Drought and Equity in the San Francisco Bay Area

Heather Cooley, Kristina Donnelly, Salote Soqo, and Colin Bailey

PACIFIC INSTITUTE

Environmental Justice Coalition For Water

June 2016

Drought and Equity in the San Francisco Bay Area

June 2016

Lead Authors
Heather Cooley, Pacific Institute
Kristina Donnelly, Pacific Institute
Salote Soqo, Environmental Justice Coalition for Water
Colin Bailey, Environmental Justice Coalition for Water

Contributing Authors
Tameeka Bennett, Youth United for Community Action
Brian Beveridge and Margaret Gordon, West Oakland Environmental Indicators Project
Henry Clark, PhD, West County Toxics Coalition
Whitney Dotson, North Richmond Shoreline Open Space Alliance
Marie Harrison and Bradley Angel, Greenaction for Health and Environmental Justice
Douglas Mundo and Terrie Green, Shore Up Marin
Sherri Norris and Lauren Hughes, California Indian Environmental Alliance
Charles Taylor, Alviso Water Collaborative

ISBN-13: 978-1-893790-73-5

Pacific Institute
654 13th Street, Preservation Park
Oakland, California 94612
Phone: 510.251.1600 | Facsimile: 510.251.2203
www.pacinst.org

Cover photo: Marilyn Nieves
Designer: Bryan Kring, Kring Design Studio

ABOUT THE PACIFIC INSTITUTE

The Pacific Institute envisions a world in which society, the economy, and the environment have the water they need to thrive now and in the future. In pursuit of this vision, the Institute creates and advances solutions to the world's most pressing water challenges, such as unsustainable water management and use; climate change; environmental degradation; food, fiber, and energy production; and basic lack of access to fresh water and sanitation.

Since 1987, the Pacific Institute has cut across traditional areas of study and actively collaborated with a diverse set of stakeholders, including leading policymakers, scientists, corporate leaders, international organizations such as the United Nations, advocacy groups, and local communities. This interdisciplinary and independent approach helps bring diverse groups together to forge effective real-world solutions.

More information about the Pacific Institute and its staff, board of directors, and programs can be found at www.pacinst.org.

ABOUT THE ENVIRONMENTAL JUSTICE COALITION FOR WATER

The Environmental Justice Coalition for Water (EJCW) works within a Community-to-Capitol framework, connecting the most pressing needs of our disadvantaged community partners to our network of partners and agencies statewide. EJCW's work is rooted in the communities most affected by environmental injustice. Issues and solutions are identified through regional chapters and statewide work groups. EJCW is positioned in the state capital, in order to connect communities with state agencies to bring about change multilaterally through advocacy, education, training, litigation, community organizing, and capacity-building, and by providing technical assistance. EJCW aims to effectively influence the intersections of water justice and environmental justice, community health, and human rights issues from community to global levels.

ACKNOWLEDGMENTS

We would like to extend our heartfelt appreciation to our Project Advisory Committee members, who generously reviewed and shared their insights on the research and results from this project: Bradley Angel (Greenaction for Health and Environmental Justice), Tameeka Bennett (Youth United for Community Action), Brian Beveridge (West Oakland Environmental Indicators Project), Henry Clark, PhD (West County Toxics Coalition), Whitney Dotson (North Richmond Shoreline Open Space Alliance), Margaret Gordon (West Oakland Environmental Indicators Project), Terrie Green (Shore Up Marin), Marie Harrison (Greenaction for Health and Environmental Justice), Lauren Hughes (California Indian Environmental Alliance), Douglas Mundo (Shore Up Marin), Sherri Norris (California Indian Environmental Alliance), and Charles Taylor (Alviso Water Collaborative). This work was supported by a grant from the San Francisco Foundation. We thank it for its support. The opinions expressed in this report are those of the authors and do not necessarily reflect the views of the San Francisco Foundation.

Contents

About the Pacific Institute I
About the Environmental Justice Coalition for Water I
Acknowledgments I
Introduction 1
Study Approach 1
Background on Water Systems in the San Francisco Bay Area 3
Key Issues and Concerns 6
- Water Infrastructure 6
- Water Affordability 7
- Inequitable Water Use 7

Defining Equity in a Drought 7
Solutions 8
- Water Rates 9
- Billing Practices 9
- Financial Assistance Programs 9
- Reducing Household Water Use 11
- Communication and Outreach Strategies 11
- Stakeholder Engagement in Decision-making 12

Conclusions 13
References 14
Appendix 1: Poject Advisory Committee members 16

FIGURES

Figure 1. Urban and residential water use, in acre-feet, in the San Francisco Bay region, 1986-2014. 5

Figure 2. Urban and residential per capita water use, in gallons per person per day, in the San Francisco Bay region, 1986-2014. 5

Figure 3. Graphical depiction of equality verses equity. 7

TABLES

Table 1. Project Advisory Committee members. 2

INTRODUCTION

California is now in the fifth year of a drought of extreme proportions. Cumulative precipitation between 2011 and 2014 was a record low of 40 inches, compared to a historical average of 70 inches (CNAP 2014). Precipitation in late 2015 and early 2016 brought welcome relief, but it was not enough to offset the four-year deficit. Dry conditions have been exacerbated by high temperatures. Calendar years 2014 and 2015 were the hottest and second-hottest years, respectively, on record.

The drought is having far-reaching effects, including on the state's agricultural sector, ecosystems, and urban areas. A key area of concern —but one that has received little attention— is how the drought is affecting low-income communities. To address this gap, the Pacific Institute and the Environmental Justice Coalition for Water partnered with eight community-based organizations to examine the ways in which the drought has affected low-income communities in the San Francisco Bay Area and to identify strategies to mitigate these impacts. This report describes the key issues and concerns identified by our community partners and recommendations for addressing those concerns. The report can serve as a tool for both water managers and community members everywhere as they work to develop more equitable and resilient communities for the climate of the future. The recommendations in this report can also be used to guide state policymakers in implementing the human right to water (AB 665), which recognizes that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes. While the focus of this effort was on drought in the San Francisco Bay Area, the approach and findings can be applied to urbanized areas everywhere.

STUDY APPROACH

This effort followed a community-based participatory research (CBPR) model. While there are multiple definitions of CBPR, one used by the W.K. Kellogg Foundation Community Health Scholars Program is among the most commonly cited, defining CBPR as:

> *"A collaborative approach to research that equitably involves all partners in the research process and recognizes the unique strengths that each brings. CBPR begins with a research topic of importance to the community and has the aim of combining knowledge with action and achieving social change..."*

CBPR is unique in that it combines the technical expertise of researchers with the experiential knowledge of community partners directly affected by the issue being studied. The CBPR model empowers communities by including them as part of the project team, working side-by-side with researchers to shape and implement the research scope, disseminate the findings in their communities, and advance them at the policy level through strategic community-based advocacy strategies. Successful CBPR partnerships benefit

all of the partners involved by, among other things, enhancing their capacity to learn from their involvement, creating a better understanding of each other's strengths and limitations, establishing new collaborative efforts through increased networking among the partners, creating new ways of thinking about their own work, and enhancing professional development to enable all partners to build needed competencies (Hartwig, Calleson, and Williams 2006).

Community engagement in this study took place from August 2015 to June 2016 through consultation with eight community partners (referred to as the Project Advisory Committee, or PAC) at key decision points in the research process. These decisions included the identification of key drought- and water-related concerns in their communities, an examination of solutions to address these concerns, and an exploration of ways to share the results with key audiences. The PAC represented seven community grassroots groups and a statewide native tribal organization that work with climate-vulnerable and environmental justice communities in the Bay Area region (Table 1). A profile of each organization on the PAC and its representative is provided in Appendix 1.

In addition to representing their organizations, PAC members are longtime residents of the Bay Area and of the communities they serve. They have worked to address various social and environmental justice issues through a number of actions—from direct organizing, outreach, and education to policy advocacy. While the PAC primarily played an advisory role, it is anticipated that, with support, PAC members could also engage with their communities about the results of this study and create a stronger partnership to implement the recommendations identified.

Several venues were used to engage PAC members, including five in-person meetings, online surveys, and one-on-one discussions. In-person meetings were held with the entire PAC between August 2015 and February 2016. These meetings typically included PowerPoint presentations followed by facilitated question-and-answer sessions and small group discussions. At the first PAC meeting in August 2015, Heather Sarantis from Commonweal—a Bolinas-based nonprofit that

Table 1.

Project Advisory Committee members.

Name of Organization/Community Group	Name of PAC Member(s)	Community
Alviso Water Collaborative	Charles Taylor	Alviso, Santa Clara County
Greenaction for Health and Environmental Justice	Marie Harrison, Bradley Angel	Bayview Hunters Point, San Francisco
Shore Up Marin	Douglas Mundo, Terrie Green	Canal and Marin City, Marin County
West Oakland Environmental Indicators Project	Brian Beveridge, Margaret Gordon	West Oakland, Alameda County
West County Toxics Coalition	Henry Clark, PhD	West County, Contra Costa County
North Richmond Shoreline Open Space Alliance	Whitney Dotson	North Richmond, Contra Costa County
Youth United for Community Action (YUCA)	Tameeka Bennett	East Palo Alto, San Mateo County
California Indian Environmental Alliance	Sherri Norris, Lauren Hughes	Native American tribes in Bay Area and statewide

works in health and healing, art, education, the environment, and justice—provided a brief overview of the principles of community-based participatory research. [1] The group then discussed and provided input on the project purpose and scope, as well as the research questions and product that would be produced. Researchers also provided an overview of the drought and its impacts on the state, and the group discussed drought impacts that PAC members were experiencing or were concerned about in their communities, including water shortages, declining water quality, rising water and energy rates, and wildfires.

At the second PAC meeting in October 2015, Pacific Institute researchers provided an overview of water systems in the San Francisco Bay Area and reported on the drought impacts of greatest concern to PAC members (as identified during the first meeting). It became clear that while some of the issues were associated with the drought, others represented longstanding issues and concerns in these communities. Rising water costs, for example, are of concern even in average years; however, drought surcharges, depending on how they are implemented, could exacerbate these concerns.

At the third meeting, in November 2015, the group continued discussions about general and drought-related concerns. During the meeting, the group decided to narrow the key issues to affordability and the condition of the region's water infrastructure. The group had detailed discussions about the cost of water and the challenges Proposition 218 poses for providing water assistance programs for low-income customers. The group then divided into smaller groups to begin a brainstorming session about solutions to affordability and infrastructure concerns. After the meeting, the Pacific Institute and the Environmental Justice Coalition for Water developed a list of proposed solutions based on suggestions from the PAC members as well as from a review of the literature.

The fourth session was held in December 2015. During the meeting, the group discussed statewide efforts and initiatives, including the human right to water and the funding available for drought relief in some areas. Small group discussions were held to review the possible solutions that had been compiled from the previous meeting and to suggest new ideas based on their interests and experiences. Finally, the group began planning for a stakeholder summit at which the project team and PAC members will share the results of this research with stakeholders, including water utilities, and begin a dialogue on how to move these strategies forward.

The fifth and final session was held in February 2016. PAC members reviewed the draft research report and continued planning the stakeholder summit. The group discussed some of the challenges water utilities might have when dealing with drought and the ways in which the research report and the summit could help to begin a dialogue about how to address these equity concerns. The group also had a brainstorming session on the goals and objectives for the summit, and it agreed that one of the goals should be to improve communication between community groups and water utilities.

BACKGROUND ON WATER SYSTEMS IN THE SAN FRANCISCO BAY AREA

The Department of Water Resources divides the state into ten hydrologic regions for planning purposes. The San Francisco Bay hydrologic region covers a 4,500-square-mile area that includes all

1 Heather Sarantis is the Women's Health Program director at Commonweal. Heather trains community members and scientists to conduct community-based participatory research (CBPR) that focuses on breast cancer prevention.

of San Francisco County and portions of Marin, Sonoma, Napa, Solano, San Mateo, Santa Clara, Contra Costa, and Alameda counties. The region has an estimated 190 community water systems that provide water to residential, commercial, industrial, and institutional users (DWR 2013).[2] The majority of these water systems (60%) serve small communities of 3,300 people or fewer; however, the majority (95%) of the population is served by medium and large systems.

Bay Area water systems are managed by a complex network of special districts, city and county agencies, and private water companies. Most water suppliers provide water service directly to households and businesses and are referred to as retail water utilities. A handful of water suppliers in the region, such as the Contra Costa Water District and Sonoma County Water Agency, sell water wholesale to retail water utilities. Some utilities provide both retail and wholesale service. For example, the San Francisco Public Utilities Commission (SFPUC) sells water directly to households and businesses in the City and County of San Francisco and sells water wholesale to 26 agencies in Alameda, Santa Clara, and San Mateo counties.

According to DWR (2013), total water use in the San Francisco Bay region in 2010, the most recent year for which complete data are available, was about 1.2 million acre-feet. Of that amount, an estimated 90% was used in urban areas for residential, commercial, industrial, and institutional purposes. Nine percent was used for agricultural irrigation, primarily in the northern and northeastern parts of the Bay Area in Napa, Marin, Sonoma, and Solano counties and to a lesser extent in Santa Clara and Alameda counties along the edge of urban development. A small amount of water (1%) was used for managed wetlands.

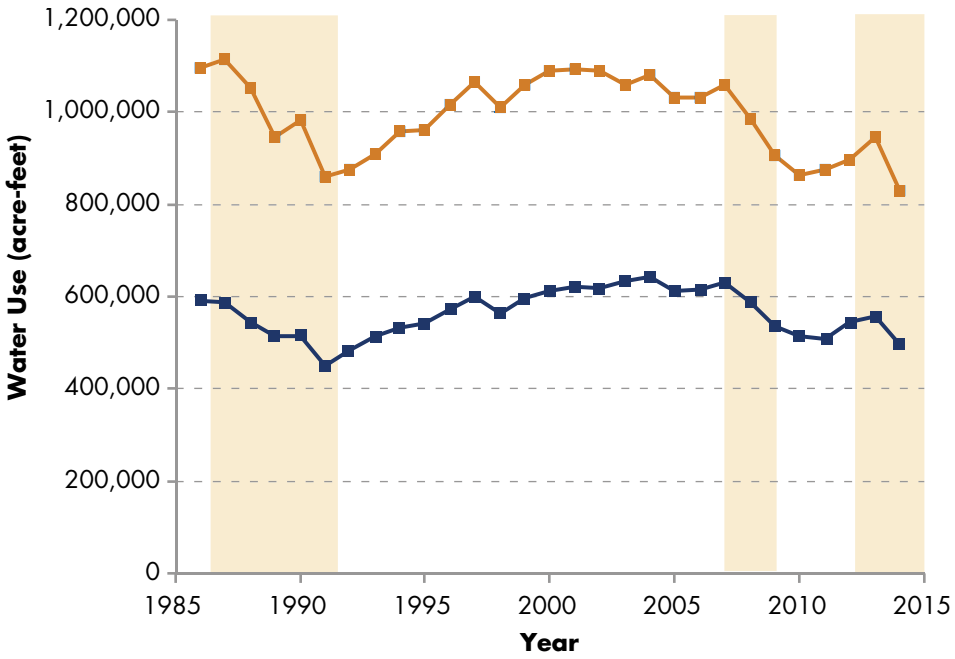
Figure 1 shows urban and residential water use in the San Francisco Bay Area between 1986 and 2014. These data show that water use has been declining across the region over the past three decades despite continued economic and population growth. Water use declines dramatically during drought periods in response to reductions in available supply. Throughout this period, the amount of water used per person, referred to as per capita water use, has been steadily declining (Figure 2). Urban and residential per capita water use dropped significantly during the 1987-1992 and the 2007-2009 droughts; although there was some rebound following the droughts, per capita use did not return to predrought levels. During the current drought, urban and residential per capita water use has fallen to record lows of 119 and 72 gallons per capita per day (gpcd), respectively. While the region's water use is relatively lower than that of the state as a whole, improvements are still possible. For example, in Southeast Queensland, Australia, residential water use was 45 gpcd in 2015 (SEQ 2015), and in Israel, it was less than 36 gpcd in 2014 (Israel Central Bureau of Statistics 2016).

The water supply portfolio of each urban water system in the San Francisco Bay Region differs depending on a variety of factors, such as geography, local water availability, historical water rights, and contracts with wholesale agencies. In total, about 70% of the urban water supply is imported from other regions and 30% comes from local water supplies. Imported water sources include the Mokelumne and Tuolumne rivers, as well as the Sacramento-San Joaquin Bay Delta. Local water sources include groundwater, which makes up 19% of the region's water supply; local rivers and streams, which make up 15% of

2 Community water systems supply water to the same population year-round. The 190-systems total does not include systems that serve fewer than 25 people.

Figure 1.

Urban and residential water use, in acre-feet, in the San Francisco Bay region, 1986-2014.

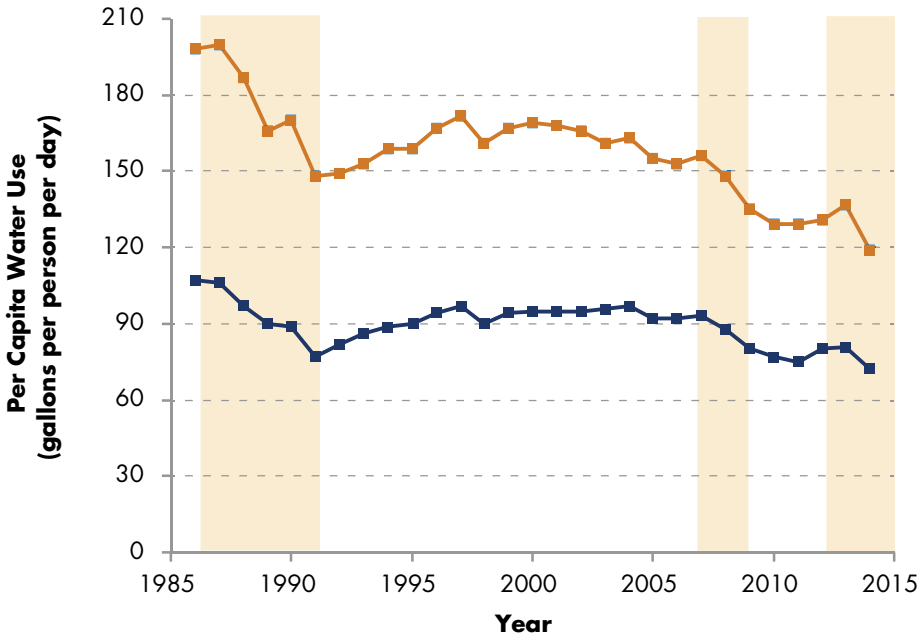


Source: Vorster (2015)

Notes: An acre-foot is the amount of water needed to cover an acre of land with one foot of water and is equivalent to nearly 326,000 gallons. Annual water use data for the entire 1986-2014 period is available from water suppliers that serve about 93% of the 6.65 million people who reside in the region. These data do not include Novato, Petaluma, Sonoma Valley, Napa Valley communities (except the City of Napa), Vallejo, American Canyon, Benicia, Fairfield, and Suisun City, which had an estimated combined population in 2014 of about 450,000.

Figure 2.

Urban and residential per capita water use, in gallons per person per day, in the San Francisco Bay region, 1986-2014.



Source: Vorster (2015)

Notes: See notes for Figure 1 above.

the region's supply; and recycled water, which constitutes 4% of the region's supply (DWR 2013).[3]

KEY ISSUES AND CONCERNS

During PAC meetings, participants identified a broad set of concerns about the impacts of the drought on communities in the San Francisco Bay Area, including household water shortages, declining water quality, wildfires, and rising water and energy prices. The project team worked together to prioritize among these concerns by examining available data on drought impacts for the region, such as the number of households that have reported water shortages and lower groundwater levels. Based on these discussions and a survey of members, the group identified water infrastructure conditions and affordability as the key concerns for low-income communities in the San Francisco Bay Area. Participants also raised concerns about inequities in water use, whereby wealthier households typically use more water than lower-income households. The group noted that these are persistent, interrelated concerns that have been exacerbated by the drought.

Water Infrastructure

Most water systems in the United States were built in the early 20th century, and significant investments are needed to repair and upgrade pipes, treatment systems, storage facilities, pumps, and more. In San Francisco, for example, 320 of the more than 1,200 miles of underground water delivery pipes within the city were rated as "high priority" for replacement in 2013 (San Francisco Public Utilities Commission 2015). In addition to upgrading aging infrastructure, utilities must make investments to comply with drinking and environmental water quality requirements.

The U.S. Environmental Protection Agency (U.S. EPA) estimates that California's capital investment needs for water and wastewater systems will be $47.0 billion and $27.1 billion (in 2015 dollars), respectively, over the next 20 years (U.S. EPA 2013; U.S. EPA 2016).[4] Hanak et al. (2014) find that expenditures on water and wastewater systems in California are generally adequate to meet the need. The authors, however, acknowledge that there are other challenges on the horizon that could increase water costs, including more expensive water and wastewater treatments systems, along with investments required to restore and protect the Sacramento–San Joaquin Delta and related water supply infrastructure. Moreover, additional investment will be needed to accommodate population growth, raw water storage, and operation and maintenance costs.

Water infrastructure may be at increased risk during a drought. Droughts tend to lower the groundwater table due to reduced infiltration and over-pumping of aquifers, resulting in land subsidence that can damage under- and above-ground water delivery infrastructure. Additionally, frequent changes in water pressure can increase wear and tear on the water delivery system. Changes in water sources or water quality that may result from a drought can increase corrosion or scaling in the water distribution system. Finally, the water utility may delay planned infrastructure investments due to reductions in water sales during a drought, which could increase long-term costs to the ratepayer.

3 Figures represent average deliveries between 2001 and 2010.

4 These figures likely underestimate the actual need, as they do not include projects to accommodate population growth, raw water storage, or operation and maintenance costs. In addition, due to data collection limitations, nearly all of the wastewater needs represent investments that will be made in the next five years, not the next 20 years.

Water Affordability

The majority of water system costs are paid by local ratepayers, and as water system costs increase, water rates are likely to rise. Hanak et al. (2014) finds that water bills in California's urban areas increased two to three times faster than inflation between 2000 and 2010 to cover infrastructure and other system costs. Rising water costs create affordability challenges for low-income households and for those on fixed incomes. Yet, affordability is a central element for ensuring basic access to water—a human right recognized by the state of California. Indeed, low-income households that cannot afford to pay for water may have their water service suspended. Late fees or fees to reinstate service exacerbate financial troubles for families that are already under financial stress.

Water rates tend to rise during a drought, worsening affordability concerns. The cost of water can go up during a drought if, for example, the water utility has to purchase more expensive supplies, increase treatment for lower quality water, or pump groundwater from greater depths. For example, the East Bay Municipal Utility District drew from a more expensive emergency supply in both 2014 and 2015 (Figueroa 2014; Figueroa 2015). Moreover, as water use declines during the drought, water sales may not be sufficient to cover the utility's costs, most of which are fixed. Water utilities may implement a temporary drought surcharge to help cover their costs during these periods and, depending on how these are implemented, these surcharges could exacerbate affordability concerns for low-income households.

Inequitable Water Use

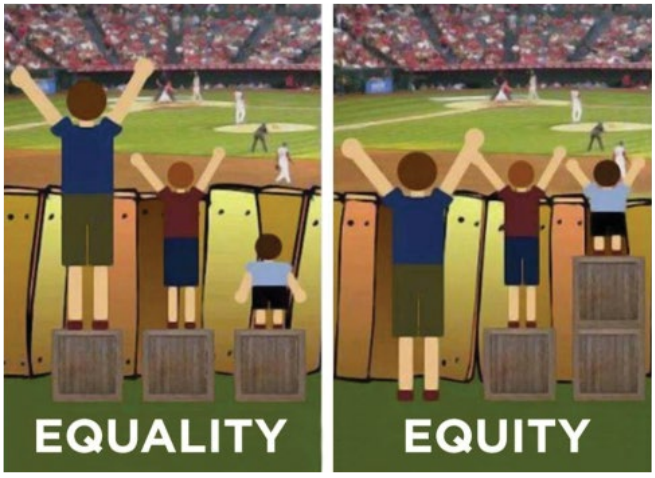
Income is a known driver of water demand (Headley 1963; Gregory and Di Leo 2003; Stoker and Rothfeder 2014), and low-income households typically have some of the lowest levels of water use. Higher-income households are more likely than low-income households to live in single-family homes with water-using features, such as large, well-watered landscapes and pools. While data on household water use and income are not available, similar trends are observed in higher-income communities. For example, in Hillsborough, where median household income exceeds $250,000, per capita household water use in 2015 was 181 gpcd. By contrast, in nearby East Palo Alto, where the median household income is less than $53,000, per capita household water use in the same year was 43 gpcd (SWRCB 2016; U.S. Census Bureau 2016). Higher levels of water use place additional burdens and costs on the water system and increase the likelihood of having to develop more expensive water supplies.

DEFINING EQUITY IN A DROUGHT

The terms "equity" and "equality" are often associated with fairness and justice. Yet, while equality is about sameness (giving everyone the same thing), equity is about making sure everyone has access to the same opportunities. Figure 3 provides a simple depiction of these concepts.

Figure 3.

Graphical depiction of equality verses equity.



The left-hand side of the image depicts equality, whereby everyone is standing on the same-size box, although only some can watch the baseball game. The right-hand side of the image depicts equity, whereby individuals stand on boxes of varying size, depending on their need, so that all are able to watch the game.

The current California drought has garnered significant national and international attention over the past several years. Yet, equity has not been featured prominently in discussions about the drought and its impacts. Recent events have highlighted the need for a frank discussion about water and equity. One of these events occurred in Flint, Michigan, which received national attention in 2015 when predominantly low-income communities suffered a public health crisis from lead poisoning in the water delivery system. Closer to home, the City of East Portersville—a community of 7,500 residents in Tulare County—relies on private wells that have been running dry since the summer of 2014, highlighting the problem of water scarcity during drought and its disproportionate impacts on low-income, rural communities.

As part of this project, the project team sought to better articulate the meaning of equity in a drought. The group determined that an equitable drought response effort would ensure that:

- basic human needs are met through affordable water for low-income communities
- water conservation and efficiency and other demand management strategies are prioritized over expensive supply-side infrastructure investments
- policies and regulations do not hinder the development of less costly and environmentally friendly alternative household or community water supplies, such as greywater systems
- new water and wastewater infrastructure investments are sustainable and provide multiple co-benefits that improve the quality of life for local communities
- information is readily accessible
- California's water-related policies and plans do not further perpetuate existing environmental and social issues.

The PAC noted that there is a need to clarify some of the terms commonly used when discussing equity, such as "disadvantaged," "low income," and "affordability," and to recognize that the definition of these terms will vary from community to community. For example, a level of income that is low for someone living in San Francisco may be relatively high for someone living in Antioch. The PAC further stressed that the specific definition matters when it is used to make public policy decisions. It also noted that households designated as "low-income" can have varying degrees of need for assistance.

SOLUTIONS

A variety of solutions are available to address the issues and concerns identified by the community groups. These solutions were identified through group brainstorming sessions at each of the PAC meetings. We divide these solutions into six key areas:

1. Fair and equitable water rates
2. Billing practices that meet low-income household needs
3. Low-income financial assistance programs
4. Programs to reduce water use in low-income households
5. Effective communication and outreach strategies
6. Stakeholder engagement in decision-making processes

Water Rates

Most San Francisco Bay Area residents rely on public utilities and, to a lesser extent, private water companies, to provide a safe, reliable supply of water. The cost of water varies across these entities depending on a number of factors, including water usage, population size and density, the cost of available water supplies, and the infrastructure needed to provide water service. However, water costs are rising across California and the United States. During a drought, water utilities may enact surcharges to purchase emergency water sources or to recover revenues from reductions in water use, exacerbating affordability concerns for low-income households or those on fixed incomes. To promote fair and equitable water rates in California, we recommend the following:

- Adopt tiered water rates, which charge lower rates for basic water needs and higher rates for usage above basic needs.
- Ensure that drought surcharges are not applied to the lowest water uses; e.g., less than 35 gallons per capita per day (gpcd).
- Ensure that development fees are sufficient to cover the entire cost of providing water service to these new customers.
- Improve demand forecasting to avoid developing expensive water supply and wastewater infrastructure that is not needed, thereby reducing long-term water system costs.

Billing Practices

Certain billing practices make it more difficult for customers to pay their bills. In California, an estimated 37% of water utilities have bimonthly billing (RFC and CA-NV AWWA 2013). While these bimonthly bills, which are delivered every two months, are less frequent, they are much larger and may be unaffordable for those with limited means. Reform of existing billing practices can help customers pay their water bills on time, thereby avoiding water shutoffs and late-payment charges. For example, water utilities could adopt a levelized billing program that allows low-income customers to pay the same amount each billing period, avoiding the shock of a large water bill, particularly during the hot, dry summer months when water bills may be higher. To implement billing practices that help low-income customers, we recommend the following:

- Provide flexible payment plans, such as allowing for levelized billing, changing bill timing to coincide with income, or providing due-date extensions.
- Separate water, wastewater, and sewer bills to better communicate the cost of providing water service and to ensure that basic access to water is maintained even if the customer cannot afford bills for other services.
- Provide full due-process protections before terminating water service—for example, requiring notice of a customer's opportunity to take advantage of a budget billing program or deferred payment arrangement.

Financial Assistance Programs

Low-income financial assistance programs offer a means to support customers who cannot afford their water bills. While some water utilities provide low-income assistance programs, they are not yet universal. Some utilities feel that these programs are too risky, due in part to concerns about violating Proposition 218, which prevents water utilities from using water-rate revenue to subsidize low-income customers. While Proposition 218 limits the use of water-rate revenue to fund low-income assistance programs, there are a number of other funding sources for these programs, such as state or federal grants, private charities, and property leases. Within the Bay Area, several water utilities, such as the City of Santa Rosa and Alameda

Box 1.
Examples of Low-income Assistance Programs in the San Francisco Bay Area

City of Santa Rosa—Help to Others (H2O) Program

In March 2016, the City of Santa Rosa launched the Help to Others (H2O) Program to help low-income customers reduce their household water bills. Santa Rosa hopes to provide assistance to 1,000 customers per year, each of whom would receive 50% off the fixed charge for water and wastewater service (equivalent to about $17 per month). The program is funded by leasing state-owned property for cell phone towers and by voluntary, tax-deductible donations from customers. To participate in the program, customers must (1) meet household income requirements, (2) attend a no-cost financial capacity workshop and financial coaching session, and (3) complete a free home water-efficiency audit. Additionally, participants must keep their household water use below a certain threshold. The city partnered with a local community group—Community Action Partnership of Sonoma County—to help connect the program with customers and evaluate their eligibility.

Alameda County Water District's Water Savings Assistance Program

In 2014, the Alameda County Water District received a Proposition 84 grant to fund a water efficiency program targeting low-income households. As part of the program, customers were offered a free home audit to identify water saving opportunities and repair leaks. Additionally, high-efficiency toilets, showerheads, and faucets were installed at no cost. Program participants also received a one-time $50 discount on their water bill. In total, nearly 120 households participated in the program.

County Water District, offer these programs to their customers (see Box 1 for more detail). Likewise, San Diego's City Council recently approved a program that would allow customers to make a tax-deductible donation to fund water bills for low-income households. While these types of programs are becoming more common, they are not yet widely implemented. To expand financial assistance to low-income customers, we recommend the following:

- Institute a mechanism that would allow water utilities to use rate-based revenue to fund low-income assistance programs.
- Fund low-income assistance programs using non-rate-based revenue sources, such as property taxes (in the case of special districts); general fund revenue (in the case of municipal utilities); customer, foundation, or private sector donations; state bond funding; and property leases.
- Allow customers to opt in to insurance programs that cover repairs to exterior household water and sewer service lines.
- Direct customers to financial assistance programs that may be available from local, state, and federal governments.
- Eliminate penalties for reconnection and/or disconnection, provide installment plans to repay old debt, and reward customers for timely payments with partial forgiveness of old debt.

Reducing Household Water Use

While financing assistance programs can help reduce water bills, a household can also reduce its bill by reducing water use through conservation and efficiency measures, greywater systems, or rainwater harvesting. Although low-income households typically have some of the lowest levels of water use, there are still clear benefits to encouraging water-saving measures. Reducing indoor water use can reduce wastewater and even energy bills, and these changes can also delay or eliminate the need to develop expensive new water and wastewater infrastructure, reducing future water rate increases. However, low-income households may not be able to afford to replace their appliances and fixtures with more efficient models. Most water utilities provide rebates to incentivize the purchase of a more efficient device or a greywater system. These rebates, however, are typically available only after the device has been purchased, and many low-income households cannot benefit from these programs because they cannot afford the initial cost of the more efficient device. Moreover, renters are often not authorized to make changes to their residence. To help low-income customers reduce their water use, we recommend the following:

- Target conservation and efficiency programs to low-income households by offering, for example, point-of-sale coupons, targeted education and outreach, and direct-install programs.
- Develop partnerships between water utilities and community groups to do direct-install programs in low-income households.
- Identify opportunities for landlords and tenants to collaborate with one another to reduce water use and structure agreements to benefit both parties.
- Develop and implement innovative financing programs to reduce household water use, such as on-bill financing or repayment via property taxes.
- Coordinate water- and energy-efficiency program offerings and seek opportunities to leverage outreach to low-income households.
- Provide education about and incentives for greywater and rainwater harvesting systems.
- Require new housing developments to offset their water use by funding water conservation and efficiency programs in low-income households or installing on-site reuse systems.
- Identify and implement green infrastructure projects to reduce pressure on grey infrastructure and beautify neighborhoods.

Communication and Outreach Strategies

In general, water utilities should have mechanisms in place to communicate with their customers. Conversely, there should be mechanisms to enable customers to easily communicate with their utility. Effective, regular communication with customers provides an opportunity for the utility to connect, raise awareness, and educate customers about ongoing issues relating to managing water. Such information is critical to helping customers better understand the costs associated with the services they receive. In order to ensure effective, two-way communication between a water utility and its customers, we recommend the following:

- Develop partnerships between water utilities and community groups to expand outreach about available programs and services.
- Work with community groups to develop outreach materials that are easily understood and available in multiple languages.
- Provide data and information to the community about the condition of local water infrastructure and the utility's schedule for replacement and upgrades.

- Implement a program or tool, such as the IVAN (Identifying Violations Affecting Neighborhoods) network, to enable communities to easily report water issues and concerns.
- Provide a hotline for customers to communicate opportunities and challenges associated with accessing information and assistance programs.

Stakeholder Engagement in Decision-making

Tackling looming water challenges will require better integration and greater stakeholder engagement in decision-making processes. Integrated decision-making can lead to innovative multibenefit projects, such as water recycling or stormwater capture projects, which promote economic efficiency, build public confidence, and improve environmental outcomes. Integration requires partnerships with local agencies and officials, whose decisions can greatly impact water utility operations. For example, water utilities can work with city planners to ensure that municipal ordinances and permit requirements do not prevent residents from installing greywater systems in their homes. Integration also requires meaningful engagement with affected communities to foster community support and to ensure that their interests and concerns are adequately addressed. The City of Seattle provides one potential model for operationalizing meaningful engagement with affected communities (see Box 2). To promote stakeholder engagement, especially among low-income communities, we recommend the following:

- Develop community advisory boards to inform water utility, local government, and state agency decisions about community issues.
- Establish partnerships between water utilities and community groups to develop and operationalize an equity checklist to ensure that utility projects and programs benefit low-income households.

Box 2.
Seattle Public Utility's Environmental Justice and Service Equity Division

The City of Seattle provides a model for the implementation of stakeholder engagement and community outreach. In 2005, Seattle established the Race and Social Justice Initiative (RSJI) as a citywide commitment to eliminate racial disparities and achieve racial equity. To implement this initiative at Seattle Public Utilities (SPU), the Environmental Justice and Service Equity Division works with local community groups to ensure that the city's programs are culturally, economically, and linguistically appropriate and accessible. The division "works to embed race and social justice and service equity policies and practices across the utility; model and advocate for inclusive community engagement within the utility in partnership with communities; and further align division efforts within SPU, as well as city, county, and community efforts" (SPU 2016). To achieve these goals, SPU helps finance the participation of local organizations and community groups in SPU decision making, outreach, and program development. In addition, SPU staff members are required to attend workshops on institutionalized racism, rate-payer equity, and environmental and social justice issues (CEC 2012).

- Provide adequate support for meaningful engagement of low-income customers, such as stipends, close proximity to public transportation, childcare services, ADA access, and language interpretation resources.
- Ensure that cities are participating and are part of the solution (e.g., by facilitating standardized

system designs, an easy permitting system, and interagency dialogue).

CONCLUSIONS

The California drought has wide-ranging social, economic, and environmental impacts. Yet, equity has not featured prominently in state and local discussions about the drought and its impacts. This study engaged community-based organizations and resident leaders in examining the impacts of the drought on low-income households in the San Francisco Bay Area. The group identified affordability, water infrastructure conditions, and inequities in water use as key concerns for low-income communities in the San Francisco Bay Area and acknowledged that these represent persistent, interrelated concerns that have been exacerbated by the drought. Further, the group identified six strategies for mitigating drought impacts on low-income households:

1. Fair and equitable water rates
2. Billing practices that meet low-income household needs
3. Low-income financial assistance programs
4. Programs to reduce water use in low-income households
5. Effective communication and outreach strategies
6. Stakeholder engagement in decision-making processes.

These solutions can help low-income communities in wet and dry years and can serve as a tool for water managers and community members everywhere as they work to develop more equitable and resilient communities for the climate of the future.

References

California Department of Water Resources (DWR). 2013. "California Water Plan: Update 2013, Investing in Innovation & Infrastructure." Volume 2 - Regional Reports. San Francisco Bay Hydrologic Region. http://www.waterplan.water.ca.gov/docs/cwpu2013/Final/Vol2_SanFranciscoBayRR.pdf.

———. 2015. California's Most Significant Droughts: Comparing Historical and Recent Conditions. Retrieved August 10, 2015, from http://www.water.ca.gov/waterconditions/docs/a9237_CalSignficantDroughts_v10_int.pdf.

City of San Diego. 2015. "Our Water System: Investing in Our Future." http://www.sandiego.gov/water/pdf/rates/ratechangefacts.pdf.

CNAP. 2014. "The California Drought of 2014: Record Hot, Record Dry." California-Nevada Climate Applications Program. http://cnap.ucsd.edu/pdffiles/CNAP_CAdrought_aug2014.pdf.

Dettinger, Michael D., Fred Martin Ralph, Tapash Das, Paul J. Neiman, and Daniel R. Cayan. 2011. "Atmospheric Rivers, Floods and the Water Resources of California." Water 3 (2): 445–78. doi:10.3390/w3020445.

Figueroa, Abby. 2014. "EBMUD to Bring in Drought Year Water Supplies." East Bay Municipal Utility District, April 22, press release. https://www.ebmud.com/about-us/news/press-releases/ebmud-bring-drought-year-water-supplies.

———. 2015. "Multiple Water Transfers Authorized by EBMUD Board." East Bay Municipal Utility District, April 28, press release. https://www.ebmud.com/about-us/news/press-releases/multiple-water-transfers-authorized-ebmud-board.

Garzon, Catalina, Heather Cooley, Matthew Heberger, Eli Moore, Lucy Allen, Eyal Matalon, Anna Doty, and The Oakland Climate Action Coalition. 2012. "Community-Based Climate Adaptation Planning: Case Study of Oakland, California." California Energy Commission, California Climate Change Center. Publication number: CEC-500-2012-038.

Gregory, Gary D., and Michael Di Leo. 2003. "Repeated Behavior and Environmental Psychology: The Role of Personal Involvement and Habit Formation in Explaining Water Consumption." Journal of Applied Social Psychology 33 (6): 1261–96. doi:10.1111/j.1559-1816.2003.tb01949.x.

Hanak, Ellen, Brian Gray, Jay Lund, David Mitchell, Caitrin Chappelle, Andrew Fahlund, Katrina Jessoe, et al. 2014. "Paying for Water in California." San Francisco, Calif.: Public Policy Institute of California. http://www.ppic.org/content/pubs/report/R_314EHR.pdf.

Hartwig, Kari, Diane Calleson, and Maurice Williams. 2006. "Unit 1: CBPR – Getting Grounded." In Developing and Sustaining Community-Based Participatory Research Partnerships: A Skill-Building Curriculum. www.cbprcurriculum.info.

Headley, J. Charles. 1963. "The Relation of Family Income and Use of Water for Residential and Commercial Purposes in the San Francisco-Oakland Metropolitan Area." Land Economics 39 (4): 441–49.

Israel Central Bureau of Statistics. 2016. "The Local Authorities in Israel." In Hebrew. http://www.cbs.gov.il/reader/?MIval=cw_usr_view_SHTML&ID=357.

Peña, Humberto. 2011. "Social Equity and Integrated Water Resources Management." Technical Committee Background Paper Series 15. Global Water Partnership Technical Committee.

Raftelis Financial Consultants, Inc. and California-Nevada Section of the American Water Works Association (RFC and CA-NV AWWA). 2013. Water Rate Survey. Rancho Cucamonga, Calif.

San Francisco Public Utilities Commission (SFPUC). 2015. "Comprehensive Annual Financial Report for the Fiscal Years Ended June 30, 2015 and 2014." http://www.sfwater.org/modules/showdocument.aspx?documentid=8233.

Philip Stoker and Robin Rothfeder. 2014. "Drivers of Urban Water Use." Sustainable Cities and Society 12.

Southeast Queensland (SEQ). (2015). Water Outlook 2015. Accessed March 17, 2016, from http://www.seqwater.com.au/sites/default/files/PDF%20Documents/Publications/Water%20Outlook%20-%20fact%20sheet.pdf.

State Water Resources Control Board (SWRCB). 2016. "Water Conservation Portal - Conservation Reporting." Accessed April 27, 2016 from http://www.waterboards.ca.gov/water_issues/programs/conservation_portal/conservation_reporting.shtml.

U.S. Census Bureau. n.d. "QuickFacts." Accessed: March 7, 2016. http://www.census.gov/quickfacts/index.html.

U.S. Environmental Protection Agency. 2013. "2011 Drinking Water Infrastructure Needs Survey and Assessment: Fifth Report to Congress." EPA 816-R-13-006. Office of Water (4606M). http://www.epa.gov/sites/production/files/2015-07/documents/epa816r13006.pdf.

———. 2016. "Clean Watersheds Needs Survey 2012: Report to Congress." EPA-830-R-15005. http://www.epa.gov/sites/production/files/2015-12/documents/cwns_2012_report_to_congress-508-opt.pdf.

Vorster, Peter. 2015. "State of the Estuary Report 2015: Technical Appendix. People—Conserving Water." San Francisco Estuary Partnership. http://www.sfestuary.org/wp-content/uploads/2015/10/28_TA_People_Conserving_Water_Vorster_SOTER_2015.pdf.

Appendix 1

PROJECT ADVISORY COMMITTEE MEMBERS

Alviso Water Collaborative
Greenaction for Health and Environmental Justice
Shore Up Marin
West Oakland Environmental Indicators Project
West County Toxics Coalition
North Richmond Shoreline Open Space Alliance
Youth United for Community Action (YUCA)
California Indian Environmental Alliance

ALVISO WATER COLLABORATIVE

The Alviso Water Collaborative is a community volunteer group that was formed in 2005 by concerned residents and friends of Alviso, a neighborhood in San Jose, California. The neighborhood group was formed in response to the lack of consideration by the Santa Clara Valley Water District and City of San Jose to address the needs of the community to provide adequate flood protection, restore the Alviso Slough to its historic condition, and support recreational boating. The collaborative also recognizes the threat of sea-level rise and climate change on Alviso and works to address these issues in concert.

Alviso is a low-income, predominantly Hispanic/Latino and minority community. Alviso is located at the very end of North First Street in San Jose, where the San Francisco Bay ends and San Jose begins. Residents consider Alviso the New Orleans of the San Francisco Bay due to its below-sea-level elevation of -13 feet, which has been attributed to the subsidence of land due to excessive siphoning of groundwater during the early 1900s, when farming and ranching activities were at their peak in Santa Clara County. Currently, Alviso experiences some flooding with minimal amounts of rainfall (2–5 inches). The location of Alviso also increases its susceptibility to flooding, as it is situated between the Lower Guadalupe River, which drains into the shallow Alviso Slough and Coyote Creek, which flow on either side of the community. The most disastrous flood event occurred in 1983 during a heavy rain event in which several members of the community lost their homes. Additionally, Alviso is on the Superfund list for asbestos pollution. Asbestos was found to be present in a ring levee that was put in place to address flood protection. Although this levee has been removed, the lingering effects of asbestos pollution have stayed with the community.

PAC REPRESENTATIVE

Charles Taylor has been the chairperson of the Alviso Water Collaborative for the past five years. He is a longtime resident of Alviso and works as an IT systems engineer in Silicon Valley. Taylor has been involved in organizing communities to address the various environmental issues that the neighborhood experiences, ranging from traffic concerns and construction to flooding and protecting open spaces. He has represented Alviso on a number of agency committees to inform them of Alviso's community interests. Among these committees are the Santa Clara Valley Water District Alviso and Lower Guadalupe River Collaborative and the Clean, Safe Creeks and Natural Flood Protection Independent Monitoring Committee. From 2007 to 2012, Taylor served as an alternate commissioner for Senator Elaine Alquist on the Bay Conservation Development Commission (BCDC). He is currently a stakeholder on the South Bay Salt Pond Restoration Committee.

CALIFORNIA INDIAN ENVIRONMENTAL ALLIANCE

The California Indian Environmental Alliance (CIEA) is a Native environmental health nonprofit founded in 2006 to address the toxic legacy of gold mining by informing families on how to avoid toxins while continuing to eat traditional foods, increasing the Tribal capacity to self-advocate and defend Native cultures and traditions from environmental contamination.

CIEA promotes policies and actions respectful of Tribal sovereignty and Tribal self-advocacy. Its constituents are California Tribes and through health outreach, Tribal members, including the most at-risk populations: pregnant women, their fetuses, and young children. In all its work, CIEA respects the integral connection between California Indian cultures, traditional knowledge, and the environment. Its core programs increase Tribal self-advocacy to address water-related issues and address the toxic legacy of mercury left over from the California Gold Rush, which threatens the physical, cultural, and spiritual health of California Indian communities.

PAC REPRESENTATIVES

Sherri Norris is CIEA's executive director. Originally from west Sonoma County, she has lived in the East Bay for 18 years and has 15 years of experience working as a tribal health and environmental advocate, both locally and at international fora, providing presentations and trainings on the cycle and health effects of mercury on human and environmental health, exposure-reduction strategies, solution development, and opportunities for advocacy related to mining issues in California. She coordinates CIEA's Tribal Self-Advocacy Program and is the primary contact for CIEA's Tribal engagement responsible to over 40 Tribes within the North Coast, Upper Feather River, and the Bay Area Integrated Regional Water Management Plan (IRWMP) regions. Norris is a graduate of the Hopa Mountain Foundation, Rockridge Leadership Institute, and a member of the Sierra Fund's Blue Ribbon Panel of mercury experts. She is a recipient of the Mills College Brave-Hearted Women Award, the Sierra Fund's Sierra Crest Award, and the Davis-Putter Scholarship for young activists.

Lauren Hughes is the assistant to the executive director of CIEA and the program coordinator. She is a pivotal part of CIEA's organizational development team and coordinates the Native Youth Environmental Leadership Program and the college Fellowship Project. Prior to joining CIEA, she was the assistant to Mary Trimble Norris, the executive director of the American Indian Child Resource Center (CRC) in Oakland. At the CRC, she was head tutor, case manager, and sustainability educator. In this capacity, she has worked to teach Native youth about the importance of academics and environmental stewardship by creating a gardening program in which students learned how to grow crops native to the land and culturally significant to indigenous peoples. Hughes has spent her career working to educate others about sustainability, renewable energy, energy efficiency, permaculture, and indigenous natural building practices. She graduated with her MSc in Sustainable Building Technology with merit from the University of Nottingham, UK. Originally from Georgia, she has lived in the Bay Area for five years.

GREENACTION FOR HEALTH AND ENVIRONMENTAL JUSTICE

Greenaction for Health and Environmental Justice is a multiracial grassroots organization working with low-income and working-class urban, rural, and indigenous communities to fight environmental racism and injustice and build a healthy and just future for all. Greenaction mobilizes community power to win victories that change government and corporate policies and practices to protect health and to promote environmental, social, and economic justice. In the Bay Area, Greenaction has been a leader in environmental health and justice organizing in Bayview Hunters Point.

Bayview Hunters Point is a low-income community of color in southeast San Francisco on San Francisco Bay. Residents and the environment are disproportionately and cumulatively impacted by stationary and mobile pollution, including toxic contamination and development work at the former Hunters Point Naval Shipyard, dozens of industrial and brownfields sites, the Southeast Sewage Treatment plant, underregulated industries, diesel freight transport, and two freeways. Residents suffer from high rates of asthma and cancer. The contamination, combined with sea-level rise from climate change, threatens public health and the land, air, and the water quality of the Bay. Safe cleanup of these sites is vital to protect the health of current and future residents and to protect water and air quality.

PAC REPRESENTATIVES

Marie Harrison has been a Greenaction community organizer since 1999, with a focus in her community of Bayview Hunters Point. She coordinates the Bayview Hunters Point Environmental Justice Task Force, a multi-stakeholder effort to improve government and industry responses to pollution. Harrison is an active member of the Bay Area Environmental Health Collaborative, the Resilient Communities Initiative, and the California Environmental Justice Coalition. Her advocacy involves decades of civic and community engagement for social, economic and environmental justice. She led the fight that closed the Pacific Gas & Electric Hunters Point power plant and coordinated Greenaction's diesel emissions reduction effort. She served on the first Bayview Hunters Point Community Court and on the San Francisco Sunshine Ordinance Task Force to assure transparency in city government. She is on the board of directors of Positive Directions Equals Change.

In 1997, Bradley Angel joined with community environmental justice leaders from California and Arizona to form Greenaction. He has worked with hundreds of diverse communities impacted by pollution and injustice. Angel was the Southwest toxics campaigner for Greenpeace USA from 1986 to 1997. He was co-director of the San Francisco Nuclear Weapons Freeze Campaign in 1985 and has been active in social justice issues since he was a teenager. He serves on the steering committees of the Bay Area Environmental Health Collaborative, the Resilient Communities Initiative, and California Environmental Justice Coalition. In 2008 he was awarded the prestigious Lannan Foundation's Cultural Freedom Prize in recognition of his decades of work with communities and Native nations.

NORTH RICHMOND SHORELINE OPEN SPACE ALLIANCE

The North Richmond Shoreline Open Space Alliance (NRSOSA) is a group of neighborhood, social justice, community, and environmental organizations and individuals committed to saving access to the last remaining open space along the northern shoreline of Richmond, California, between Point Molate and Point Pinole.

North Richmond is in western Contra Costa County. It is primarily a low-income community of color with existing air quality and social justice issues that are exacerbated by large-scale development. In inclusionary housing, only 5% to15% of units are "low-income" in areas that are 100% low-income. Tract homes valued at $400,000 to more than $700,000 and aimed at the middle-class are built rapidly, often profiting a single developer outside of Richmond in a practice that displaces families living in North Richmond. The North Richmond Shoreline neighborhoods work aggressively to ensure that the shoreline will be restored and protected to provide jobs, educational opportunities, a safe place to recreate, and a source of clean, healthy food.

PAC REPRESENTATIVE

Whitney Dotson is the president of NRSOSA and was also elected to the East Bay Regional Park District's board of directors in November 2008. Dotson is a longtime resident of Parchester Village in Richmond and is a well-known community activist who served as president of his neighborhood council and now serves as its vice chair. He also served as the associate director of the Neighborhood House of North Richmond, a nonprofit agency that provides services to North Richmond residents, and is vice chair of the Community Advisory Group monitoring the cleanup of Campus Bay and the UC Berkeley Richmond Field Station. He holds a master's degree in Public Health Planning, Administration, and Education from UC Berkeley. Parks in his ward include: Brooks Island, Eastshore State Park, Kennedy Grove, Miller/Knox Regional Shoreline, Point Isabel, Point Pinole, Sobrante Ridge, Tilden Park, and Wildcat Canyon Regional Park.

SHORE UP MARIN

Shore Up Marin is a partnership founded by Earth Day Marin, Canal Welcome Center, Marin Grassroots, GreenUp Learning, and the Martin Luther King (MLK) Coalition. Its mission is to support a diverse coalition of Marin residents across race, class, and other differences to advocate for equitable responses to climate change and sea-level rise. Our main focus is mobilizing residents and stakeholders in low-lying areas in Novato, San Rafael, Southern Marin, and West Marin.

Shore Up's work primarily focuses on Marin City and the Canal area, which are low income neighborhoods with predominantly minority populations. Marin City, an unincorporated community, lies next to Highway 101 and is exposed to air pollution from passing vehicles. Both neighborhoods experience chronic flooding during heavy rain events and are expected to be extensively inundated with sea-level rise. The vulnerability of residents is further increased due to the availability of only a single access road into and out of the community, which leaves residents immobile during heavy rain events. Recently, residents were also left trapped in their communities without power. Residents are concerned that rising waters may wash up toxic contaminants from an old landfill site nearby, further increasing their exposure to toxics-related health risks. Residents also live in debilitating public housing conditions that have received very little attention from city and Marin County officials. Marin City occasionally experiences sewer backups during heavy rain events and lacks access to a community grocery store.

PAC REPRESENTATIVES

Douglas Mundo is the co-director of Shore Up Marin and the founder-executive director of the Canal Welcome Center. He received his degree in Nonprofit Administration from the University of San Francisco and has vast experience in program management, leadership, and community outreach. As part of Mundo's role, he manages and coordinates the development and administration of programs and establishes sound working relationships and cooperative arrangements with community groups and organizations. He represents Shore Up Marin and the Canal area in several community, local government, regional planning, and policy development processes.

Terrie Green is the co-director of Shore Up Marin. She has a BA in Political Science/Urban Studies from San Francisco State University and a Community Health Worker Certificate from City College of San Francisco. A longtime resident of Marin City, she has led and served on a number of community programs and initiatives that provide outreach and increase health awareness, community capacity, and community governance among Marin City residents. Green has vast experience in community development leadership, including her role in serving on a number of community boards as president and vice chair. She co-founded Marin City Charter School and ISOJI, a community advocacy group. In addition to her role as director of the Marin City Parent and Leadership Academy, which serves 20 families with children up to 5 years old, she has been a foster parent for the past 39 years and has served 98 children in her home.

WEST COUNTY TOXICS COALITION

The West County Toxics Coalition (WCTC) is a nonprofit organization of community members in Richmond that has been fighting toxic contamination since 1986. The group is an outgrowth of the National Toxics Campaign and was formed to empower low- and moderate-income residents to exercise greater control over environmental problems that impact their quality of life in Contra Costa County, particularly in the communities of West County.

The area known as West County includes a number of communities that are located along the San Francisco Bay of Contra Costa County. This area includes low-income to moderate-income communities and predominantly communities of color, such as San Pablo, Richmond, and Pinole. Residents are highly exposed to air contamination and face an ongoing struggle to eliminate the prevalence of environmental hazards resulting from the release of toxic chemicals by various industries in the area, such as Chevron's Richmond Refinery, and emissions from vehicles using Interstate 80. In addition, these communities have become increasingly gentrified, with new high-rise developments moving into their neighborhoods. There is also increasing concern among the communities about the transportation of oil by railroad through their neighborhoods, exacerbating air pollution. Extreme heat due to climate change is expected to have its greatest impact on inland Contra Costa County; however, vulnerable communities in West County are projected to experience temperature increases over the next few decades, placing many residents at risk. Richmond and parts of Pinole are also susceptible to sea-level rise due to their shoreline locations.

PAC REPRESENTATIVE

Henry Clark, PhD, is the director of the West County Toxics Coalition (WCTC). He has been the director for the past 28 years and represents WCTC in a number of regional and statewide committees and organizations fighting to end environmental injustice. Born and raised in North Richmond, Clark has worked primarily to address air quality issues relating to the activities of Chevron and other industrial sources. Under his leadership, WCTC has also worked to address water issues and flooding in North Richmond and San Pablo, where he led a campaign to get Chevron to divert clean water from its cooling towers to schools with contaminated water in North Richmond. He represents the local community on North Richmond's Municipal Advisory Council and is one of the founding members of he Environmental Justice Coalition for Water, the California Environmental Justice Coalition (CEJC), and a number of other environmental justice groups in the state. In addition to his work with communities in North Richmond, he has also worked with communities in Ecuador, Venezuela, South Africa, and Nigeria on various issues relating to air quality and water.

WEST OAKLAND ENVIRONMENTAL INDICATORS PROJECT (WOEIP)

The West Oakland Environmental Indicators Project (WOEIP) is a resident-led, community-based environmental justice organization dedicated to achieving healthy homes, healthy jobs, and healthy neighborhoods for all who live, work, learn, and play in West Oakland, California. Through its community-based participatory research projects and collaborative problem-solving model, it builds community empowerment and helps local residents to achieve their own vision for healthy neighborhoods. WOEIP's mission is to build grassroots capacity to provide local leadership for positive change. Its work aids residents in understanding the political, social, and natural forces that impact their lives. It gives impacted residents the tools to participate in these processes and to drive change from the bottom up.

PAC REPRESENTATIVES

Margaret Gordon co-founded and co-directs the West Oakland Environmental Indicators Project. In 2007, she was inducted into the Alameda County Women's Hall of Fame for her leadership on behalf of West Oakland's residents. Due to her knowledge of the Port of Oakland's maritime operations, she was appointed by Mayor Ron Dellums to the Oakland Port Commission in 2008. Gordon is a lifetime resident of the Bay Area, a mother to three adult sons, and grandmother of eleven. She has won a number of awards and serves on a number of boards and committees, including:

- 2010 Encore Purpose Prize for Community Development
- 2011 Spotlight Award from the Bay Area Business Roundtable
- Member of Senior Fellow Institute for the School of Public Health, UC Berkeley (2006)
- Board member of the Pacific Institute (2010-2015)
- Board member of the Oakland Community Land Trust (2010)
- Member of the USEPA Clean Air Act Advisory Committee (2010-present)

Brian Beveridge co-founded and co-directs WOEIP and has more than 30 years of experience in communications. For 17 years, he owned and managed an independent video production company in the Bay Area. Beveridge has created marketing programs for Fortune 500 corporations, produced TV programs for the Sports Channel and the San Francisco Giants and written and directed documentary videos for nonprofit groups, including the California Child Care Resource & Referral Network and the East Bay Asian Local Development Corporation. As a new resident to West Oakland in 1999, he joined the struggle for environmental justice after personally experiencing toxic emissions from the Lesaffre Corporation's Red Star Yeast factory in his neighborhood.

YOUTH UNITED FOR COMMUNITY ACTION

Youth United for Community Action (YUCA) is a grassroots community organization based in East Palo Alto created, led, and run by young people of color, mainly from low-income communities, providing a safe space for young people to empower themselves and work on environmental and social justice issues to establish positive systemic change.

East Palo Alto's population is made up of primarily low-income families of color. Situated in the heart of Silicon Valley, East Palo Alto has recently become prime real estate for those wanting to situate themselves near Facebook, Google, and other leading tech companies, and thus it has become increasingly gentrified. East Palo Alto holds nearly 15 percent of San Mateo's affordable housing stock, so residents and tenants are constantly on the defense, fighting to save the largest portfolio of affordable housing in the county. East Palo Alto has surpassed its share of water resources from Hetch Hetchy Reservoir, supplied through the SFPUC, and the community is now searching for other sources of water, including groundwater. East Palo Alto also has battled mercury and VOC contamination in its soils and groundwater aquifers, as a result of the dumping of toxic chemicals by many industrial properties, such as auto wrecking yards, plating shops, and waste processing facilities, all of which have exposed residents to toxics-related health impacts. East Palo Alto's residents are highly vulnerable to sea-level rise and other climate-change impacts, which would exacerbate East Palo Alto's existing environmental issues.

PAC REPRESENTATIVE

Tameeka Bennett is the executive director of YUCA and is an experienced organizer and lifelong East Palo Alto resident. As a youth, she was involved with the East Palo Alto Youth Commission. She holds fond memories of what the commission was able to accomplish and credits the group for rallying the organizer inside of her. During her senior year of high school, she was a youth leader with Peninsula Interfaith Action. After a year as a youth organizer, she was hired as its regional campaign organizer, leading housing campaigns and organizing many congregations along the Peninsula region. Bennett joined the YUCA family in 2011. She formerly co-coordinated all leadership development activities and still serves as the main campaign organizer with its environmental justice and affordable housing campaign. She is also a member of a host of commissions, committees, and boards dedicated to making a difference in the areas of climate change, social and environmental justice, affordable housing, youth leadership development, and racial justice. She is the co-founder of a nonprofit called Rebooting History, a documentary effort to record East Palo Alto's history and lift up the stories of those fortunate enough to experience what was once known as Ravenswood High School (East Palo Alto's only public high school, closed in 1976).

Pacific Institute
654 13th Street, Preservation Park, Oakland, CA 94612
510-251-1600 | info@pacinst.org | pacinst.org

ISBN-13: 978-1-893790-73-5