci.

Delta Region DCIs 2016.xlsx
Distress Score Rank

Community/City/Zip Code	Percent of Population in Distressed Zip Codes	No High School Degree	Housing Vacancy Rate	Adults Not Working	Poverty Rate	Median Income Ratio	Percent Change in Employment	Percent Change in Businesses	Distress Score	Community/City/Zip Code
95202 (Downtown)		37.0%	31.0%	69.0%	56.0%	24.0%	16.4%	-10.1%	97.9	95202 (Downtown)
95814 (Downtown)		17.0%	17.0%	55.0%	33.0%	54.0%	-3.1%	-9.3%	97.1	95814 (Downtown)
95203 (Port/West Downtown)		28.0%	10.0%	52.0%	34.0%	61.0%	-11.0%	-4.4%	96.2	95203 (Port/West Downtown)
95641 (Isleton Area)		20.0%	15.0%	56.0%	15.0%	63.0%	-13.6%	-13.6%	95.9	95641 (Isleton Area)
95231 (French Camp)		43.0%	6.0%	73.0%	32.0%	59.0%	-8.0%	-5.7%	95.4	95231 (French Camp)
City of Stockton	70.2%	25.0%	9.0%	49.0%	26.0%	74.0%	2.7%	-4.3%	95.2	City of Stockton
95210 (East Hammer)		29.0%	7.0%	52.0%	30.0%	63.0%	-12.6%	-5.2%	94.1	95210 (East Hammer)
95824 (Parkway-South Sacramento)		40.0%	8.0%	56.0%	37.0%	46.0%	-0.1%	-4.9%	94.0	95824 (Parkway-South Sacramento)
95205 (East Stockton)		47.0%	11.0%	53.0%	37.0%	54.0%	9.4%	-6.8%	93.3	95205 (East Stockton)
95815 (Discovery Park)		32.0%	12.0%	54.0%	39.0%	48.0%	6.8%	0.5%	90.7	95815 (Discovery Park)
95206 (South Delta)		39.0%	9.0%	52.0%	29.0%	69.0%	3.4%	-2.9%	89.4	95206 (South Delta)
95204 (Country Club)		19.0%	9.0%	49.0%	22.0%	71.0%	-1.9%	-5.8%	86.5	95204 (Country Club)
95207 (Lincoln Village)		18.0%	9.0%	52.0%	27.0%	63.0%	7.6%	-4.2%	84.2	95207 (Lincoln Village)
95605 (N West Sacramento)		24.0%	8.0%	49.0%	31.0%	62.0%	-7.9%	12.0%	81.5	95605 (N West Sacramento)
95823 (Parkway)		26.0%	7.0%	51.0%	30.0%	60.0%	7.7%	1.2%	79.7	95823 (Parkway)
95822 (Sacramento City College)		21.0%	7.0%	53.0%	24.0%	72.0%	2.8%	-0.2%	78.7	95822 (Sacramento City College)
City of Sacramento	11.0%	17.0%	7.0%	45.0%	22.0%	81.0%	2.4%	1.3%	77.5	City of Sacramento
95817 (North Oak Park)		18.0%	9.0%	51.0%	34.0%	57.0%	9.7%	3.4%	77.1	95817 (North Oak Park)
Antioch (94509)		16.0%	9.0%	46.0%	18.0%	88.0%	-3.4%	-7.5%	77.0	Antioch (94509)
California	11.0%	19.0%	6.0%	44.0%	16.0%	100.0%	6.9%	2.9%	77.0	**California**
95690 (Locke/Walnut Grove)		18.0%	22.0%	42.0%	9.0%	91.0%	-1.7%	-14.1%	75.6	95690 (Locke/Walnut Grove)
95615 (Courtland Area)		19.0%	21.0%	47.0%	15.0%	96.0%	0.0%	0.0%	73.4	95615 (Courtland Area)
95828 (Florin)		27.0%	6.0%	51.0%	22.0%	74.0%	13.9%	1.9%	68.4	95828 (Florin)
Pittsburg (94565)		23.0%	6.0%	43.0%	21.0%	91.0%	-4.7%	-0.1%	67.6	Pittsburg (94565)
95832 (Freeport/Meadowview)		31.0%	7.0%	49.0%	29.0%	69.0%	15.4%	21.2%	65.3	95832 (Freeport/Meadowview)
San Joaquin County	43.0%	22.0%	7.0%	48.0%	19.0%	87.0%	3.5%	-1.5%	58.5	**San Joaquin County**
Yolo County	8.0%	15.0%	6.0%	44.0%	20.0%	90.0%	5.6%	1.9%	34.9	**Yolo County**
Sacramento County	8.0%	14.0%	7.0%	45.0%	18.0%	90.0%	6.0%	1.4%	32.9	**Sacramento County**
Solano County	8.0%	13.0%	7.0%	45.0%	13.0%	110.0%	5.6%	-1.0%	22.1	**Solano County**
Contra Costa County	0.0%	11.0%	5.0%	41.0%	11.0%	130.0%	4.5%	2.0%	8.1	**Contra Costa County**

Source: Economic Innovations Group, accessible at http://eig.org/dci.

Delta Region DCIs 2016.xlsx
No HS Degree

Community/City/Zip Code	Percent of Population in Distressed Zip Codes	No High School Degree	Housing Vacancy Rate	Adults Not Working	Poverty Rate	Median Income Ratio	Percent Change in Employment	Percent Change in Businesses	Distress Score	Community/City/Zip Code
95205 (East Stockton)		47.0%	11.0%	53.0%	37.0%	54.0%	9.4%	-6.8%	93.3	95205 (East Stockton)
95231 (French Camp)		43.0%	6.0%	73.0%	32.0%	59.0%	-8.0%	-5.7%	95.4	95231 (French Camp)
95824 (Parkway-South Sacramento)		40.0%	8.0%	56.0%	37.0%	46.0%	-0.1%	-4.9%	94.0	95824 (Parkway-South Sacramento)
95206 (South Delta)		39.0%	9.0%	52.0%	29.0%	69.0%	3.4%	-2.9%	89.4	95206 (South Delta)
95202 (Downtown)		37.0%	31.0%	69.0%	56.0%	24.0%	16.4%	-10.1%	97.9	95202 (Downtown)
95815 (Discovery Park)		32.0%	12.0%	54.0%	39.0%	48.0%	6.8%	0.5%	90.7	95815 (Discovery Park)
95832 (Freeport/Meadowview)		31.0%	7.0%	49.0%	29.0%	69.0%	15.4%	21.2%	65.3	95832 (Freeport/Meadowview)
95210 (East Hammer)		29.0%	7.0%	52.0%	30.0%	63.0%	-12.6%	-5.2%	94.1	95210 (East Hammer)
95203 (Port/West Downtown)		28.0%	10.0%	52.0%	34.0%	61.0%	-11.0%	-4.4%	96.2	95203 (Port/West Downtown)
95828 (Florin)		27.0%	6.0%	51.0%	22.0%	74.0%	13.9%	1.9%	68.4	95828 (Florin)
95823 (Parkway)		26.0%	7.0%	51.0%	30.0%	60.0%	7.7%	1.2%	79.7	95823 (Parkway)
City of Stockton	70.2%	25.0%	9.0%	49.0%	26.0%	74.0%	2.7%	-4.3%	95.2	City of Stockton
95605 (N West Sacramento)		24.0%	8.0%	49.0%	31.0%	62.0%	-7.9%	12.0%	81.5	95605 (N West Sacramento)
Pittsburg (94565)		23.0%	6.0%	43.0%	21.0%	91.0%	-4.7%	-0.1%	67.6	Pittsburg (94565)
San Joaquin County	43.0%	22.0%	7.0%	48.0%	19.0%	87.0%	3.5%	-1.5%	58.5	**San Joaquin County**
95822 (Sacramento City College)		21.0%	7.0%	53.0%	24.0%	72.0%	2.8%	-0.2%	78.7	95822 (Sacramento City College)
95641 (Isleton Area)		20.0%	15.0%	56.0%	15.0%	63.0%	-13.6%	-13.6%	95.9	95641 (Isleton Area)
95204 (Country Club)		19.0%	9.0%	49.0%	22.0%	71.0%	-1.9%	-5.8%	86.5	95204 (Country Club)
95615 (Courtland Area)		19.0%	21.0%	47.0%	15.0%	96.0%	0.0%	0.0%	73.4	95615 (Courtland Area)
California	11.0%	19.0%	6.0%	44.0%	16.0%	100.0%	6.9%	2.9%	77.0	**California**
95207 (Lincoln Village)		18.0%	9.0%	52.0%	27.0%	63.0%	7.6%	-4.2%	84.2	95207 (Lincoln Village)
95817 (North Oak Park)		18.0%	9.0%	51.0%	34.0%	57.0%	9.7%	3.4%	77.1	95817 (North Oak Park)
95690 (Locke/Walnut Grove)		18.0%	22.0%	42.0%	9.0%	91.0%	-1.7%	-14.1%	75.6	95690 (Locke/Walnut Grove)
City of Sacramento	11.0%	17.0%	7.0%	45.0%	22.0%	81.0%	2.4%	1.3%	77.5	City of Sacramento
95814 (Downtown)		17.0%	17.0%	55.0%	33.0%	54.0%	-3.1%	-9.3%	97.1	95814 (Downtown)
Antioch (94509)		16.0%	9.0%	46.0%	18.0%	88.0%	-3.4%	-7.5%	77.0	Antioch (94509)
Yolo County	8.0%	15.0%	6.0%	44.0%	20.0%	90.0%	5.6%	1.9%	34.9	**Yolo County**
Sacramento County	8.0%	14.0%	7.0%	45.0%	18.0%	90.0%	6.0%	1.4%	32.9	**Sacramento County**
Solano County	8.0%	13.0%	7.0%	45.0%	13.0%	110.0%	5.6%	-1.0%	22.1	**Solano County**
Contra Costa County	0.0%	11.0%	5.0%	41.0%	11.0%	130.0%	4.5%	2.0%	8.1	**Contra Costa County**

Source: Economic Innovations Group, accessible at http://eig.org/dci.

Community/City/Zip Code	Percent of Population in Distressed Zip Codes	No High School Degree	Housing Vacancy Rate	Adults Not Working	Poverty Rate	Median Income Ratio	Percent Change in Employment	Percent Change in Businesses	Distress Score	Community/City/Zip Code
95202 (Downtown)		37.0%	31.0%	69.0%	56.0%	24.0%	16.4%	-10.1%	97.9	95202 (Downtown)
95690 (Locke/Walnut Grove)		18.0%	22.0%	42.0%	9.0%	91.0%	-1.7%	-14.1%	75.6	95690 (Locke/Walnut Grove)
95615 (Courtland Area)		19.0%	21.0%	47.0%	15.0%	96.0%	0.0%	0.0%	73.4	95615 (Courtland Area)
95814 (Downtown)		17.0%	17.0%	55.0%	33.0%	54.0%	-3.1%	-9.3%	97.1	95814 (Downtown)
95641 (Isleton Area)		20.0%	15.0%	56.0%	15.0%	63.0%	-13.6%	-13.6%	95.9	95641 (Isleton Area)
95815 (Discovery Park)		32.0%	12.0%	54.0%	39.0%	48.0%	6.8%	0.5%	90.7	95815 (Discovery Park)
95205 (East Stockton)		47.0%	11.0%	53.0%	37.0%	54.0%	9.4%	-6.8%	93.3	95205 (East Stockton)
95203 (Port/West Downtown)		28.0%	10.0%	52.0%	34.0%	61.0%	-11.0%	-4.4%	96.2	95203 (Port/West Downtown)
95206 (South Delta)		39.0%	9.0%	52.0%	29.0%	69.0%	3.4%	-2.9%	89.4	95206 (South Delta)
City of Stockton	70.2%	25.0%	9.0%	49.0%	26.0%	74.0%	2.7%	-4.3%	95.2	City of Stockton
95204 (Country Club)		19.0%	9.0%	49.0%	22.0%	71.0%	-1.9%	-5.8%	86.5	95204 (Country Club)
95207 (Lincoln Village)		18.0%	9.0%	52.0%	27.0%	63.0%	7.6%	-4.2%	84.2	95207 (Lincoln Village)
95817 (North Oak Park)		18.0%	9.0%	51.0%	34.0%	57.0%	9.7%	3.4%	77.1	95817 (North Oak Park)
Antioch (94509)		16.0%	9.0%	46.0%	18.0%	88.0%	-3.4%	-7.5%	77.0	Antioch (94509)
95824 (Parkway-South Sacramento)		40.0%	8.0%	56.0%	37.0%	46.0%	-0.1%	-4.9%	94.0	95824 (Parkway-South Sacramento)
95605 (N West Sacramento)		24.0%	8.0%	49.0%	31.0%	62.0%	-7.9%	12.0%	81.5	95605 (N West Sacramento)
95832 (Freeport/Meadowview)		31.0%	7.0%	49.0%	29.0%	69.0%	15.4%	21.2%	65.3	95832 (Freeport/Meadowview)
95210 (East Hammer)		29.0%	7.0%	52.0%	30.0%	63.0%	-12.6%	-5.2%	94.1	95210 (East Hammer)
95823 (Parkway)		26.0%	7.0%	51.0%	30.0%	60.0%	7.7%	1.2%	79.7	95823 (Parkway)
San Joaquin County	43.0%	22.0%	7.0%	48.0%	19.0%	87.0%	3.5%	-1.5%	58.5	**San Joaquin County**
95822 (Sacramento City College)		21.0%	7.0%	53.0%	24.0%	72.0%	2.8%	-0.2%	78.7	95822 (Sacramento City College)
City of Sacramento	11.0%	17.0%	7.0%	45.0%	22.0%	81.0%	2.4%	1.3%	77.5	City of Sacramento
Sacramento County	8.0%	14.0%	7.0%	45.0%	18.0%	90.0%	6.0%	1.4%	32.9	**Sacramento County**
Solano County	8.0%	13.0%	7.0%	45.0%	13.0%	110.0%	5.6%	-1.0%	22.1	**Solano County**
95231 (French Camp)		43.0%	6.0%	73.0%	32.0%	59.0%	-8.0%	-5.7%	95.4	95231 (French Camp)
95828 (Florin)		27.0%	6.0%	51.0%	22.0%	74.0%	13.9%	1.9%	68.4	95828 (Florin)
Pittsburg (94565)		23.0%	6.0%	43.0%	21.0%	91.0%	-4.7%	-0.1%	67.6	Pittsburg (94565)
California	11.0%	19.0%	6.0%	44.0%	16.0%	100.0%	6.9%	2.9%	77.0	**California**
Yolo County	8.0%	15.0%	6.0%	44.0%	20.0%	90.0%	5.6%	1.9%	34.9	**Yolo County**
Contra Costa County	0.0%	11.0%	5.0%	41.0%	11.0%	130.0%	4.5%	2.0%	8.1	**Contra Costa County**

Source: Economic Innovations Group, accessible at http://eig.org/dci.

Community/City/Zip Code	Percent of Population in Distressed Zip Codes	No High School Degree	Housing Vacancy Rate	Adults Not Working	Poverty Rate	Median Income Ratio	Percent Change in Employment	Percent Change in Businesses	Distress Score	Community/City/Zip Code
95231 (French Camp)		43.0%	6.0%	73.0%	32.0%	59.0%	-8.0%	-5.7%	95.4	95231 (French Camp)
95202 (Downtown)		37.0%	31.0%	69.0%	56.0%	24.0%	16.4%	-10.1%	97.9	95202 (Downtown)
95824 (Parkway-South Sacramento)		40.0%	8.0%	56.0%	37.0%	46.0%	-0.1%	-4.9%	94.0	95824 (Parkway-South Sacramento)
95641 (Isleton Area)		20.0%	15.0%	56.0%	15.0%	63.0%	-13.6%	-13.6%	95.9	95641 (Isleton Area)
95814 (Downtown)		17.0%	17.0%	55.0%	33.0%	54.0%	-3.1%	-9.3%	97.1	95814 (Downtown)
95815 (Discovery Park)		32.0%	12.0%	54.0%	39.0%	48.0%	6.8%	0.5%	90.7	95815 (Discovery Park)
95205 (East Stockton)		47.0%	11.0%	53.0%	37.0%	54.0%	9.4%	-6.8%	93.3	95205 (East Stockton)
95822 (Sacramento City College)		21.0%	7.0%	53.0%	24.0%	72.0%	2.8%	-0.2%	78.7	95822 (Sacramento City College)
95206 (South Delta)		39.0%	9.0%	52.0%	29.0%	69.0%	3.4%	-2.9%	89.4	95206 (South Delta)
95210 (East Hammer)		29.0%	7.0%	52.0%	30.0%	63.0%	-12.6%	-5.2%	94.1	95210 (East Hammer)
95203 (Port/West Downtown)		28.0%	10.0%	52.0%	34.0%	61.0%	-11.0%	-4.4%	96.2	95203 (Port/West Downtown)
95207 (Lincoln Village)		18.0%	9.0%	52.0%	27.0%	63.0%	7.6%	-4.2%	84.2	95207 (Lincoln Village)
95828 (Florin)		27.0%	6.0%	51.0%	22.0%	74.0%	13.9%	1.9%	68.4	95828 (Florin)
95823 (Parkway)		26.0%	7.0%	51.0%	30.0%	60.0%	7.7%	1.2%	79.7	95823 (Parkway)
95817 (North Oak Park)		18.0%	9.0%	51.0%	34.0%	57.0%	9.7%	3.4%	77.1	95817 (North Oak Park)
95832 (Freeport/Meadowview)		31.0%	7.0%	49.0%	29.0%	69.0%	15.4%	21.2%	65.3	95832 (Freeport/Meadowview)
City of Stockton	70.2%	25.0%	9.0%	49.0%	26.0%	74.0%	2.7%	-4.3%	95.2	City of Stockton
95605 (N West Sacramento)		24.0%	8.0%	49.0%	31.0%	62.0%	-7.9%	12.0%	81.5	95605 (N West Sacramento)
95204 (Country Club)		19.0%	9.0%	49.0%	22.0%	71.0%	-1.9%	-5.8%	86.5	95204 (Country Club)
San Joaquin County	43.0%	22.0%	7.0%	48.0%	19.0%	87.0%	3.5%	-1.5%	58.5	**San Joaquin County**
95615 (Courtland Area)		19.0%	21.0%	47.0%	15.0%	96.0%	0.0%	0.0%	73.4	95615 (Courtland Area)
Antioch (94509)		16.0%	9.0%	46.0%	18.0%	88.0%	-3.4%	-7.5%	77.0	Antioch (94509)
City of Sacramento	11.0%	17.0%	7.0%	45.0%	22.0%	81.0%	2.4%	1.3%	77.5	City of Sacramento
Sacramento County	8.0%	14.0%	7.0%	45.0%	18.0%	90.0%	6.0%	1.4%	32.9	**Sacramento County**
Solano County	8.0%	13.0%	7.0%	45.0%	13.0%	110.0%	5.6%	-1.0%	22.1	**Solano County**
California	11.0%	19.0%	6.0%	44.0%	16.0%	100.0%	6.9%	2.9%	77.0	**California**
Yolo County	8.0%	15.0%	6.0%	44.0%	20.0%	90.0%	5.6%	1.9%	34.9	**Yolo County**
Pittsburg (94565)		23.0%	6.0%	43.0%	21.0%	91.0%	-4.7%	-0.1%	67.6	Pittsburg (94565)
95690 (Locke/Walnut Grove)		18.0%	22.0%	42.0%	9.0%	91.0%	-1.7%	-14.1%	75.6	95690 (Locke/Walnut Grove)
Contra Costa County	0.0%	11.0%	5.0%	41.0%	11.0%	130.0%	4.5%	2.0%	8.1	**Contra Costa County**

Source: Economic Innovations Group, accessible at http://eig.org/dci.

Community/City/Zip Code	Percent of Population in Distressed Zip Codes	No High School Degree	Housing Vacancy Rate	Adults Not Working	Poverty Rate	Median Income Ratio	Percent Change in Employment	Percent Change in Businesses	Distress Score	Community/City/Zip Code
95202 (Downtown)		37.0%	31.0%	69.0%	56.0%	24.0%	16.4%	-10.1%	97.9	95202 (Downtown)
95815 (Discovery Park)		32.0%	12.0%	54.0%	39.0%	48.0%	6.8%	0.5%	90.7	95815 (Discovery Park)
95205 (East Stockton)		47.0%	11.0%	53.0%	37.0%	54.0%	9.4%	-6.8%	93.3	95205 (East Stockton)
95824 (Parkway-South Sacramento)		40.0%	8.0%	56.0%	37.0%	46.0%	-0.1%	-4.9%	94.0	95824 (Parkway-South Sacramento)
95203 (Port/West Downtown)		28.0%	10.0%	52.0%	34.0%	61.0%	-11.0%	-4.4%	96.2	95203 (Port/West Downtown)
95817 (North Oak Park)		18.0%	9.0%	51.0%	34.0%	57.0%	9.7%	3.4%	77.1	95817 (North Oak Park)
95814 (Downtown)		17.0%	17.0%	55.0%	33.0%	54.0%	-3.1%	-9.3%	97.1	95814 (Downtown)
95231 (French Camp)		43.0%	6.0%	73.0%	32.0%	59.0%	-8.0%	-5.7%	95.4	95231 (French Camp)
95605 (N West Sacramento)		24.0%	8.0%	49.0%	31.0%	62.0%	-7.9%	12.0%	81.5	95605 (N West Sacramento)
95210 (East Hammer)		29.0%	7.0%	52.0%	30.0%	63.0%	-12.6%	-5.2%	94.1	95210 (East Hammer)
95823 (Parkway)		26.0%	7.0%	51.0%	30.0%	60.0%	7.7%	1.2%	79.7	95823 (Parkway)
95206 (South Delta)		39.0%	9.0%	52.0%	29.0%	69.0%	3.4%	-2.9%	89.4	95206 (South Delta)
95832 (Freeport/Meadowview)		31.0%	7.0%	49.0%	29.0%	69.0%	15.4%	21.2%	65.3	95832 (Freeport/Meadowview)
95207 (Lincoln Village)		18.0%	9.0%	52.0%	27.0%	63.0%	7.6%	-4.2%	84.2	95207 (Lincoln Village)
City of Stockton	70.2%	25.0%	9.0%	49.0%	26.0%	74.0%	2.7%	-4.3%	95.2	City of Stockton
95822 (Sacramento City College)		21.0%	7.0%	53.0%	24.0%	72.0%	2.8%	-0.2%	78.7	95822 (Sacramento City College)
95828 (Florin)		27.0%	6.0%	51.0%	22.0%	74.0%	13.9%	1.9%	68.4	95828 (Florin)
95204 (Country Club)		19.0%	9.0%	49.0%	22.0%	71.0%	-1.9%	-5.8%	86.5	95204 (Country Club)
City of Sacramento	11.0%	17.0%	7.0%	45.0%	22.0%	81.0%	2.4%	1.3%	77.5	City of Sacramento
Pittsburg (94565)		23.0%	6.0%	43.0%	21.0%	91.0%	-4.7%	-0.1%	67.6	Pittsburg (94565)
Yolo County	8.0%	15.0%	6.0%	44.0%	20.0%	90.0%	5.6%	1.9%	34.9	**Yolo County**
San Joaquin County	43.0%	22.0%	7.0%	48.0%	19.0%	87.0%	3.5%	-1.5%	58.5	**San Joaquin County**
Antioch (94509)		16.0%	9.0%	46.0%	18.0%	88.0%	-3.4%	-7.5%	77.0	Antioch (94509)
Sacramento County	8.0%	14.0%	7.0%	45.0%	18.0%	90.0%	6.0%	1.4%	32.9	**Sacramento County**
California	11.0%	19.0%	6.0%	44.0%	16.0%	100.0%	6.9%	2.9%	77.0	**California**
95641 (Isleton Area)		20.0%	15.0%	56.0%	15.0%	63.0%	-13.6%	-13.6%	95.9	95641 (Isleton Area)
95615 (Courtland Area)		19.0%	21.0%	47.0%	15.0%	96.0%	0.0%	0.0%	73.4	95615 (Courtland Area)
Solano County	8.0%	13.0%	7.0%	45.0%	13.0%	110.0%	5.6%	-1.0%	22.1	**Solano County**
Contra Costa County	0.0%	11.0%	5.0%	41.0%	11.0%	130.0%	4.5%	2.0%	8.1	**Contra Costa County**
95690 (Locke/Walnut Grove)		18.0%	22.0%	42.0%	9.0%	91.0%	-1.7%	-14.1%	75.6	95690 (Locke/Walnut Grove)

Source: Economic Innovations Group, accessible at http://eig.org/dci.

Delta Region DCIs 2016.xlsx
Median Income Ratio

Community/City/Zip Code	Percent of Population in Distressed Zip Codes	No High School Degree	Housing Vacancy Rate	Adults Not Working	Poverty Rate	Median Income Ratio	Percent Change in Employment	Percent Change in Businesses	Distress Score	Community/City/Zip Code
95202 (Downtown)		37.0%	31.0%	69.0%	56.0%	24.0%	16.4%	-10.1%	97.9	95202 (Downtown)
95824 (Parkway-South Sacramento)		40.0%	8.0%	56.0%	37.0%	46.0%	-0.1%	-4.9%	94.0	95824 (Parkway-South Sacramento)
95815 (Discovery Park)		32.0%	12.0%	54.0%	39.0%	48.0%	6.8%	0.5%	90.7	95815 (Discovery Park)
95205 (East Stockton)		47.0%	11.0%	53.0%	37.0%	54.0%	9.4%	-6.8%	93.3	95205 (East Stockton)
95814 (Downtown)		17.0%	17.0%	55.0%	33.0%	54.0%	-3.1%	-9.3%	97.1	95814 (Downtown)
95817 (North Oak Park)		18.0%	9.0%	51.0%	34.0%	57.0%	9.7%	3.4%	77.1	95817 (North Oak Park)
95231 (French Camp)		43.0%	6.0%	73.0%	32.0%	59.0%	-8.0%	-5.7%	95.4	95231 (French Camp)
95823 (Parkway)		26.0%	7.0%	51.0%	30.0%	60.0%	7.7%	1.2%	79.7	95823 (Parkway)
95203 (Port/West Downtown)		28.0%	10.0%	52.0%	34.0%	61.0%	-11.0%	-4.4%	96.2	95203 (Port/West Downtown)
95605 (N West Sacramento)		24.0%	8.0%	49.0%	31.0%	62.0%	-7.9%	12.0%	81.5	95605 (N West Sacramento)
95210 (East Hammer)		29.0%	7.0%	52.0%	30.0%	63.0%	-12.6%	-5.2%	94.1	95210 (East Hammer)
95641 (Isleton Area)		20.0%	15.0%	56.0%	15.0%	63.0%	-13.6%	-13.6%	95.9	95641 (Isleton Area)
95207 (Lincoln Village)		18.0%	9.0%	52.0%	27.0%	63.0%	7.6%	-4.2%	84.2	95207 (Lincoln Village)
95206 (South Delta)		39.0%	9.0%	52.0%	29.0%	69.0%	3.4%	-2.9%	89.4	95206 (South Delta)
95832 (Freeport/Meadowview)		31.0%	7.0%	49.0%	29.0%	69.0%	15.4%	21.2%	65.3	95832 (Freeport/Meadowview)
95204 (Country Club)		19.0%	9.0%	49.0%	22.0%	71.0%	-1.9%	-5.8%	86.5	95204 (Country Club)
95822 (Sacramento City College)		21.0%	7.0%	53.0%	24.0%	72.0%	2.8%	-0.2%	78.7	95822 (Sacramento City College)
95828 (Florin)		27.0%	6.0%	51.0%	22.0%	74.0%	13.9%	1.9%	68.4	95828 (Florin)
City of Stockton	70.2%	25.0%	9.0%	49.0%	26.0%	74.0%	2.7%	-4.3%	95.2	City of Stockton
City of Sacramento	11.0%	17.0%	7.0%	45.0%	22.0%	81.0%	2.4%	1.3%	77.5	City of Sacramento
San Joaquin County	43.0%	22.0%	7.0%	48.0%	19.0%	87.0%	3.5%	-1.5%	58.5	**San Joaquin County**
Antioch (94509)		16.0%	9.0%	46.0%	18.0%	88.0%	-3.4%	-7.5%	77.0	Antioch (94509)
Yolo County	8.0%	15.0%	6.0%	44.0%	20.0%	90.0%	5.6%	1.9%	34.9	**Yolo County**
Sacramento County	8.0%	14.0%	7.0%	45.0%	18.0%	90.0%	6.0%	1.4%	32.9	**Sacramento County**
Pittsburg (94565)		23.0%	6.0%	43.0%	21.0%	91.0%	-4.7%	-0.1%	67.6	Pittsburg (94565)
95690 (Locke/Walnut Grove)		18.0%	22.0%	42.0%	9.0%	91.0%	-1.7%	-14.1%	75.6	95690 (Locke/Walnut Grove)
95615 (Courtland Area)		19.0%	21.0%	47.0%	15.0%	96.0%	0.0%	0.0%	73.4	95615 (Courtland Area)
California	11.0%	19.0%	6.0%	44.0%	16.0%	100.0%	6.9%	2.9%	77.0	**California**
Solano County	8.0%	13.0%	7.0%	45.0%	13.0%	110.0%	5.6%	-1.0%	22.1	**Solano County**
Contra Costa County	0.0%	11.0%	5.0%	41.0%	11.0%	130.0%	4.5%	2.0%	8.1	**Contra Costa County**

Source: Economic Innovations Group, accessible at http://eig.org/dci.

Delta Region DCIs 2016.xlsx
Employment Change

Community/City/Zip Code	Percent of Population in Distressed Zip Codes	No High School Degree	Housing Vacancy Rate	Adults Not Working	Poverty Rate	Median Income Ratio	Percent Change in Employment	Percent Change in Businesses	Distress Score	Community/City/Zip Code
95641 (Isleton Area)		20.0%	15.0%	56.0%	15.0%	63.0%	-13.6%	-13.6%	95.9	95641 (Isleton Area)
95210 (East Hammer)		29.0%	7.0%	52.0%	30.0%	63.0%	-12.6%	-5.2%	94.1	95210 (East Hammer)
95203 (Port/West Downtown)		28.0%	10.0%	52.0%	34.0%	61.0%	-11.0%	-4.4%	96.2	95203 (Port/West Downtown)
95231 (French Camp)		43.0%	6.0%	73.0%	32.0%	59.0%	-8.0%	-5.7%	95.4	95231 (French Camp)
95605 (N West Sacramento)		24.0%	8.0%	49.0%	31.0%	62.0%	-7.9%	12.0%	81.5	95605 (N West Sacramento)
Pittsburg (94565)		23.0%	6.0%	43.0%	21.0%	91.0%	-4.7%	-0.1%	67.6	Pittsburg (94565)
Antioch (94509)		16.0%	9.0%	46.0%	18.0%	88.0%	-3.4%	-7.5%	77.0	Antioch (94509)
95814 (Downtown)		17.0%	17.0%	55.0%	33.0%	54.0%	-3.1%	-9.3%	97.1	95814 (Downtown)
95204 (Country Club)		19.0%	9.0%	49.0%	22.0%	71.0%	-1.9%	-5.8%	86.5	95204 (Country Club)
95690 (Locke/Walnut Grove)		18.0%	22.0%	42.0%	9.0%	91.0%	-1.7%	-14.1%	75.6	95690 (Locke/Walnut Grove)
95824 (Parkway-South Sacramento)		40.0%	8.0%	56.0%	37.0%	46.0%	-0.1%	-4.9%	94.0	95824 (Parkway-South Sacramento)
95615 (Courtland Area)		19.0%	21.0%	47.0%	15.0%	96.0%	0.0%	0.0%	73.4	95615 (Courtland Area)
City of Sacramento	11.0%	17.0%	7.0%	45.0%	22.0%	81.0%	2.4%	1.3%	77.5	City of Sacramento
City of Stockton	70.2%	25.0%	9.0%	49.0%	26.0%	74.0%	2.7%	-4.3%	95.2	City of Stockton
95822 (Sacramento City College)		21.0%	7.0%	53.0%	24.0%	72.0%	2.8%	-0.2%	78.7	95822 (Sacramento City College)
95206 (South Delta)		39.0%	9.0%	52.0%	29.0%	69.0%	3.4%	-2.9%	89.4	95206 (South Delta)
San Joaquin County	43.0%	22.0%	7.0%	48.0%	19.0%	87.0%	3.5%	-1.5%	58.5	**San Joaquin County**
Contra Costa County	0.0%	11.0%	5.0%	41.0%	11.0%	130.0%	4.5%	2.0%	8.1	**Contra Costa County**
Yolo County	8.0%	15.0%	6.0%	44.0%	20.0%	90.0%	5.6%	1.9%	34.9	**Yolo County**
Solano County	8.0%	13.0%	7.0%	45.0%	13.0%	110.0%	5.6%	-1.0%	22.1	**Solano County**
Sacramento County	8.0%	14.0%	7.0%	45.0%	18.0%	90.0%	6.0%	1.4%	32.9	**Sacramento County**
95815 (Discovery Park)		32.0%	12.0%	54.0%	39.0%	48.0%	6.8%	0.5%	90.7	95815 (Discovery Park)
California	11.0%	19.0%	6.0%	44.0%	16.0%	100.0%	6.9%	2.9%	77.0	**California**
95207 (Lincoln Village)		18.0%	9.0%	52.0%	27.0%	63.0%	7.6%	-4.2%	84.2	95207 (Lincoln Village)
95823 (Parkway)		26.0%	7.0%	51.0%	30.0%	60.0%	7.7%	1.2%	79.7	95823 (Parkway)
95205 (East Stockton)		47.0%	11.0%	53.0%	37.0%	54.0%	9.4%	-6.8%	93.3	95205 (East Stockton)
95817 (North Oak Park)		18.0%	9.0%	51.0%	34.0%	57.0%	9.7%	3.4%	77.1	95817 (North Oak Park)
95828 (Florin)		27.0%	6.0%	51.0%	22.0%	74.0%	13.9%	1.9%	68.4	95828 (Florin)
95832 (Freeport/Meadowview)		31.0%	7.0%	49.0%	29.0%	69.0%	15.4%	21.2%	65.3	95832 (Freeport/Meadowview)
95202 (Downtown)		37.0%	31.0%	69.0%	56.0%	24.0%	16.4%	-10.1%	97.9	95202 (Downtown)

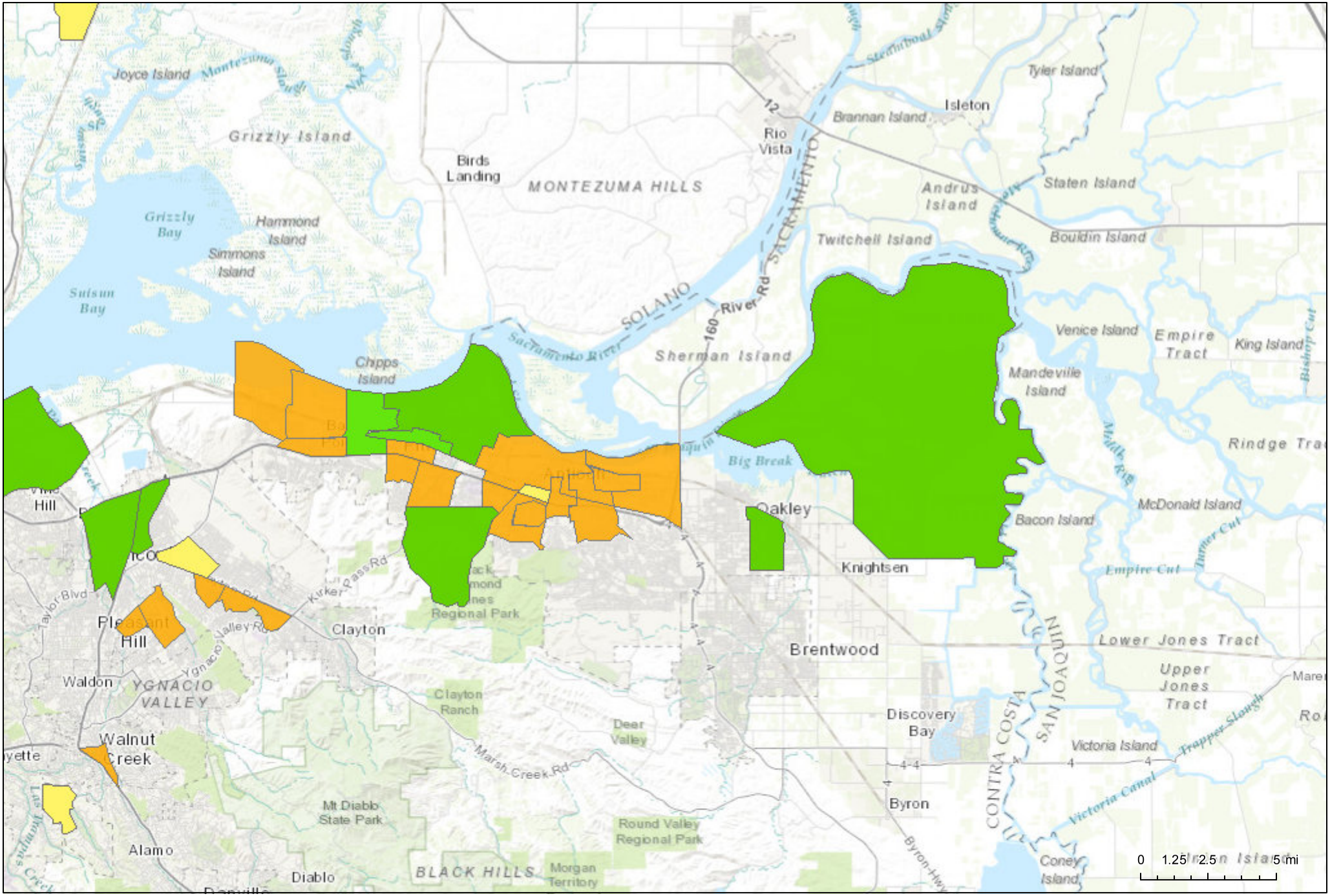
Source: Economic Innovations Group, accessible at http://eig.org/dci.

Community/City/Zip Code	Percent of Population in Distressed Zip Codes	No High School Degree	Housing Vacancy Rate	Adults Not Working	Poverty Rate	Median Income Ratio	Percent Change in Employment	Percent Change in Businesses	Distress Score	Community/City/Zip Code
95690 (Locke/Walnut Grove)		18.0%	22.0%	42.0%	9.0%	91.0%	-1.7%	-14.1%	75.6	95690 (Locke/Walnut Grove)
95641 (Isleton Area)		20.0%	15.0%	56.0%	15.0%	63.0%	-13.6%	-13.6%	95.9	95641 (Isleton Area)
95202 (Downtown)		37.0%	31.0%	69.0%	56.0%	24.0%	16.4%	-10.1%	97.9	95202 (Downtown)
95814 (Downtown)		17.0%	17.0%	55.0%	33.0%	54.0%	-3.1%	-9.3%	97.1	95814 (Downtown)
Antioch (94509)		16.0%	9.0%	46.0%	18.0%	88.0%	-3.4%	-7.5%	77.0	Antioch (94509)
95205 (East Stockton)		47.0%	11.0%	53.0%	37.0%	54.0%	9.4%	-6.8%	93.3	95205 (East Stockton)
95204 (Country Club)		19.0%	9.0%	49.0%	22.0%	71.0%	-1.9%	-5.8%	86.5	95204 (Country Club)
95231 (French Camp)		43.0%	6.0%	73.0%	32.0%	59.0%	-8.0%	-5.7%	95.4	95231 (French Camp)
95210 (East Hammer)		29.0%	7.0%	52.0%	30.0%	63.0%	-12.6%	-5.2%	94.1	95210 (East Hammer)
95824 (Parkway-South Sacramento)		40.0%	8.0%	56.0%	37.0%	46.0%	-0.1%	-4.9%	94.0	95824 (Parkway-South Sacramento)
95203 (Port/West Downtown)		28.0%	10.0%	52.0%	34.0%	61.0%	-11.0%	-4.4%	96.2	95203 (Port/West Downtown)
City of Stockton	70.2%	25.0%	9.0%	49.0%	26.0%	74.0%	2.7%	-4.3%	95.2	City of Stockton
95207 (Lincoln Village)		18.0%	9.0%	52.0%	27.0%	63.0%	7.6%	-4.2%	84.2	95207 (Lincoln Village)
95206 (South Delta)		39.0%	9.0%	52.0%	29.0%	69.0%	3.4%	-2.9%	89.4	95206 (South Delta)
San Joaquin County	43.0%	22.0%	7.0%	48.0%	19.0%	87.0%	3.5%	-1.5%	58.5	**San Joaquin County**
Solano County	8.0%	13.0%	7.0%	45.0%	13.0%	110.0%	5.6%	-1.0%	22.1	**Solano County**
95822 (Sacramento City College)		21.0%	7.0%	53.0%	24.0%	72.0%	2.8%	-0.2%	78.7	95822 (Sacramento City College)
Pittsburg (94565)		23.0%	6.0%	43.0%	21.0%	91.0%	-4.7%	-0.1%	67.6	Pittsburg (94565)
95615 (Courtland Area)		19.0%	21.0%	47.0%	15.0%	96.0%	0.0%	0.0%	73.4	95615 (Courtland Area)
95815 (Discovery Park)		32.0%	12.0%	54.0%	39.0%	48.0%	6.8%	0.5%	90.7	95815 (Discovery Park)
95823 (Parkway)		26.0%	7.0%	51.0%	30.0%	60.0%	7.7%	1.2%	79.7	95823 (Parkway)
City of Sacramento	11.0%	17.0%	7.0%	45.0%	22.0%	81.0%	2.4%	1.3%	77.5	City of Sacramento
Sacramento County	8.0%	14.0%	7.0%	45.0%	18.0%	90.0%	6.0%	1.4%	32.9	**Sacramento County**
95828 (Florin)		27.0%	6.0%	51.0%	22.0%	74.0%	13.9%	1.9%	68.4	95828 (Florin)
Yolo County	8.0%	15.0%	6.0%	44.0%	20.0%	90.0%	5.6%	1.9%	34.9	**Yolo County**
Contra Costa County	0.0%	11.0%	5.0%	41.0%	11.0%	130.0%	4.5%	2.0%	8.1	**Contra Costa County**
California	11.0%	19.0%	6.0%	44.0%	16.0%	100.0%	6.9%	2.9%	77.0	**California**
95817 (North Oak Park)		18.0%	9.0%	51.0%	34.0%	57.0%	9.7%	3.4%	77.1	95817 (North Oak Park)
95605 (N West Sacramento)		24.0%	8.0%	49.0%	31.0%	62.0%	-7.9%	12.0%	81.5	95605 (N West Sacramento)
95832 (Freeport/Meadowview)		31.0%	7.0%	49.0%	29.0%	69.0%	15.4%	21.2%	65.3	95832 (Freeport/Meadowview)

Source: Economic Innovations Group, accessible at http://eig.org/dci.

Appendix 3:

Food Desert Maps of Delta region communities from U.S. Department of Agriculture, Economic Research Service



Central Western Delta Food Access Map

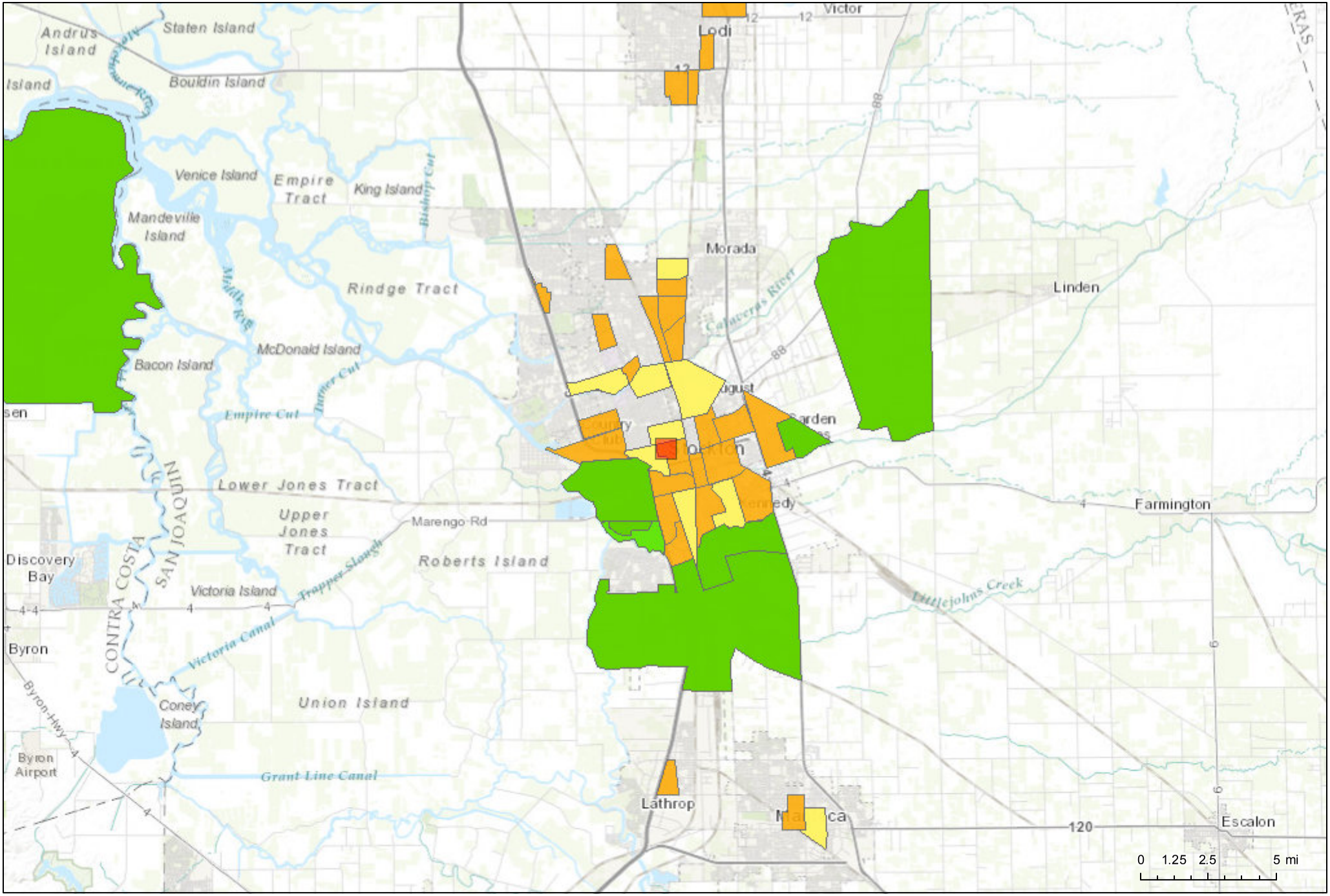
LILATracts_1And10Gen — LILA at 1 and 10

LILATracts_VehicleGen — LILA using Vehicle Access

LILATracts_1And20Gen — LILA at 1 and 20

LILATracts_halfAnd10Gen — LILA at 1/2 and 10

Date: 7/22/2016 Source: USDA Economic Research Service, ESRI. For more information: http://www.ers.usda.gov/data-products/food-access-research-atlas/documentation.aspx



Stockton Low Income and Low Access Map

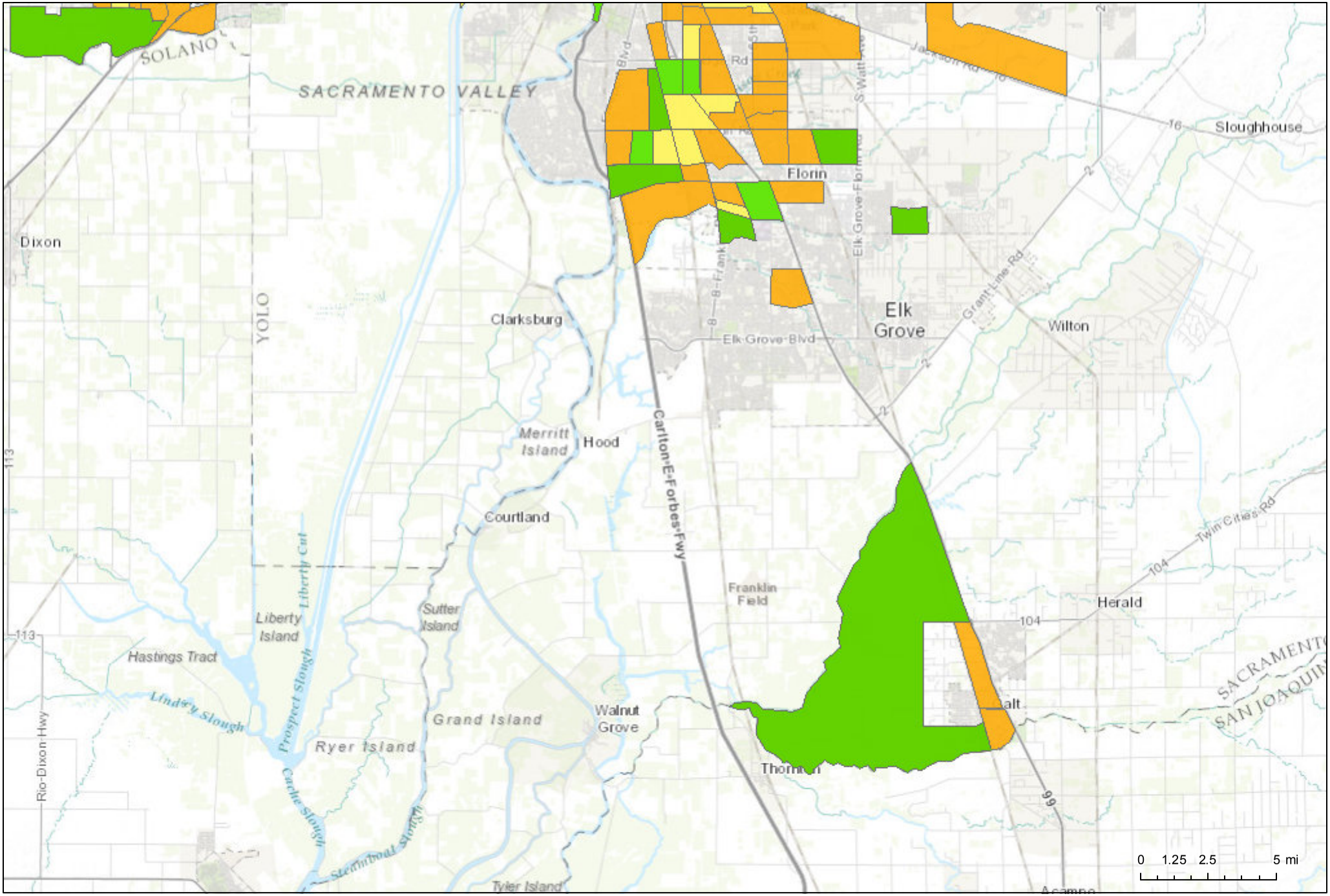
LILATracts_1And10Gen — LILA at 1 and 10

LILATracts_VehicleGen — LILA using Vehicle Access

LILATracts_1And20Gen — LILA at 1 and 20

LILATracts_halfAnd10Gen — LILA at 1/2 and 10

Date: 7/22/2016 Source: USDA Economic Research Service, ESRI. For more information: http://www.ers.usda.gov/data-products/food-access-research-atlas/documentation.aspx



North Delta Food Access Map

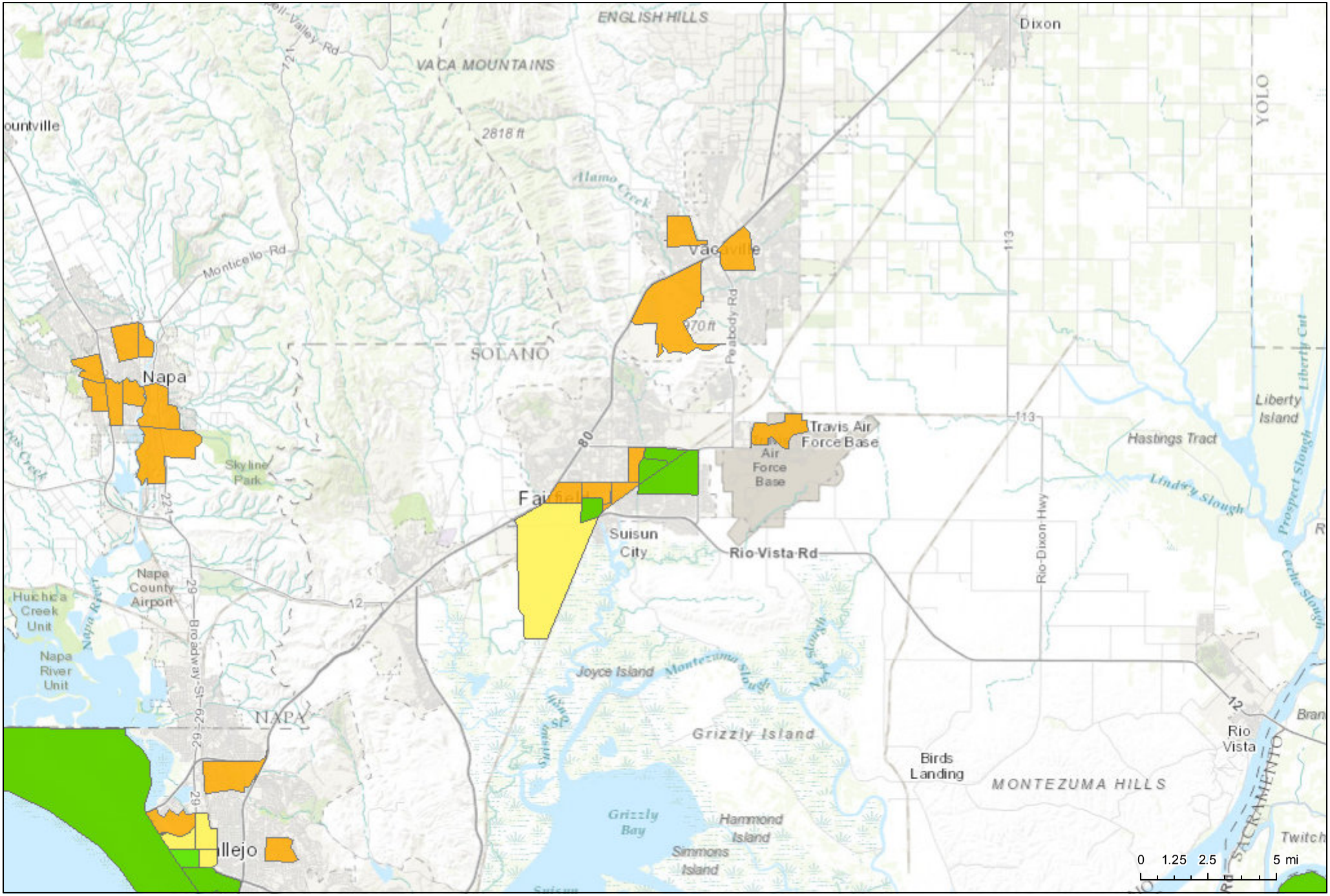
LILATracts_1And10Gen
- LILA at 1 and 10

LILATracts_VehicleGen
- LILA using Vehicle Access

LILATracts_1And20Gen
- LILA at 1 and 20

LILATracts_halfAnd10Gen
- LILA at 1/2 and 10

Date: 7/22/2016 Source: USDA Economic Research Service, ESRI. For more information: http://www.ers.usda.gov/data-products/food-access-research-atlas/documentation.aspx



Solano Area Food Access Map

LILATracts_1And10Gen LILA at 1 and 10

LILATracts_VehicleGen LILA using Vehicle Access

LILATracts_1And20Gen LILA at 1 and 20

LILATracts_halfAnd10Gen LILA at 1/2 and 10

Date: 7/22/2016 Source: USDA Economic Research Service, ESRI. For more information: http://www.ers.usda.gov/data-products/food-access-research-atlas/documentation.aspx

Appendix 4:

Food desert census tract data for Delta region from U.S. Department of Agriculture, Economic Research Service

CensusTract	State	County	LILATracts_1And10	LILATracts_halfAnd 10	LILATracts_1And20	LILATracts_Vehicle	Urban	Rural
		Contra Costa Total	15	53	15	15	202	6
		Sacramento Total	25	114	25	37	304	13
		San Joaquin Total	7	47	7	11	121	18
		Solano Total	7	22	7	5	89	7
		Yolo Total	1	14	1	3	37	4
		Grand Total	55	250	55	71	753	48

Geography	Total Census Tracts	Total Low Income and Low Access Census Tracts	Percent Low Income and Low Access: 1 mile (urban) and 10 miles (rural)	1/2 mile (urban) and 10 miles (rural)	1 mile (urban) and 20 miles (rural)	No Vehicle Access
Contra Costa County	208	98	15.3%	54.1%	15.3%	15.3%
Sacramento County	**317**	**201**	**12.4%**	**56.7%**	**12.4%**	**18.4%**
San Joaquin County	**139**	**72**	**9.7%**	**65.3%**	**9.7%**	**15.3%**
Solano County	96	41	17.1%	53.7%	17.1%	12.2%
Yolo County	**41**	**19**	**5.3%**	**73.7%**	**5.3%**	**15.8%**
Total, Delta Counties	801	431	12.8%	58.0%	12.8%	16.5%

Appendix 5:

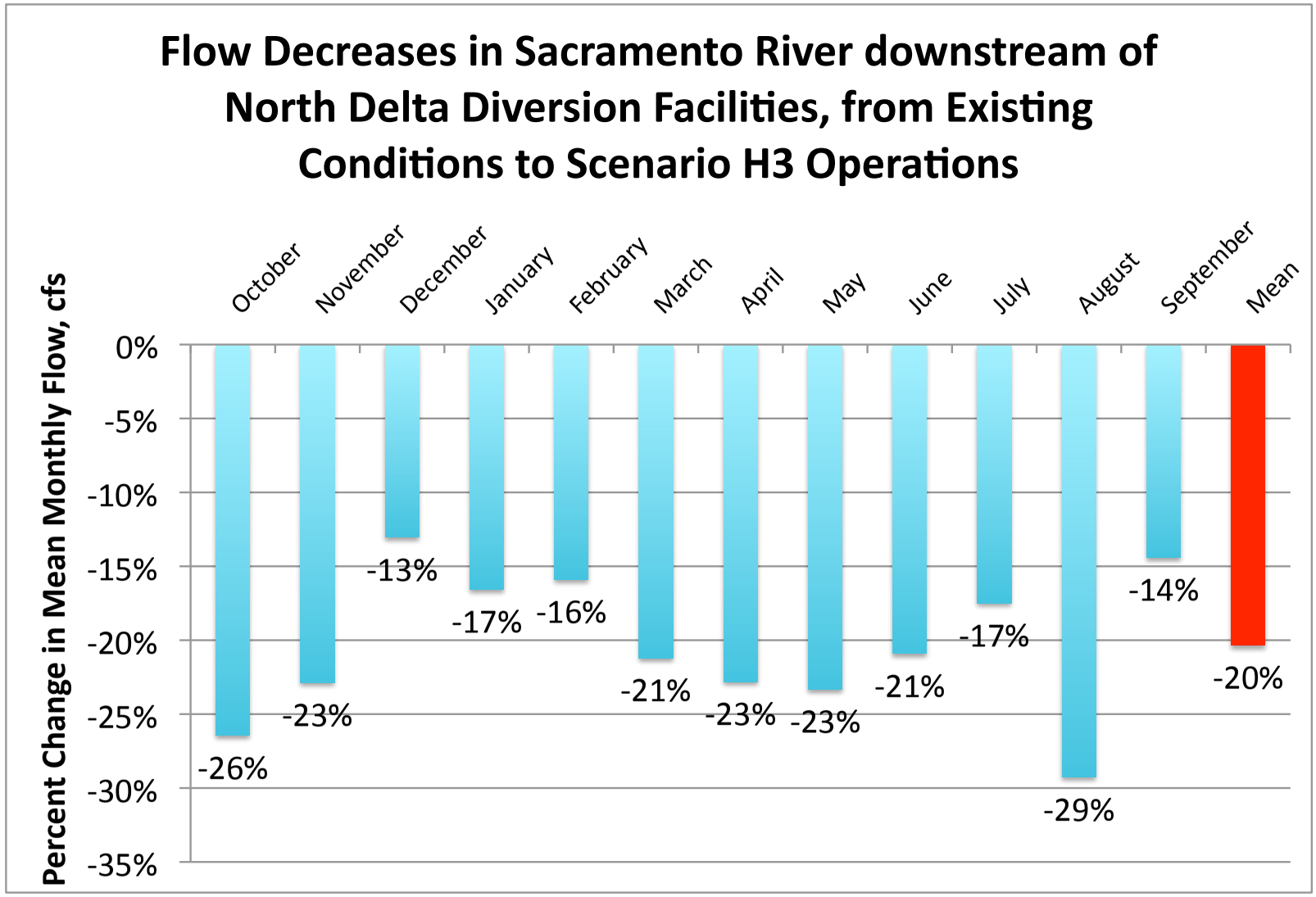
Mean monthly flows data for Sacramento River downstream of north Delta diversions

Mean Monthly Flows (cfs) for Model Scenarios for the Sacramento River Downstream of the North Delta Diversion Facility, Year-Round

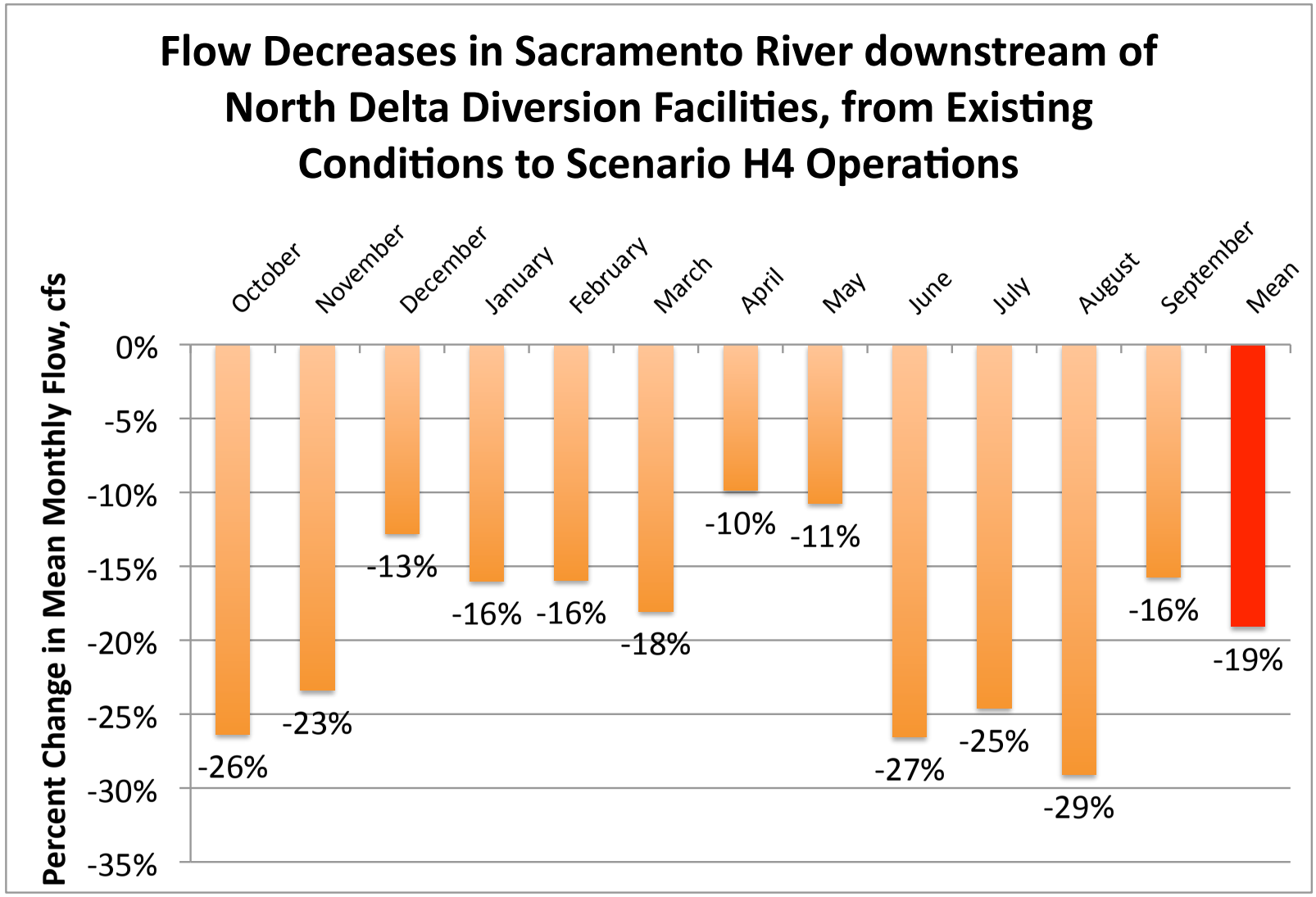
Month	Existing Conditions (EC)	No Action Alternative (NAA), Early Long Term	Alternative 4A, Scenario H3, Early Long Term	Alternative 4A, Scenario H4, Early Long Term	Percent Change from EC to H3	Percent Change from EC to H4	Percent Change from NAA to H3	Percent Change from NAA to H4
October	11,613	11,005	8,542	8,552	-26%	-26%	-22%	-22%
November	14,788	15,400	11,406	11,327	-23%	-23%	-26%	-26%
December	23,727	23,689	20,633	20,693	-13%	-13%	-13%	-13%
January	31,971	32,073	26,679	26,857	-17%	-16%	-17%	-16%
February	37,116	37,671	31,223	31,197	-16%	-16%	-17%	-17%
March	32,834	32,807	25,876	26,913	-21%	-18%	-21%	-18%
April	23,169	22,959	17,887	20,881	-23%	-10%	-22%	-9%
May	19,175	17,837	14,707	17,113	-23%	-11%	-18%	-4%
June	16,412	14,916	12,981	12,056	-21%	-27%	-13%	-19%
July	19,520	19,439	16,106	14,719	-17%	-25%	-17%	-24%
August	15,210	14,610	10,758	10,786	-29%	-29%	-26%	-26%
September	13,751	17,065	11,772	11,588	-14%	-16%	-31%	-32%
Maximum	37,116	37,671	31,223	31,197	-13%	-10%	-13%	-4%
Minimum	11,613	11,005	8,542	8,552	-29%	-29%	-31%	-32%
Mean	**21,607**	**21,623**	**17,381**	**17,724**	**-20%**	**-19%**	**-20%**	**-19%**

Source: SWRCB-3, Appendix B, pp. B-355 to B-356.

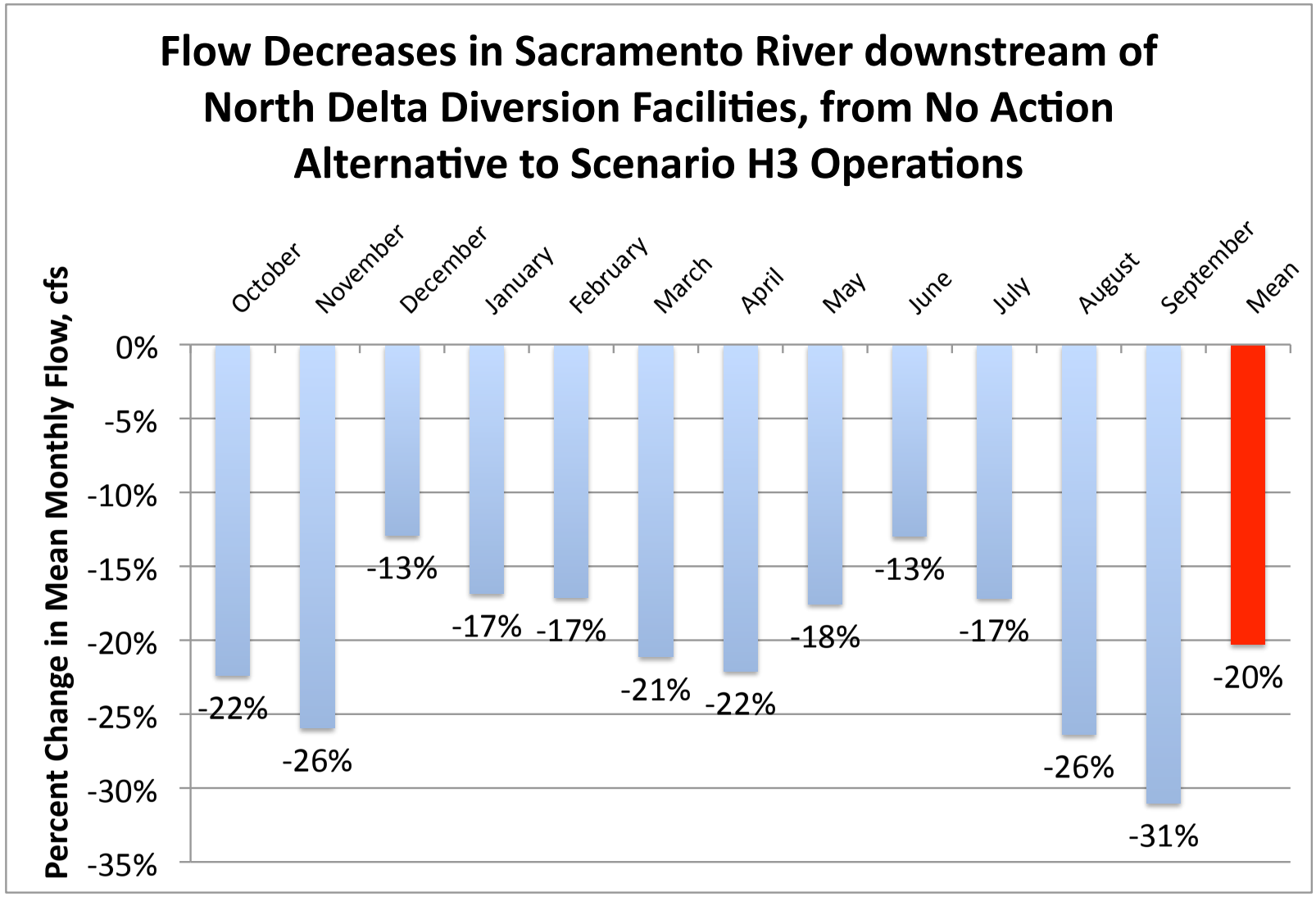
Source: SWRCB-3, Appendix B, pp. B-355 to B-356, Table B.7-27.



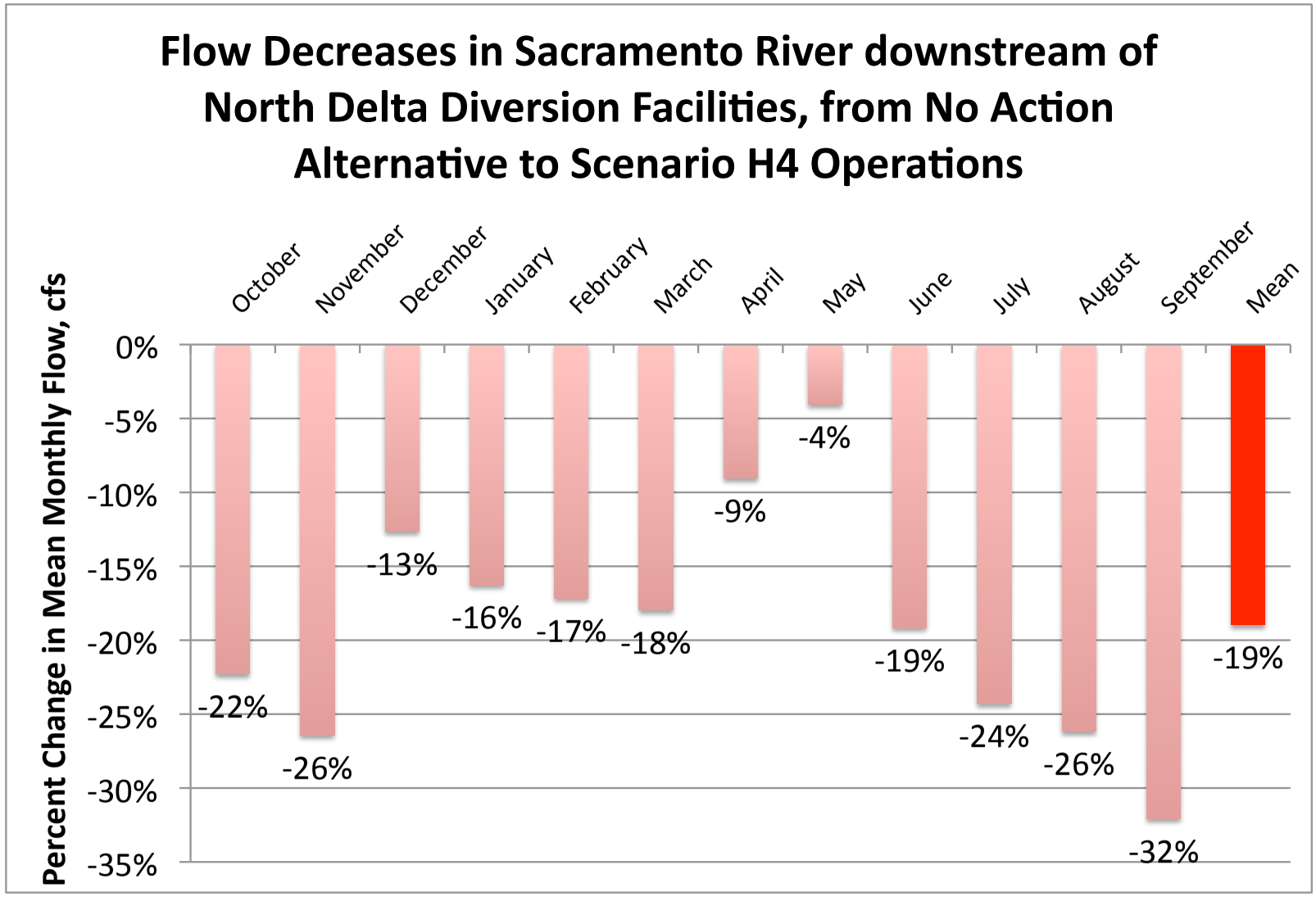
Source: SWRCB-3, Appendix B, pp. B-355 to B-356, Table B.7-27.



Source: SWRCB-3, Appendix B, pp. B-355 to B-356, Table B.7-27.



Source: SWRCB-3, Appendix B, pp. B-355 to B-356, Table B.7-27.



Source: SWRCB-3, Appendix B, pp. B-355 to B-356, Table B.7-27.

Appendix 6:

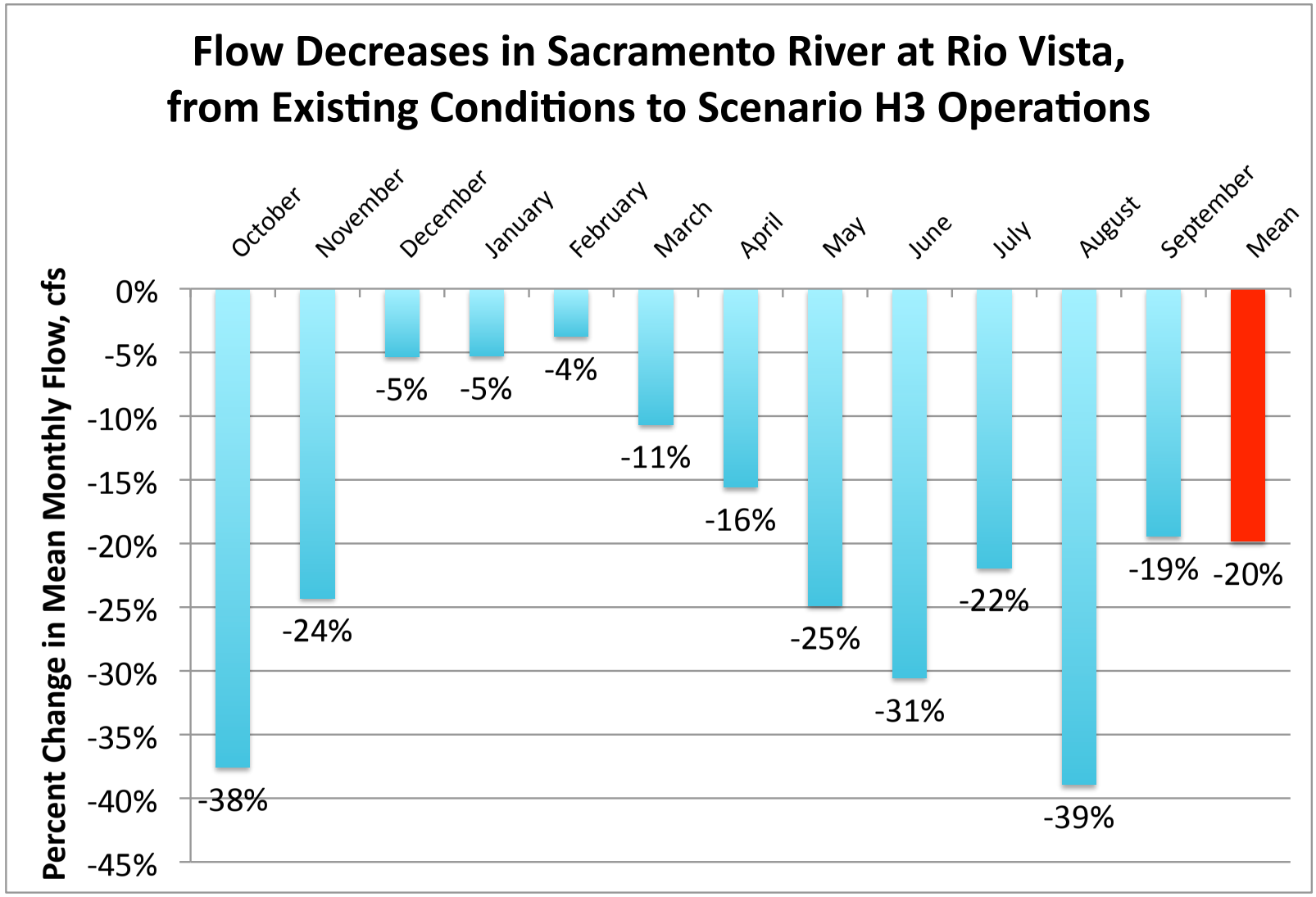
Mean monthly flows data for Sacramento River at Rio Vista

Mean Monthly Flows (cfs) for Model Scenarios for the Sacramento River at Rio Vista, Year-Round

Month	Existing Conditions	No Action Alternative, Early Long Term	Alternative 4A, Scenario H3, Early Long Term	Alternative 4A, Scenario H4, Early Long Term	Percent Change from EC to H3	Percent Change from EC to H4	Percent Change from NAA to H3	Percent Change from NAA to H4
October	6,667	6,058	4,162	4,206	-38%	-37%	-31%	-31%
November	10,793	11,671	8,172	8,126	-24%	-25%	-30%	-30%
December	22,749	23,283	21,538	21,832	-5%	-4%	-7%	-6%
January	37,268	38,556	35,310	35,579	-5%	-5%	-8%	-8%
February	44,541	46,674	42,869	42,676	-4%	-4%	-8%	-9%
March	36,084	36,744	32,241	33,240	-11%	-8%	-12%	-10%
April	21,333	21,306	18,012	21,138	-16%	-1%	-15%	-1%
May	15,456	14,232	11,613	13,708	-25%	-11%	-18%	-4%
June	9,847	8,525	6,839	6,181	-31%	-37%	-20%	-27%
July	10,740	10,604	8,388	7,311	-22%	-32%	-21%	-31%
August	8,052	7,610	4,918	4,931	-39%	-39%	-35%	-35%
September	7,348	11,025	5,921	5,809	-19%	-21%	-46%	-47%
Maximum	44,541	46,674	42,869	42,676	-4%	-1%	-7%	-1%
Minimum	6,667	6,058	4,162	4,206	-39%	-39%	-46%	-47%
Mean	19,240	19,691	16,665	17,061	-20%	-19%	-21%	-20%

Source: SWRCB-3, Appendix B, pp. B-359 to B-360.

Source: SWRCB-3, Appendix B, Table B.7-29, pp. B-359 to B-360.



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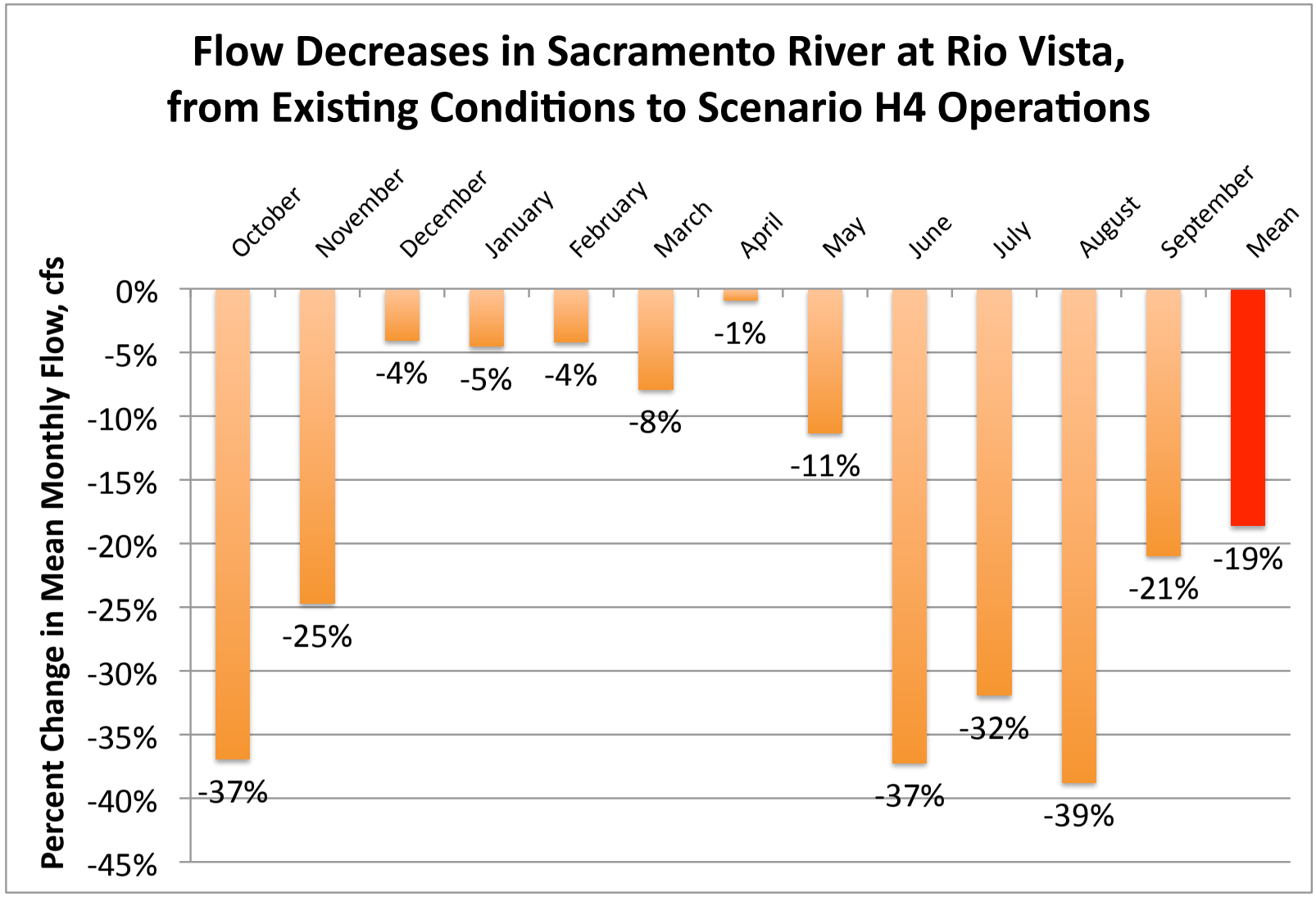

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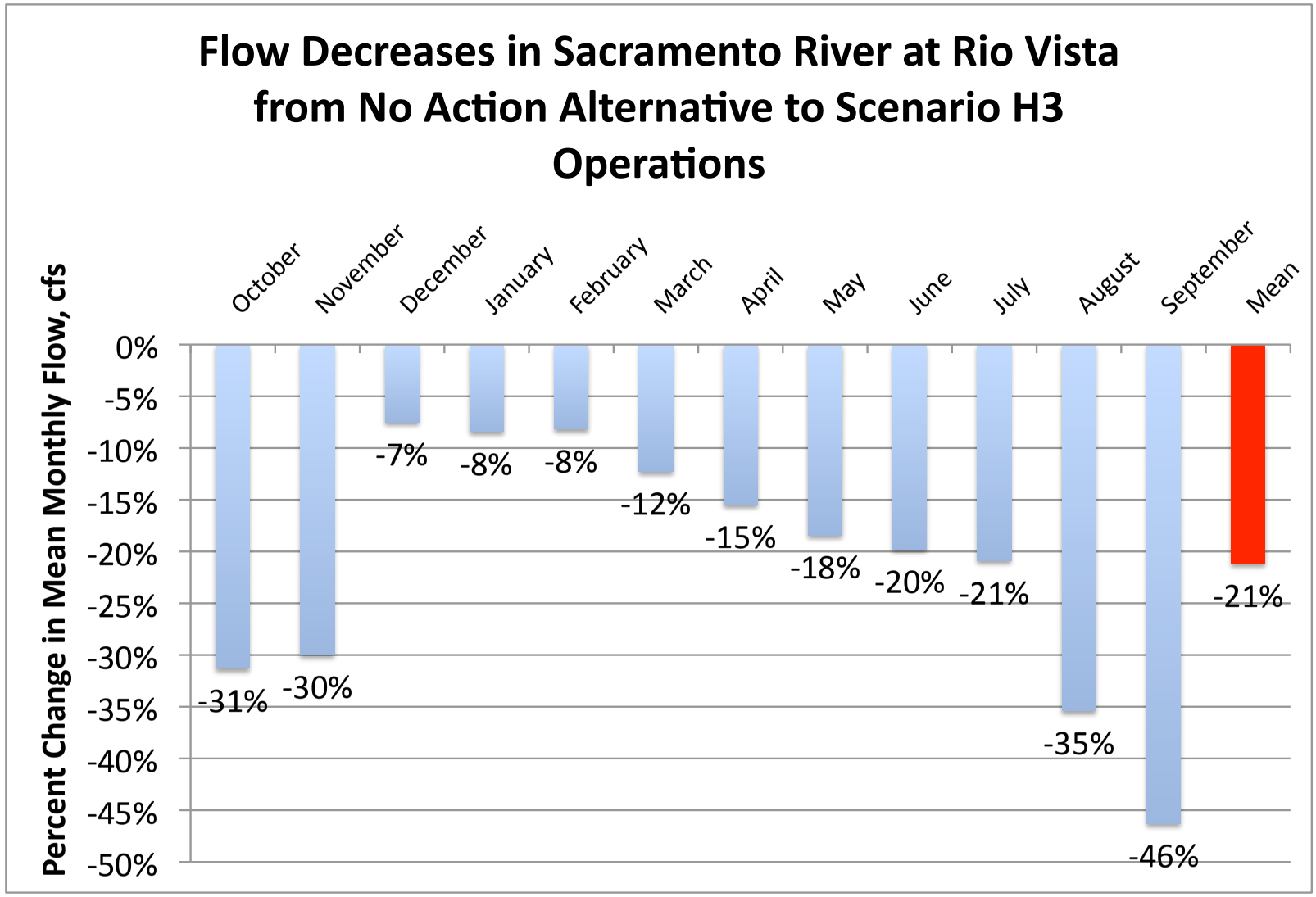

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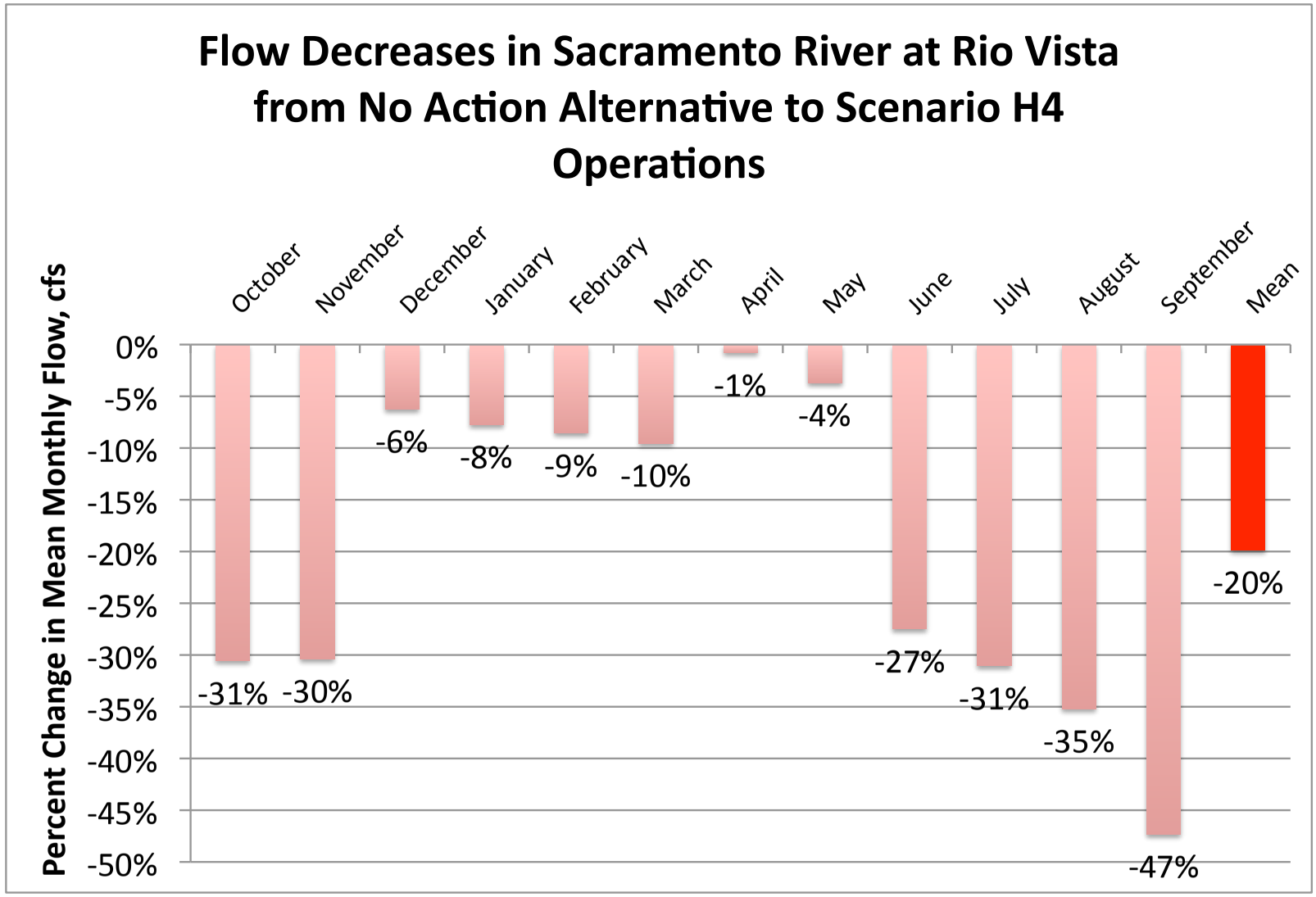

Source: SWRCB-3, Appendix B, Table B.7-29, pp. B-359 to B-360.

Appendix 7:

Delta Economic Sustainability Plan
Independent Review Panel correspondence

RTD-302

Independent Panel Review of the Economic Sustainability Plan for the Sacramento-San Joaquin Delta December 2, 2011

By

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Oregon State University

Janie M. Chermak
University of New Mexico

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Review performed for the
Delta Science Program

Summary

As requested by the Delta Science Program (DSP), the independent review panel reviewed the Economic Sustainability Plan commissioned and funded by the Delta Protection Commission (DPC). We find that the Sustainability Plan offers useful information to policy makers on the economic viability of the Delta region and its contributions to the broader region. Although the Sustainability Plan findings should not be used to evaluate specific "futures" or alternative options regarding the coequal goals, the Economic Sustainability Plan contains valuable information and proposes strategies to improve economic viability which the Delta Stewardship Council (DSC) may consider as it attempts to meet the coequal goals while retaining the economic, cultural and legacy viability of the Delta.

In summary, we offer these observations for consideration by the DPC and the DSC. First, maintenance of the levee system is important to sustain the viability of the Delta. The sections of the levee system that protect human life from flooding should be identified and those levees should be brought up to the same standards currently being used for urban levees in Sacramento (beyond PL84-99). For other sections of the system protecting only property, lower standards could be established providing that (1) the public is involved in the process of establishing the standards, and (2) any future land development that would result in putting humans at risk would require that the levees be upgraded accordingly before proceeding. For areas where the public agrees that levees are not needed for achievement of the coequal goals, removal of the levees, and hence flooding of the protected land, should be a planned event and not left to nature.

Second, the Economic Sustainability Plan proposes that a levee system can be relied upon to achieve a reliable water supply and that upgrading this system would improve the reliability of the water supply. This premise is not supported and a comprehensive risk analysis of the entire system with the recommended levee upgrades would be required to demonstrate that it could reduce the seismic risk. In addition, the most frequent cause of disruption to the water supply is caused by enforcement of provisions of the Endangered Species Act and not related to levees. Proponents of an isolated conveyance system contend that such a system will reduce ESA issues by eliminating some of the stressors on delta smelt and endangered stocks of salmon. However, an isolated conveyance to improve water-supply reliability could potentially impact the sustainability of the Delta by increasing salinity and decreasing local water availability because it will reduce through-flow of fresher Sacramento River water in the Delta. Therefore, the Sustainability Plan and the cost of implementing isolated conveyance should include the following: mitigation of salinity impacts, mitigation of local water supply impacts and mitigation of catastrophic salt-water intrusion in the event of a large earthquake that causes widespread failure of Delta levees.

Background

Ecological and economic problems associated with water transfers from rivers in northern California to southern California users have challenged policy makers in California for decades. As the point of transfer of northern California water, the Delta, writ large, has borne a disproportionate share of the ecological and economic costs of meeting the water export demand from areas south of the Delta. Endangered species issues associated with delta smelt and stocks of Chinook salmon intensified these concerns. In an effort to protect these species and other ecological values, a series of judicial rulings over the past decade have disrupted the export of water from the southern Delta to agricultural users in the San Joaquin Valley and municipal uses in southern California.

The state legislature passed the Delta Reform Act of 2009 in response to the documented ecological deterioration of the Delta, and declines in species which depend on this complex ecosystem, as well as the economic costs associated with disruptions of water supplies to users. This act created an institutional framework which is charged with attaining the "coequal goals of providing a more reliable water supply for California and protecting, restoring and enhancing the Delta ecosystem". The legislation also mandated that these coequal goals be achieved in such a way as to "protect and enhance the unique cultural, recreational, natural resource and agricultural values of the Delta as an evolving place". A key player in this process is the Delta Stewardship Council (DSC) which is tasked with developing the Delta Plan to achieve these coequal goals.

Another organization involved in this process is the Delta Protection Commission (DPC), which is charged with providing input to the DSC on mechanisms and programs to protect and enhance the economic sustainability of the Delta. The DPC funded an Economic Sustainability Plan in early 2011. An excerpt from the DPC's Request for Proposals, which includes the charge to the authors, is presented in Appendix 1. A draft of this Sustainability Plan was provided to the Council on October 10, 2011. Such plans are typically reviewed by external referees to assure that procedures, data, assumptions, results and policy interpretation s meet minimum scientific and engineering standards. These reviews are developed and coordinated by the Delta Science Program (DSP). The DSP commissioned this panel to review the Economic Sustainability Plan developed by the DPC.

Charge to the Panel

The panel was charged by the DSP with several broad tasks. Specifically,

> **"The Panel will be charged with assessing the scientific and technical quality of the Economic Sustainability Plan. The Panel will make recommendations for how the plan might be improved with respect to achieving stated goals."**

In addition to these general issues regarding the Sustainability Plan, there are sixteen questions that involve scientific and disciplinary aspects of the plan. These sixteen questions, along with the entire "charge" document, are presented in Appendix 2. The first four questions relate to issues of general

technical and scientific merit and are presented here because they are the most relevant to the overall findings of this panel.

They are:

1. How well are the purpose and scope of the Plan defined and described? Is the Plan an objective analysis of economic sustainability in the Delta, consistent with the requirements stated in the Delta Reform Act?
2. Is the Plan internally consistent and scientifically valid?
3. Are the analyses and results well-presented and clear? Is the analytical approach integrated, reasonable and scientifically defensible? Are the key findings and issues supported by adequate research and analysis?
4. Is the best available science and information used in the Plan and is it defined, assembled, summarized and integrated into the analysis? Does the Plan identify gaps in data and research that limit the Plan and/or should be a priority for future research?

The following section summarizes the process used by the panel in arriving at our conclusions. This is followed by the panel's response to both general issues of technical and scientific merit, and specific disciplinary questions.

Process

In preparation for this review, the panel was provided with the Economic Sustainability Plan and appendices by the Delta Science Program staff. Subsequent to receipt of the Sustainability Plan the panel received other supporting documents. A full listing of the documents provided to the panel is available on the Delta Science Program website.

The panel assembled in Sacramento on the morning of November 1, and traveled to Walnut Grove to hear presentations by the authors of the Sustainability Plan and to receive public comment. On the trip south to Walnut Grove, the panel visited the Freeport Regional Water Project intake facility, a diversion site for water for both Sacramento County and the Contra Costa Water District. On the trip to Walnut Grove, the panel also visited several other "legacy communities" and experienced the levee system on which the viability of the Delta depends. The morning meeting in Walnut Grove consisted of the presentations by the authors and public comments; the afternoon was devoted to panel discussions. Following the meeting in Walnut Grove, the panel again toured southern and eastern areas of the Delta.

On November 2, the panel met in private in the morning to formulate responses to the charges provided by the DSP. The panel then met in public session with the authors and the Executive Director of the Delta Protection Commission. At that meeting, the panel presented its preliminary findings. This report was prepared subsequent to the panel's meeting in Sacramento and Walnut Grove. The panel engaged in two conference calls and email exchanges to arrive at its final report. This report was submitted to the DSP on December 2, 2011.

Panel Response to the Sustainability Plan

We start by identifying what in our judgment are the strengths and limitations of the Economic Sustainability Plan relevant to the charge that the authors were asked to address by the Delta Science Program.

Strengths of Plan Relative to Charge

The strengths of the Plan are that it:

1. Describes clearly the intrinsic value of the Delta and its economy and documents the many public-good services provided by the Delta
2. Provides valuable baseline information about the Delta economy
3. Gives a starting point in combination with other recent studies to conduct a comprehensive, cost-benefit analysis of alternatives for improving water supply reliability and enhancing the ecosystem
4. Offers creative ideas for strengthening the Delta economy
5. Substantiates the importance of lowland levees for protecting people, property and the environment
6. Provides a potentially viable alternative to improve reliability of lowland levees

We feel that these "strengths" can be used by the DSC in terms of developing the final Delta Plan in the following ways.

1. The Sustainability Plan documents the economic contributions of the three key sectors to the viability of the Delta region. The economy is driven largely by agriculture, which plays an important role both within the region and as a supplier of inputs to other agricultural activities outside the region, such as dairy. The Delta provides important recreational benefits in the form of fishing, hunting, boating and other water based recreation. Given its location between the populous Bay Area and the cities of the Central Valley, the region contains important infrastructure that serves residents in these external areas, such as highways, pipelines, railroads, and utility transmission lines. Data provided in this Plan can be used as "baseline" information with which to assess trends or change in the viability of the Delta. **These data, in combination with other recent studies, can also be instructive in any process to prioritize levees for maintenance, enhancement or abandonment.**

2. The Plan demonstrates that the Delta provides both substantial public and private goods to the region and the state. These are varied but include such private goods features as protection of private farmland and infrastructure, to a range of public goods such as protection of human safety, commerce (e.g.; shipping routes to the ports of Sacramento and Stockton, and recreational activities associated with the Delta ecosystem. The provision of this range of goods

and services is important given that the overarching issue in terms of Delta viability is the levee system. Specifically, it is well documented that levee failure puts at risk the economic activities documented in the Plan, as well as human life (DRMS 2010). **In the panel's opinion, critical questions for policy makers include: 1) who should pay for the maintenance and enhancement of this levee system? And 2) what should the design(s) and configuration of that levee system be as the DSC adopts its final plans for meeting the coequal goals?**

Limitations of Plan Relative to Charge

The panel also found limitations with the Sustainability Plan relative to the charge the authors were given by the DSP and, more importantly, its potential utility to the DSC. These are:

1. The Sustainability Plan is not and should not be used for benefit-cost analyses of alternatives for improving water supply reliability and enhancing the ecosystem.
2. The Plan does not explicitly provide information to prioritize how future resources are invested in the Delta.
3. The Plan does not offer a clear or viable definition of economic sustainability.
4. The Plan provides a potentially optimistic and misleading estimate for the cost of upgrading lowland levees.
5. The Plan does not address the need for evacuation planning to protect public safety.
6. The Plan's approach of upgrading the levee system will not necessarily improve Delta water supply reliability because the recommended upgrades are not shown to substantively reduce disruptions due to large earthquakes and they will have little impact on restrictions in pumping due to the Endangered Species Act.

The Sustainability Plan limitations relate to the fact that it does not address the challenge of how to prioritize investments within the Delta, either for levee maintenance or improvements. The Plan documents substantial economic and human values within the various geographical definitions of the Delta (legal, primary, secondary), but is silent on which levees are most critical; i.e.; which should be the highest priority in terms of improvements. In addition, the Plan does not define economic metrics by which to define and judge a viable or sustainable Delta. The issue of prioritization of resource expenditures is important because the likelihood of maintaining all levees strikes us as low, given resource constraints faced by the State of California and the federal government. The report offers a levee design which the authors believe can be used to replace/improve current standards and for a lower cost (the so-called "fat levee"). Subsequent to our public presentation in Sacramento on November 2, the authors provided additional comments and references to support their cost estimates for construction of the proposed levee design, for which we are grateful. However, we remain concerned that theses estimates are not consistent with (i.e., are much lower than) levee construction

costs in other settings. **In the panel's opinion, the cost of this levee design remains unsubstantiated. In addition, the more fundamental question of whether all levees within the Delta should be preserved remains unanswered.**

The Sustainability Plan proposes that the levee system can be relied upon to achieve a reliable water supply and that upgrading this system would improve the reliability of the water supply. This premise is not supported. The Delta Risk Management Strategy effort (DRMS Phases I and II) showed that strategies of upgrading the levees (including seismically-armoring levees along a through-Delta conveyance) had essentially no impact on the risk of disruptions to the Delta water supply caused by earthquakes. A similar comprehensive analysis of the entire system with the levee upgrades recommended in the Sustainability Plan would be required to demonstrate that it could reduce the seismic risk. In addition, the most frequent cause of disruption to the water supply is caused by enforcement of provisions of the Endangered Species Act and not related to levees. Proponents of an isolated conveyance system contend that such a system will reduce ESA issues by eliminating some of the stressors on delta smelt and endangered stocks of salmon. However, an isolated conveyance to improve water-supply reliability could potentially impact the sustainability of the Delta by increasing salinity and decreasing local water availability because it will reduce through-flow of fresher Sacramento River water in the Delta. **Therefore, t**he costs required to mitigate salinity impacts, local water supply impacts and catastrophic salt-water intrusion in the event of a large earthquake are a relevant consideration in assessing isolated conveyance.**

Another issue relates to the type of economic information provided in the Sustainability Plan. Specifically, the economic estimates provided in the Plan are what economists refer to as "impact analyses". Such estimates are useful in that they can give policy makers an understanding of the relative contributions made by economic sectors to overall economic viability, such as employment and sales, or the increase in economic activity (within a local region) that may arise from a particular investment. However, these estimates are not appropriate information on which to prioritize resource allocation decisions or options. Specifically, they are not intended for use in assessing the efficacy of trade-offs, between, say upgrading levees or building an isolated conveyance system. In fairness to the authors, they were not specifically charged with performing a benefit-cost (B-C) analysis, and as we noted above under "Strengths," there is substantial information within the report that could be used within a B-C framework: e.g.; data on the costs of agricultural production, revenues from agricultural and other economic activities and so forth). **Prioritization of expenditures on levees (maintenance, enhancement or abandonment) would require a comprehensive benefit-cost analysis of investments, within and outside the Delta, to meet the coequal goals.**

Finally, in our opinion, "sustainability" is an oft-used but typically imprecise term. For example, the attempt to design "sustainable" cities, states, or countries has captivated policy makers for decades. However, arriving at a definition which is acceptable to numerous stakeholders, with metrics which are both measurable and economically and ecologically compatible, makes this a difficult outcome to achieve in a pluralistic society. In the case of the Economic Sustainability Plan, the authors were essentially given a definition of sustainability which implies that the only sustainable economy is one with no diminution of economic output/activity from any of the three key economic sectors. **This is the**

***status quo* situation and does not allow for tradeoffs. Such a definition of sustainability would appear to be of limited use in policy decisions. Conversations with the authors in Sacramento make clear that the authors understand the limitations of this definition and would be willing to pursue other measures of viability, if requested.**

Recommendations to the Authors of the Sustainability Plan

The panel was charged with providing specific recommendations to the authors for improving the Economic Sustainability Plan in terms of meeting its goals. In the event that the DPC or the authors wish to revise the analyses underlying the Sustainability Plan, we offer the following suggestions.

1. In terms of the public safety aspects of the Plan, we recommend that the authors provide guidance for evacuation planning and effective communication/education about the risk of flooding.

2. We recommend that the authors expand their discussion regarding the consequences of levee failure and clearly identify which areas have the highest potential and which areas have the lowest or no potential for life loss. This information would be helpful in for prioritizing levee upgrades and developing appropriate standards for upgrades.

3. We recommend that the authors investigate and evaluate what the Department of Water Resources (DWR) is doing with regard to both riverine and Delta levees. We are referring to what DWR calls their Urban Levee Evaluations (ULE), and the Non-Urban Levee Evaluations (NULE). If levees in the California Delta provide for public safety, as opposed to only agriculture, we further recommend the authors discuss and justify why Delta levees should be designed to a lower standard that ULE or NULE levees in the Sacramento-San Joaquin Valley.

4. We recommend that the cost estimate of a "fat levee" concept be better substantiated as in our opinion the current estimate of the cost of design and construction is overly optimistic. At a minimum, we recommend that a realistic upper bound be presented, assuming that the federal government is a partner and that right-of-way and borrow material acquisition are involved.

5. We suggest that the authors provide a discussion of how the lack of formal inclusion of risk and uncertainty in the analyses impacts their findings. We are not suggesting that the authors attempt a formal risk-based analysis at this time, given the availability of the DRMS analysis. However, the authors may wish to provide qualitative information relative to areas of greatest uncertainty in their estimates.

6. The authors should address the issue of what is meant by "sustainability", particularly in terms of developing a viable economic future for the area. For example, how would the programs and strategies proposed here perform if a different definition of sustainability is used?

7. The authors may wish to develop their own agricultural sectors and production function coefficients to reflect the agricultural sectors in the 5 county study area. This would require use of University of California extension budgets and following procedures outlined by Willis and Holland (1997) and Coupal and Holland (1995). The study team may find there are other production function adjustments required besides the increase in custom purchases as oppose to the national agricultural production function averages.

8. While we find the multinomial logit (MNL) model to be a useful approach to estimating the effects of salinity and other factors on agricultural activity, we suggest that the authors provide more detail on this model and incorporate more the results into the report.

Recommendations to Delta Stewardship Council

Based on our review of the Economic Sustainability Plan, and our assessment of its relative strengths and weaknesses, we propose the following to the DSC:

1. Develop strategies to implement a user-fee system to address the public-goods nature of the Delta.

2. Conduct a comprehensive and credible cost-benefit analysis to analyze alternatives for improving water supply reliability and enhancing ecosystem services.

3. Regional, state and federal agencies work with the public to develop standards for levees in the Delta.

4. Include costs for mitigating economic as well as environmental impacts to the Delta in analyzing water export alternatives.

5. State agencies work with local stakeholders to develop a prioritization plan for investing future resources in the Delta.

6. Take immediate steps to improve maintenance and monitoring for existing levees and evacuation and emergency flood response.

As noted in the Economic Sustainability Plan and numerous other publicly funded assessments of Delta water issues (e.g.; DRMS) the critical public policy issue in the Delta revolves around the maintenance of

the levee system. The current levee system has evolved over decades; financing of maintenance features a mix of public (state and federal) and private funding (local reclamation districts, or in some cases owners of selected infrastructure, such as Pacific Gas and Electric pipelines). The Sustainability Plan and these other reports document the importance of the levee system to the region and beyond. Given the importance of this system, in whatever form it is ultimately configured, mechanisms are needed to spread the cost of that system equitably across beneficiaries. The current financing system appears to have incentivized "free-riding" behavior on the part of selected state agencies (e.g.; CALTRANS) and private parties. The California Department of Water Resources *Economic Analysis Guidebook* (2008), provides general principles concerning the distribution of costs and benefits in water resource projects, noting that among other financial feasibility criteria, "beneficiaries are able to pay reimbursable costs for project outputs over the project's repayment period" (pp viii, xii). **Consistent with this basic principle, we believe an equitable outcome concerning the distribution of benefits and costs of levee expenditures will ultimately require an agency with the authority to assign and assess beneficiaries their share of these costs.**

A current benefit of the water export system is that flows of relatively fresh water into the southern and eastern Delta have kept salinity levels sufficiently low to facilitate agricultural production. The Economic Sustainability Plan demonstrates the potential negative effects of increasing salinity levels on agricultural yields in the southern Delta. Although the Sustainability Plan does not document potential changes to salinity levels arising from the operation of an isolated conveyance system, it is reasonable to assume that diversion of up to 15,000cfs of flow from the Sacramento River (North Delta) and movement via pipelines to the Tracy pumping facilities, would alter Delta through-flows. To the extent that these alterations in flows increase south Delta salinity levels, the economic and ecosystem impacts of these alterations must be recognized, and where appropriate, mitigated. **Given that water exporters will be the primary beneficiaries of such a conveyance system, the DPC and the DSC need to ensure that the sponsors of a conveyance system fully pay for any and all Delta mitigation.**

Finally, we note that there has been a substantial amount of recent research dealing with the "economics" of water and the Delta. These include the DRMS report, which contained an economic inventory of the various values arising from the Delta system (and implicitly from the levees which provide protection for the current infrastructure). In addition, there have been a series of reports from researchers who are primarily associated with the University of California, Davis. These include three books dealing with alternative futures or "visions" for the Delta (Lund et al. 2007, Lund et al. 2010, and Hanak et al. 2011). There have also been journal articles (e.g.; Suddeth et al. 2010) on the benefits and costs associated with different configurations of levees within the Delta and reports (e.g.; Sumner and Rosen-Molina 2010) on the viability of agriculture and other economic sectors of the Delta economy. These books, reports and articles have different objectives and employ different methods than the Economic Sustainability Plan but we believe that there is commonality in the findings between these other studies and the Sustainability Plan. Specifically, in a general sense, all support the finding reported in this Plan of significant economic activity and value associated with the Delta. Another common finding is that any future would include a Delta levee system which includes the majority of the present levee system. The major difference between the Plan and these other reports tends to be on how many

of the lowland levees would be allowed to fail. As noted earlier, the Sustainability Plan baseline economic data can be helpful in discussions regarding the future of selected levees, particularly those in the middle Delta region**. We encourage the DSC to consider these common findings as it addresses the challenge of meeting the coequal goals while providing protections for the Delta economy.**

Responses to Specific Questions

1. *How well are the purpose and scope of the Plan defined and described? Is the Plan an objective analysis of economic sustainability in the Delta, consistent with the requirements stated in the Delta Reform Act?*

   Yes. In our opinion, the purpose and scope of the Sustainability Plan are well defined. We also find the analysis of baseline economic conditions to be performed in a technically competent fashion and to be objective.

   However, we find that interpretation of the assessment overreaches since it is an impact analysis, not a benefit-cost analysis, and since the study area is confined to the Delta. Thus, it is not appropriate to use these results to measure the efficacy of alternatives outside the Delta or of levee investments within the Delta.

2. *Is the Plan internally consistent and scientifically valid?*

   As noted above, the baseline assessment of economic impacts within the Delta is consistent and defensible.

   The estimated costs for improving the levees are not defensible because (1) the standards have not yet been established by all of the stakeholders and (2) the estimates have not necessarily included all costs involved.

3. *Are the analyses and results well-presented and clear? Is the analytical approach integrated, reasonable and scientifically defensible? Are the key findings and issues supported by adequate research and analysis?*

   The analyses presented in chapters 2, 7, 8, and 9 covering the economy of the Delta are, in our opinion, well drafted and use appropriate techniques.

   In chapter 2, background information of the economy, culture and other unique characteristics of the Delta provide useful, needed information to understand the unique nature of the Delta.

   Chapters 7 (agriculture), 8 (recreation and tourism), and 9 (infra-structure) provide details of the economic baseline of the Delta. The impact analysis techniques provided in these chapters are consistent with the standard for this type of assessment. However, the aggregated impacts, which are useful, could be disaggregated into individual economic sectors. This would provide a distributional analysis as to the impacts and show economic sectors that are closely related to the Delta's agricultural and tourism sectors.

   Collectively the information provided in chapters 2, 7, 8, and 9 clearly documents the Delta's contributions to the region and to the state. This type of information does not appear to have been collected and provided within a single document prior to this time.

4. *Is the best available science and information used in the Plan and is it defined, assembled, summarized and integrated into the analysis? Does the Plan identify gaps in data and research that limit the Plan and/or should be a priority for future research?*

   The authors appear to have used the best available data in their development of the baseline and the development of the impact model. The authors draw from a wide range of data sources and augmented the IMPLAN model to account for local conditions. For example, they addressed California agricultural production practices that have a greater use of custom operations. These adjustments were made after consultation with University of California extension personnel. This is a notable accomplishment given the short timeframe of the study. We also recognize the difficulties in addressing sub-county level analysis. The authors appear to have dealt with this appropriately.

5. *How well does the Plan integrate analyses at various spatial and temporal scales?*

   The authors are consistent within the definition of the physical Delta as provided to the authors.

   It is not clear to us how the authors arrived at the basis of the forecasting time dimension. We appreciate the difficulty in making long-run forecasts, but it is not clear how they came up with the basis for the dynamic analysis. We recognize that IMPLAN is a static forecasting tool and limits the ability to consider changes and constraints overtime. The authors need to provide more details in their discussion of results and limitations.

6. *How well does the Plan address uncertainty?*

   In general, the Economic Sustainability Plan does not consider uncertainty, which we interpret to mean a probabilistic or stochastic-based analysis of economic and public health outcomes (nor was this an explicit requirement of the RFP). Risk is inherent in the choice of levee design and outcome as well as in the economic development strategy. Any levee design has a probability and consequence of failure, based on that design and future conditions. Similarly, risk is inherent in economic outcomes, as the future states of the world are not known. Point estimate analysis, as is performed in the Sustainability Plan, does not take this into account. Different assumptions and restrictions (implicit or explicit) result in different point estimates of economic measures. The exception to this abstraction from risk is the multinomial logit (MNL) model, which is statistics-based and hence has standard errors implicit in the results. However, those standard errors are not employed in the forecasting of future crop acreage.

   Although risk (uncertainty) is not considered in the Plan, in the panel's opinion, the inclusion of risk and uncertainty associated with potential policy choices (i.e., magnitude and direction of impact as well as confidence interval around the mean) provides policymakers with more complete information with which to make decisions. While the analysis could be improved by including probabilistic-based forecasts, we do not feel that it would be warranted to redo this current analysis. Instead, we encourage the Delta Stewardship Council to exercise the DRMS Risk

Model, refining it with the recent information from this report and other studies, in its deliberations for developing the Delta Plan.

7. *Is the identification of key economic sectors in the Delta sound, and the analysis of the baseline and trends for key sectors of the Delta adequate?*

   Yes, please see response to question 4. However, the table of economic, employment, and value added impacts shows information in aggregate form. More information could be provided by disaggregating impacts into economic sectors. This would show the distributional impacts among sectors in the 5 county study area and indicate those sectors closely related to Delta agricultural and tourism sectors.

8. *Is the baseline estimate of Delta agricultural production accurate and reliable?*

   Yes, see response to question 4.

9. *Is the multinomial logit model a methodologically sound approach for estimating the impacts of water policy proposals on Delta agriculture and/or on environmental change, such as salinity, on crop choice and production?*

   We commend the authors for using this approach. A multinomial logit (MNL) is a standard, recognized method in the extant literature for problems with discrete, limited dependent variables. However, the authors' discussion of key assumptions and procedures is too brief. For example, in the main text, the authors suggest that the MNL is a conditional MNL, where the conditional is on the current land use (pg 123). More detail of this assumption and its impact would be helpful in the Appendix.

10. *Is the interpretation of the model results reasonable and appropriate?*

    We have two concerns. First, the historical salinity levels used in the analysis may not be appropriate for forecasting future salinity impacts, as much of the data on salinity used in the estimated MNL model appear to be below levels evaluated by the authors. Subsequent to our November 2 presentation, the authors provided the panel with data on historical salinity levels within the Delta. The historical record reflects wide ranges in salinity, which mitigates this general concern but raises the question of what salinity levels will be in the future.

    Second, it is difficult to assess the model results due to absence of a full discussion of the model. For example, Appendix G does not include a discussion of the ranges of the data (Table G-5 is inadequate), does not provide complete model results, nor does it include an assumption of the model structure and other information that are normally included in an econometric result. The results would be more defensible if the Appendix included not only the coefficients and standard errors but also some indication of overall fit. Given the potential significance of the MNL results and in particular the salinity elasticity, we encourage the authors to expand this discussion.

Finally, given the results from an MNL and the data from which this MNL was estimated, it appears possible to generate maps from the results to forecast the areas where there is a high probability of changing crops. Given time constraints in preparing this Sustainability Plan, it is not necessary to do so now but we would encourage the authors to explore further use of the MNL model results beyond the presentation in the Plan.

11. *Is the economic impact analysis of Delta agriculture and recreation reliable? Are the multipliers reasonable and consistent with standard practice? Is the interpretation and discussion of results reasonable?*

Yes, please see response 4 above. Additionally the multipliers for the 5 county area are reasonable and smaller than the state multipliers. This is consistent since the state economy is much larger than the study area and therefore has greater and more numerous economic linkages among economic sectors.

12. *Are the standards recommended for the various Delta levees in the Plan adequately analyzed and scientifically supported? Are the standards recommended for levees adequately analyzed and scientifically supported?*

No, the standards are not defined sufficiently nor have they been discussed with or agreed to by all of the stakeholders.

A critical consideration for levee standards is public safety, which is the first item to be addressed in the Sustainability Plan according to the Charge to the Authors: "The Plan will include, but not be limited to the following: 1) Public safety recommendations, such as flood protection recommendations and relationship to economic sustainability." Public safety is mentioned briefly in the draft document, with recommendations to improve "emergency response" and "preparedness for dealing with failures after they occur." However, the draft document does not address the potential for loss of life due to flooding, it does not identify which areas have the highest potential and which have the lowest or no potential for life loss, it does not recommend that evacuation planning be included in the "emergency response" efforts, and it does not provide information on the cost of improving public safety.

Concerning public safety, we recommend the following:

1. Evacuation related efforts are treated with high priority. The probability is not zero that in the next decade or two the Delta will experience a major flood or an earthquake that causes levee failures. The State can substantially reduce the likelihood or minimize the potential for loss of life by concentrating on evacuation related efforts.

2. Effective communication of the risk of flooding should be emphasized. This communication needs to be clear and understandable to the general public. For example, one can talk about design for a 100-year storm or a 1% annual probability of levee failure. That does not have the same impact as discussing for designing for a 100-year storm and owning a house behind the levee with a 30-year mortgage and saying the

chances of seeing the storm during your mortgage is about 1 in 3 or similar to the risk taken while playing Russian Roulette with two bullets in the pistol cylinder. While both approaches are clear to the well-educated scientist, the second approach is likely to be more effective with the general public.

These efforts concerning public safety are important whether or not the levee system is upgraded, and they are particularly important if the levee system is not upgraded.

The draft Sustainability Plan recommends that all levees be updated to PL 84-99, as a minimum, and that a more robust cross-section (the "fat levee") be adopted in upgrading the levees further. The concept of a "fat levee" has merit and may prove to be a feasible and effective means to improve the stability of the levees. However, the devil is in the details; levees are like a chain in that they are only as strong as the weakest link. A conceptual cross-section is only one piece of an integrated system plan that addresses navigation, utility crossings, transportation, water control gates, monitoring and maintenance. There is also a lack of field data regarding levee geometry and levee and foundation soil characteristics/properties over this 1,000-mile long system. These data are needed to define "reaches "of levees that are similar in both levee and foundation cross sectional geometry and material properties; such that, a detailed plan could be developed that is appropriate for that specific reach. In this manner the levees within the Delta could be divided into reaches and separate detailed designs developed for each reach. These field data are on the "critical path" if meaningful work is to be initiated in the near future.

We recommend that levees in the Delta that protect people be upgraded to the recent flood control legislation enacted in 2007 (commonly referred to as SB 5), which calls for a minimum of 200-year flood protection for urban and urbanizing areas in the Sacramento-San Joaquin Valley. It would not be sensible or appropriate to use different standards for different people in this region. SB 5 limits the conditions for further development if this level of flood protection has not been achieved, conditions have not been imposed on development to provide this level of flood protection, or adequate progress towards achieving this level of protection cannot be shown.

We strongly recommend that regional, state and federal agencies work with the public to develop standards for levees in the Delta. These deliberations on design need to consider the consequences of failure, which will be informative in terms of levee prioritization.

13. Are the cost estimates for levee improvements reasonable and supported?

In the panel's opinion, the cost estimates in the draft Plan are questionably optimistic (too low). The authors propose that current cost estimate to improve the levees to PL84-99 is $1 to 2 million per mile, and that additional improvement using the "fat levee" concept adds an additional $2 to 3 million per mile. As a point of comparison, levees in the greater New Orleans' area, after Katrina, cost about $50 million per mile to upgrade. While the comparison between New Orleans and the California Delta is obviously not perfect, we question why there is more than an order of magnitude difference in estimated cost per mile. We believe that if the

suggested improvements are supported by the federal government, then the costs will likely be similar to recent experience, such as the cost of the post-Katrina improvements. For areas where the intent is to remove classification as being within the FEMA 100-year flood zone, then the federal government will certainly be involved in establishing the standards and impacting the costs. Further, we question whether the cost of land and right-of-way acquisition, movement of utilities, permitting, and obtaining the necessary quality and quantity of borrow material have been realistically included in these estimates.

We recommend that the authors provide more substantive and defensible information concerning their cost estimates for levee improvements.

14. *Are opportunities and strategies to protect and enhance economic sustainability effectively identified?*

Yes, a range of potential strategies is identified, including enhancing agriculture, recreation and development. However, as noted above, there is no metric for economic sustainability, making it difficult to compare the value of individual strategies. For example, the authors suggest that agro-tourism and increased recreation opportunities would enhance economic sustainability. Agro-tourism in particular seems problematic, given the other opportunities for potential consumers (tourists) in adjacent areas, such as the Napa-Sonoma area, as well as areas to the south of the Delta.

15. *Are the challenges and constraints to protect and enhance economic sustainability effectively identified?*

The Economic Sustainability Plan identifies numerous potential problems that threaten the economic sustainability of the Delta. The Sustainability Plan asserts that a prominent constraint to economic sustainability is a uniquely burdensome regulatory environment in the Delta compared to elsewhere. A more detailed description of these issues and how they might be mitigated is needed.

16. *Are the recommended strategies consistent with the coequal goals of improving water supply reliability and protecting, restoring and enhancing the Delta ecosystem?*

Yes, the strategies recommended recognize the need to address the coequal goals. However, as noted earlier, this economic impact analysis is not the appropriate procedure for assessing, comparing, and selecting optimal strategies.

We believe that the recommendation for creating a regional authority responsible for levee maintenance, monitoring, improvement and emergency preparedness and response has merit, particularly if it has the ability to address the current problems of free riding behavior with respect to the financing of levees.

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Appendix A

Charge to Authors of the Sustainability Plan (excerpt from the "Request for Proposal's" prepared by the DPC)

The Commission is soliciting proposals from qualified consultants to assist in developing the Economic Sustainability Plan for the Sacramento-San Joaquin Delta (Sustainability Plan). With the passage of the Delta legislative water package in November 2009, (SB X7 1 Section 29759), the Commission was tasked with the development of an Economic Sustainability Plan to be completed by July 1, 2011. The Sustainability Plan will serve two primary functions, including providing a blueprint for a sustainable Delta economy in compliance with SB X7 1, and establishing a basis to evaluate future public policy and program decisions, and probable physical changes affecting the Delta for their potential impact upon the Delta's long-term economic sustainability. The Sustainability Plan will be a working document that shall be reviewed every five years.

In addition, the Sustainability Plan shall include information and recommendations that inform the Delta Stewardship Council's policies regarding the socioeconomic sustainability of the Delta region, specifically to protect, enhance, and sustain the unique cultural, historical, recreational, agricultural values of the Delta as an evolving place in a manner consistent with the coequal goals of protecting, restoring and enhancing the Delta ecosystem and providing a more reliable water supply for California.

The Sustainability Plan will include, but not be limited to the following:

1) Public safety recommendations, such as flood protection recommendations and relationship to economic sustainability;
2) A summation of economic goals, policies, and objectives consistent with local general plans and other local economic efforts, including recommendations on continued socioeconomic sustainability of agriculture and its infrastructure and legacy communities in the Delta;
3) Comments and recommendations to the Department of Water Resources concerning its periodic update of the flood management plan for the Delta as it relates to economic sustainability;
4) Identification of ways to encourage recreational investment along the key river corridors, as appropriate;
5) Evaluate socioeconomic sustainability of the Delta with respect to the State enacting various policy proposals or combination of policy proposals affecting the Delta (i.e. Delta Vision Strategic Plan; various studies of the Public Policy Institute of California; Bay Delta Conservation Plan; Delta Stewardship Council Plan); and
6) Recommendations as to the sustainability of Legacy Towns in the Primary Zone, including but not limited to recommendations as to land use, preservation of historical architecture, and integration with State Department of Parks' vision for the Delta.

The Commission has established an Economic Sustainability Plan Committee (ESP) to guide the preparation of the Economic Sustainability Plan. In addition to the above-mentioned items, the Committee has identified a number of areas that should be a part of the Sustainability Plan and should be taken into consideration in the establishment of the Economic Sustainability Plan, including:

- demonstrate and illustrate a Delta identity;
- recognition of Delta values, and impacts to values, including trends;
- a document of action strategy (not a reference shelf document);
- a foundation or basis to inform local, regional, state and federal policy development;
- acknowledge need for rational balance among Delta uses;
- identify priority areas in need of influence;
- recognize science and resources;
- address gaps and recognize nexus;
- integration with the Delta Protection Commission Resource Management Plan and Delta Stewardship Council's Delta Plan (consistency), other relevant plans, programs;
- recognize "Quality of Life" is measured by the 3E's (Environment, Economy, social Equity; plus public health);
- financing opportunities and planning recommendations to accomplish economic sustainability;
- entrepreneur stimulus, tools to influence and foster (public/private partnerships); and
- stakeholder influence

Appendix B

REVIEW PANEL CHARGE

The Panel will be charged with assessing the scientific and technical quality of the Economic Sustainability Plan. The Panel will make recommendations for how the Plan might be improved with respect to achieving stated goals.

Specific attention will be applied to the following questions:

1. How well are the purpose and scope of the Plan defined and described? Is the Plan an objective analysis of economic sustainability in the Delta, consistent with the requirements stated in the Delta Reform Act?
2. Is the Plan internally consistent and scientifically valid?
3. Are the analyses and results well-presented and clear? Is the analytical approach integrated, reasonable and scientifically defensible? Are the key findings and issues supported by adequate research and analysis?
4. Is the best available science and information used in the Plan and is it defined, assembled, summarized and integrated into the analysis? Does the Plan identify gaps in data and research that limit the Plan and/or should be a priority for future research?
5. How well does the Plan integrate analyses at various spatial and temporal scales?
6. How well does the Plan address uncertainty? How could this aspect be improved?
7. Is the identification of key economic sectors in the Delta sound, and the analysis of the baseline and trends for key sectors of the Delta adequate?
8. Is the baseline estimate of Delta agricultural production accurate and reliable?
9. Is the multinomial logit model a methodologically sound approach for estimating the impacts of water policy proposals on Delta agriculture and/or on environmental change, such as salinity, on crop choice and production?
10. Is the interpretation of the model results reasonable and appropriate?
11. Is the economic impact analysis of Delta agriculture and recreation reliable? Are the multipliers reasonable and consistent with standard practice? Is the interpretation and discussion of results reasonable?
12. Are the standards recommended for the various Delta levees in the Plan adequately analyzed and scientifically supported?
13. Are cost estimates for levee improvement reasonable and supported?
14. Did the Plan effectively identify opportunities and strategies to protect and enhance the economic sustainability of the Delta?
15. Did the Plan effectively identify challenges and constraints to protect and enhance the economic sustainability of the Delta?

16. The coequal goals of the Delta Reform Act are “providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem. The coequal goals shall be achieved in a manner that protects and enhances the unique cultural, recreational, natural resource, and agricultural values of the Delta as an evolving place.” Are the recommended strategies consistent with the coequal goals?

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RTD-303

December 6, 2011

Dr. Clifford N. Dahm
Lead Scientist
Delta Science Program
980 9th St., Suite 1500
Sacramento, CA 95814

Dear Dr. Dahm:

We thank the Delta Science Program (DSP) for convening and coordinating the independent review of the Economic Sustainability Plan (ESP), and the useful feedback we have received from the panel's December 2, 2011 report titled, "Review of the Economic Sustainability Plan for the Sacramento-San Joaquin Delta." Attached is our response to the panel's review report.

For the most part, the review panel has validated the analysis in the ESP including several important elements that have been the target of inaccurate criticism. Most of the limitations the panel has identified in the ESP are really calls for additional analysis with which we generally agree or are challenges in developing the ESP that stem from the lack of clear definitions of concepts such as sustainability or reliability in the Delta Reform Act, the draft Delta Plan, the Delta Protection Commission's RFP, or even the academic literature. We are making several improvements to the ESP as a result of the review, the most substantial of which is strengthening the area of emergency response and evacuation planning. The revised ESP reflecting the comments from the Peer Review Panel will be completed in January 2012. If you have any questions regarding this letter and/or the attachment please contact Jeffrey Michael (University of the Pacific) at (209) 946-7385; or Michael Machado (DPC) at (916) 776-2290.

Sincerely,

Michael Machado
Executive Director,
Delta Protection Commission

Sincerely,

Dr. Jeffrey A. Michael
Principal Investigator,
Economic Sustainability Plan
University of the Pacific

Enclosure

Cc
Phil Isenberg, Chair of the Delta Stewardship Council
Don Nottoli, Chair of the Delta Protection Commission
Joe Grindstaff, Delta Stewardship Council
Dr. Lauren Hastings, Delta Science Program
Dr. Richard Norgaard, Delta Independent Science Board

Attachment to Response Letter on the Independent Review Panel's Review Report of the "Economic Sustainability Plan for the Sacramento-San Joaquin Delta

The review panel has recognized and validated the quality of the economic analysis in the ESP, stating in particular that chapters 2, 7, 8, 9 are "well drafted and use appropriate techniques." These chapters describe the overall composition of the Delta economy and detailed analysis of the key sectors of agriculture, recreation, and infrastructure services which include energy, transportation, and water systems. In particular, the review team commended the statistical analysis used in the agriculture sector, calling it "state of the art" in their November 2 verbal report. This validation is important because the key findings of these ESP chapters refute some myths about the Delta economy that have been advanced by others. These findings and myths include:

- The ESP validates agriculture as the key driver of the Delta economy. It is a myth that recreation and tourism is equal in importance to agriculture and is capable of replacing the contribution of agriculture in the future. Both agriculture and recreation could be negatively impacted by many water supply and environmental proposals for the Delta.
- Infrastructure services, including energy, transportation and regional water supplies dependent on the Delta, are of enormous importance to the regional and state economies, and exceed the economic value of water exports to the state. Economic sustainability for the Delta and the state requires greater consideration of these broader infrastructure values in Delta plans.
- The ESP shows that salinity significantly impacts Delta agriculture even at recently observed levels of water quality. It is a myth that Delta water quality standards can be weakened and an isolated conveyance introduced without negative impacts on Delta agriculture.

The review panel also validated a number of findings in the ESP regarding the Delta levee system that are too often overlooked. The review panel concurred with the recommendation contained in the ESP that the Delta-specific PL 84-99 standard should be the minimum standard for all Delta levees, and recommended that even higher standards comparable to urban levees should be used for levees that protect human life. The review panel found that the ESP "substantiates the importance of lowland levees" and "provides a potentially viable alternative to improve reliability of lowland levees." Some Delta studies downplay the importance of lowland levees in the central and western Delta because they are typically found on islands with predominantly agricultural use. In contrast, the ESP and other engineering studies point out failure of lowland levees put more stress on the overall integrity of the levee system. The concept of matching levee investment to land use ignores the fact that levees work together as a system and levees that are adjacent to lower value land uses are often most critical to the stability of the system or non-land based uses such as Delta boating which is most popular in the channels protected by lowland levees.

The review panel states that "The concept of a 'fat levee' has merit and may prove to be a feasible and effective means to improve the stability of the levees." The panel feels the cost estimates for this strategy need additional substantiation. While it is prudent to be skeptical of initial cost estimates for large, public works our cost estimates were developed in consultation with engineers with detailed knowledge and experience working in the area, and we have more than doubled the base engineering and construction cost estimate to allow for additional program management costs. The way to more fully address the panel's skepticism is to further develop the "fat" levee concept and that will result in more detailed design and cost estimates. It is imperative that the Stewardship Council give it serious

consideration for the Delta Plan. In addition to the ESP and the independent review panel, both the PPIC and DRMS analysis have made similar findings as the ESP regarding the cost of similar strategies.[1] Given the many uncertainties regarding whether BDCP will succeed and isolated conveyance will prove financially or environmentally viable, it is prudent for the Delta Stewardship Council to consider alternative ideas to address the co-equal goals, particularly when those concepts are more supportive of sustaining and enhancing the Delta, protect a variety of other critical statewide energy and transportation infrastructure, and could prove to be more cost-effective.

The panel also identified a strength of the ESP is that it offers creative ideas for strengthening the Delta economy. Although the ESP is realistic about the challenges and constraints facing recreation, tourism, and legacy communities in the Delta, it does lay out strategies and plans that can be used to guide investment and strengthen these areas in the future. Even though the potential to supplant agriculture as a driver is limited, sustaining and enhancing recreation and tourism is an important and achievable goal for the Delta economy and quality of life.

We also agree with the panel's recommendations to the Delta Stewardship Council, many of which are similar to recommendations in the ESP. In particular, the review panel highlighted the public goods nature of the Delta and the problem of "free-riding" behavior of public and private beneficiaries of the levee system. The panel states, "we believe an equitable outcome concerning the distribution of benefits and costs of levee expenditures will ultimately require an agency with the authority to assign and assess beneficiaries their share of these costs." The panel also recognized the negative impacts of proposed isolated conveyance on the Delta and states, "Given that water exporters will be the primary beneficiaries of such a conveyance system, the DPC and the DSC need to ensure that the sponsors of a conveyance system fully pay for any and all Delta mitigation."

The review panel also identified six "Limitations of the Plan Relative to Charge." The remainder of this letter provides our response to each of these six specific limitations.

1. "The Sustainability Plan is not and should not be used for benefit-cost analyses of alternatives for improving water supply reliability and enhancing the ecosystem."

This limitation simply restates the limitations acknowledged up front in the ESP in Chapter 1 (pages 3-4), so obviously we agree with the review panels' call for comprehensive and credible cost-benefit analysis. Our only quibble is that since cost-benefit analysis was not in the ESP charge and we state the identical limitation in the plan, this statement is misplaced in this section and could be misinterpreted as identifying some type of error in the analysis.

[1] The 2007 PPIC report described a similar strategy, "Fortress Delta" with estimated costs of approximately $4 billion. The PPIC removed the option in its initial screening not because it was unviable, but because of "extreme costs" compared to a peripheral canal they assumed would cost $3 billion or less. A January 2008 DWR report required by AB 1200 (Laird) identified seismically improved levees as one of 3 strategies with the highest risk-reduction potential, and noted that the improved levees scenario had the lowest cost of the three (See page 20, http://www.water.ca.gov/floodmgmt/dsmo/sab/drmsp/docs/AB1200_Report_to_Legislature.pdf). However, the final DRMS Phase 2 report was not released until a few months ago, and curiously did not contain any description, analysis or reference to the seismically improved levees that it had identified as one of the "three high-ranking building blocks" in the 2008 report.

It should be noted that there is a cost-benefit analysis of Delta options, the recently released DRMS phase 2 report.[2] Some of the strengths and weaknesses of the DRMS Phase 2 are discussed in the ESP, but we have only recently been able to examine the detailed findings of this new report. Below are some of the important findings from DRMS Phase 2 cost-benefit analysis that will be included in the final ESP.

- The "improved levees" scenario was found to have the highest benefit-cost ratio of all 4 scenarios, including the isolated conveyance scenario.[3]
- Water export interruption only accounts for 20% of the economic cost associated with a large earthquake scenario that would flood between 10 and 30 Delta islands.
- Water export interruption accounts for less than 2% of the economic cost associated with non-seismic flood events such as storms.

Levee upgrades perform well in cost-benefit analysis of Delta options, because they reduce risk in all areas including water conveyance, other infrastructure, and in-Delta property. In contrast, isolated conveyance only protects water exports which DRMS clearly identifies as a minority of the economic risks.

2. "The Plan does not explicitly provide information to prioritize how future resources are invested in the Delta."

While the ESP does not have an explicit list or ranking of investment priorities, the ESP does provide substantial information and strategies to guide investments in the Delta. For example, the recreation plan and Legacy Community chapters lay out investment needs and strategies and highlight the need for a Facilitator Organization to strategically coordinate investments among other duties.

When it comes to levees, the ESP actually does go through an exercise of considering levee upgrades on an island by island cost-benefit basis. The ESP finds that there are 4 small islands with a total of 16.7 levee miles that may not warrant PL 84-99 levee upgrades on a cost-benefit basis and therefore these would have low investment priority. It is true that we recommend PL 84-99 for all Delta levees, because the modest net benefit from putting lower priority on these 16.7 miles of levees is not worth the cost, delays and complexity of deviating from a standards-based approach. Since the panel stated that PL 84-99 should be the minimum standard for all existing Delta levees, it is clear that they agree with our assessment. Prioritization will be required in identifying what we estimate are 300-600 miles of levees that should receive seismic upgrades to the fat levee standards, and this would be an important part of further development of this component.

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[2] http://www.water.ca.gov/floodmgmt/dsmo/sab/drmsp/phase2_information.cfm

[3] This was true even though DRMS Phase 2 assumed isolated conveyance construction costs were under $5 billion, less than half current estimates and the "improved levees" scenario omitted the improved levee upgrades that were identified as having high risk reduction benefits in the 2008 AB 1200 report to the legislature. (See page 20, http://www.water.ca.gov/floodmgmt/dsmo/sab/drmsp/docs/AB1200_Report_to_Legislature.pdf

3. "The Plan does not offer a clear or viable definition of economic sustainability."

This is a good point, but we emphasize that the review panel does not offer a suggestion on a preferred or standard definition or even an example of an effective definition. In fact, the review panel notes that sustainability is an imprecise concept for which measurable metrics are difficult to identify and that it is a hard concept to implement. However, the panel is correct that the strong definition in the ESP that limits substitutability is problematic, but reflects the desires of Delta stakeholders and the performance measures in the Delta Stewardship Council's 5th Delta Plan.

We will add discussion of the impact of allowing additional substitutability into the final ESP. However, we anticipate it will have little to no impact on the recommendations because one of the findings of the ESP is that the opportunity to substitute agriculture with growth in other economic sectors in the Delta is limited. The ESP already acknowledges that movement to higher value agriculture could accommodate some loss of agricultural land to environmental restoration. Even if substitutability for possible recreation growth were included in the definition of sustainability, this alternative definition of sustainability would, at most, only allow for an additional 5% decline in agricultural output. Such a calculation was actually included in an earlier draft of the ESP but was eliminated in response to stakeholder feedback and the fact that he it had virtually no effect on the recommendations. Even utilizing an alternative definition of sustainability, a sustainable Delta economy is unable to accommodate the impact of a large 15,000 cfs isolated conveyance or over 100,000 acres converted to habitat as envisioned in the Bay Delta Conservation Plan. However, the Economic Sustainability Plan is supportive of the co-equal goals including the vast majority of ecosystem enhancements that have been proposed for the Delta.

4. "The Plan provides a potentially optimistic and misleading estimate for the cost of upgrading lowland levees."

As discussed above, we agree that additional development and more refined cost estimates of the "fat levee" concept are needed. However, the cost estimate for seismic levee upgrades in the ESP is substantiated and consistent with other reports. The cost of PL 84-99 upgrades is generally accepted and validated by a number of past and current projects in the Delta, and we assume this criticism is not directed to the estimated costs of PL 84-99 projects.

The comparisons to post-Katrina New Orleans are deceptive. The engineering experts who worked on the ESP have significant experience with levees in both New Orleans and the Delta, and have offered several explanations for why levee improvement in the Delta is significantly less costly. These explanations will be included in the final ESP. Furthermore, the cost estimates were developed in consultation with local engineers who design and build many levee improvement projects in the Delta and are very familiar with the costs and constraints.

We have identified two credible reports that have discussed similar levee upgrades in the Delta that appear to have comparable costs. As discussed in the ESP, the first is the 2007 PPIC report which estimated costs of roughly $4 billion for its "Fortress Delta" alternative. We have also recently learned that the DRMS Phase 2 analysis conducted for the Department of Water Resources developed and

analyzed a Seismically Improved Levees "building block" that is similar to the recommended strategy in the ESP. As discussed previously, the detailed description and results of the Seismically Improved Levees component was not included in the final report of DRMS Phase 2, but we have requested the information from DWR. The brief summary in the 2008 DWR report to the Legislature is qualitative and does not include exact costs. However, it does state that the "improved levees" scenario which includes the seismically improved levees building block has the lowest costs of all the scenarios. This implies that the cost of seismically improved levees is probably less than the $5 billion estimated for isolated conveyance in the final DRMS report.

We emphasize that the cost of these levee upgrades must be considered in the context of their large economic benefits as discussed in our response to Limitation 1.

5. "The Plan does not address the need for evacuation planning to protect public safety."

This is a valid criticism, and we acknowledge that our treatment of emergency response and evacuation planning was thin. In response to the review panel's initial comments on this topic during the November 2nd feedback session, we took the proactive step of engaging a regional expert on these issues with extensive experience in the Delta to review and develop detailed emergency plans and strategies to be recommended in the ESP. This addition will be included in the final version of the ESP.

6. "The Plan's approach of upgrading the levee system will not necessarily improve Delta water supply reliability because the recommended upgrades are not shown to substantively reduce disruptions due to large earthquakes and they will have little impact on restrictions in pumping due to the Endangered Species Act."

This criticism is not well supported, and was not included in the initial findings communicated in the November 2 meeting. Even the water exporters advocating for an isolated conveyance system have acknowledged in many forums that upgrading the levee system would improve water supply reliability. The DRMS reports cited by the review panel as support did not consider the kind of seismically resistant and repairable upgrade to the existing levee system described in the ESP.

The panel refers to the fact that the "Armored Pathway" option includes seismically resistant setback levees, but these levees only protect the pathway, not the entire island and thus do nothing to reduce the risk of island flooding due to a seismic event. As a result, DRMS found that the "Armored Pathway" option increased water supply reliability for seismic events that flood 10 or fewer islands, but did not reduce water supply interruptions for the most devastating scenarios in which a seismic event floods more than 10 islands. In contrast, the upgrades to the "fat" levee upgrades discussed in the ESP protect entire islands in the highest risk areas, and the probability of a seismic event that would flood 10 or more islands is much lower than in the case of the "Armored Pathway". Certainly, the exact amount of risk reduction can not be quantified by without further analysis, and that needs to be done. However, the statement in this limitation is far too strong, and we are confident that these levee upgrades would substantially improve water supply reliability by reducing risk to water exports from both seismic and flood hazards.

The comment also points to a second part of water supply reliability, the quantity of water that can be exported from the Delta which has been curtailed by recent judicial ruling involving the ESA. It is true that the ESP does not address this quantity aspect of reliability, and it is still unclear whether even an isolated conveyance will allow for any significant increase in water exports. Furthermore, the Delta Reform Act states that it is the policy of the state to reduce reliance on the Delta in meeting the state's future water supply needs. The 5th draft Delta Plan clearly states that actions to reduce reliance on the Delta improve water supply reliability, and we agree with that assessment. Thus, it is clear that the 2009 Delta Reform Act is not focused on increasing the quantity of water exported, and it is preventing catastrophic interruptions of supply that are the most important component of reliability. The levee strategy in the ESP would substantially reduce this risk and result in a more reliable water supply for California, and it would also increase reliability for all users of Delta water, whereas isolated conveyance would only increase reliability for the State Water Project and Central Valley Project.

Appendix 8:

May 28, 2014 Letter to BDCP regarding lack of access for limited English speakers

RTD-245

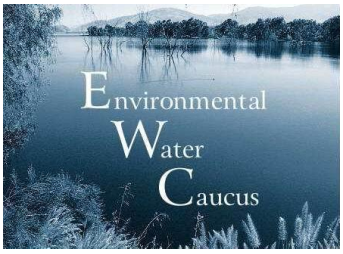
RESTORE THE DELTA
Fishable, Swimmable, Drinkable, Farmable

cafe coop

Environmental Justice Coalition For Water

APSARA
Asian Pacific Self-development And Residential Association

American Friends Service Committee
PROYECTO VOZ



CALIFORNIA SPORTFISHING PROTECTION ALLIANCE
CSPA
Since 1983

Friends of the River
Since 1973

May 28, 2014

BDCP.Comments@noaa.gov (via email)

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Additional Addressees at end of letter

Re: Request for Restarting and Extending Bay Delta Conservation Plan Comment Period Due to Lack of Meaningful Access for Limited English Speakers

Dear Federal and California Agencies, Officers, and Staff Members Carrying out the BDCP:

We are writing on behalf of Restore the Delta, the Environmental Justice Coalition for Water, Asian Pacific Self-Development and Residential Association, Café Coop, American Friends Service Committee Proyecto Voz, Environmental Water Caucus, California Sportfishing Protection Alliance, California Water Impact Network, and Friends of the River, as well as hundreds of thousands of limited English speakers who reside largely in low-income communities of color within the five Delta counties, to request a restart and extension of the public comment period due to the agencies' failure to provide for meaningful access and participation of California limited English speakers, including Delta limited English speakers attempting to engage with the draft Bay Delta Conservation Plan and draft EIS/EIR. In particular, we request that the agencies hold public hearings and provide interpreters; translate vital documents such as, at the very least, the Executive Summary of the draft EIS/EIR; and provide affordable access to documents to allow the thousands of low-income and limited English speakers to have meaningful participation in the process.

While a very limited amount of outreach material can be found on the BDCP website in Spanish, the plan itself and its corresponding EIS/EIR have not been translated into Spanish. In particular, the

EIS/EIR identifies forty-seven significant and unavoidable adverse impacts (Chapter 31 EIR/EIS) that will have a direct impact on residents of the five Delta counties. The majority of Spanish, Cambodian, and Hmong speakers have not been made aware of these impacts, let alone that there is presently an ongoing comment period regarding the BDCP, or even that the project exists. In addition, Cambodian, Hmong, and Spanish speakers who fish for sustenance throughout the Delta have not been made aware of the project and have not been able to access any materials in their native languages. This is especially problematic considering that the EIR/EIS reveals increases of mercury fish tissue concentrations will result from implementation of the BDCP.[1]

In California, of the 34 million residents, 19.6% "speak English less than very well" according to the American Community Survey for the last five years. Statistics from the Stockton Unified School District, Lincoln Unified School District, and the River Delta Unified School District reveal that 11% to 30% of households are families in which English is not the primary language. Additionally, statistics from the American Community Survey of 2012 for the five Delta counties reveal that 571,188 individuals speak languages other than English and do not "speak English very well." These individuals represent roughly 14 % of the 4 million residents who live in the five Delta counties (San Joaquin, Sacramento, Solano, Yolo, Contra Costa).

A review of the BDCP website shows that all public "open house" meetings have been completed and that for these most recent meetings during the public comment period no translation or interpretation services were offered to the public. Attendees of these open house meetings have noted back to us that no interpretation services were advertised at these meetings. Furthermore, a Lexus-Nexus search for Bay Delta Conservation Plan meeting notices shows only four stories in languages other than English discussing the proposed plan, with those stories appearing only between February 2010 and April 2011, with not one reporting on the public comment period for the BDCP. There is no record of media outreach to limited English speakers throughout California, let alone limited English speakers in Delta communities that will bear the brunt of the impacts for this project, or media outreach to non-English speaking communities regarding the release of the public draft of the plan and its EIS/EIR or the public meetings held in the early months of this comment period.
http://baydeltaconservationplan.com/PublicReview/PublicOpenHouseMeetings.aspx

Furthermore, the agencies have failed to respond adequately to requests for materials in Spanish, Cambodian and Hmong. Calls made by community members to the Spanish hotline resulted in them being directed to a few webpages, and provided a fact sheet upon request. People are permitted to make written comments in Spanish, but a copy of the BDCP and EIR/EIS documents does not exist in Spanish for people to use to make comments.

Moreover, the environmental justice survey completed to support Chapter 28 of the EIS/EIR (Environmental Justice) excluded non-English speakers within the Delta environmental justice

[1] Bay Delta Conservation Plan, EIR/EIS, Appendix 8I, *Mercury*, Tables I-7a, I-15Aa, I-11Ba, I-11Ca, I-11Da.

community. Of 1400 subjects identified by BDCP to interview throughout California, only 231 were interviewed completely, with only 76 subjects identified from "within or near the Delta." All interviews were conducted in English. Of those 76 "within or near Delta" subjects, 38 were elected officials, 14 were business or agriculture leaders, and only 24 representatives from community, church, and ethnic groups could be considered as having ties to the environmental justice community. However, even among those 24 subjects, only 3 subjects expressed understanding of the link between the health of the Delta, subsistence fishing, and non-English speaking populations. Since these surveys were completed, the Bay Delta Conservation Plan has failed to continue with outreach to the subsistence fishing community, or to attempt to extend its survey to reach those in the environmental justice community with limited English proficiency. Additionally, not one representative for Delta farm workers was interviewed.

In addition, there are also significant problems regarding public access to the document for low-income communities. The only two ways an individual can review the English-only plan is to request computer discs or to review hard copies of the documents at the BDCP repositories located in Sacramento and West Sacramento. Notably, paper copies of the plan were not placed in libraries throughout the Delta in order to enable greater public access. Furthermore, the BDCP has refused to provide paper copies to individuals who do not have computer access, unless the individual is willing to pay $6,000 per copy. By not making copies available, low income community members who do not have computer access are barred from participating in the process. The American Community Survey of 2012 identifies 694,000 persons or 17% of the population of the five Delta counties as living below the poverty level.

Consequently, the lack of access to information regarding the project, lack of provision of adequate oral and written bilingual information, failure to notice meetings in various languages, and limited public access to the document through required computer access and exorbitant fees violates the below cited principles of environmental justice and constitutes violations of CEQA and NEPA, as well as federal and state civil rights of a significant population of the five Delta counties. Such violations include but are not limited to:

1. CEQA participation requirements— CEQA requires a process that provides an opportunity for meaningful participation of the public. According to Public Resources Code Section 21061: "The purpose of an environmental impact report is to provide public agencies and the public in general with detailed information about the effect which a proposed project is likely to have on the environment; to list ways in which the significant effects of such a project can be minimized; and to indicate alternatives to such a project." Public Resources Code section 21003(b) provides: "Documents prepared pursuant to [CEQA] should be organized and written in such a manner that will be meaningful and useful to decision makers and to the public." CEQA Guidelines section 15201 explains that "Public participation is an essential part of the CEQA process. Each public agency should include

provisions in its CEQA procedures for wide public involvement . . . in order to receive and evaluate public reactions to environmental issues relating to the agency's activities."[2]

2. NEPA participation requirements, and Equal Justice Executive Order 12898: Federal Executive Order (EO) 12898 (1994), Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires Federal agencies to make environmental justice part of their mission and to develop environmental justice strategies. The Presidential Memorandum accompanying the Executive Order specifically singles out NEPA, and states that "[e]ach Federal agency must provide opportunities for effective community participation in the NEPA process, including identifying potential effects and mitigation measures in consultation with affected communities and improving the accessibility of public meetings, crucial documents, and notices." (Memorandum from President Clinton, March 1994, available at http://www.epa.gov/fedfac/documents/executive_order_12898.htm.)

3. Title VI of the Civil Rights Act of 1964 provides: "No Person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance." Executive Order 13166 "Improving Access to Services for Persons with Limited English Proficiency," *See* 65 Fed. Reg. 50,121 (Aug. 16, 200). EPA "Guidance to Environmental Protection Agency Financial Assistance Recipients Regarding Title VI Prohibition Against National Origin Discrimination Affecting Limited English Proficient Persons, 69 Fed. Reg, 39602. (June 25, 2004). Lau v. Nichols, 414 U.S. 563 (1974) providing that National Origin Discrimination to Limited English Speakers.

4. California Government Code section 11135 (a) and implementing regulations in the California Code of Regulations Title 22 Sections 98211 (c) and 98100. Government Code 11135(a) provides: "No person in the State of California shall, on the basis of race, national origin, ethnic group identification, religion, age, sex, sexual orientation, color, genetic information, or disability, be unlawfully denied full and equal access to the benefits of, or be unlawfully subjected to discrimination under, any program or activity that is conducted, operated, or administered by the state or by any state agency, is funded directly by the state, or receives any financial assistance from the state."

[2] Indeed, the California court of appeals found that "[e]nvironmental review derives its vitality from public participation," and must be informed of significant impacts. (*Ocean View Estates Homeowners Assn., Inc. v. Montecito Water Dist.* (2004) 116 Cal. App. 4th 396, 400.) Public review is crucial to ensuring government accountability and informed self- government. Public review serves a dual purpose in that it both bolsters the public's confidence in the government process, and provides lead agencies the appropriate resources and expertise on certain subjects regarding environmental impacts. (*Joy Road Area Forest and Watershed Ass'n v. California Dept. of Foresty and Fire Protection*, (2006) 142 Cal. App. 4th 656, 670.)

5. The Dymally-Alatorre Bilingual Services Act—Government Code Sections 7290-7299.8 which requires that, when state and local agencies serve a "substantial number of non-English-speaking people," they must among other things translate documents explaining available services into their clients' languages.

Therefore, we are calling on officials to address these significant language and other access issues and then to restart the public comment period in accordance with the laws and policies discussed above.

Sincerely yours,

Barbara Barrigan-Parrilla, Executive Director
Restore the Delta

Colin Bailey, Executive Director
Environmental Justice Coalition for Water

Sovanna Koert, Executive Director
Asian Pacific Self-Development and Residential Association

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(Encl. two attachments for Comments@NOAA.gov)

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Appendix 9:

Chronology of South Delta Salinity Regulation, 1978-2010

Attachment 2
Chronology of SWRCB and Others' Statements About and Actions Concerning South Delta Salinity Objectives

Year/ Document	South Delta Salinity Objectives	Narrative Quotation or Explanation
1978 Sacramento-San Joaquin Delta and Suisun Marsh Water Quality Control Plan	Table VI-1: **Vernalis on the San Joaquin River—**500 mg/L TDS in all years, Maximum 30-day running average of Mean Daily TDS **Tracy Road Bridge on Old River; Old River near Middle River; Brandt Bridge on San Joaquin River; Vernalis on San Joaquin River—** April 1 through August 31 0.7 EC; September 1 through March 31 1.0 EC. Footnote 4 (p. VI-35): If contracts to ensure such facilities and water supplies are not executed by January 1, 1980, the Board will take appropriate enforcement actions to prevent encroachment on riparian rights in the southern Delta.	Page V-11: "An implementable solution for the southern Delta has eluded the best efforts of responsible public agencies for well over twenty years. Prior to 1944 water quality in the southern Delta was suitable for agricultural uses. Upstream depletions and water quality degradation of the San Joaquin River and its tributaries have greatly reduced the flows and quality available for protection of the southern Delta. "Riparian rights (taking into account upstream diversions by other riparians) would be generally sufficient to satisfy water quality needs of agricultural users in the southern Delta without regard to hydrologic year type. However, the permits of water development facilities in the San Joaquin River watershed, including those of the Bureau[fn2], which may be major contributors to southern Delta quality and quantity deterioration are not before the Board, nor has any jurisdiction been reserved in those permits to amend or supplement terms and conditions therein. Notwithstanding this, the permits do provide that such appropriations are subject to prior vested rights. "The direct effects of SWP and CVP diversions covered by permits currently before the Board do not result in major impact on water quality conditions in the southern Delta. It is questionable whether the Board could justify imposing terms and conditions in the permits before the Board to resolve all of the water quality problems in this area. "Thus, it would appear that the Board's vested water right authority through which terms and conditions are imposed in water right permits will not yield an implementable solution based on a consideration only of project facilities on the Sacramento River system and the Delta. "Under this specific areal alternative, water quality standards for the southern Delta would be established through the Board's water quality control authority. The level of protection provided agricultural uses in the southern Delta would be set to satisfy riparian rights. Implementation of these standards could be achieved through the Board's broad enforcement authority. As previously indicated, all of the water right permits for the San Joaquin River Basin upstream of the Delta include a paramount provision that appropriations under these Board entitlements are subject to prior vested rights." Page VI-22: "…[A] phased approach has been developed to resolve the long standing water quality problems in the southern Delta….The most practical solution for long-term protection of southern Delta agriculture is construction of physical facilities to provide adequate circulation and substitute supplies. If necessary physical facilities are constructed, the circulation flows needed may be only a moderate increase above those committed from New Melones Reservoir.[fn5] Negotiations concerning such facilities are currently underway between the project operators and the South Delta Water Agency."

Attachment 2
Chronology of SWRCB and Others' Statements About and Actions Concerning South Delta Salinity Objectives

Year/ Document	South Delta Salinity Objectives	Narrative Quotation or Explanation
Water Rights Decision 1485, August 1978	None	Page 11: "The current negotiations between the project operators and the South Delta Water Agency concerning the construction of physical facilities to provide adequate circulation in the southern Delta to meet these standards are discussed in Chapter I of the Delta Plan. These negotiations appear to be directed toward the most practical solution for the long-term protection of southern Delta agriculture and should be concluded as soon as practicable, at least by January 1980. If an agreement is not executed by January 1, 1980, the Board will examine in detail souther Delta water rights, determine the causes and sources of any encroachment, and take appropriate action to the extent of the Board's authority." Page 12: "Riparian rights would be generally sufficient to provide suitable water quality for agricultural uses in the southern Delta. Upstream depletion and water quality degradation of the San Joaquin River and its tributaries have greatly reduced the flows available for protection of agriculture in the southern Delta. However, the permits of water development facilities in the San Joaquin River watershed, including those of the Bureau [fn2], which contribute to southern Delta quality and quantity deterioration are not before the Board, nor has any jurisdiction been reserved therein. However, the permits do provide that the appropriations authorized thereby are subject to prior vested rights. "In the event facilities under the permits currently before the Board are found to have an effect on water quality conditions in the southern Delta, the Board would use the jurisdiction reserved under this decision to amend terms and conditions in these permits as appropriate."

Attachment 2
Chronology of SWRCB and Others' Statements About and Actions Concerning South Delta Salinity Objectives

Year/ Document	South Delta Salinity Objectives	Narrative Quotation or Explanation
Racanelli Decision - 182 Cal.App. 3d 82 (1986)	None	Page 115: "In short, the scope of our review is essentially twofold: 1) with respect to D-1485, the only question before us is whether the Board acted within its jurisdiction in imposing the water quality standards upon the projects; 2) with respect to the Plan, the only question is whether the Board acted contrary to procedures required by law." Page 116: "The trial court concluded that the without project standards were invalid. While we reach a similar conclusion, our analysis focuses upon two erroneous assumptions made by the Board in establishing the qualitative standards. …"First, the Board viewed "without project" as the measure of water flows necessary to protect the existing *water rights* in the Delta against impairment by the projects. [fn8] The approach taken is fundamentally defective…."In its *water quality* role of setting the level of water quality protection, the Board's task is not to protect water rights, but to protect 'beneficial uses.'" (emphasis in original) Page 118: "In performing its dual role, including development of water quality objectives, the Board is directed to consider not only the availability of unappropriated water (§ 174) but also *all* competing demands for water in determining what is a reasonable level of water quality protection (§ 13000). In addition, the Board must consider 'past, present, and probable future beneficial uses of water' (§ 13241, subd. (a))as well as '[w]ater quality conditions that could reasonable be achieved through the coordinated control of *all* factors which affect water quality in the area' (§ 13241, subd. (c), emphasis added)." Page130: "We perceive no legal obstacle to the Board's determination that particular methods of use have become unreasonable by their deleterious effects upon water quality. Obviously, some accommodation must be reached concerning the major public interests at stake: the quality of valuable water resources and transport of adequate supplies for needs southward. The decision is essentially a policy judgment requiring a balancing of the competing public interests, one the Board is uniquely qualified to make in view of its special knowledge and expertise and its combined statewide responsibility to allocate the rights to, and to control the quality of state water resources. (§ 174.) We conclude, finally, that the Board's power to prevent unreasonable methods of use should be broadly interpreted to enable the Board to strike the proper balance between the interests in water quality and project activities in order to objectively determine whether a reasonable method of use is manifested."

Attachment 2
Chronology of SWRCB and Others' Statements About and Actions Concerning South Delta Salinity Objectives

Year/ Document	South Delta Salinity Objectives	Narrative Quotation or Explanation
1991 Water Quality Control Plan	Table 1-1: **Tracy Road Bridge on Old River; Old River near Middle River; Brandt Bridge on San Joaquin River; Vernalis on San Joaquin River**— April 1 through August 31 0.7 EC; September 1 through March 31 1.0 EC. Footnote 3: Staged implementation— Interim stage 1 - 500 mg/L mean monthly TDS all year at Vernalis; Interim Stage 2 (by 1994) of above Vernalis and Brandt Bridge; Final stage - extending to all four south Delta stations by 1996; OR a three-party contract implemented among DWR, Bureau and South Delta Water Agency settling water quality issues. [See also p. 7-4.]	Page 5-10: Essentially, the Basin 5 Plan and D-1422 state that for the San Joaquin River at Vernalis, the mean average TDS concentration shall not exceed 500 mg/L over any consecutive 30-day period." ***(500 mg/L TDS converts to about 806 dS/cm of EC. [TDS = 0.62 * EC])*** "This objective has not always been met, particularly in recent years of drought. South Delta Water Agency and USBR have agreed on a number of occasions to release the limited supply from New Melones in a pattern which causes the objective to be violated at certain times of year, in order to preserve the dilution capability for more critical periods. "The USBR, SDWA, and DWR entered into a Framework Agreement in October 1986 in an attempt to settle litigation brought by SDWA against the USBR and DWR. Since that time the parties have negotiated a proposed contract to settle the SDWA litigation. The proposed contract was agreed to by DWR's Director, USBR's Director of the Mid-Pacific Regional Office and SDWA's Board of Directors in August 1990. Each party also has its own approval process that must take place before the contract is fully executed." Page 5-12: "Beans and alfalfa, the two most widely grown salt-sensitive crops in the southern Delta, were chosen as target crops for the purpose of setting objectives. Meeting the objectives for these crops will protect the less salt-sensitive crops. In developing objectives for beans and alfalfa, the evidence and exhibits from the Phase I hearings, information from DWR-sponsored South Delta Agriculture Subworkgroup, and the southern Delta negotiations were taken in to consideration. "…[T]hree key issues were discussed that influence the level of salinity required for the protection of beans and alfalfa: crop response during the early stages of growth, the determination of leaching fractions, and the effectiveness of rainfall in reducing soil salinity during the irrigation season. The members of the sub workgroup have been unable to reach consensus. The State Board will base its analysis on the University of California's "Guidelines for the Interpretation of Water Quality for Agriculture" and the Delta Plan (1978, Delta Plan, UC ex.D)." The subject of agriculture objectives for the southern Delta should consider ongoing negotiations between DWR, USBR, and SDWA. Care should be exercised in setting objectives so as not to undermine negotiations but to bring [them] to a timely and fruitful conclusion. Any agreement resulting from the negotiations will be reviewed by the State Board before the objectives are revised to reflect those contained in the agreement."

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Chronology of SWRCB and Others' Statements About and Actions Concerning South Delta Salinity Objectives

Year/ Document	South Delta Salinity Objectives	Narrative Quotation or Explanation
1992 Draft Water Rights Decision 1630	Same as those in 1991 Bay-Delta WQCP above. No footnote 3.	None found.
1995 Bay-Delta Water Quality Control Plan	Table 2: **Tracy Road Bridge on Old River; Old River near Middle River; Brandt Bridge on San Joaquin River; Vernalis on San Joaquin River**—April 1 through August 31 0.7 EC; September 1 through March 31 1.0 EC. OR—implementation of contract among DWR, USBR and SDWA. Footnote 5: ***The EC objectives shall be implemented at this location by December 31, 1997.***	None found in the WQCP. The WQCP Environmental Report at page VIII-24 reports modeling results indicating that "Figures VIII-27 through VIII-30 show salinity under the preferred alternative [The Bay Delta Accord] and the base case at southern Delta stations for which the preferred alternative establishes year-round salinity objectives. Salinity changes in the southern Delta due to Delta Cross Channel closure are small. In general, salinity decreases under the preferred alternative from base conditions, especially from April through August. However, the 0.7 mmhos/cm standard for April through August is often exceeded in the later months (July and August) because of the 70 TAF cap on flows released from New Melones Reservoir to the San Joaquin River for water quality purposes. "Since salinity is an inverse function of flow at Vernalis, the base case versus preferred alternative differences in salinity shown in Figure VIII-30 directly reflect differences in flow. For example, November, December, and January flows are 0 to 14 percent less under the preferred alternative, resulting in 0 to 7 percent greater salinity. In general, the preferred alternative generates higher flows and lower salinities in October and April through July. Over the 1987-1992 period, average monthly salinity at Vernalis is reduced under the preferred alternative from the base case by 10 percent in April, 14 percent in May, 16 percent in June, and 3 percent in July."

Attachment 2
Chronology of SWRCB and Others' Statements About and Actions Concerning South Delta Salinity Objectives

Year/ Document	South Delta Salinity Objectives	Narrative Quotation or Explanation
Water Right Order 95-06	Maintained D-1485 interior southern Delta salinity objectives in place, per Term 2 of the order.	Page 31: "…Term 8 [of D-1485] addresses salinity protections for southern Delta agriculture which were required in 1980. A number of the parties objected to the deletion of these terms [including Term 8]. Accordingly, these terms will not be deleted." Page 41: "SDWA commented that full compliance with the southern Delta agricultural standards through freshwater releases from upstream projects in addition to New Melones Reservoir should be evaluated before implementing the Vernalis objective. [citation] Such an evaluation is unnecessary for this order since other southern Delta salinity objectives are not now being implemented and the Vernalis objective is equivalent to the D-1422 standard [for New Melones Reservoir]. This order is limited to making the water right permits of the DWR and the USBR consistent with the 1995 Bay-Delta Plan. At this time, such an evaluation would be speculative since the alternative methods to implement these standards in the long term are not yet determined. The SWRCB is not required to speculate about the effects of its future action. [citation] The SWRCB will consider the reasonableness of implementing the other southern Delta salinity standards during the water rights phase. [citation] "Objectives to protect the beneficial uses in the southern Delta previously have been implemented largely through releases of fresh water from New Melones Reservoir. The fresh water releases help compensate for diversions of fresh water that have left [Page 42] mainly salty return flows in the San Joaquin River. While fresh water releases from New Melones Reservoir should continue, they do not prevent salts from entering the river. Return flows and drainage from agricultural operations add salts to the San Joaquin River. Also, there has not been enough fresh water available every year to meet the water quality objectives. Therefore, future actions will be needed to reduce the amounts of salts in the San Joaquin River during periods when higher levels of salt would violate the objectives [citation] Such actions already have been initiated. "In the 1991 Bay-Delta Plan, the SWRCB directed the Central Valley RWQCB to reduce salt loads to the San Joaquin River by ten percent. The RWQCB responded by requiring drainage operation plans from the areas on the westside of the San Joaquin River with the worst drainage problems. The drainage operation plans focus on water conservation to reduce salt and trace metal loading to the river. [citation]"
Water Right Order 98-09	Maintained D-1485 interior southern Delta salinity objectives in place, per Term 2 of the order.	None found.

Attachment 2
Chronology of SWRCB and Others' Statements About and Actions Concerning South Delta Salinity Objectives

Year/ Document	South Delta Salinity Objectives	Narrative Quotation or Explanation
2000 Water Rights Decision 1641	Table 2: Tracy Road Bridge on Old River; Old River near Middle River; Brandt Bridge on San Joaquin River; Vernalis on San Joaquin River—April 1 through August 31 0.7 EC; September 1 through March 31 1.0 EC. [fn5]	Footnote 5, p. 182: ***"Footnote 5: "The 0.7 EC objective becomes effective on April 1, 2005. The DWR and the USBR shall meet 1.0 EC at these stations year round until April 1, 2005. The 0.7 EC objective is replaced by the 1.0 EC objective from April through August after April 1, 2005 if permanent barriers are constructed, or equivalent measures are implemented in the southern Delta, and an operations plan that reasonably protects south Delta agriculture is prepared by the DWR and the USBR and approved by the Executive Director of the SWRCB. The SWRCB will review the salinity objectives for the southern Delta in the next review of the Bay-Delta objectives following construction of the barriers."*** Regarding causes, Page 86: "Water quality in the southern Delta downstream of Vernalis is influenced by San Joaquin River inflow; tidal action; diversions of water by the SWP, CVP, and local water users; agricultural return flows; and channel capacity. [citation] The salinity objectives for the interior southern Delta can [be] implemented by providing dilution flows, controlling in-Delta discharges of salts, or by using measures that affect circulation in the Delta. … Actions, pages 87-88: DWR has since 1991 installed and operated temporary barriers to assist SDWA diversions. "Permanent barriers are proposed as components of the preferred alternative for the [South Delta Improvements Program]." No agreement as of D-1641 had yet been signed. "The construction of permanent barriers alone is not expected to result in attainment of the water quality objectives. The objectives can be met consistently only by providing more dilution or by treatment.… "The DWR and the USBR are partially responsible for salinity problems in the southern Delta because of hydrologic changes that are caused by export pumping. Therefore, this order amends the export permits of the DWR and of the USBR to require the projects to take actions that will achieve the benefits of the permanent barriers in the southern Delta to help meet the 1995 Bay-Delta Plan's interior Delta salinity objectives by April 1, 2005. Until then, the DWR and the USBR will be required to meet a salinity requirement of 1.0 mmhos/cm. ***If, after actions are taken to achieve the benefits of barriers, it is determined that it is not feasible to fully implement the objectives, the SWRCB will consider revising the interior Delta salinity objectives when it reviews the 1995 Bay-Delta Plan.*** The USBR and the DWR will be responsible to take any actions required by CEQA, NEPA, and the federal and State ESA prior to constructing the barriers." Page 89: ***"This decision requires the USBR to meet the Vernalis objective using any measures available to it. This decision also requires the DWR and the USBR to meet a salinity requirement of 1.0 mmhos/cm at the interior southern Delta stations…."*** (Emphases added.)

Attachment 2
Chronology of SWRCB and Others' Statements About and Actions Concerning South Delta Salinity Objectives

Year/ Document	South Delta Salinity Objectives	Narrative Quotation or Explanation
2006 Cease and Desist Order WR 2006-0006	See D-1641.	Page 7: Section 2.3 - "DWR's permits and USBR's license and permits…are subject to conditions imposed by Water Right Decision 1641, revised March 15, 2000, in accordance with Order WR 2000-02 (hereinafter D-1641). USBR and DWR are each fully responsible for meeting certain water quality objectives, including the interior southern Delta salinity objectives, as described in Table 2 of D-1641. Only USBR is responsible for meeting the salinity objectives on the San Joaquin River at Vernalis." Page 27: Conclusion 5 - "DWR and USBR estimate they can implement measures that will obviate the threat of non-compliance with the 0.7 interior southern Delta EC objectives by early 2009. In the hearing leading to D-1641, DWR and USBR assured the State Water Board that they would have barriers in place to protect southern Delta agriculture by April 1, 2005. Considering that the objectives were first adopted in the water quality control plan in 1978, and there is evidence that salinity is a factor in limiting crop yields for southern Delta agriculture, the State Water Board will not extend the date for removing the threat of non—compliance beyond July 1, 2009." Pages 28-32: The CDO ordered DWR and the Bureau to submit a compliance plan and schedule within 60 days of the order's issuance; a permanent barriers operations plan for approval by the SWRCB no later than January 1, 2009; in the event of more potential exceedances of these objectives, DWR and USBR "shall immediately inform the State Water Board of the potential exceedance and shall describe the corrective actions they are initiating to avoid the exceedance" and that such corrective actions could include a wide variety of water sources, physical engineered solutions, and water purchases or exchanges; and a variety of reporting and monitoring requirements.
2006 Robie Decision (136 Cal.App.4th 735)	See D-1641.	Page 735: "There is nothing in the 1995 Bay-Delta Plan that allowed the Board to further delay implementation of the 0.7 EC objective at the two Old River sites, or that allowed the Board to delay implementation of that objective at the Brandt Bridge site, or that allowed the Board to replace that objective with a different objective under any circumstances. In taking these actions, the Board failed to adequately implement the 1995 Bay-Delta Plan and instead effectively amended the 1995 Bay-Delta Plan without complying with the procedural requirements for amending a water quality control plan. "Since the extended implementation date of April 1, 2005, has already passed, the Board's delay in implementing the 0.7 EC objective until that date is a moot issue. However, the provision in Decision 1641 that replaces the 0.7 EC objective with the 1.0 EC objective under certain conditions *after* April 1, 2005, is not moot….[T]he Board must either fully implement the southern Delta salinity objectives as set forth in the 1995 Bay-Delta Plan or must duly amend the plan." (Emphasis in original.)

Attachment 2
Chronology of SWRCB and Others' Statements About and Actions Concerning South Delta Salinity Objectives

Year/ Document	South Delta Salinity Objectives	Narrative Quotation or Explanation
2006 Water Quality Control Plan, December 13	Table 2: Tracy Road Bridge on Old River; Old River near Middle River; Brandt Bridge on San Joaquin River; Vernalis on San Joaquin River—April 1 through August 31 0.7 EC; September 1 through March 31 1.0 EC. Maximum 30-day running average of mean daily EC (mmhos/ cm)	Page 10: "The water quality objectives in this plan apply to waters of the San Francisco Bay system and the legal Sacramento-San Joaquin Delta, as specified in the objectives. Unless otherwise indicated water quality objectives cited for a general area, such as for the southern Delta, are applicable for all locations in that general area and compliance locations will be used to determine compliance with the cited objectives." "Page 11: "The water quality objectives in Table 2 provide reasonable protection of the beneficial use AGR, from the effects of salinity intrusion and agricultural drainage in the western, interior, and southern Delta. These objectives are unchanged from the 1991 Bay-Delta Plan." Page 27: "Agriculture in the Southern Delta: The water rights of the DWR and the USBR are conditioned upon implementation of the southern Delta salinity objectives to protect agricultural beneficial uses. Implementation of salinity objectives in the southern Delta requires a mix of salt load control and flow related measures. It is there fore discussed in section B of the Program of Implementation…." Page 28: "The salinity objectives for the interior southern Delta can be implemented by measures that include state regulatory actions, state funding of projects and studies, regulation of water diversions, pollutant discharge controls, improvements in water circulation, and long-term implementation of best management practices to control saline discharges." Other approaches included DWR and USBR water rights permit conditions; Board-administered loan programs; Grasslands Bypass Project, Westside Regional Drainage Plan, San Luis Unit Feature Reevaluation Project, CVPIA land retirement program, and Delta-Mendota Canal Recirculation; and Central Valley Salinity Committee and Salinity Study Task Force. In addition, the Board identified: Page 31: "South Delta Improvements Program: DWR and USBR propose to construct permanent tidal gates in the southern Delta as part of the South Delta Improvements Program (SDIP). DWR and USBR expect that the gates project will assist in achieving the salinity objectives at the two Old River compliance measurement locations by improving water circulation in the southern Delta. Currently, DWR and USBR expect the project to be operational in the spring of 2009." Page 32: "Southern Delta Salinity Objectives: There is a need for an updated independent scientific investigation of irrigation salinity needs in the southern Delta (similar to the investigation on which the current objectives are based). The scientific investigation should address whether the agricultural beneficial uses in the southern Delta would be reasonably protected at different salinity levels, whether management practices are available that would allow for protection of the beneficial uses at a higher salinity level in the channels of the southern Delta, and whether such management practices are technically and financially feasible….The State Water Board will conduct a workshop to discuss this subject in January 2007."

Attachment 2
Chronology of SWRCB and Others' Statements About and Actions Concerning South Delta Salinity Objectives

Year/ Document	South Delta Salinity Objectives	Narrative Quotation or Explanation
2006 Water Quality Control Plan, December 13; Appendix 1	Same as those in 2006 Water Quality Control Plan.	Pages 64-73: Extensive discussion of positions of various parties on the southern Delta salinity objectives. Page 67: "The State Water Board received information from several parties concerning the southern Delta agricultural salinity objectives. Some of that information concerned potential changes to the objectives or the program of implementation, while much of the information was related to other matters or proceedings outside of the scope of the review of the objectives. The SJRGA advocated increasing the salinity objectives at Vernalis to 1.0 mmhos/cm throughout the year and eliminating the objectives during August, September, and October of below normal, dry, and critically dry years. The San Joaquin River Water Authority Exchange Contractors (SJEC) also argued for increasing the 0.7 mmhos/cm southern Delta EC objectives to 1.0 mmhos/cm or higher. DWR and SWC did not recommend any specific changes to the salinity objectives; however, they did recommend that additional analyses be conducted to determine the appropriateness of the objectives. DWR also recommended various changes to the program of implementation to delay implementation of the 0.7 EC objective at the interior southern Delta sites until various actions occur. SWC also recommended a review of DWR's responsibility for implementing the objectives at Brandt Bridge. SDWA opposed increasing the salinity objectives and advocated increasing the effective period of the 0.7 EC objective from March 1 through September 30. CCWD, the Central Valley Regional Water Board, and the USEPA recommended that no changes be made to the southern Delta agricultural EC objectives." Page 72: "Conclusion: The State Water Board does not have adequate evidence on which to base substantive changes to the southern Delta EC (salinity) objectives for the protection of agricultural beneficial uses at this time. Therefore, these objectives remain unchanged in the 2006 Plan. The State Water Board will receive additional information on the objectives and their implementation beginning in January 2007. "Footnote 5 of Table 2 of the 1995 Plan states that the 0.7 mmhos/cm EC objective will be implemented at the two Old River sites by December 31, 1997. The 2006 Plan deletes this footnote because it is obsolete. Currently, DWR and USBR are responsible for meeting both the 1.0 and the 0.7 EC objectives at these sites. The 2006 Plan also deletes the statement in Table 2 of the 1995 Plan regarding a three-party contract, since the objectives have already been implemented. As necessary, the State Water Board may review the southern Delta EC objectives or their implementation in the future as conditions warrant." The Board further indicated in conclusion that it would continue to consider the matter, and encouraged other agencies to assist in achieving the southern Delta salinity objectives.

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Chronology of SWRCB and Others' Statements About and Actions Concerning South Delta Salinity Objectives

Year/ Document	South Delta Salinity Objectives	Narrative Quotation or Explanation
2008 SWRCB Strategic Workplan, Juily	Same as those in 2006 Water Quality Control Plan.	Southern Delta Salinity and San Joaquin River Flow Objectives work item, discussed from pages 62 through 68. Southern Delta Salinity discussed, pages 62-65. "**Goal:** The goal of this activity is to ensure that the water quality objectives included in the Bay-Delta Plan for southern Delta salinity…are protective of the specified beneficial uses and that the objectives are appropriately implemented." Objective: conduct concurrent basin planning and water rights proceeding for both sets of objectives. Additionally, the Board intended to evaluate compliance with both sets of objectives and take enforcement and other actions as appropriate. "**Impetus:** The southern Delta salinity and San Joaquin River flow objectives and the implementation of those objectives may not be appropriate. Revised objectives and implementation may benefit beneficial uses including: San Joaquin Basin salmonids, pelagic organisms and other species; and may improve San Joaquin River water quality (salinity, DO, and other constituents). In addition the State Water Board committed to review these issues in the 2006 Bay-Delta Plan. Further both issues constitute an ongoing compliance problem…." Page 64: ""The southern Delta salinity compliance issues are closely connected with the use of Joint Points of Diversion. In D-1641, the State Water Board approved a petition filed by DWR and USBR for use of each other's points of diversion in the southern Delta (known as "JPOD"). The State Water Board approved JPOD in three stages that allow for incremental increases in diversions and require corresponding increases in mitigation for potential impacts to other water users and the environment. Authorization for all stages of JPOD is subject to compliance by DWR and USBR with all of the conditions of their water rights, including compliance with the southern Delta salinity objectives, regardless of whether JPOD would adversely affect southern Delta salinity. In 2007, DWR and USBR conducted JPOD while the southern Delta salinity objectives were being exceeded to make up for major export reductions taken to protect delta smelt (Stage 1). Due to the unique circumstances occurring that year, the State Water Board did not take enforcement action. DWR and USBR anticipate the need to again conduct significant JPOD diversions this year while the salinity objectives are potentially being exceeded to make up for export reductions imposed by a federal court to protect delta smelt. The question of enforcement, and what constitutes a violation, will continue to be an ongoing issue. southern Delta salinity. In 2007, DWR and USBR conducted JPOD while the southern Delta salinity objectives were being exceeded to make up for major export reductions taken to protect delta smelt (Stage 1). Due to the unique circumstances occurring that year, the State Water Board did not take enforcement action. DWR and USBR anticipate the need to again conduct significant JPOD diversions this year while the salinity objectives are potentially being exceeded to make up for export reductions imposed by a federal court to protect delta smelt. The question of enforcement, and what constitutes a violation, will continue to be an ongoing issue."

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Chronology of SWRCB and Others' Statements About and Actions Concerning South Delta Salinity Objectives

Year/ Document	South Delta Salinity Objectives	Narrative Quotation or Explanation
2009 Periodic Review	Same as those in 2006 Water Quality Control Plan.	The Periodic Review described the process the Board expected for evaluating southern Delta salinity objectives, and considered sources of salinity to the southern Delta; source loading and evapo-concentration; and flow-related concentration effects. (Pages 14-16.) Page 16: "The way flow is managed in the watershed leads to conditions that either result in accumulation of salt in soils and groundwater or otherwise have an effect on salinity concentrations in the San Joaquin River watershed and southern Delta. • "Under most hydrologic conditions the CVP pumps near Tracy entrain much of the flow from the San Joaquin River at the head of Old River; the associated salt load is then re-circulated back to the river via the DMC [Delta Mendota Canal], effectively trapping and accumulating salt within the watershed. Between 1977 and 1997 the DMC contributed approximately 513,000 tons or 47 percent of the total annual salt load in the San Joaquin River at Vernalis [citation]. • "Water exports out of the basin and diversions to storage from low salinity sources and subsequent consumptive use act to increase salinity concentrations in downstream surface waters of the watershed. For example, the export of Hetch-Hetchy water from the Tuolumne River removed from the San Joaquin River watershed an average of 250,000 acre-feet per year between 1985 and 1994, which is estimated to have increased salinity concentration in the San Joaquin River during that period from 506 microsiemens/cm (μS/cm equal to micromhos/cm) to 570 μS/cm [citation]. Conversely, activities that provide relatively lower EC water to the river system can result in lower salinity. • "Occasional inputs of Sacramento River water to the interior southern Delta can occur depending on Sacramento and San Joaquin River hydrology, SWP and CVP operations, and temporary barrier operations. DWR fingerprint modeling analysis shows these inputs occur primarily at Old River near Tracy, and Old River near Middle River. When these inputs occur there is typically a corresponding decrease in salinity concentrations at those same locations [citation]. "The averaging periods and temporal occurrence of the above loading information varies. Therefore it is not intended to be provided for direct comparison, but rather to demonstrate the relative effect of each factor. Better information and analysis regarding the above conditions will be needed to develop a comprehensive salt balance for the southern Delta. Such analyses will inform development of a program of implementation for salinity objectives in any updates to the Bay-Delta Plan."

Attachment 2
Chronology of SWRCB and Others' Statements About and Actions Concerning South Delta Salinity Objectives

Year/ Document	South Delta Salinity Objectives	Narrative Quotation or Explanation
2010 Cease and Desist Order Modification, January 5	See D-1641.	Page 8: "Since the State Water Board issued the 2006 CDO against DWR and USBR in February 2006, salinity levels at Station P-12 (Old River at Tracy Road Bridge have exceeded the 0.7 mmhos/cm salinity objective on numerous occasions. According to the exceedance reports that USBR and DWR submitted to the State Water Board as part of this proceeding, the salinity objective was exceeded at Station P-12 during the following periods: (1) April 2007…; (2) June 16 through July 13, 2008…; (3) April 1 through April 20, 2009…; and (4) June 24 through July 3, 2009….In addition the exceedance reports…indicate that the salinity objective was exceeded at Station C-6 (San Joaquin River at Brandt Bridge) from Juen 25 through July 13, and at Station C-8 (Old River near Middle River) from June 22 through July 13, 2008. [citation] "The only corrective action identified in DWR's and USBR's exceedance reports that DWR or USBR took in order to avoid or curtail exceedances of the interior southern Delta salinity objective was the implementation of the temporary barriers program. [citation] The temporary barriers program entails the seasonal construction and operation of three flow barriers in the souther Delta. [citation] As stated earlier, the temporary barriers improve salinity levels, but they are not sufficient by themselves to ensure that the objective will be met. [citation]" Page 19: "We find that DWR and USBR have been diligent in their efforts to obtain the approvals necessary to construct permanent, operable gates in the southern Delta in accordance with the compliance plan approved by the Executive Director in 2006. That plan is no longer viable, however, in light of NOAA Fisheries' recent biological opinion, and the associated delay and uncertainty regarding the feasibility of constructing the permanent gates. In recognition of the fact that it will take time to develop and implement a revised compliance plan, we will extend the [Page 20] compliance deadline set forth in the Order WR 2006-0006….We will also require DWR and USBR to provide any technical assistance necessary to support our efforts to complete our review of the 2006 Bay-Delta Plan and any subsequent water right proceeding expeditiously." Pages 20-27: The Board modified the CDO to require DWR and USBR submit a revised, detailed compliance plan to the Board; continue the temporary barriers program in the south Delta in consultation with South Delta Water Agency; USBR would complete a Delta Mendota Canal Recirculation Project Feasibility Study; DWR and USBR would "study the feasibility of controlling salinity by implementing measures other than the temporary barriers project, recirculation of water through the San Joaquin River, and construction and operation of the permanent, operable gates." Two studies were required: a low-head pump study and a dilution study that would examine increase San Joaquin River flows needed to achieve compliance with interior southern Delta salinity objectives.

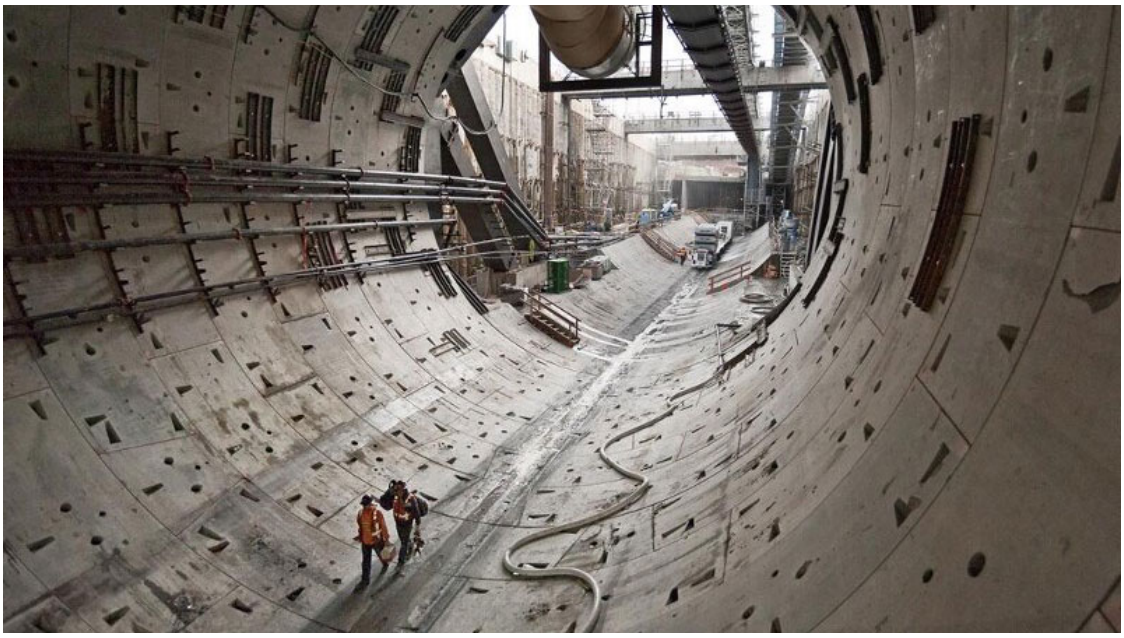
Appendix 10:

Article on Public-Private Partnerships from KCET

BAY DELTA

Delta Tunnel Planners Should Learn From Seattle's Expensive Goof

Conner Everts | November 2, 2016



Just inside the expensively delayed Alaskan Way Viaduct Tunnel | Photo: WSDOT

Commentary: Engineers will converge in Los Angeles from November 6-9, during the election, for the Cutting Edge 2016: Advances in Tunneling Technology conference. California, it seems, is a hotspot for industrial tunneling these days.

International tunneling firms will wine-and-dine political leaders in hopes of landing extremely profitable contracts, like the proposed Delta tunnels, while Californians are fixated on the elections.

So before the conference begins, let's review some recent West Coast tunnel history.

Seattle's Big Dig vs. the Delta Tunnels

The Alaskan Way Viaduct (Highway) replacement tunnel project in Seattle and the proposed Delta tunnels in California have some interesting parallels.

But one thing the two projects don't have in common is length. The Seattle Tunnel, a single tunnel, will eventually be just 1.7 miles long. The proposed twin Delta Tunnels would be 35 miles long, for a total of 70 tunnel miles.

The Alaskan Way Viaduct replacement tunnel will be a single, deep-bore tunnel that will contain

two levels of traffic with a massive diameter of 57.5 feet.

The proposed Delta tunnels are pressurized water tunnels, each 44 feet in diameter with 6-foot-thick walls, which will require a boring diameter of 52 feet, making each Delta Tunnel similar in size to the Seattle Tunnel.

The seismically unsafe Alaskan Way Viaduct in Downtown Seattle, due to be replaced once the tunnel gets dug. | Photo: lakewentworth, some rights reserved

Political Opposition

Both the Seattle and Delta tunnel projects were born out of political controversy.Voters rejected the Seattle tunnel project in 2007. Rural and suburban legislators had no appetite to pay for a risky

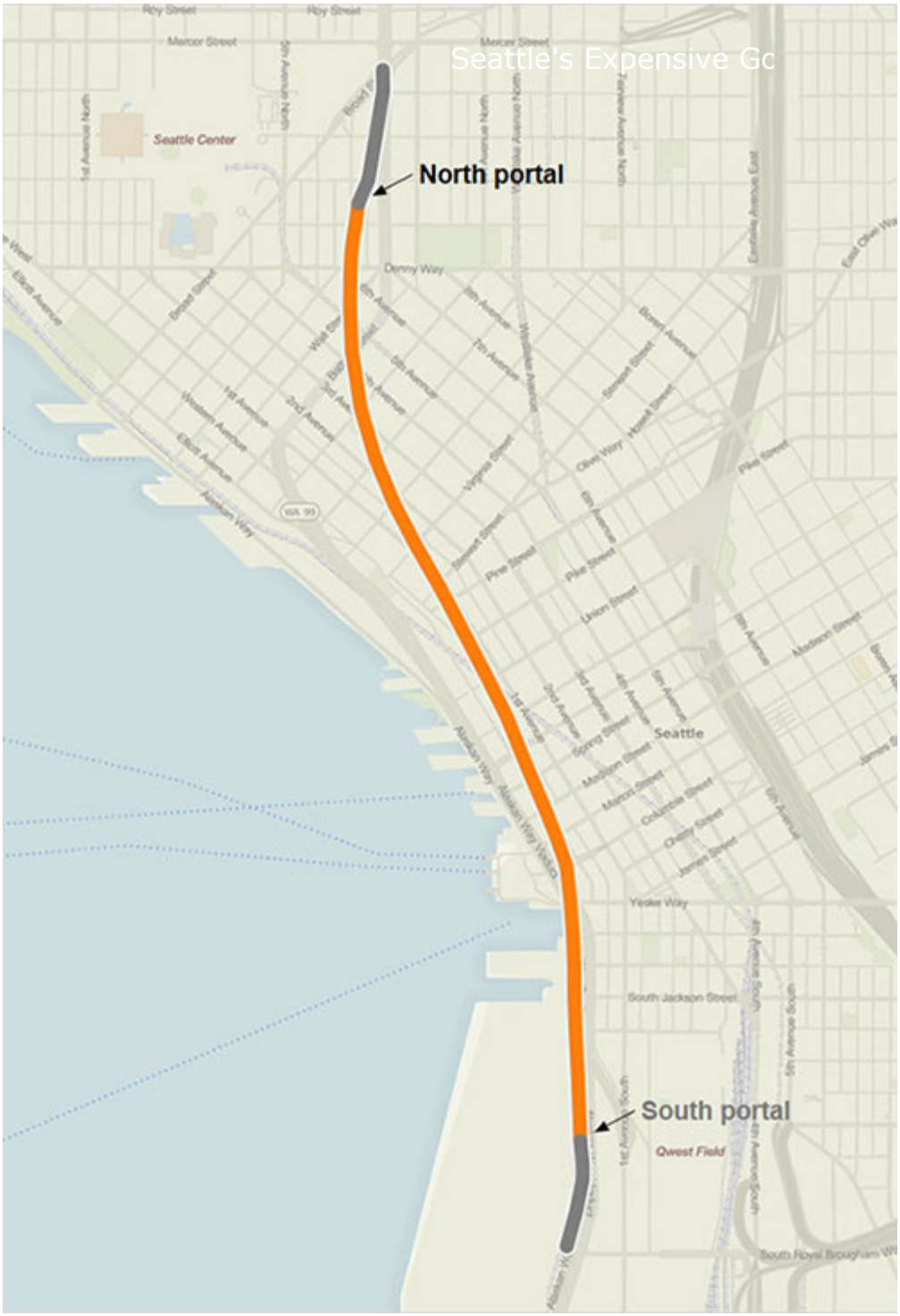
tunnel venture in Seattle. This opposition led to the creation of a public-private partnership. If the tunnel ran over budget, the bill read, extra costs would "be borne by property owners in the Seattle area who benefit" from the tunnel.

In 2011, Seattle voters did eventually grant authority to the Seattle City Council to proceed with the tunnel contracts; however, there have been years of regret and frustration for area residents due to cost overruns.

In 1982, California voters rejected the Peripheral Canal, a project that would have served the same basic function as the proposed Delta tunnels, taking water from the northern Delta and sending it via the State and Federal water projects to big agricultural interests in the San Joaquin Valley and Southland water users. Californians may never get a second vote on the Delta tunnels proposal. Tunnel supporters, including Governor Jerry Brown, have outright ignored the initiative vote on the Peripheral Canal.

Funding Issues

The original Seattle Tunnel Project was estimated to cost $4.25 billion, with $2.8 billion coming from the state and federal governments to cover tunnel boring, a new



The 1.7-mile Alaskan Way replacement tunnel is beset by delays and cost overruns...

highway interchange, and an above ground park. (The Delta Tunnels would have a much higher cost, starting at $17 billion before

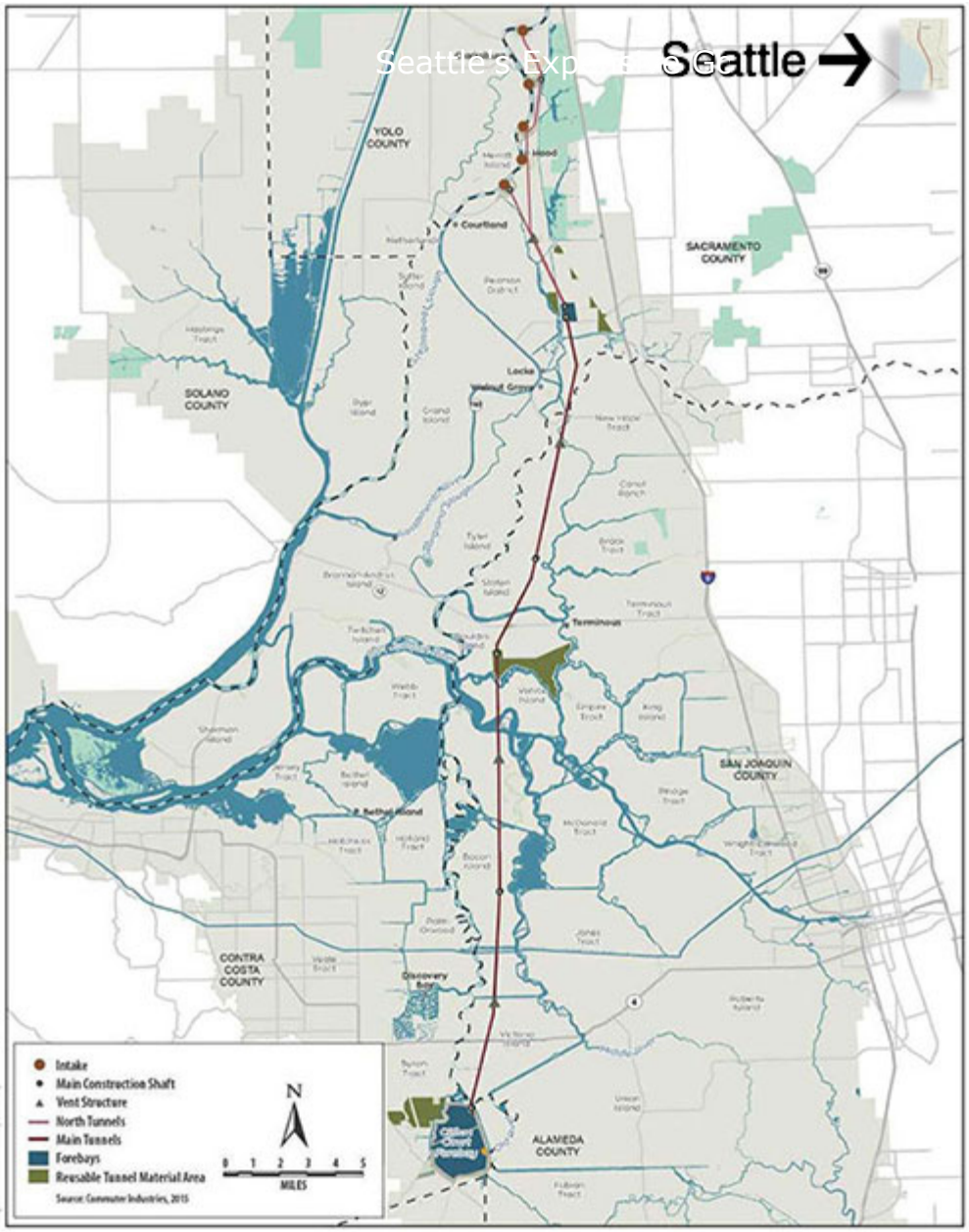
interest, operation expenses, and cost overruns that are likely due to the challenges of constructing two water tunnels, side-by-side, in soft soil.)

The Washington State Department of Transportation awarded a $1.4 billion design-build contract to Seattle Tunnel Partners (STP), a joint venture between Tutor Perini, a California-based construction company and Dragados, a Spanish company. When the STP public-private partnership was formed, state taxpayers were only supposed to contribute the $1.4 billion for initial construction costs. Cost overruns and delays were to be paid by the private partners.

Project Delays

STP had an $80 million tunnel-boring machine nicknamed "Bertha" built especially for the Seattle tunnel project. Bertha began digging on July 30, 2013.

In December 2013, Bertha hit a metal pipe and overheated. The machine could not move backwards for repairs because it had laid a concrete wall behind it. Bertha had to be dug out of the ground, taken apart, repaired, and reassembled. That process took two years. The 1.7-mile, four-lane tunnel was originally supposed to open to drivers by the end of 2015.



... and the Delta tunnels would be far more ambitious. Seattle map inset to scale, upper right. Maps: public domain.

The project's new proposed completion date is early 2019.

Responsibility for Bertha's two-year delay is now before the courts. The contractor claims the state did not

warn them of the metal pipe. STP filed claims of more than $200 million. Who will pay the final costs may not be known for years. If STP wins this case, state taxpayers will pay these costs.

In July 2016, Washington taxpayers were told they will also be on the hook for another $223 million in costs to keep staff and engineers engaged until 2019. Gasoline taxes, tolls, fees, or perhaps more transportation-fund debt would pay for those costs.

Public-Private Partnerships

The Seattle Tunnel Project public-private partnership has required hundreds of millions of dollars of additional public investment due to Bertha's breakdowns.

The Delta tunnels project, with the creation of a Joint Powers Authority, is poised to experience many of the same financial problems related to construction challenges. With water districts that cannot afford the tunnels participating in the JPA, taxpayers and ratepayers (especially in Southern California) could end up paying settlements with contractors for overruns and delays, just like the taxpayers of Washington.

MORE ON THE BAY AND DELTA

When Salmon Speak: The Winnemem Wintu and the Winter-Run Chinook

State Finally Admits Its Rivers Flow Downhill From Mountains

New Sea Level Rise Study Calls Delta Tunnels Into Doubt

Recent documents obtained from the California Department of Water Resources show that Delta tunnel backers have created an exit strategy in the finance plan for water districts to quit the project if they choose. Agricultural water districts in the San Joaquin Valley are not sure the project will pencil out for them and have made no firm commitments.

If one or two water districts like Metropolitan Water District of Southern California are left holding the bag of total expenses for the Delta Tunnels, MWD would likely need a state bailout, or would need to cover additional expenses via property taxes, potentially leaving Southern Californians on the hook for billions of dollars.

Despite all the potential financial problems, MWD remains the primary water district pushing for the Delta Tunnels. Documents from a recent Public Records Act reveal that MWD employee and lead engineer for CA WaterFix, John Bednarski, is on the organizing committee of the 2016 Cutting Edge tunneling conference. Initially, Bednarski was scheduled to present at the Enabling Tunnel Works Session, but his presentation has been dropped from the schedule in recent days. In attendance, however, will be Chuck Gardner, who runs the Design Construction Enterprise for the project and is at the center of all tunnels management decisions at the Department of Water Resources. Gardner landed his position in a no-bid contract deal, and both his and Bednarski's work is not subject to public oversight.

At the conference, Bednarski and Gardner will be ideally situated to sell the Delta Tunnels concept to international investors as part of the finance plan to solidify the Joint Powers Authority.

Sunset on the Delta | Photo: Greg Balzer, some rights reserved

Lessons from Seattle for Californians

International firms vying for Delta Tunnels contracts may assume they have an unspoken financial backstop (California taxpayers) if cost overruns and delays unfold like in Seattle. Californians, however, were promised a project that was supposed to be paid for entirely by beneficiaries of the Delta Tunnels.

California taxpayers and legislators should study the financial mess created in Seattle before moving forward with one of the most expensive projects in the state's history, that will also fail to provide more water to Southern California.

Commentaries are the opinions of their authors, and do not necessarily reflect the views of KCETLink. Banner: Bertha. Photo: WSDOT

VIEW COMMENTS (2)

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