

California State University, San Bernardino

CSUSB ScholarWorks

Geography and Environmental Studies Faculty
Publications

Geography and Environmental Studies

2020

Participatory Water Resource Management: Advancing Engagement in Disadvantaged Communities across the Santa Ana River Watershed

Jennifer B. Alford

California State University - San Bernardino, jennifer.alford@csusb.edu

Follow this and additional works at: <https://scholarworks.lib.csusb.edu/geog-enviro-publications>



Part of the [Environmental Studies Commons](#), [Geography Commons](#), and the [Water Resource Management Commons](#)

Recommended Citation

Alford, Jennifer B., "Participatory Water Resource Management: Advancing Engagement in Disadvantaged Communities across the Santa Ana River Watershed" (2020). *Geography and Environmental Studies Faculty Publications*. 2.

<https://scholarworks.lib.csusb.edu/geog-enviro-publications/2>

This Unpublished Paper is brought to you for free and open access by the Geography and Environmental Studies at CSUSB ScholarWorks. It has been accepted for inclusion in Geography and Environmental Studies Faculty Publications by an authorized administrator of CSUSB ScholarWorks. For more information, please contact scholarworks@csusb.edu.

Participatory Water Resource Management: Advancing Engagement in Disadvantaged Communities across the Santa Ana River Watershed

SANTA ANA RIVER WATERSHED, CALIFORNIA
PROPOSITION 1 INTEGRATED REGIONAL WATER MANAGEMENT
DISADVANTAGED COMMUNITY INVOLVEMENT PROGRAM

2018-2019 FINAL REPORT



Jennifer B. Alford, Phd Lead Author, Editor

with research support and contributions from
California State University San Bernardino, Native Listening Session Team
California State University Fullerton
California Rural Water Association
Local Government Commission, Riverside
Santa Ana Watershed Project Authority (SAWPA)
University of California, Irvine

Table of Contents

Chapter 1	Developing Watershed Collaboration.....	pg. 5
	1.1 An Innovative Approach to Community Engagement.....	pg. 6
	1.2 Framework for Collaboration.....	pg. 7
Chapter 2	Collaborative Approaches to Community Engagement (Methods).....	pg. 9
	2.1 Engagement Strategies: Year 1.....	pg. 9
	2.1.1 Geospatial Analyses to Locate the Ideal Site	
	2.1.2 Application of Geographic Information Systems	
	2.2 Community Engagement Strategies.....	pg. 23
	2.2.1 Defining Stakeholders	
	2.2.2 Listening Session Methods	
	Methods Example: Native, Tribal, Indigenous Listening and Feedback Sessions	
	2.3 Project Partners Community Outreach and Engagement.....	pg. 26
	2.3.1 Water Agencies Engagement Strategies	
	2.3.2 Mutual Water Companies Engagement Strategies	
	2.3.3 Elected Leaders Engagement Strategies	
	2.3.4 Community Members Engagement Strategies	
	2.3.5 Native, Tribal and Indigenous Communities Engagement Strategies	
Chapter 3	Community Listening Session Findings.....	pg. 30
	3.1 Watershed Stakeholder Needs and Strengths Perspectives.....	pg. 30
	3.1.1 Water Agencies Needs and Strengths Assessment Findings	
	3.1.2 Mutual Water Companies Needs and Strengths Assessment Findings	
	3.1.3 Elected Leaders Needs and Strengths Assessment Findings	
	3.1.4 Community Members Needs and Strengths Assessment Findings	
	3.1.5 Native, Tribal and Indigenous Community Listening Sessions Findings	
	3.2 Regional Spatial Analysis of Watershed Strengths and Needs.....	pg. 41
	3.2.1 Central Region	
	3.2.2 Eastern and Southeastern Region	
	3.2.3 Northern Region	
	3.2.4 Southwestern and Western Region	
Chapter 4	Evolving Solutions.....	pg. 48
	4.1 Technical Assistance and Criteria for Projects	
	4.1.1 SAWPA DAC Project Submission and Evaluation Process	
	4.2 Community Centered GIS Toolkit.....	pg. 51
References.....		pg. 55
Appendices.....		pg. 56
	Appendix A - Partnership Profiles	
	Appendix B - Nonprofit Organization Outreach	
	Appendix C - GIS Database Tabular Data	

Figures

Figure 1. CA Department of Water Resources Disadvantaged Communities Mapping Tool pg. 10
Figures 2a and b. Various Census Level Polygons or Units.....pg. 11
Figure 3. The Vertical Dimension is Income Level.....pg. 14
Figure 4. DAC Census Tracts, by the median household income criterion..... pg. 17
Figure 5. DAC Census Block Groups. Same income criterion but applied at the
block group-level.....pg. 18
Figure 6. Wrongly labelled DAC Block Groups. Block groups.....pg.19
Figure 7. Illustrates a zoom-in view of the geographic distribution of pockets of
mistaken classified areas.....pg. 20
Figure 8. Distribution of population with poor, or no, English language ability.....pg. 21

Figure 9. Defined Watershed Regions Based on Listening Session Reporting.....pg. 21
Figure 10. GIS Toolkit displaying a water report related to the City of Upland.....pg. 52
Figure 11. GIS Toolkit illustrating the 20 K-12 programs provided by the Elsinore Valley Municipal
Water District.pg. 53

Tables

Table 1. Varying Results of Identified disadvantaged communities using Census Block Groups
verse a Tract Level Geography.....pg. 15
Table 2. DACs by Various Census Geographies.....pg. 22
Table 3. County Population by Ethnicity or Race.....pg. 22
Table 4. DAC Demographics by County.....pg. 22
Table 5. Examples of Community Based Questions.....pg. 25
Table 6. Examples of Water Centered Questions.....pg. 25
Table 7. Perspectives from Cahuilla and Urban Tribes: First Listening Session Strengths,
Weaknesses, and Needs Statements.....pg. 38
Table 8. Categorical Results of Listening Session Themes #1 Analysis: Cahuilla and Urban
Tribes.....pg. 38
Table 9. Tongva Native Listening Session Strengths, Weaknesses, and Needs
Statements.....pg.39
Table 10. Categorical Results of Listening Session #1 Analysis: Tongva and Urban
Themes.....pg.40

Acknowledgements

Chapter 1

Developing Watershed Collaboration

The Santa Ana River (SAR) Watershed is the largest, most populated and fastest urbanizing watershed in Southern California, draining an estimated 2,700 square miles of diverse landscape and hydrological features (WEF 2018). Headwater streams of the SAR Watershed are located in the San Bernardino National Forest near Big Bear Lake, the San Gabriel Mountains, and the San Jacinto Mountains. These streams traverse the coastal sage habitat through numerous water infrastructure features in the Inland Empire before terminating into the Pacific Ocean at the City of Huntington Beach. Groundwater resources, seasonal rains, and snowmelt provide a small fraction of the water resources needed to sustain the estimated 5.9 million residents living in the watershed. To augment limited local water supply, the SAR Watershed imports water into the region from Northern California and the Colorado River (USGS 2018, SAWPA Report Chapter 3, 2010). With recent drought conditions and a growing population, community stakeholders and the Santa Ana Watershed Project Authority (SAWPA), a leading regional water agency, are exploring innovative ways to manage water resources that support both human and ecological activities.

Historically, the watershed landscape was dominated by chaparral and coastal sage scrub with large scale agricultural production focused on citrus, orchards, and viticulture. Over the past several decades the landscape has rapidly transitioned from forest and agricultural land to urban and suburban land that is largely characterized by sprawling buildings, roads, and other forms of impervious surfaces (SAWPA Chapter 3 Report, 2018). This has resulted in widespread habitat fragmentation that threatens the native and endangered species that occupy these transitioning landscapes. The loss of vegetation cover and increase of impervious surface also reduce the watershed's capacity to sustain local water resources. The cultural configuration of the basin includes Indigenous communities, European settlers, Spanish and Mexican ranchers, and immigrants of Asian descent who have all historically occupied portions of the river basin and continue to do so today (AIIA, 2018).

The SAR Watershed is expected to continue current human population growth trends and related development from an estimated 5.9 million people in 2010 to 9.9 million people by 2050. In addition to the rapid population growth, communities within the SAR Watershed contain some of the State's poorest residents with per capita income 25% below the state average (SAWPA Chapter 3 Report, 2018). The California Department of Water Resources (DWR) Economic Distressed Areas Mapping Tool also confirms multiple urban and rural communities within this watershed as having median household income (MHI) below 85% of the statewide MHI (DWR, 2018). These socio-economic indicators often mean that both residents and the communities in which they reside have limited resources to tackle community needs such as providing adequate social programs, jobs, infrastructure, and natural resources management.

To spatially identify and designate communities by socioeconomic factors, the California Environmental Protection Agency (CalEPA), following Senate Bill 535 (De Leon), developed the California Communities Environmental Health Screening Tool, CalEnviroScreen. This tool identifies communities that are burdened by various pollution sources and are susceptible to adverse health effects from exposure while taking into consideration socioeconomic characteristics and underlying health conditions. CalEnviroScreen score is calculated by combining all indicator scores such as: exposures to pollution, environmental conditions, population sensitivity, health conditions, and socioeconomic factors for the generation of a final score. This assessment system allows for comparison of different regions and communities in the entire California. Higher scores mean greater pollution burdens and population vulnerability. Using a census tract scale, CalEnviroScreen determines communities that score at or above

the 80th percentile and designates them as “Disadvantaged Communities” (OEHHA, 2018). This designation method is widely utilized by multiple resource agencies across California, including the Department of Water Resources (DWR) and the SAWPA to assist and provide resources to disadvantaged communities in relation to air, soil, food, and water resources.

1.1 An Innovative Approach to Community Engagement

The California Disadvantaged Communities Involvement (DCI) Program is designed to provide extra support to those funding areas serving large populations of individuals who meet the State of California’s definition of “disadvantaged community” (DAC): “a community with an annual median household income that is less than 80 percent [\$51,026] of the Statewide annual median household income [\$63,783]” (Water Code §79505.5). This definition is solely based on MHI and does not accurately reflect other metrics such as quality of education and public services, which may designate a community as “in need.” Nevertheless, in water-system-services terms, disadvantaged communities are considered to be underserved and chronically excluded from watershed planning processes. The MHI definition to identify disadvantaged communities is also used by DWR and the State of California to specify distinct funding instruments available for projects in those communities.

In June of 2017, SAWPA, with the California State University (CSU) Water Resources and Policy Initiatives (WRPI), University of California Irvine (UCI), California Rural Water Association (CRWA), the Local Government Commission (LGC), California State University Fullerton (CSUF), and CivicSpark Water Fellows providing additional project management and expertise (Appendix A), entered into a \$6.3 million agreement with DWR. The agreement charged SAWPA and their partners with identifying the strengths and needs of disadvantaged communities within the Santa Ana River Watershed, as seen through the different lenses of community members, elected officials, and water agencies. The DCI Program in the Santa Ana River Watershed includes three program elements, each of which links to, relies on, and complements the others:

- (1) **Strengths and Needs Assessment.** The identification of strengths and needs will provide an understanding of watershed communities based on how those community members inform project partners, ensuring that the insights of community members are honored and driving the project goals. The activities of this effort focus on project partners listening and learning from members of the watershed through interviews and listening sessions.
- (2) **Engagement and Education.** Outreach activities will build a bridge of familiarity between decision-makers and community members. Water managers and interested partners will learn about the communities of the watershed and the strengths and needs of those communities. In turn, communities will learn about water management processes and about how their participation can bring needed change to their communities. Through facilitated events where learning, networking, and engagement are core principles, the social fabric of the watershed will be strengthened to benefit water governance and community resilience.
- (3) **Project Development.** This program element will ensure that solutions to previously documented needs in (1) and (2) are being advanced. It also ensures that newly discovered water-management needs within disadvantaged or underrepresented communities have solutions identified and are given every opportunity to achieve future implementation funding. By documenting the findings, lessons learned, and next steps of the DCI Program, the region will have a roadmap to stay engaged with members of overburdened and underrepresented communities while continuing to address their needs.

When complete, this three-year project will inform new watershed-project funding and may be further developed to provide a model for water agency pre-planning inclusion, education, and responsiveness (Brooks et al, 2018).

[1.2 Building a Framework for Collaboration](#)

Public planning agencies play a fundamental role in the organizing of civic society, and an equitable planning process should adequately reflect the needs of the communities being served. Historically, resource agencies have assumed a role as “experts” by identifying problems through the lens of their own internal missions and goals, seeking only to engage community members once a need, and subsequent project, have been identified. This limited view can restrict the public’s ability to inform decision makers regarding what they see as their own community’s strengths and needs. As a result of the exclusion of community input, community planning often fails to ensure adequate consultation and transparency during the project identification, design, and implementation stages. Engaging communities often requires multiple approaches that are mindful of the social, economic, and environmental factors that characterize diversity within a given location.

One approach that prioritizes these constraints is the use of ethnography—the qualitative, holistic analysis of human social experiences through the lens of those living within an identified social or physical environment (i.e. community based research). Ethnography includes on-site learning that allows researchers to document participants’ knowledge about issues relevant to their community and in their own terms. Tools typically used by civic ethnographers, such as open ended interview questions, surveys, focus groups, and community meetings, help inform the decision making process by creating a collaborative platform in which community members interact with decision makers and other stakeholders to develop strategies that meet both local and regional needs. The value of ethnography is not just associated with its ability to understand people within the context of their own environments, but it also has the potential to help reframe the policymakers’ and government’s relationship with the communities they serve. In addition to listening to and engaging community members, geographic applications have been coupled with ethnography (i.e. ethnogeography or participatory geographic information systems) to determine how themes identified by different communities vary at a local and regional scales (Brown et al. 2017). This is done through the use of various spatial analyses, including Geographic Information System (GIS), which create interactive maps that project information gained from ethnographic processes. As a result, community members and researchers are both contributing to and learning from each other, while also understanding how communities differ or align geographically (Jankowski 2009).

In order to better understand where certain community generated needs and strengths related to water resources are identified, this project included various spatial data to identify community characteristics including the following: the geographic location of community organizations that serve and interact with DACs, location of water agencies service boundaries, water quality data and related trends across the watershed, community resources (i.e. education materials) and socio-economic data such as income, education, housing, and employment factors. To ensure data aligned with Department of Water Resources (DWR) program goals and objectives, project partners (Appendix A) compared collected data with [DWR Disadvantaged Communities Mapping Tool](#) to gain a deeper understanding of DAC locations and socioeconomic characteristics. Incorporating this information allowed project partners to develop a baseline knowledge about communities so that appropriate partnerships with community organizations could be developed. For example, if a community was identified as having poor water quality, local organizations familiar with this topic were contacted to see if they could assist project partners with holding community meetings and events. Although this process seems direct in nature, it requires a specific methodological approach so that project partners working in communities to identify community “needs” and “strengths” accurately document statements expressed by those living in such communities.

In recognizing the diversity of communities across the Santa Ana River Watershed, and by understanding that community members are the true experts of their environments, this project attempts to document the strengths and needs of communities and empower individuals with knowledge so that they are able to align needs with resources to create and sustain a more resilient and collaborative approach to water

resource management. Project partners hope to introduce civic ethnogeography as a now widely accepted method for mobilizing regional resources and local knowledge in improving communities. From this work, water agencies, community organizations, and citizens can work together to begin crafting policies and programs that accurately reflect the strengths and burdens of communities across the watershed.

Chapter 2

Collaborative Approaches to Community Engagement (Methods)

The DCI Program hopes to “flip the script” on how water agencies interact with communities to resolve issues related to water management at the local and regional scales. Historically, planning and implementation processes carried out by water agencies have lacked public input regarding what they see as their own community’s strengths and needs. Public comment periods are often short and poorly publicized, and the power dynamics between elected officials, resource agencies, and community members do not necessarily encourage and facilitate collaborative planning. In order to reduce barriers to community participation, this project utilized an approach that will henceforth be referred to as “ethnogeography” when both processes (i.e. ethnography and geography) are represented as strategies and methods for engagement. It’s important to note that both ethnography and geospatial analyses have operated within the scope of civic engagement before; what’s novel in this approach is the unison of the two disciplines and the recognition that water needs of disadvantaged, overburdened, and underrepresented communities are more easily understood when the public has an easily navigable and recurring pathway to voice opinions to decision makers.

[2.1 Engagement Strategies: Year 1](#)

The diversity and breadth of the Santa Ana River Watershed presents various opportunities for collaboration when it comes to regional water planning. In order to determine the relevant community groups to sample during community listening sessions, nonprofit organizations whose work engages with disadvantaged communities in the Santa Ana River Watershed were identified. These organizations have established relationships with various community members including elected officials, residents, and local business owners. Tapping into these preexisting networks enabled efficient and effective outreach strategies to be implemented and resulted in a deeper understanding of the complex challenges that communities across the Santa Ana River Watershed are up against.

[2.1.1 Geospatial Analyses to Locate the Ideal Site](#)

The rationale behind choosing to work with the selected organizations associated with or working with one or more of the following factors, in addition to the organizations being located within or serving DAC related to:

- Vulnerability (i.e. lack of access to public resources, lack of resilience to economic changes, etc.)
- Underrepresented (e.g. Tribal communities and homeless)
- Underemployment
- Mentally Disabled Populations
- Elderly Populations (> 65 years)
- Homelessness
- Victims of hunger and poverty (Food scarcity; food deserts)
- Conservation projects that focus on the environment and or water resources

Since many of these organizations intersect with multiple communities, they embody a more representative population sample. In certain regions, more organizations were willing to assist with listening sessions than others. Those that were more likely to support the listening sessions consisted of environmental organizations, cultural alliances, community shelters, and other community organizations interested in environmental justice issues. Appendix B highlights the 33 organizations contacted. Of these, seven agreed to hold sessions and schedule community meetings. The remaining non-profits

contacted that responded indicated they did not have staff available or they did not respond to multiple requests to participate.

In addition to local outreach, DWR's Disadvantaged Communities Mapping tool (Figure 1) was used to identify disadvantaged communities across the three counties in the watershed (Orange County, Riverside County, and San Bernardino County). Within the mapping tool, disadvantaged communities were categorized into two block groups as defined by California law:

- **Disadvantaged Community:** defined as households making less than 80% of state median household incomes
- **Severely Disadvantaged Community:** defined as households making less than 60% of state

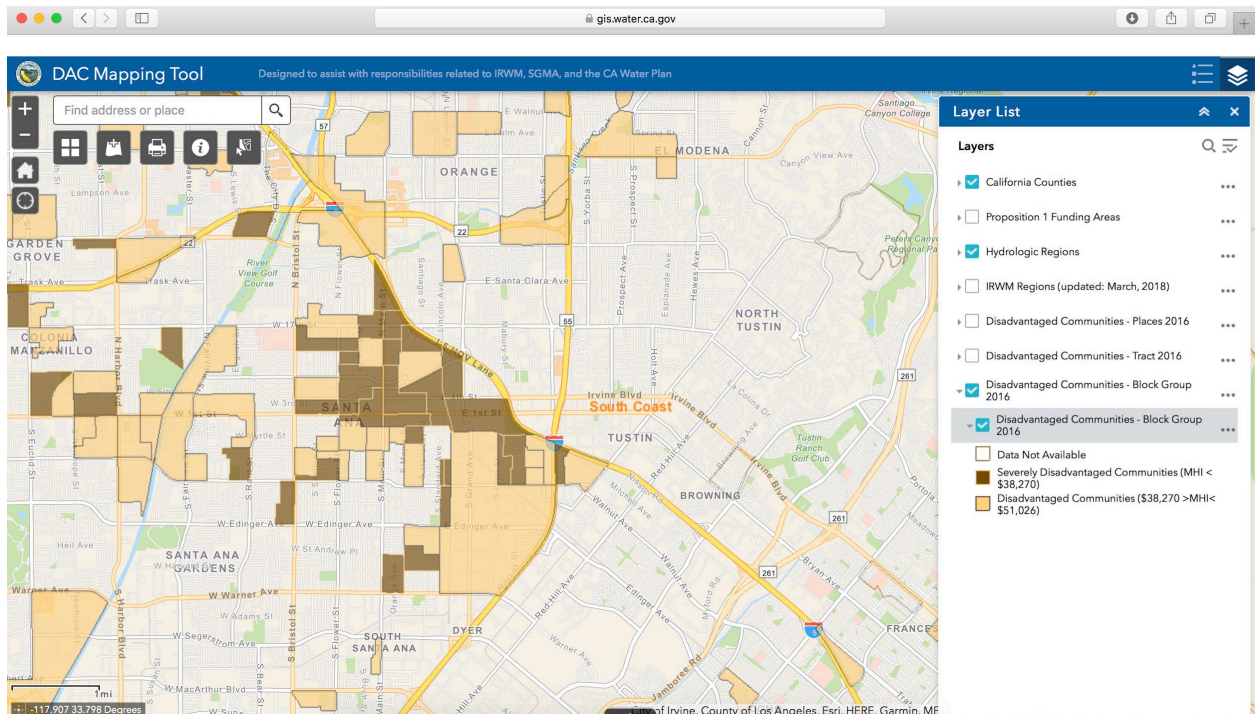


Figure 1. CA Department of Water Resources Disadvantaged Communities Mapping Tool

This mapping tool was useful in identifying the geographic locations of DACs in relation to DAC thresholds (i.e. 60%-80% below state MHI), their spatial relationships to Proposition 1 funded areas, hydrologic regions, municipal boundaries and IRWM Regions. However, this tool was limited in assisting project partners with understanding specific characteristics about these DACs including demographic data, water quality and related community resources. To mitigate these deficiencies, CSU WRPI conducted additional analysis using GIS to understand the location and characteristics of DACs located within US Census polygons or units. This resulted in a framework to conceptualize and develop a GIS Toolkit that evolves the DWR's DAC Mapping tool to spatially relate water provider boundaries with DACs. Aligning water providers with DAC communities offers an opportunity to support stakeholders in becoming more informed as to how water resources are managed, while simultaneously creating an avenue to provide DAC communities with knowledge and opportunities to formulate collaborative water resource management programs and policies.

2.1.2 Application of Geographic Information Systems

To understand and spatially illustrate the socioeconomic characteristics of the SAR Watershed and relate them to water service agencies, GIS software and data from multiple regional and federal agencies were collected to determine spatial relationships between DACs and water service agency boundaries so that these stakeholders could better understand the characteristics of the communities in which they interact. GIS is a powerful computer software tool that can be used to develop, store, analyze, and spatially display complex sets of data and information including the natural resource, socio-economic and utility provider characteristics of a given location. Ultimately, different sets of data can be displayed or “layered” on top of one another to produce content-specific maps, allowing users to visually interpret what would otherwise be a large spreadsheet of numbers and figures. As a starting point for project partners to understand more about the data that “represents” the priority communities identified by the DWR DAC Mapping tool, the CSU WRPI team began to conceptualize and develop a robust GIS mapping tool that was created in tandem with the ethnographic components of the project methods.

As a starting point, The US Census Bureau shapefiles were downloaded and imported into GIS to represent census tracts, block groups and blocks (Figures 2) to determine the location, population demographic and socioeconomic factors of communities across multiple geographic scales. As illustrated in Figure 2 below, tracts are inclusive of both blocks and block groups. While census units are typically used in the social sciences and by governmental agencies, they do not provide detailed information about smaller communities within these units, such as DACs. One of the challenges to identifying smaller DACs within these Census units is the challenge of how to develop a subset of a Census block. This is of particular interest to this project because DACs can be within a Census block that is masked by the fact that a majority of the Census block may be classified with a higher median household income. The proceeding section is an attempt at resolving this highly complex issues that all DACs, regardless of size or geographic reach are identified and represented.

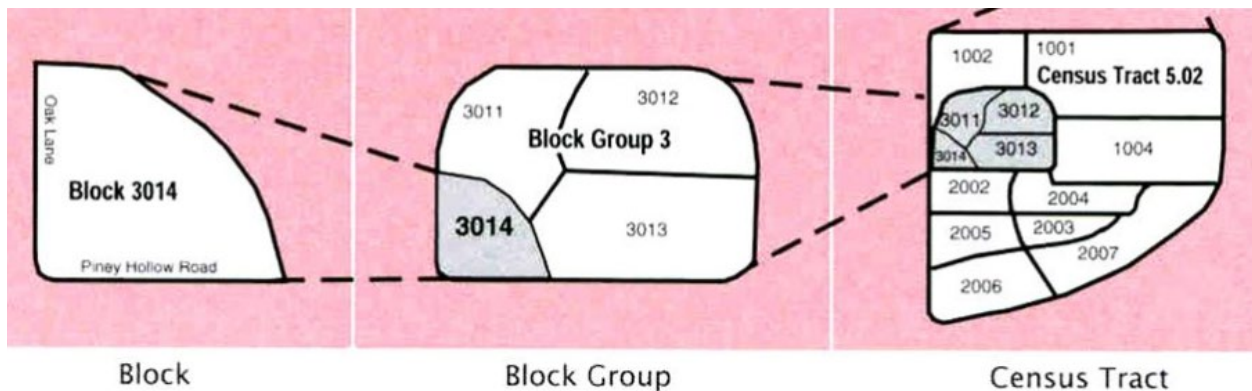


Figure 2a. Various Census Level Geography of Block, Block Groups and Tracts.
Source: University of Pittsburgh, 2019.

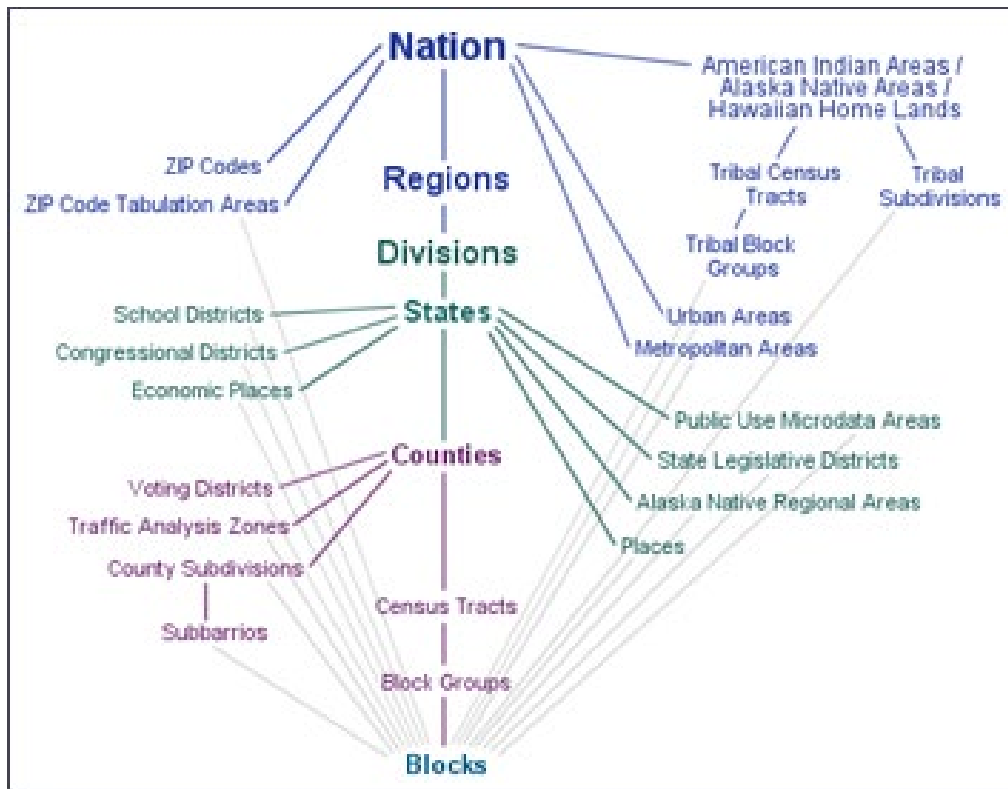


Figure 2b. Various Census Level Geography Hierarchy.
Source: University of Pittsburgh, 2019.

To spatially illustrate and accurately reflect the socio-economic attributes of both urban and rural communities within the SAR Watershed, both census block and block group level boundaries downloaded from the [US Census Bureau's](#) digital file and digital water service agency boundary files downloaded from the [California Environmental Health Tracking Program's Drinking Water Systems Geographic Reporting Tool](#) were imported into the GIS workspace. To identify socio-economic characteristics, Census blocks represent the smallest geographical area for which the US Census Bureau collects and tabulates data and the Census Block Group level boundaries represent the next geospatial level above census blocks. Block Level is the smallest geographical entity for which the Census published 10-year data. To estimate population data between this 10-year period, the Census also tabulates and releases the American Community Survey which consist of 5-year estimates (Census Blocks, 2018). The 2016 five-year estimates of household counts within a given income interval (i.e. \$50,000 to \$59,999) (Table B19001) were downloaded from the [Census Bureau's American Factfinder](#) data extraction portal (Census Factfinder, 2018).

The American Community Survey 2016 five-year estimate for California statewide median household income is \$63,783. The 80% threshold is thus \$51,026 and 60% is \$38,270. Water agencies with a custom base estimated median household incomes below these thresholds qualify as disadvantaged and severely disadvantaged, respectively. Because the income interval breaks used for Table B19001 do not match the 80th and 60th percentiles of state median income, you have to proportionally assign people counted in the income intervals that straddle these

boundaries to one side or the other of the boundaries (see below for more details). The resulting income points from these procedures were imported into ArcGIS along with the Census Tiger files for block groups. This enables the estimated values for income to be overlaid onto the census block groups to identify the geographical location of where households falling within this income bracket are located within water agency service boundaries. The final step was to estimate the percentage of disadvantaged communities and severely disadvantaged communities within each water agencies service area. This was done by taking the ratio of the count estimates below the disadvantaged communities and severely disadvantaged communities thresholds (numerators) to the weighted and summed population estimates (denominators) to get the estimated percentage of each public water provider agencies population below the disadvantaged and severely disadvantaged communities thresholds.

To accomplish this goal the following procedures were followed:

1. Download water agency digital service area boundary files from the California Environmental Health Tracking Program's Drinking Water Systems Geographic Reporting Tool, also known as the Water Boundary Tool (WBT) at <http://www.cehtp.org/water/>.
2. Download Census block group level digital boundary files from https://www.census.gov/geo/maps-data/data/cbf/cbf_blkgrp.html
3. Download block group level American Community Survey 2016 five-year estimates of household counts within income intervals (Table B19001) using the Census Bureau's American Factfinder data extraction portal at: https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_16_5YR_B19001&prodType=table

It is recommended that the following steps be completed in an Excel file that can then be converted to a GIS shape file or feature class.

- Note that relevant California law and regulations define disadvantaged communities as those with <80% of state median household income and severely disadvantaged communities as those with <60% of state median household income. The American Community Survey 2016 five-year estimate for California statewide median household income is \$63,783. The 80% threshold is thus \$51,026 and the 60% threshold is \$38,270. Water agencies with estimated median household incomes below these thresholds qualify as disadvantaged and severely disadvantaged, respectively.
- Because the income interval breaks used for Table B19001 do not match the 80th and 60th percentiles of state median income, you have to proportionally assign people counted in the income intervals that straddle these boundaries to one side or the other of the boundaries. For example to estimate the population at or below income threshold M if you have a count interval that runs from Q to R:

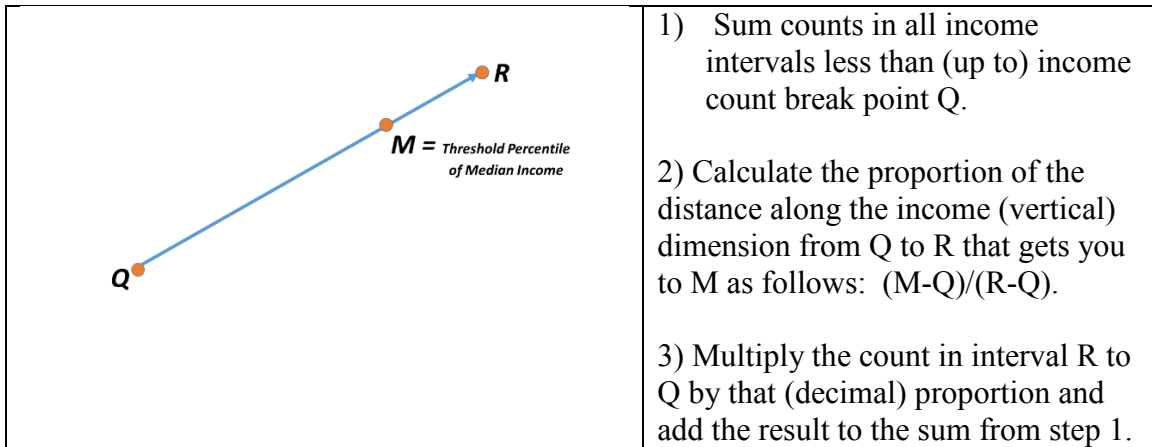


Figure 3. The vertical dimension is income level, the horizontal dimension is the cumulative count

As a result, for the 80% of state HMI threshold of \$51,026, you first subtotal the counts in all the categories below \$50,000. Then you estimate the proportion of the \$50,000 to \$59,999 count that falls between \$50,000 and \$51,026 as:

$$\$51,026 - \$50,000 = \$1,026$$

$$\$59,999 - \$50,000 = \$9,999$$

$$\$1,026 / \$9,999 = .1026$$

Next, multiply the count for the interval \$50,000 to \$59,999 by .1026, add that amount to the subtotal of counts below \$50,000 and you have your estimated population below the threshold. Apply same computation for all block groups, then repeat using the SDAC threshold.

4. Download digital georeferenced street network data (line objects) as TIGER/Line shapefiles from the U.S. Census Bureau geography website at <https://www.census.gov/cgi-bin/geo/shapefiles/index.php>
5. Re-project all geographic files to NAD 1983 State Plane California Zone V.
6. Load everything into an ArcMap project and join the income table fields to the block group boundaries.
7. Create intersections (areas of overlap) of block groups and water agency areas, save as a feature class.
8. Merge source zone (block group) total population counts and interpolated count estimates of source zone populations below DAC and SDAC thresholds into these intersection zone records (one to many).
9. Create subsets of the street network within (corresponding to) both the block groups and the block group/water area intersection zones (use identity tool to chop up the street layer in this manner).
10. Compute aggregate (total) lengths for the street networks in each block group and each intersection zone.

11. Calculate the street weights (W_{st}) for each intersection zone as the ratio of the aggregate length of the street vectors in the intersection zone (L_{st}) to the aggregate length of the street vectors in the source zone (L_s):

$$W_{st} = \frac{\sum L_{st}}{\sum L_s}$$

12. Weight the source zone (block group level) total population and household counts below income thresholds that are attached to the intersection zones: multiply by the intersection zone street weights computed in the previous step.
13. Sum the weighted intersection zone counts across their corresponding target zones (water agency service areas).
14. For the water agency service areas, take the ratio of the count estimates below the DAC and SDAC thresholds (numerators) to the weighted and summed population estimates (denominators) to get the estimated percentage of each water agency's population below the DAC and SDAC thresholds.

The California DCI Program encourages the involvement of underrepresented communities in regional planning. DWR published two disadvantaged communities lists in its Disadvantaged Communities Mapping Tool, one for Census Tracts and the other based on Block Groups. This memorandum documents the scale sensitivity of those two lists. Using the American Community Survey five-year data published for 2016, the Census Tract and Census Block Group income data for the five counties in our study area using the 80% Statewide Income level (ACS 2016 CA MHI, \$63,783) were compared to classify the geographies at these two scales, separately.

Table 1. Varying Results of Identified disadvantaged communities using Census Block Groups verse a Tract Level Geography.

	Num of Tracts	Num of Block Groups	Population	Households
Tract-level Classifier	824	3,791	6.634M	2.174M
Would not be included (if by BG)		629	966,262	302,783
Would be included (if by BG)		902	1.324M	469.396

Based on the 2016, five-year ACS the following community household (hh) income characteristics were identified across the SAR Watershed (also see Table 1).

There are

- 10,800 block groups, 6,375,740 households, and 18,463,122 persons in the project study area.
- 3,791 disadvantaged communities block groups, by tract-level classifier, containing 2,174,997 hh, and 6,634,343 persons.

- Of these there are 629 block groups (302,783 hh, 966,262 persons) which are classified as disadvantaged communities (by tract-level classifier) even their block group level MHI is above the disadvantaged communities threshold.
- There are additionally 902 block groups (469,396 hh, 1,324,017 persons) that are denied disadvantaged communities classification because their parent tract is above the income threshold.

The following maps are examples of the various spatial context of using different forms of Census Tract Levels (i.e. tracts, block groups, etc.) and how these often do not align with the identification of DACs that may be located within Census geography.

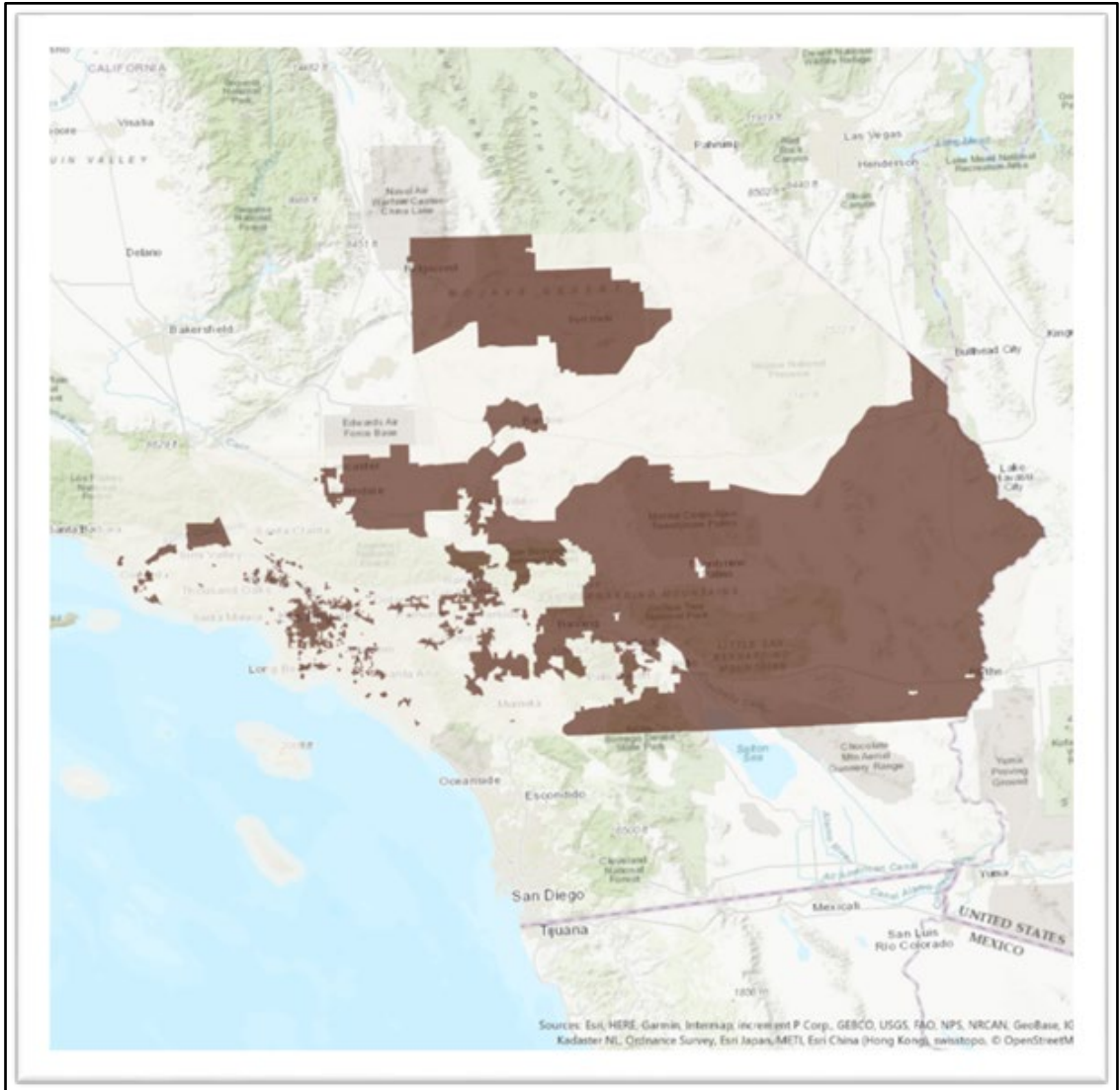


Figure 4. DAC Census Tracts, by the median household income criterion. 824 tracts are classified as DAC, containing 3,791 block groups.

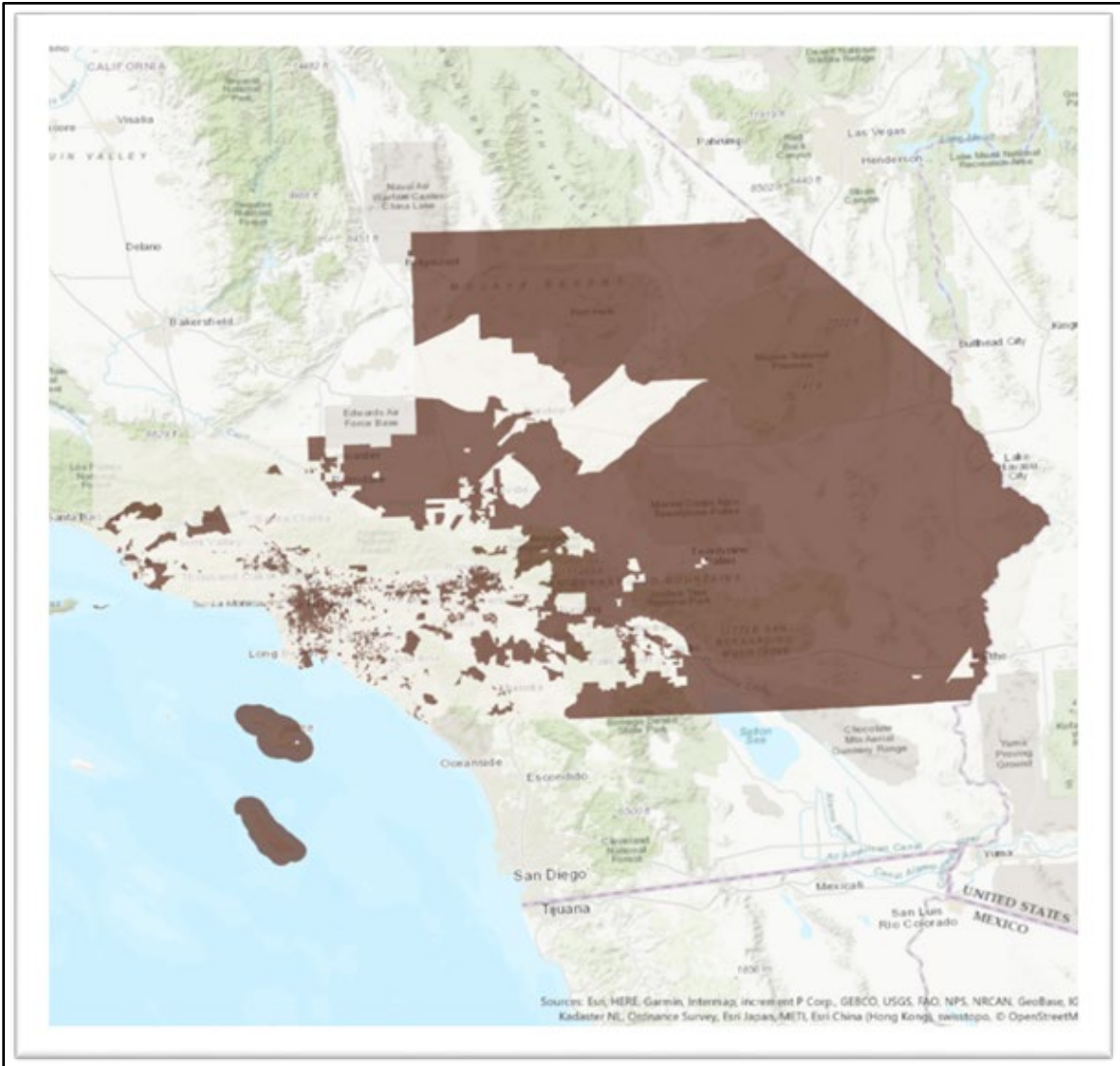


Figure 5. DAC Census Block Groups. Same income criterion but applied at the block group-level. Total 4,064 block groups, spread out within 1,213 tracts.

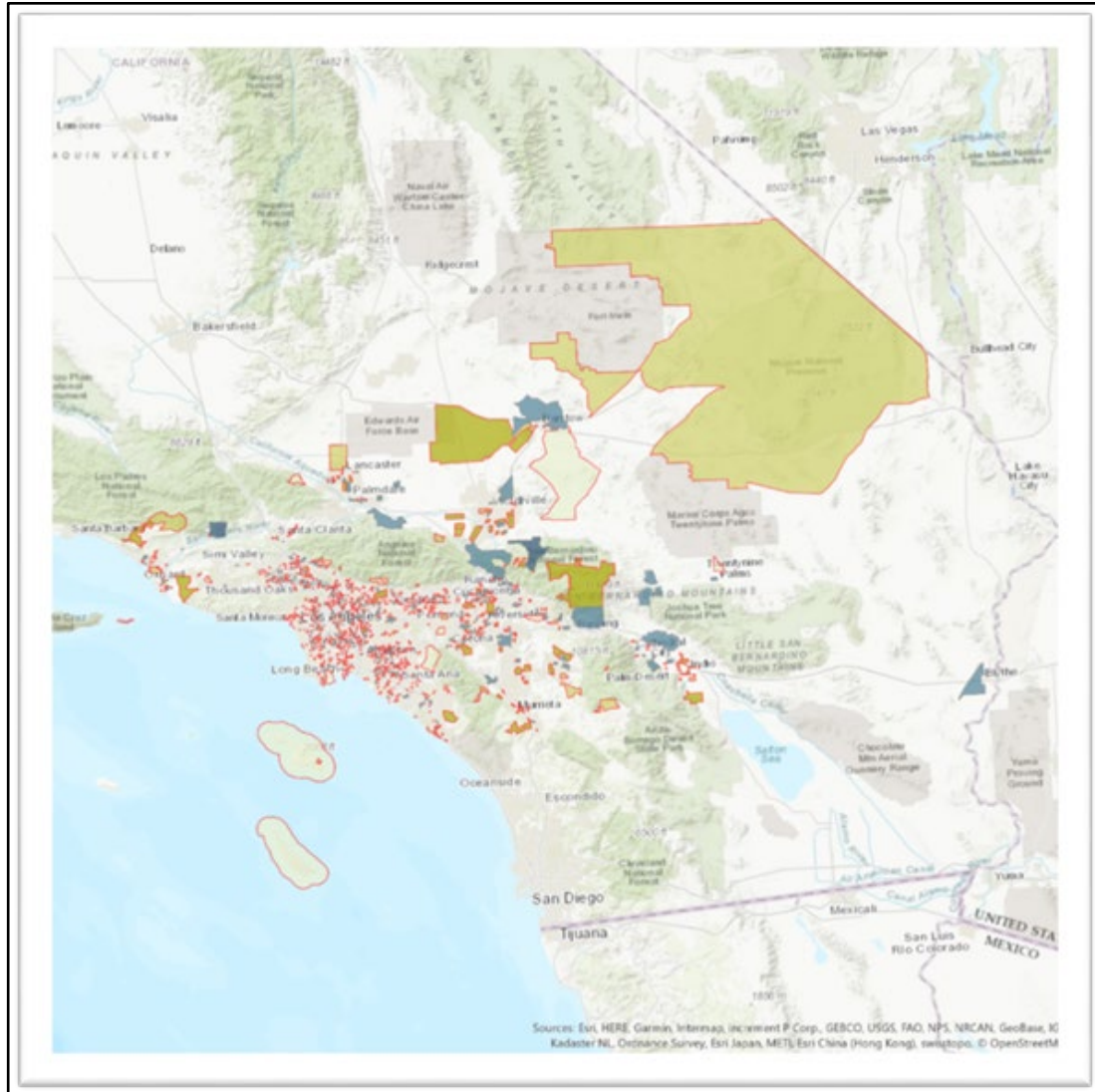


Figure 6. shows the wrongly labelled DAC Block Groups. Block groups in blue are economic enclaves within DAC tracts. Conversely, areas highlighted by red borders are block groups hidden from DAC by wealthier neighbors in the same tract.

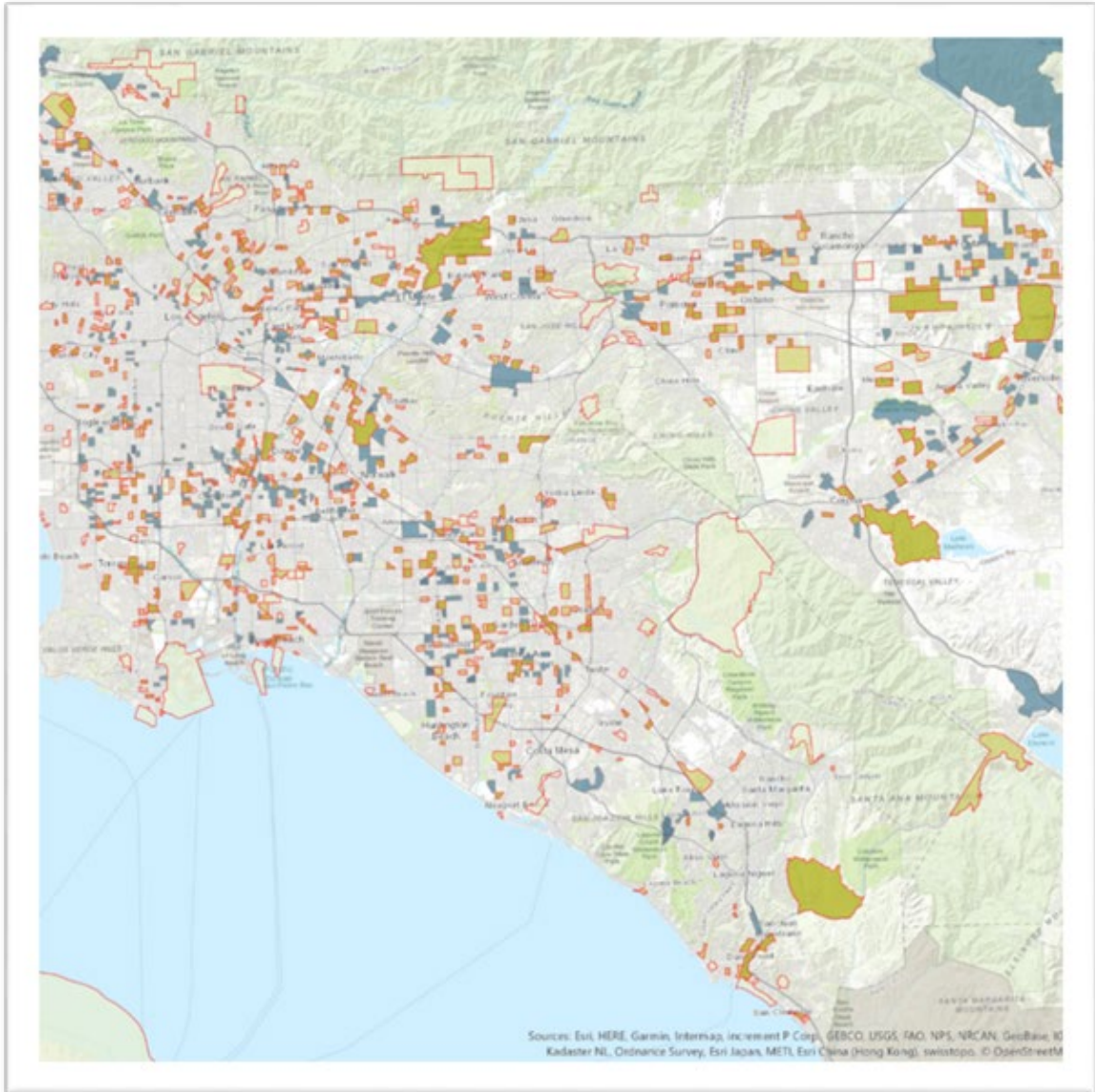


Figure 7. Illustrates a zoom-in view of the geographic distribution of pockets of mistaken classified areas.

For reference, disadvantaged communities classified using the top 25% scoring Census Tracts from CalEnviroScreen can be viewed at the following link <https://gis.water.ca.gov/app/dacs/>. Please note that this link is currently being updated and reflects the latest assessments of disadvantaged communities.

As the mapping tool indicates, there are 2,005 tracts classified as disadvantaged communities for the State, with 1,375 in our study area, the Santa Ana River Watershed. To align these spatial characteristics with the listening session findings, regional strengths and needs of the Watershed were determined and provided in the section below based on identified stakeholder community groups and the resulting community listening sessions.

Another Census data layer which has been instrumental to the project is the language skill data. Below is a map showing the distribution of population with poor, or no, English language ability. Each purple dot

actually represents approximately 20 persons. It is apparent the geographical correlation between English language ability clusters and DAC communities. While a continuous cluster of poor English ability residents in the Anaheim and Santa Ana area, the languages these residents speak at home is predominantly Spanish in Santa Ana and towards South-East Asian further north.

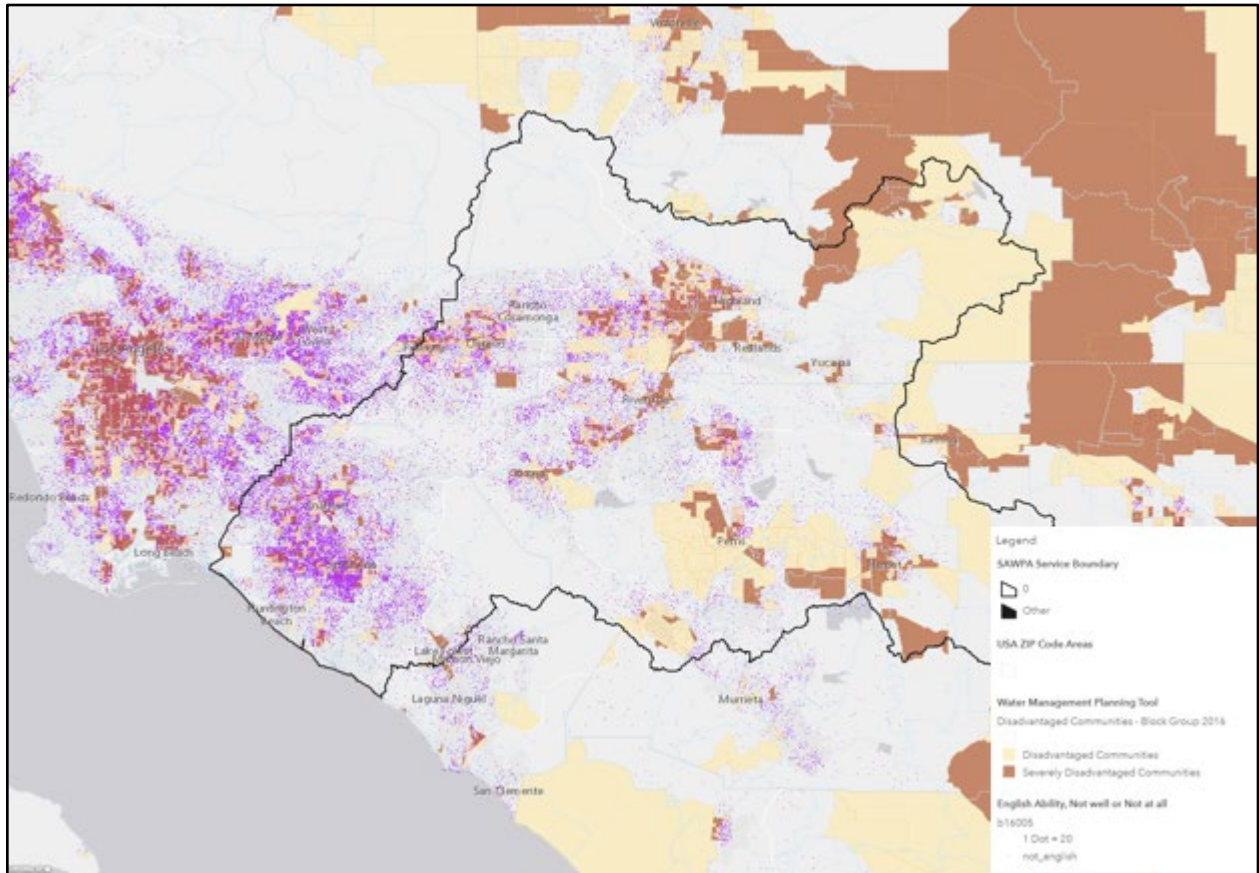


Figure 8. Distribution of population with poor, or no, English language ability.

Additionally, this process allowed for the identification of the number of census tracts at various levels (i.e. tract vs block group) and their specific population characteristics related to race/ethnicity to be extracted and spatially related to DAC and non-DAC areas within the basin (Table 2). Los Angeles County was included in this query since a portion of the city of Pomona is included when watershed boundaries are applied later using the GIS Toolkit (see chapter 4.2). According to the US Census data, Orange County has a total population of 2,626,704 people (Tables 2 and 3), 490 census tracts and 1,508 block groups. Within these tracts there are 494,699 people and 605,2112 within block groups. At the block group census level the percentage of Orange County’s population residing in DACs includes 56% white, 2% black/African American, 0.5% American Indian/Alaskan Native, 19% Asian, 0.5% Hawaiian or other Pacific Islanders, 20% identified as other and 3% identified with two or more ethnicities/races (Table 4).

Table 2. DACs by Various Census Geographies

County Name	Number of Census Tracts	DACs w/in Tracts	Number of Census Block Groups	DACs w/in Block Groups (BG)	Total Households	Total Population	DAC pop by Tracts	DAC pop by BG
Los Angeles	59	12	119	38	69,296	227,090	60,545	68,620
Orange	490	81	1,508	332	873,168	2,646,704	494,699	605,221
Riverside	299	120	685	281	483,667	571,735	581,631	571,735
San Bernardino	286	119	845	383	507,405	644,194	599,028	644,194

Table 3. Population by Ethnicity or Race

County Name	Total Population	White (%)	Black/ African American (%)	American Indian and Alaska Native (%)	Asian (%)	Hawaiian and Other Pacific Islander (%)	Other (%)	Identify with Two or More (%)
Los Angeles	227,090	51	5	1	24	0.3	15	4
Orange	2,646,704	62	2	0.5	20	0.3	11	4
Riverside	1,582,521	62	7	0.9	6	0.3	20	4
San Bernardino	1,593,349	60	7	0.7	7	0.4	21	4

Table 4. DACs within Census Block Group Demographics by County

County Name	Total Population	White (%)	Black/ African American (%)	American Indian and Alaska Native (%)	Asian (%)	Hawaiian and Other Pacific Islander (%)	Other (%)	Identify with Two or More (%)
Los Angeles	68,620	55	6	3	9	0.1	24	4
Orange	650,221	56	2	0.5	19	0.5	20	3
Riverside	571,735	59	7	1	4	0.3	26	4
San Bernardino	644,194	57	9	0.8	4	0.5	25	4

Running queries like the examples presented in Tables 2, 3, and 4 will allow the CSU WRPI outreach staff to gain a deeper understanding of the different characteristics of DAC communities so that programs

and opportunities can be designed that best meet their specific economic, cultural, social, and environmental resource needs.

2.2 Community Engagement Strategies

From 2018-2019, project partners held one-on-one or group interviews to document needs and strengths related to water resources across five subject groups including elected officials, mutual water providers, water agencies, Tribal/Native and Indigenous communities, and lay community members. These interviews focused on strengths and needs, with an ongoing focus on the needs and inequities experienced by the 1.7 million people in the Santa Ana River watershed who live in a state-defined “disadvantaged community.”

2.2.1 Defining Stakeholders

To distinguish between community participant types within DACs, project partners used the following definitions to distinguish these groups in reports, data and other forms of documentation:

- **Tribal, Native, Indigenous Community Members** - To distinguish and describe the differences and similarities among these three community types, the following descriptive identifiers were applied. Tribal is a generic descriptor, like communities, laws, and sometimes policies or as in Tribal Sovereignty as it is used in courts. Native is across the board, but used in Anthropology so broadly that it does not have specificity unless with other terms, such as Americans (Native American), or sometimes practices or products as in foods, social structures, including as individuals (not tribal). Indigenous can be universal and is often used as being from perspectives, from international Native peoples, and as an alternative to tribe but not nation in the Americas. These groups were identified using knowledge from Tribal, Native and Indigenous community members (Personal Communication, Fenelon, 2019).
- **Lay Community Members** -The term "lay" to distinguish non-water or government professionals. "Lay Community Members" was used to designate participants who attended the community-based public listening sessions conducted by CSUF in Year 1 and by UCI Newkirk Center in Year 2. While all of the participants in our project belonged to communities and were asked to respond to our questions from their community perspective, we use "lay" to emphasize that our community-based public listening sessions were intended for people living and working outside the professional governmental or water agency domains (Personal Communication, UCI, 2019).
- **Water Providers/Agencies (Urban Utilities)** - California Water Association (CWA) - Represents the interests of these companies as they strive to provide safe, reliable, high-quality water and excellent customer service in a cost-effective manner (CWA, 2019).
- **Mutual Water Companies (Rural)** - California Rural Water Association (CRWA) - Provide training, technical assistance, resources and information to assist water and wastewater utilities in achieving high standards of service (CRWA, 2019).
- **Elected Officials** - Individuals elected to office by citizens through a voting system. Terms may vary by position and election cycles.

2.2.2 Listening Session Methods

Project partners conducted these interviews using carefully crafted, open-ended questions and prompts posed to all community subject groups; all prompts and questions were designed to elicit narrative responses on broad topics such as “community strengths” and “water stories”. Given the labor-intensiveness of interviewing, for both interviewers and respondents, this simple instrument allows respondents to identify their sense of community membership and perspectives on water issues (see Tables 2 and 3). The instrument provided suggested prompts or follow-up questions to ensure interviewers were able to maintain rapport and to synchronize data collection across subject groups. All

prompts were modified in consultation with the project partners and tailored to fit different community groups and partner needs. Prior to the listening sessions, the CSUSB Internal Review Board (IRB) issued and approved the project methodologies for outreach to community members which includes Native/Tribal communities. UCI also obtained an IRB specific to their outreach to communities and conducting community listening sessions.

The ethnographic advantage of this process is also noteworthy. Posting the same open-ended questions to everyone allowed respondents to speak in a way that was most meaningful for them and allowed respondents to discuss their lived experiences to a greater degree than would have been possible using surveys or limited engagement sessions. Most importantly, the design created an opportunity for respondents to talk about processes, strengths, and needs not already anticipated by SAWPA or other water agencies in the watershed.

Community partners who conducted these interviews took notes during the process and report here on the strengths and needs they identified with their particular subject group:

Community Listening Sessions: CSU Fullerton (year 1)

Water Agency Interviews: SAWPA and CivicSpark

Mutual Water Company Interviews: California Rural Water Agency

Elected Leader Interviews: Local Government Commission

Tribal Community Listening Sessions: CSU WRPI Native Team

The formal listening session was framed by questions (Table 2), and team members collected audio recordings and documented responses and common themes based on participants' responses. Prompts and questions designed to capture and document Native perspectives on water in the Santa Ana River Watershed were similar in nature to those conducted with the general community with a slight modification to the prompt to highlight and recognize how individuals identify with their Native community.

The Native/Tribal sessions varied greatly from the community sessions with respect to protocols including activities, communication, and governance. For example the statement,

“Today, we are asking questions to you as a member of a Native community, in relation to environmental issues, broadly defined”

was used to assist these Native/Tribal members through identifying and acknowledging their specific community. Such procedures are revealed in the documented findings of the Tribal/Native sessions as well (Chapter 3). Procedures typically included one full round of questions presented to the entire group, which once completed supported the identification of themes and interests for smaller break out groups to emerge. This allowed project team members to document more detailed information in an effort to capture specific needs, strengths, and weaknesses related to their communities and various water issues. The sessions typically concluded with an opportunity to share what was discussed in small groups, a brief discussion about the project's next steps, and a closing cultural activity.

The UCI (i.e. lay community member sessions) and the CSU WRPI Native Team (i.e. Tribal, Native, Ingenious sessions) then transcribed and aggregated the recordings and notes, allowing the team to conduct analyses (i.e. NVivo) and compare and contrast responses among these subject groups. By the end of the process, both teams were able to determine community-group similarities and differences as

they relate to identified strengths and needs of their given communities and how these findings were replicated or not across the entire watershed.

Table 5. Examples of Community Based Questions

Opening Question	Community Clarification Prompt	Completion Prompt	Categorical prompt to ensure collection of “strengths” and “needs
“You probably consider yourself to be a member of many communities. Today, we’d like you to think of yourself as a member of the _____ community. Please tell us about your community’s strengths, and what it needs.”	If respondent does not agree with community definition or identification, ask them to explain and use that designation.	Check that respondent answers both parts of the question; repeat as necessary.	“You’ve identified a set of [strengths or needs], can you tell me more about your community’s [strengths or needs]?”

Table 6. Examples of Water Centered Questions

Opening Water Question	Completion Prompt	Completion/Linkage Prompt	Completion Prompt
“We are particularly interested in your perspectives on water issues. Please tell us about water in the _____ community.”	Ask follow-up questions to elicit responses on specific issues, such as water quality, drought, etc.	“Thinking specifically about water, please tell us about your community’s strengths and what it needs.”	“Specific to water, what do you see as your community’s priorities? Are there barriers to accomplishing them? What might help you accomplish them?”

[Methods Example: Native, Tribal, Indigenous Listening and Feedback Sessions](#)

The CSU Native and Tribal Listening Team completed four preview Native informational and presentation events, (2017), three formal Listening sessions (2018), two field-testing sessions, and two follow-up Feedback (formal) response sessions (2019). Collectively, these efforts resulted in over 200 participants. The following outlines the multiple methods and procedures taken to complete initial, field testing and feedback sessions in four stages in multiple Native, Tribal and Indigenous communities in the watershed.

- Stage1: Four Preview Native Informational and Presentation Events, (2017)

Tribal Alliance informational meetings at Torres-Martinez, Cahuilla, and a later post-session meeting at Morongo, with significant interaction at the Tribal Water Summit in Sacramento. These meetings included 100 + participants (some overlap for the Tribal Alliances), buttressed by

formal and informal interviews and rolling discussions with various tribal managers, leaders, and active members at meetings, noting CSU’s two team leaders—Julia Bogany, Luke Madrigal—themselves qualify in these areas as significant contributors as well as facilitators.

- Stage 2: Two Formal Listening sessions (2018)

The first formal listening session was held with the Tongva tribe led with “urban” Native American participants representing the Tongva, which produced significant response and recorded data. The second listening session was Cahuilla led with many other Native/Tribal participants from California and nationally known tribes, producing even more responses and data including cultural water stories. These sessions included at least 40 participants in the two formal sessions, or more than 70+ if counting all sessions as listening. Documentation of recurring statements and themes were analyzed using NVivo software, which allows researchers to import audio and text information into the system. The resulting analysis develops general subject themes (i.e. water, infrastructure, etc.) and frequency in which themes are mentioned. These findings will be presented to Native/Tribal community participants during the feedback sessions (Stage 4).

- Stage 3: Two Field-Testing Sessions

These sessions were designed to collect further data and try out or “field-test” some responsive output and suggestions from listening sessions were conducted at professional office in Temecula, CA (multi-tribal), another held at the University of California Riverside (UCR) under their Policy Institute’s support (Cahuilla and multi-tribal), included some 20+ participants, with cultural perspectives shared informally at Temecula and formally at UCR, and a legal policy breakdowns shared at UCR in a professional presentation.

- Stage 4: Two Follow-up Feedback (formal) Response Sessions

The first formal Feedback-Response (listening) session with Tongva tribal members led with multi-tribal representation including Chumash tribal members, where we presented our “data” findings and elicited direct feedback and suggestions for potential projects. The second Feedback-response session was help with the Cahuilla tribal community members led with multi-tribal participants, where we shared initial analysis output and probable findings, with an excellent formal presentation by a Cahuilla-Apache-tribal woman with emphasis on water and sacred lands. These had about 30+ participants, many tribal leaders, we are still analyzing and presenting informational feedback.

2.3 Project Partners Community Outreach and Engagement

The primary goal of implementing the civic ethnogeographic assessment strategy was to listen to what various stakeholder groups said regarding their communities’ strengths and needs so that findings could be used to inform and direct various policies and to prioritize identified needs. Each project partner was tasked with identifying stakeholder groups that collectively provide a broad representation of the communities in which they reside. This strategy resulted in outreach and communication with water agencies located in urban areas, mutual water companies representing rural or unincorporated areas, elected officials, community members representing residents, activists, and professionals living and working in identified disadvantaged communities throughout the SAR Watershed.

2.3.1 Water Agencies Engagement Strategies

In an effort to identify and engage water agencies, CivicSpark Fellows worked with SAWPA staff to identify a list of agencies to contact and interview. Though there was no standard developed to inform the selection process, agencies selected were located or had jurisdiction in the three counties that are partially or completely located within the Santa Ana River Watershed. Retail, flood control, and public works agencies were interviewed to provide as representative a sample as possible. Mike Antos and the CivicSpark Fellows had greater ease of access to the water agencies and also presented a more accessible purpose for the interview for the agency representatives. The CivicSpark Fellows called and emailed to schedule interviews. General Managers were the target interviewee, but often agencies would send either Public Affairs or Water Resource managers.

2.3.2 Mutual Water Companies Engagement Strategies

CalRural (CRWA) supported project goals by gathering data on mutual water systems and median household income in several different ways. SAWPA staff reached out to SAWPA member agencies to tap knowledge of mutual water companies that are in their communities. Some member agencies were able to provide more information than others. CRWA staff also searched for mutual water systems in the area by using the Safe Drinking Water Information System (SDWIS) database (<https://sdwis.waterboards.ca.gov/PDWW/>). Staff searched for mutual water systems in the counties that SAWPA serves and utilized maps to determine which systems are inside or outside the SAWPA region. Once staff were able to generate a list of mutual water companies specific to the region, they began to analyze for possible disadvantaged communities using various tools, with one of the primary tools being the DWR's Disadvantaged Communities Mapping Tool (<https://gis.water.ca.gov/app/dacs/>). If staff needed to see five-year American Community Survey median household income (MHI) data more directly, they used American Factfinder database system. One challenge with the current approach to disadvantaged communities' water systems is that boundaries of census-designated places and water system service areas do not always match up. For many of the mutual water companies in the SAWPA region, part of their service area was in a disadvantaged community and part was not. In addition, CRWA had prior strong relationships in the area, so they had most of the contact information for the final list of mutuals.

As a result of these efforts, 17 mutual water systems serving members of disadvantaged communities were identified. One system did not have any current contact information available. The 16 remaining systems were contacted by CRWA staff (as well as an introductory letter sent by SAWPA and CRWA) and offered needs assessments. A few of those 16 did not respond to attempts at outreach, some declined the offer, and one was directly hostile to staff. Ultimately, CRWA performed 10 mutual water system strengths and needs assessments representing 58 percent of the total mutual water companies identified in DACs located in the SAR Watershed.

2.3.3 Elected Leaders Engagement Strategies

The Local Government Commission (LGC) sought to engage elected officials representing jurisdictions within the Santa Ana Watershed through in-person interviews. LGC facilitated two "rounds" of interviews in the watershed. The LGC team traveled to the watershed for each round, meeting each elected official at their offices, or at another location in one of the communities they serve. The first round of interviews, completed in October 2017, were conducted with elected officials that were already engaged in LGC's "network"—meaning they had served on the LGC Board of Directors, attended one of LGC's events, collaborated on an earlier project, or received an LGC newsletter. Interview invitations were issued to elected officials who served in the watershed or had demonstrated an interest in water issues, and to officials serving all three counties: Orange, San Bernardino and Riverside. Invitations were sent to 12 elected officials, and interviews were completed with five of those elected officials, representing four jurisdictions. For the second round of interviews, completed in March 2018, invitations were sent to another 17 elected officials, selected for variety of geographic location, serving members of

large disadvantaged communities, and a variety of elected bodies—at the city level, county level, on school boards, etc. Interviews were conducted with seven elected officials. These structured interviews were based on a fixed set of predetermined questions. The same interview script was used in each interview, which allowed close comparison between different conversations.

2.3.4 Community Members Engagement Strategies

The California State University, Fullerton (CSUF) listening team conducted a general search of non-profits within the Orange County area with whom Center for Internships and Community Engagement (CICE) had an existing partnership and who may serve communities within the DWR disadvantaged communities map. Each location was categorized into general water agency service areas, such as homelessness, education, children/family services, and health. Using an online collaborative tool, the spreadsheet was shared with project administrators for further discussion and revision prior to beginning outreach.

Once approval was obtained, office staff contacted organizations with whom the campus had a relationship. Three key locations within Orange County were targeted in identifying the first sites: Santa Ana, Anaheim, and Fullerton. The first two locations were solicited due to their historically high-concentration of residents who meet the criteria for disadvantaged populations. Nonprofits in these areas seem to most often involve issues such as food insecurity, health, and education. Fullerton-based sites were selected due to their close proximity to the CSU Fullerton campus and deep partnerships with past campus initiatives.

Reasons for Refusal

Despite a wide-scale interest in the project, CSUF received a high volume of refusals from partnering agencies. Two primary reasons were given for their lack of interest: 1. Limited time between the point of solicitation and the target listening session deadline; and 2. Little to no-direct connection to the partnering agency's overall service mission in their perspective. The former issue resulted from a late start to recruit host sites. This was due to a number of factors, including delayed planning, limited clarity among project team of tasks and project requirements, and delayed approval of proposed target sites. The second challenge raised by sites that are not interested in hosting a listening session involved the agency's inability to identify or accept suggested benefits for their respective communities. This involved both direct and indirect issues of incongruity with the organizations' mission.

Directly, many sites found it difficult to connect water management issues with the needs of their service clients. In a number of circumstances, decisions to not participate resulted from one or several meetings of their board of directors. While the CSUF campus enjoys partnership with a mid-level manager or program director, that person always had to seek approval from a group of stakeholders with whom the campus had little to no relationship. Despite the contact's initial enthusiastic interest in hosting a listening session, quite a few denials were received after a meeting with advisory boards or other leadership in the organization. Time permitting, it would be best advised to have requested speaking to these committees or key decision makers when pitching the project for future sessions.

Indirectly, quite a few sites voiced concerns of misrepresenting their own services to their client communities. Specifically, agencies that require clients to complete a number of prerequisites prior to receiving services from that organization were concerned that hosting a listening session may be perceived as mandatory by their client communities, thereby inhibiting their willing participation in other critical agency activities. At least three agencies provided examples of previous joint events that resulted in clients either withdrawing from service programs or feeling overburdened by perceived agency requirements. In the future, finding opportunities to integrate into existing agency programming may help to alleviate this concern and promote greater session attendance.

Selected Sites

The final group of partner sites involved agencies that had existing collaborative projects with the campus (e.g. Center for Healthy Neighborhoods; Pathways of Hope); provided a public service not contingent on prerequisite program requirements (e.g. Makara Center for the Arts); or whose organizational mission directly related to food or water management (e.g. Orange County Coastkeepers; OC Food Access).

2.3.5 Native, Tribal and Indigenous Communities Engagement Strategies

The CSU Native and Tribal Listening Session Team (CSUSB) consisted of team members who had close ties with Native communities in the Santa Ana River Watershed. Team members identified a recent Tribal Water Summit, coordinated by tribal representatives in conjunction with the state of California and other stakeholder groups, as a prime opportunity to prepare deeper inroads into the experiential and socio-political understandings needed to operate in our region of California. This CSUSB-based team participated in planning and coordination for the entire summit and contributed to the overall success of the summit while learning lessons about planning for initial listening sessions. This resulted in additional listening sessions that presented opportunities to learn from Indigenous communities regarding their unique cultural, historical, and present perspectives on water-related themes and issues, including strengths and needs.

Sessions that were focused on engaging and documenting Native and Indigenous communities' identified needs and strengths through following a similar process of Indigenous protocols which often included opening prayers and introduction (formal consent) followed by a cultural activity or Bird Singers. Birdsongs focused on water and acknowledging a firm connection to the land to set the meeting tone. Introductions followed traditional protocols where tribal affiliations, family lineages, and birth places were shared. This communicated how each person was uniquely connected to water issues as an act of resistance to the general stereotypes of Indigenous people.

Chapter 3 Listening Session Findings

3.1 Watershed Stakeholder Needs and Strengths Perspectives

The extensive and diverse outreach and engagement strategies employed by project partners resulted in the identification of common themes and opportunities for improved communication and collaboration across watershed stakeholder participants. Both elected officials and mutual water companies expressed concern over water rates and the misconceptions by customers, often indicating the need for more education related to rate determination. Concerns were also expressed regarding how rates impact small mutual water companies and the burden that rates put on disadvantaged communities. Elected officials also focused on the need for more community engagement and support for developing a diverse workforce and more housing opportunities that may simultaneously address homelessness. General themes identified from community member listening sessions include that there is a strong trust among communities, however, this does not necessarily extend to water providers.

Community members offered numerous suggestions for how water providers and elected officials could bridge this gap through various programs and outreach strategies. To better understand potential opportunities for these groups to address community needs while also building meaningful relationships, project partners provided thematic needs and strengths that emerged from the listening sessions and outreach efforts. Detailed listening session findings are reported below by stakeholder groups with the preceding section highlighting how these findings align, or do not, across the watershed. This process supports one of the long-term project goals of determining the geographic context of needs and strengths so that stakeholders can communicate and share resources to resolve local and regional issues related to water resources management (Chapter 3 section 3.2).

3.1.1 Water Agencies Needs and Strengths Assessment Findings Project Partner: SAWPA and Civic Spark

Strengths

Outreach Through Public Education

Several water agency employees mentioned outreach through school systems as being a viable means of spreading awareness related to water quality and conservation. Science curricula that address water conservation and quality concerns are becoming normalized, and some water agencies provide water-saving fixtures and monitoring training in schools so that students can measure water savings at home. Additionally, in an effort to promote the value of tap water, some schools are working with water agencies to provide bottle filling stations that talk about water quality issues and water quality testing.

Water Quality

Water agencies cited the high quality of the water they deliver to the tap as a consistent strength. One agency representative said, "In terms of water quality, Santa Ana has won, actually, best tasting water in the United States just this year. In 2018. Water quality wise, we are doing really well. We don't have any serious contamination issues, or treatment issues".

Recycled Water

Water agency staff expressed pride in the success of implementing water recycling throughout the watershed, particularly as a source of drinking water in the last decade. Water agencies also discussed replacing the potable water used for irrigation of land (sports fields in particular) with recycled and reclaimed water as an easy step toward saving water.

Needs

Public and Private Green Space

Representatives from water agencies noted strong opportunities for institutional collaboration on projects related to public green space, but mentioned various challenges as well. Among these challenges was a need to better identify funding opportunities for green space projects. Water professionals also mentioned a need to better promote community stewardship and maintenance of public green spaces and noted that the issue of homelessness complicates the public's relationship with open spaces.

The discussion of programs related to the management of private green space also illustrated several needs contributing to lack of success. Water representatives highlighted a gap between the conservation value of drought-tolerant landscapes and their aesthetics and noted that the reimbursement structure for xeriscaping programs doesn't make sense to most disadvantaged community members: "[Current programs are] taxing on the individual where you have to come up with—from two to ten thousand dollars to convert the lawn, and then hope that you will get the money back, or even a portion of it. Not all of it, of course.

Disconnect between Agencies and the Public

Water agencies expressed concern that their efforts to communicate educational material regarding incentive programs to the public was constrained by a lack of staff dedicated to communication and public outreach. One interviewee noted that their role as a water conservation coordinator overlapped with duties typically designated to public affairs coordinators, including the marketing and advertising of incentive programs offered by the agency. They note that "in other agencies, you'll actually see that there can be as much as a team of five". In particular, agency representatives highlighted the need for communication staff specifically tasked with engaging non-English speaking communities. The communication disconnect goes both ways: several water agency representatives voiced the need for clearer mechanisms whereby community members can contact water and public works agencies to report leakages or water quality concerns expediently and directly, whether it be a rapid-response hotline or app.

Mistrust of Tap Water

Water agency representatives were highly concerned with the public misperception of tap water and resulting overreliance on purchasing corner-store water. Representatives cited incidents like Flint, Michigan, the marketing of tap-mounted filtration systems, and engrained ill-perceptions of the safety of tap water from immigrants' countries of origin as detrimental to the public's trust in water delivered to the tap.

Septic Contamination

Water agencies cited several cases where ill-maintained septic systems have resulted in contamination of nearby ground and surface waters. In the particular case of Quail Valley, located in Riverside County, the septic systems were designed to handle lower flows than they currently receive. The issue of identification of failing systems is complicated by the fact that septic systems are "off the grid," not currently tied into existing sewer networks.

Impact from and to People Experiencing Homelessness

Water agencies and their representatives are aware that issues associated with homelessness are beginning to impact the activities of water management; however, there appears to be a general sense of confusion about how to go about solving these issues. Water employees spoke to the accumulation of waste and human objects in flood control channels that results from encampments, but noted the need to balance flood risks and public safety concerns with access to resources and ensuring basic human rights (i.e. access to water) are met.

Relationship between Conservation and Rates

Several water agency representatives spoke about the need to balance conservation efforts while maintaining affordable rates. In times of drought, the public, and disadvantaged communities in

particular, tend to be at the forefront of water conservation efforts; however, when conservation initiatives succeed, agencies sell less water and generate less revenue. One interviewee mentioned that rates had to be increased as a result of drought conservation measures, highlighting the complex relationship between drought, rate increases, and the affordability of water.

Nevertheless, water agencies believe they are doing a “good job of controlling our rates and charges,” with one representative voicing that “the water industry has almost done too good of a job [of keeping prices low]”. Collectively, these sentiments may suggest that the economics of water fail to reflect its true value in relation to a rapidly changing environment.

3.1.2 Mutual Water Companies Needs and Strengths Assessment Findings Project Partner: CalRural Regional Water Agency

Strengths Assessment

The mutual water companies that were interviewed spoke of the same challenges that many small, rural, and/or disadvantaged community water systems face, particularly in relation to replacing old and antiquated infrastructure and complying with increasingly strict regulations. However, these same systems (and associated communities) show a remarkable amount of strength and resilience that one might not observe immediately from the outside.

Several observations of these systems showcased their strengths on the “softer” side of water management—doing outreach to customers, building and maintaining relationships, looking out for each other:

- The very nature of mutual water companies being private corporations lends itself to a higher level of involvement in the water system by community members/ratepayers.
- Mutual water system representatives that were interviewed are members of the communities they serve and are emotionally invested in the success of the water system and the well-being of the community. Interviewees cited close relationships with community members and tight-knit communities in general. System representatives talk directly with ratepayers and understand their needs on a personal level. There is concern about and interest in issues that may affect their community positively or negatively.
- Operations and maintenance costs, as well as capital improvement projects, are more well-funded in mutual water systems as compared to many public agency water systems. Some systems use this as a point of pride and point out that they are able to maintain and update their system without help from government agencies.

Because they are so well-funded, they have no issue providing accessible and affordable drinking water to customers. There are no issues with wastewater systems, stormwater, or compliance with regulations. All infrastructure is well-maintained, there is a large storage capacity available, and large land used for groundwater recharge. In addition, many feel that they have stable and reliable board of directors.

Needs Assessment

When interviewing the mutual water companies in the southwestern region, all seemed worried about the increasing population of people experiencing homelessness and shelters being built in their communities. They believed homelessness was increasing the crime rates in their communities. At least one agency felt that the sense of community was disappearing and that a rehabilitation of the community center would provide a place for the community to gather again.

Aging Infrastructure: Many of these water systems would be partial to acquiring everything new if funding were available. Most water systems have aging infrastructure and are looking for financial assistance to replace the oldest areas of distribution pipes and service lines in the system. These older communities have greater water loss due to leaks in both the main line and service lines. Leaks are costly

for water systems because additional electrical power is used for pumping, more water needs to be treated for compliance, and the infrastructure requires maintenance repairs. In addition to the costs for the water systems, leaks can potentially contaminate the water. Source water is a major concern due to existence of older groundwater wells and pumps that need rehabilitation. Additionally, new wells are needed due to capacity needs or contamination. Aging water storage tanks also need rehabilitation or replacement.

Operational Issues: These water systems' main concerns are the issues associated with system operations and maintenance. Some water systems do all operation and management in house, while others contract out the larger jobs. Increasingly stringent sampling and regulatory compliance are becoming more and more problematic for these smaller systems. As Maximum Contaminant Levels are lowered and new contaminant monitoring is required, small systems struggle to stay in compliance because of their limited budgets. As a result, there are concerns regarding consolidation into surrounding larger agencies because of non-compliance issues.

Rate Issues: Customer concerns with rate changes seem to be an ongoing issue with many water systems. These concerns are addressed at public hearings or monthly board meeting by educating customers about what they can expect in service, water quality, and rates. Smaller water systems are finding that rate increases are problematic for many customers due to the fact that many are on fixed incomes. Others are upset with increases and watering regulations for conservation because they are not aware of the overall costs for supplying safe and affordable drinking water.

3.1.3 Elected Leaders Needs and Strengths Assessment Findings

The Local Government Commission (LGC) team engaged local elected leaders throughout the Santa Ana Watershed to learn the elected leaders' perspective on water and their community, as well as to identify knowledge gaps on relevant water and community topics. In addition to contributing to the Strengths and Needs Assessments, LGC also incorporated these perspectives into training sessions for local elected leaders. To that end, LGC were listening and watching carefully for cues that identify strengths or opportunities within their respective communities, tangible needs that could be addressed in part through IRWM, and beneficial training topics to fill knowledge or awareness gaps. Two rounds of outreach and subsequent interviews were conducted to reach as many Elected Officials as possible.

Strength Assessment

Resiliency: Throughout the interviews with elected officials the central theme of resilience was mentioned. This was typically discussed in the context of how the community members were resilient to changes taking place and the community's ability to deal with drought conditions, adjust to changing job markets, and to identify opportunities for economic development, affordable housing, and homelessness solutions.

During the second round of interviews, a new group of elected officials were interviewed and a noted shift in rhetoric was immediately recognized. Each elected official interviewed emphasized the successes and achievements of their community. A number of factors are speculated as contributing to this shift. First, 2018 is an election year. All of the interviewees are either running for re-election themselves or advocating for a ballot measure of importance to them. Election season significantly shapes the conversation with any elected official, as they are perpetually campaigning. Additionally, seasonal weather patterns have been shown to have a subconscious impact on public awareness and concern around environmental issues such as climate change and water supply reliability. March is the end of the rainy season in California, with cooler, wetter conditions. The general public, and the elected officials who represent them, tend to be less concerned with drought or water supply reliability amidst these conditions.

Diversity & Cultural Identity: All local elected leaders that were interviewed by the LGC team shared that the demographics and culture in the communities that they serve are quite varied, and this was always identified as a strength. They described their communities as places where people from all walks of life come together, creating a diverse community of perspectives and experiences. When asked to expand on the type of diversity, they mentioned different genders, religions, ethnicities, ages, races, and socioeconomic backgrounds. But, they also described diversity as it goes beyond gender, race or sexual orientation - and included things like geography of neighborhoods, and life experiences in their definition. They identified diversity as helping them build stronger leaders and stronger communities.

Engaged & Active Residents: LGC staff observed a lot about the strength of active citizenship. Many communities in the watershed have seen a growing interest in ‘active’ (or ‘responsible’) citizenship, especially as it relates to local public projects. Local elected leaders identified strong public participation as a strength that contributes to their ability to serve their constituents. They recognized that promoting genuine active citizenship is easier said than done - but the desire and interest is there, and it is their responsibility to support it. In particular, small business owners and community groups such as the Rotary Club & Chamber of Commerce are extremely active, and come together often to discuss ideas. They also noted that increased engagement and ownership over community projects prevents vandalism and increases overall public participation.

Natural Resources: Another theme that arose during LGC’s conversations with elected leaders was the pride felt in the natural resources of their communities. Specifically, almost every elected leader mentioned the Santa Ana riverbed as an asset—and discussed the value of having outdoor recreation space. They spoke about how a well-designed open space that encourages outdoor activity and social communication is a community asset that contributes to the health of local residents and the social good will of the community. Outdoor water features, such as fountains, ponds, streams, and pools were said to be particularly popular and attract many community members.

Needs Assessment

Collaboration: Many of the elected official interviewees highlight the importance of greater collaboration within their own agencies or jurisdictions, as well as across agencies and jurisdictions. Some interviewees, however, highlighted specific successes of collaboration between departments within their jurisdiction. For example, the Santa Ana River Conservancy was established by a three-county coalition of elected officials, nonprofits, and government agencies. Most interviewees identified the need for greater coordination with other jurisdictions, such as addressing the issue of people experiencing homelessness, and how their encampments can become a point source of pollution—which often stretches across regions and jurisdictions.

Water Rates: Water rates came up in two separate contexts. First, with regard to affordability for community members facing disadvantages, the compounding impact of high rent, high commute costs, and high water bills create a financial liability for lower income residents to pay higher water rates or to be able to react to ongoing rate increases. Second, many communities achieved their mandatory water conservation goals during the governor’s declared drought emergency, and then were frustrated when their water agencies raised water rates to cover budget shortfalls. This illustrates a lack of understanding on the community’s part about water agency finance, and a challenge for elected officials to conduct adequate community outreach and messaging.

Public Engagement and Outreach: Most elected officials interviewed mentioned the need for more direct engagement with their residents and highlighted the opportunity to engage school-age children who can then share information with their families. Interviewees expressed that their constituents are generally unaware of their local watersheds, where their water comes from, and whether or not their drinking water is safe. Public engagement is especially needed with regard to drinking water quality. Even in

jurisdictions with high tap water quality, some subset of the community simply lack trust in the local government and are afraid to drink their tap water. This is especially true in lower income communities, communities of color, and communities for which English is a second language. These residents purchase bottled water instead of drinking their tap water, which contributes to existing affordability challenges. Inadequate and ineffective community engagement perpetuates distrust and reinforces barriers between residents and their local government representatives.

Workforce Development & Social Mobility: Elected officials mentioned social mobility, which they define as the ability for their residents to receive the education and training needed to allow them to enter the workforce, as an important issue in their communities. Several elected officials mentioned that they serve young populations who want to start their careers. Today's complex water issues mean that we need a reliable workforce that can maintain our water systems and provide service to all who need it today and in the future. Electeds see many opportunities where their constituents could participate in the water and wastewater utility workforce. Young people in low-income communities aren't getting these opportunities, however, to gain entry. One elected official suggested that we should invest more in workforce development programs that are aimed at developing qualified candidates from low-income communities for mission-critical jobs.

Housing: Multiple elected officials interviewed shared the concern that their communities lack adequate housing to meet current demand and accommodate necessary growth, especially affordable housing for lower-income communities. Some of these interviewees identified a concern that limited water supply availability and regulatory requirements to provide adequate water supply will inhibit necessary housing development. Other interviewees expressed an alternate concern that unscrupulous developers will use the housing crisis as an opportunity to build water-intensive developments, despite local water supply limitations. The unifying concern with regard to water and housing was ensuring that communities can meet their housing needs with the existing water supply.

Across both rounds of interviews - October 2017 and March 2018 - a number of common themes or topics of interest emerged. These include collaboration across and between agencies, water rates, public engagement and outreach, social mobility, and housing.

3.1.4 Community Members Needs and Strengths Assessment Findings

During the course of five listening sessions, several common themes emerged across each event when engaging with community members. While members of disadvantaged communities participating in these sessions included residents, activists, and non-profit professionals, commonalities regarding community strengths and weaknesses can be easily identified and are listed below:

Strengths Assessment

Trust: Participants immediately identified trust within their communities as a strength. Despite issues pertaining to homelessness or a lack of organized events (see below), residents seem to convey a sentiment of safety within their known community groups. There seems to be a sense of shared pride in this area, and evidences a socially-focused mindset present in each listening session.

Cultural Identity: Participants mentioned a few key things during the southwestern region community listening sessions. It appears that residents perceive a strong connection between the arts and muralism and their sense of community and history. In this region where the arts and literature are held in high esteem, members throughout the southwestern region identified original art projects throughout their cities as a critical aspect of community strength.

Engaged City Officials: During the central region session, a resident boasted of their city government's efforts to build a strategic plan that created impeccable community spaces and prosocial school settings.

Needs Assessment

Homelessness: Every community shared concerns about the increased number of people experiencing homelessness and the limited (perceived) efforts on the part of city officials to address the issue. Most, if not all, participants expressed sincere, sympathetic sentiments towards the people experiencing homelessness and called for their cities to provide more housing and wrap-around services to mitigate the costs and potential dangers of having large numbers of people on the streets.

Community Spaces: Most of the listening sessions included some reference towards the need for more active community events or spaces. Participants referenced examples like movie nights, farmers markets, and entertainment events that are centralized and open to all members of the community. In many cases, there was an implied sense that these events should be held more regularly, and that parks and other densely populated public spaces be converted to places where people can intentionally congregate and socialize.

Urban Gardens: At least two sessions involved a request to increase the number of urban and micro gardens to promote nutritional programs while educating communities about native plant life and healthier food choices.

Lack of Green Spaces: Since the drought, residents reported a high rate of neglected landscapes and agriculture, leading to unsightly neighborhoods and common areas. One resident noted the adverse effects of minimal green space on mental health in low-income communities.

Water Bottle Filler Stations: Community members at every session referenced the need for more public access to filler stations in schools, parks, and business centers throughout the cities. Existing fountains are few and non-operational, or many in parks or near public restrooms are poorly maintained and thus, avoided.

Mobile Water Testing Stations: To introduce skeptical or otherwise ambivalent residents to the possibility of drinking tap water, it was recommended that testing stations should be conducted regularly to inform and educate community members on the safety of their own tap water.

Educational Outreach: More information on water safety and accessibility was requested, particularly given the limited or unappealing efforts by water agencies. Mediums such as social media, radio, and promotions as centralized community events were recommended with this effort.

Water Monitoring: Participants suggested that having more options for residents to monitor their water usage by phone applications or online accounts would help engage residents who may be concerned about their water bill or who are trying to exercise more effective conservation efforts.

Water Conservation Services and Resources: Residents suggested a need for a large-scale effort to distribute low-flow faucets and shower heads, assistance by the city with installing low-flow toilets, and other home assessments to improve conservation efforts. Additionally, multiple sessions included requests for assistance with installing drought tolerant landscapes.

In summary, communities would like to encourage one another to move away from bottled water by implementing new educational outreach campaigns and installing water bottle filling stations that are more accessible and properly maintained. Municipal water agencies and water management groups could be more active in assisting with conservation efforts, including subsidies for installing devices at home, monitoring water use, and drought tolerant landscaping. Finally, improving green spaces that could

support community-based events or serve as water education demonstration sites (i.e. rain gardens) received strong support within the sessions.

3.1.5 Native, Tribal and Indigenous Community Listening Sessions Findings

The inclusion of Native Americans and Indigenous Communities in the DCI SAWPA program represents a unique collaborative process that aims to enhance water resource management for *all communities and individuals* in the Santa Ana River Watershed. This effort is unique because the inclusion of these communities requires an approach that is mindful and inclusive of rich, culturally-based activities and governance. The CSU WRPI Native Listening Team conducted two listening sessions that represented perspectives from Cahuilla, Tongva, and related Tribes including representation from the Tribal Alliance and the Urban Indian Population. These groups represent communities who have historically and currently occupy portions of the watershed. As outlined in Chapter 3, this process included two listening sessions; one with Cahuilla and Urban Natives and one with Tongva and Urban Natives. During the session, the CSU WRPI Native Listening Team documented (i.e. written and audio recordings) comments made during the session. After the completion of session the documentation was analyzed to determine the central themes and results were presented to each community at follow up sessions to ensure what was documented accurately reflected their previous contributions.

Perspectives from Cahuilla, Tongva and Urban Natives

Each of the sessions had represented from multiple Native/Tribal communities including the Cahuilla, Tongva, Acjachemen, Luiseno, Serrano California Peoples, Apachean, Taino, Huichol, Penobscot, and Lakota to name a few. Participants ranged from community leaders, to tribal lawyers, ex chair and tribal council members, Native academics, medicine people, singers, college students, and Native veterans and others.

General themes emerged from these sessions including participants perspectives related to their spiritual connection to water and their role, or lack thereof, in decisions about water that may impact the greater community. This often included recognition of historical documentation of seasonal rains, including how water connects to the land and wildlife. Over time, the diversion of water resources to serve development has resulted in changes to wildlife diversity and cultural activities including access to water for cultural activities and native plants. Although there is a strong interest to be recognized and represented when water-related decisions are cultivated, there is no consistent communication with governmental entities, so Native/Tribal concerns and beliefs are often marginalized. As a result of this exclusiveness, Native/Tribal communities feel they need to formally “claim [their] water rights” to gain recognition in water governance and management, which often results in conflicts with water agency missions and objectives. It was noted, however, that to participate in such decisions, they need to be more organized in their participation strategies. During the sessions, it was suggested several times that the inclusion of Native/Tribal communities would enhance water management because of their unique history and spiritual connection to water, which recognizes the responsibility to balance human needs while simultaneously supporting ecosystems.

The listening session produced several strengths, weaknesses and needs (Tables 4 and 6) as expressed by the Cahuilla and Urban Native community member participants. Categorical results of audio recordings taken during the listening session and analyzed using NVivo software are presented in Tables 5 and 7.

Table 7. Perspectives from Cahuilla and Urban Tribes: First Listening Session Strengths, Weaknesses, and Needs Statements

Strengths	Weaknesses	Needs
<ul style="list-style-type: none"> ● Water is a rich theme across these communities in respect to their spiritual connection to the Earth and water rights. ● Recognize that water dictated where people settled and as such we should be mindful that if this is taken away it will impact communities for present and future generations. ● Water can heal and solutions are in our landscape. ● Recognize that water is part of all communities not just native/tribal communities. “We don’t own it, it owns us.” 	<ul style="list-style-type: none"> ● Trends in water management have created barriers for them to connect to the land and water spirits (gates, reservoirs, etc.). ● Designation of “Disadvantaged” is derogatory and often creates barriers to participation in decision making processes. ● Lack of representation in governmental process means they are often “marginalized” in respect to inclusion on water decisions. ● Many don’t get involved until it impacts them as individuals. 	<ul style="list-style-type: none"> ● Community needs opportunities to contribute to water management by sharing their knowledge related to their documented historical records to accurately recognize water and its contributions to communities and help to address how to we balance development with the rights of water (spiritually). ● They want to learn to “talk water” with water community (i.e. agencies, providers, etc.). ● They want action oriented results.

Table 8. Categorical Results of Listening Session Themes #1 Analysis: Cahuilla and Urban Tribes

Themes	Examples
Legal/Societal Structures	<ul style="list-style-type: none"> ● Political structure of tribal governance can lead to isolation of knowledgeable individuals. ● Alteration Of landscape has resulted in diversion of water and no separation between people, land and water. ● Desire to have tribal leaders on local resource boards so that their knowledge can be shared and their communities represented. ● Our responsibility is to the water - we don’t own it.
Consultation, consent, and agreement	<ul style="list-style-type: none"> ● Consultation is necessary to work with Native/Tribal communities. ● Debriefing is an important process in working with multiple communities to reach a common goal.

	<ul style="list-style-type: none"> ● Environmental groups have advocated that Native nations have equal voting seats. ● Native/Tribal communities have inherited rights that need to be recognized.
Discrimination, resistance, revitalization	<ul style="list-style-type: none"> ● Disadvantaged is an inappropriate term. ● Non-Indian communities think of water differently, so communication is need to support collaboration.
Spiritual, land, culture, and water	<ul style="list-style-type: none"> ● Water is a central theme in the Native/Tribal communities and is embedded in spiritual and historical narratives, prayers, dance and songs. ● Water themes are part of designs that define many of the Native/Tribal communities. ● Belief that spirits are in the water.

Table 9. Tongva Native Listening Session Strengths, Weaknesses, and Needs Statements

Strengths	Weaknesses	Needs
<ul style="list-style-type: none"> ● Historical wisdom of Environment; understand cause and effect. ● Coordinate and Host outreach summits. ● Line of communication with tribal government and other sovereign people. 	<ul style="list-style-type: none"> ● Concerns fall on deaf ears. ● Profiteering water districts steal water to sell back to them. ● Government agencies do not want to recognize, listen to Tongva people because they know it's native water and they don't want to recognize native rights. ● Agencies and water companies take from the land and do not give back to the land or communities. ● Discrimination. 	<ul style="list-style-type: none"> ● Respect for the rights and needs. ● Need to transition from a consultant to a decision maker in water issues. ● More accountability of companies and government agencies related to water management. ● Greater understanding of water governance and agency roles to build coalitions. ● Unity across all communities: non-native, native, government, etc.

Table 10. Categorical Results of Listening Session #1 Analysis: Tongva and Urban Themes

Themes	Examples
Legal/Societal Structures	<ul style="list-style-type: none"> ● CA tribes seen as a formality or courtesy to reach out to them but there is no “teeth” or accountability to not following Native wishes about land-use.
Consultation	<ul style="list-style-type: none"> ● “If we’re not at the table, we’re on the menu.” ● More recognition and citizen involvement needed.
Signs of Discrimination	<ul style="list-style-type: none"> ● More education in school ● Wasteful companies take water and trees from land and give nothing back to the community
Spiritual	<ul style="list-style-type: none"> ● Government agencies do not want to recognize/listen to Tongva people because they know its native water and they do not want to recognize where its been taken from. ● Atrocity when developers do not divert projects for Native burial sites preservation.
Environment	<ul style="list-style-type: none"> ● Historical Wisdom and of Environment. ● Ceremonial sites including Big Bear, sacred mountain Spirit in Hot Springs ● Tongva support kept a dangerous development project from destroying Bighorn Sheep and migratory bird paths.
Sovereignty	<ul style="list-style-type: none"> ● Environmental concern around indigenous sovereignty, water quality environmental urgency and how indigenous knowledge systems can unite pedagogy and activism. ● Environmental justice and indigenous.
Water Issues	<ul style="list-style-type: none"> ● Each person/people was uniquely connected to water issues act of resistance.

Feedback session for both groups mimicked many of the same meeting structure as the first listening session, which included sharing prayers, bird songs, stories and presentations. Central to these sessions were the discussion of water issues related to previous listening session findings. This enabled participants to communicate with the CSU WRPI Native Team if any of the information presented was inaccurate or if documented information needed further explanation. Results suggest that most of the participants felt the findings and documentation of the listening session was accurate. The session were

also beneficial to their communities in prioritizing ways that they can become more actively involved and represented in water issues that impact the Earth's systems, wildlife, preservation of their communities while also balancing the needs for future generations.

3.2 Regional Spatial Analysis of Watershed Strengths and Needs

In an effort to understand the spatial context of the listening session findings, the locations in which session and interview were held were grouped into regions within the watershed as illustrated in Figure 9. Summaries of the strengths and needs of each stakeholder group by region are provided below. This process may assist both stakeholders and resource agencies with prioritizing how they tackle the diverse water resource needs, while also engaging with and learning from communities that have been successful in addressing the ever shifting issues related to water resources management.

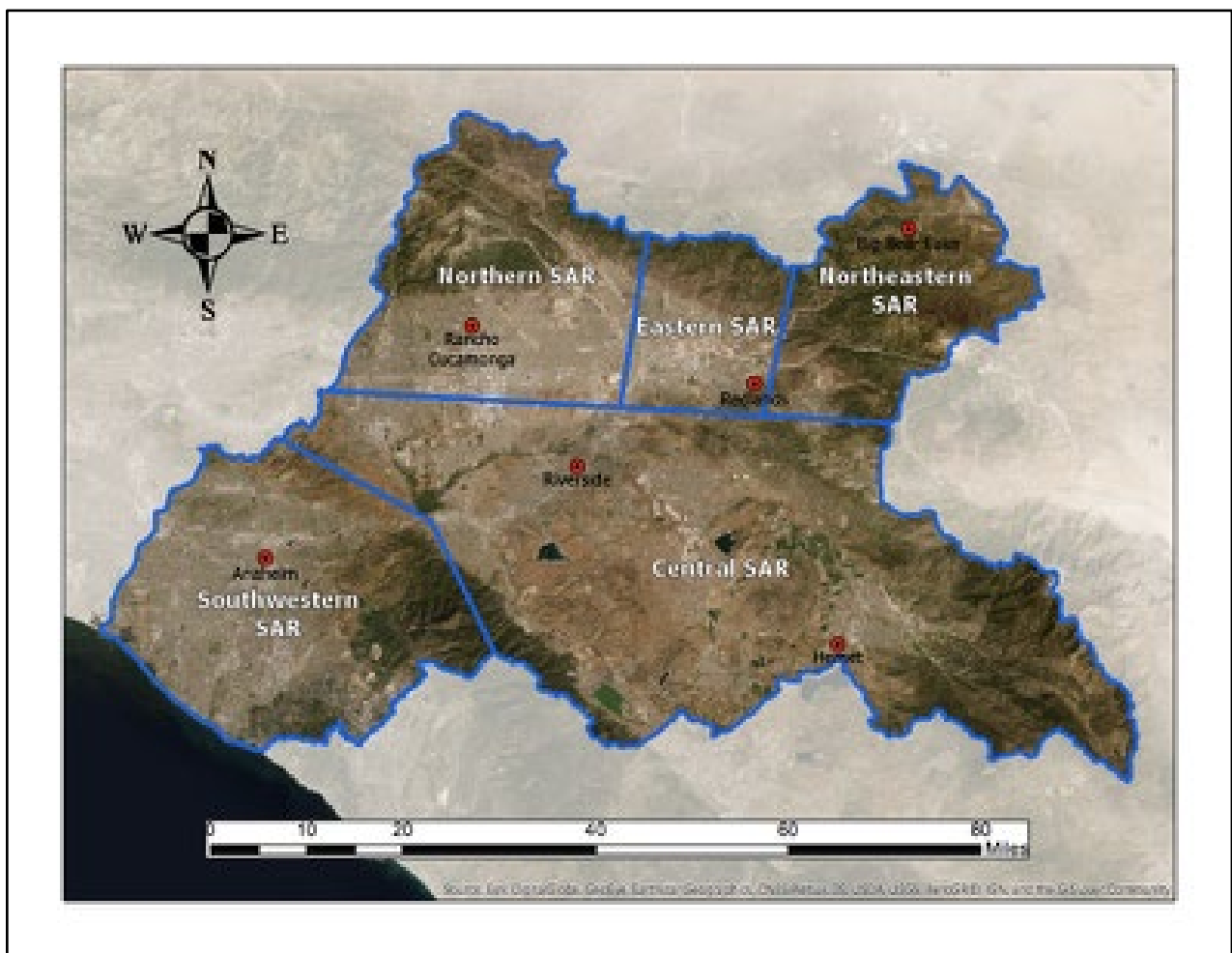


Figure 9. Defined Watershed Regions Based on Listening Session Reporting

3.2.1 Central Region

Elected officials and mutual water companies in this region brought up many important topics concerning water and the community, however, there was very little overlap between what the two groups discussed. This suggests that their knowledge on the subject of water is vastly different. They did agree on one thing: that this region has a reliable water supply. Community members acknowledged some elected official efforts to improve community open spaces, however, the need to increase these spaces and to provide the community with adequate resources and education was seen as a need.

Elected Officials

Strengths Assessment: Elected leaders in the central region of the SAR Watershed discussed that one of their primary strengths was the great demographic diversity and culture within the community, which has resulted in a strong community identity and opportunities for partnerships. Elected officials felt that a key element of their success when working with citizens was to focus on issues, not ideology. Another important strength identified was the *natural riverbed*, which is an important open space for the people in the community. When considering the economic strengths, elected officials linked a strong economic sector to diversity in educational opportunities as well as public and private sector jobs. *Concerning water*, elected officials feel strongly that the regional water board is effective and consistent. Water supply is never an issue and water agencies manage water well despite the drought. Water conservation goals have been met and exceeded. There have been no issues with flooding in this region and they are seismically prepared. Also, water rate increases are rare.

Needs Assessment: Elected leaders expressed that one of the primary weaknesses is that a significant percentage of the region are disadvantaged communities. Additionally, there are many people who are experiencing homelessness with large numbers near the river that cause pollution. Because there are limited avenues to inform people, outreach in the community has been challenging and as a result many people in the community are unaware of existing community services and how to access them. It was also expressed that the general fund budget of some of the cities could be more robust to overcome some of the financial setbacks that the region faces such as a lack of money for street maintenance. Because many communities have been around for a long time, much of the infrastructure is old and needs to be updated.

Elected officials would also like to see more open water available for recreational use, but impounding water is difficult because of the endangered species that are found in the area. Officials in this region battle the perception that the water is not safe to drink even though it is and also deal with complaints from residents when rate increases. Officials also question why more houses are being built in the area when there isn't enough water for more people; sprawl especially encourages more water use. There is also a conflict over the riverbed: some people would like to use it to ride horses while others feel that horses should not be allowed. Parking to access the river is an issue and the city is experimenting with permits. Another big concern is that this region contains a superfund site that is contaminating groundwater. Lastly, officials in this region feel that they should make purple pipe water their focus for the future.

Mutual Water Companies

Strengths Assessment: Mutual water companies in this region feel that their strengths are accessible drinking water and a reliable water source. It is a strength that they are able to supply their own water, reducing their reliance on other infrastructure, water allocations and agencies.

Needs Assessment: Water quality is an issue in this region in some cases. Perchlorate is a contaminate in some water sources that is of concern. Also, some wells have high levels of nitrates and declining water levels. Parts of the community need to make the switch from septic to sewer as well. Finally, there are some leaks in the system that need to be replaced with copper.

Community Members

Strength Assessment: Community members representing the central SAR Watershed noted that they had very engaged city officials. Their efforts include building a strategic plan that created public spaces and areas where citizens of all ages can interact (i.e. general public and K-12).

Needs Assessment: Despite a few community members noting the new and or improve green or open spaces (i.e. parks), participants in general felt that additional open spaces are needed. This may include multi-use areas such as urban gardens that promote sustainable agriculture and nutritional foods and pedestrian friendly areas that display educational materials about water and other community resources. Additional features could include water bottle filling stations to reduce waste in landfills.

3.2.2 Eastern Region

Elected officials and mutual water companies in this region agreed that they have great water quality and inexpensive water rates, but the two groups also have mentioned different focuses in their strengths and needs. Despite outreach efforts, there was no contact with community organizations representing the eastern and southeastern region, so they are not represented in these findings.

Elected Officials

Strengths Assessment: Elected officials of the eastern region feel that the strong sense of community is one of their most important strengths. The residents and business owners are supportive and philanthropy is pervasive in the region. In addition, the eastern region boasts many historic downtown centers and is abundant with natural resources. Elected officials also discussed their reasonable water rates and excellent water quality.

Needs Assessment: Elected officials cite segregation among communities as a major weakness-- there are pockets of Hispanic communities and pockets of Caucasian communities that create a cultural division. Members of the region perceive a shortfall in assistance for the Hispanic community. In addition, there seems to be a rift between the landowners who run agricultural operations and their labor force. The various differences in community members creates a barrier to water conservation and use. There is also a lack of engagement among broader parts of the community because so few people attend community meetings. Decision makers are not listening to the few voices as attentively and as a result many needs are not addressed. Attempts to engage additional community members through social media often fail because many do not have access to technology and do not trust officials. The groundwater level is the lowest it has ever been and water conservation has been a real issue for this region. Because of restrictions, many dead lawns and dead trees have become a safety issue. People don't understand that they can reduce water and still water plants, take showers, and do laundry. A lack of emergency preparedness is also a weakness of the region. Flooding will eventually be a problem because part of the community is located on a floodplain. There is also conflict between city and water agencies in part of the region because there hasn't been a lot of collaboration between them. Some elected officials are also interested in switching to automated water metering.

Mutual Water Companies

Strengths Assessment: Water companies in this region of the Watershed discussed many strengths of the community. Drinking water in this region is easily accessible and affordable for residents. The water companies feel that they excel at identifying and rectifying urban, storm, or wastewater regulatory issues. As a result of their good financial standing, the conveyance systems are well maintained and there is ample water storage. The quantity meets customer demand and is also available for fire protection. Also, in respect to water quality, there is no treatment, power, or chemicals needed to run some of the water systems that provide water to the region. Another strength the water companies mentioned is the water-conscious mindset of the community members. The companies even feel that their community could

teach other regions about water conservation. Additionally, capital improvement projects financed by the water company have produced fewer leaks.

Needs Assessment: Despite their many strengths, water companies feel that their communities in this region of the SAR Watershed do have some weaknesses. Firstly, they would like to drill an additional well for the system. There are also stormwater runoff issues due to the topography of the area. Another concern is the dependability of their infrastructure during summer monsoon flooding. One company would like to drill a third well in the system to stay ahead of growing water needs. Some areas have issues with nitrates in the water due to farming chickens and other livestock. There was a compliance issue with 1,2,3-TCP during the first quarter of the year. One company needs to upgrade a pump house needs and rehabilitate a well. Areas of the distribution system need replacement due to age. Some companies feel that they need better financing to maintain the system, especially repairing main breaks, service line, and generators.

3.2.3 Northern Region

In the Northern region of the SAR Watershed the mutual water companies represent a microcosm for the community as a whole in terms of some strengths and needs. There were a few commonalities between the elected officials and mutual water companies; both identified the strong workforce as one of the primary strengths: the water companies boasting their exceptional personnel and the officials discussing eager workforce that is prevalent in the region. They also shared that the region experiences several financial issues although it was discussed in varying contexts. Water quality was a concern brought up by both the electeds and mutual water companies as well.

Elected Officials

Strengths Assessment: Elected officials in the Northern region of the SAR Watershed discussed how social contributions made in the communities highlight the potential for the region. The region has a strong local workforce as well. Elected officials in the region feel that they are facing local housing issues head-on, and are largely effective at maintaining inexpensive housing options. Elected officials discussed meeting and exceeding water conservation goals.

Needs Assessment: Elected officials expressed several needs and weaknesses. A large portion of the population are minimum-wage workers and there is a lack of high-wage jobs. Addressing the lack of jobs in the region will also take care of another issue: traffic. By decreasing the need for residents to commute to other areas, they would also be able to decrease the traffic. Another concern for the elected officials is the growing portion of the population experiencing homelessness. The elected officials discussed the increased levels of poverty among people over 65, the large amounts of money spent on social assistance every year, and the displacement of economically impacted families as a main concern.

Air pollution is another growing problem for the region. Due to the topography of the area, inter-coastal winds blow in smog from the west to the northern region of the SAR Watershed where it is stopped by the mountains. The acid rain produced washes into the soil and pollutes groundwater. There are other water quality issues because of the military base, airport, and the use of fertilizers. Growth in the area is dependent on the availability of water which is an issue. Flood control for this region is also crucial; water is diverted into flood channels and they need legislation to keep people out of the channels. Elected officials also feel that water rates are increasing disproportionately. Another topic of concern is dealing with contaminants in permeable landscapes including biohazardous waste from homeless encampments. Elected officials also voiced the need for CEQA reform.

Mutual Water Companies

Strengths Assessment: Water companies in the northern region of the SAR Watershed identified many strengths in their communities. Access to affordable drinking water was one of their most important

strengths. Companies also discussed the strength of the water system itself and as a result there are no issues with the wastewater system, water quality, or compliance. Lastly, the companies are impressed by the strong workforce and great employees that work for them.

Needs Assessment: Despite the community's strengths, there were many needs brought up by the water companies in the region. Although some companies felt that their water quality was a strength, other companies felt that there could be improvements made. The main issue described was the high levels of perchlorate and nitrates in the water. One well has been deactivated because of benzene in the water supply while they look at treatment options. Additionally, some companies felt that there is not a large enough quantity of water for their community and others felt that there needs to be more water conservation efforts initiated by the state. One tank has unstable ground underneath it so they are not able to fill completely. There are some issues with the infrastructure; the main line is aging and needs band repairs. The system has many low producing wells and ample storage. The company explained that installing a new Supervisory Control and Data (SCADA) system will provide better tank controls to prevent overflow and purchase of unused water; a SCADA system has been approved but not installed yet. Relatively new field staff are going through the whole system to determine what needs to be done and to get field operations such as hydrant exercise and valve turning completed. Other needs were brought up that were not related to water including patchy road repairs, aging downtown centers, and a need for more police to fight crime. Financial issues were also mentioned with a need for an increase in the general fund.

3.2.4 Southwestern and Western Region

In the southwestern and western regions of the SAR Watershed, community members, elected leaders, mutual water companies, and water associations all expressed good financial standing as a strength of the region, however, more is needed to support needed infrastructure upgrades. A sense of community and members' desires to be involved was another commonality. The impacts of homelessness was a concern highlighted by these stakeholder groups, however, the approach in resolving this issue were varied. Some felt that helping the people experiencing homelessness should be a priority while some felt that building homeless shelters caused more problems. Elected officials in this region seemed knowledgeable about water issues overall and shared commonalities with the water companies and agencies.

Elected Leaders

Strengths Assessment: Elected leaders and councilmembers of the southwestern region described their diverse community members as one of their most important strengths. The region boasts a high percent of young, motivated people, undocumented immigrants, and women-- all of which add to the resilience of the community. Many residents show an interest in being involved in the community in various ways, for example, volunteering to be neighborhood watch captains. There are low crime rates in the region and one city in the area is a nationally ranked safe city. People have to work hard to afford to live in this area, and even residents who are not as affluent show an upward mobility in terms of education. With the right leadership, we could easily reach to residents. The region also is great at maintaining open land--there is a mix of rural and suburban pockets. Some elected officials felt that their communities were financially secure. Lastly, the community met water conservation goals during the drought and were even efficient before the drought. They also feel that they have impressive groundwater resources and that their basin does well using recycled water for groundwater recharge.

Needs Assessment: Elected leaders of southwestern region of the SAR Watershed highlighted the need to address the high rates of poverty and resulting homelessness experienced by their community as well as the desire to properly serve the immigrant population. This community characteristic may be linked to the need for both affordable and public housing, an issue that is compounded by the lack of land to develop new buildings. Lack of land has also made it difficult to provide greenspace for parks, recreational areas and neighborhood playgrounds that often attract new residence. To resolve identified issues, elected

official suggested focusing on building density and variable mechanism to generate revenue for the general fund to address high crime rates, immigrant population needs, poverty and infrastructure upgrades. One of the barriers to generating revenue that elected official expressed was the communities' reluctance to support new or increased taxes.

One way to address such issues could be to offer more opportunities for elected officials to engage with community members to create more collaborative opportunities to address community issues. In addition, several elected officials suggested the need for educational opportunities for elected officials to learn from other communities that have successfully addressed the needs they face. One issue is the residents' lack of trust of the drinking water. There are dozens of water stores where people buy water even though this community has the third best drinking water in the country. The lack of trust also has residents drinking more soda and juice instead of water.

There is also a need for updates on the water infrastructure. Sewers are nearly 100 years old and need updating as well as corrugated metal pipes for conveyance. Another infrastructure need for one community is to install drip irrigation for watering trees in city medians. City employees are watering by hand and safety is an issue. It costs \$250k to water all of them, but unable to reach them all. Installation of drip irrigation would cost several million dollars. Some elected officials feel that flooding and storm drains should be a top priority. There are public schools located within a flood zone, and there are many flood hazard areas. People paving their backyards only increases runoff issues. Also, there are low numbers of customers on paper because of a lack of water meters, however, because of the high density of homes, water use is high. Other communities in the region face the opposite problem: low water use because consumers cannot afford it especially people on large lots with fixed incomes. Some officials feel that funding is an issue. There is so little money for water projects that some cities only have enough to pay city staff. Some officials feel that there is too much focus on people experiencing homelessness rather than low-income communities. They feel that the goal of removing homeless encampments away from the river is short-sighted goal and that the long-term solution is Housing First. Another challenge that parts of this region faces is getting rid of brine that is produced during water treatment. Some officials feel that they are not reaching all of their customers because outreach is always done in English. In the future, elected officials in this region hope to be maximizing recycled water.

Mutual Water Companies

Strengths Assessment: Water companies discussed many strengths of the southwestern region including the accessible and affordable drinking water. The water they supply is relatively cheap-- cheaper than the city water. The companies are able to supply their own water and have a large storage capacity. Some companies explained that there are no major issues with the wastewater system and there are no compliance regulatory issues with drinking water, stormwater, urban water, or wastewater as a result of maintaining their infrastructure. The water companies have been able to update multiple well infrastructure and software with their own funding as well. The large land area used for groundwater recharge was also cited as a strength. The companies feel that they have a stable and effective board of directors. One of the most important strengths is that everyone appreciates their community and are eager to help.

Needs Assessment: There are several specific needs identified by water companies including a need for funds for a new well. Rural areas of this region will become financially vulnerable if they pay for the new well because of their small budget and the increasing cost associated with maintaining the system will cause a need for additional tax revenue. This well is necessary because when one well is down, pressure is too low. Although there is a large underdeveloped area that allows water to recharge the aquifer, the

infrastructure must be upgraded to insure that using groundwater is a viable option to serve community needs. One water company, on the other hand, feels that they will switch from wells and begin using city water because regulations are becoming expensive to meet and it is difficult to find an operator. Because becoming a certified operator is a “hindrance” it has proven difficult to find someone to volunteer. The water companies also feel that they are held responsible for flood management and urban runoff issues, which warrants additional staff and resources to address and maintain. Some feel that the community lacks sufficient water for fighting fires. Perchlorate and 1,4-dioxane are found in some water sources and there is yet to be a state Maximum Contaminant Level set for 1,4-dioxane.

Water Associations

Strengths Assessment: Water associations in the Southwestern Region expressed the accessibility and affordability of drinking water as one of their important strengths. There were no issues or challenges reported by the company in terms of water quantity, waste water system, urban, flood and stormwater management, regulatory or infrastructure. They have a stable board of directors and a good financial standing.

Needs Assessment: Water associations in the Southwestern Region expressed some weaknesses such as increase in crime rates and the removal of businesses to build more homeless shelters.

Community Members

Strengths Assessment: Participants immediately identified trust, a perceived connection between the arts and muralism and their sense of community and history within their communities as a strength. In relation to governance, residents felt that their city government’s efforts to build a strategic plan that created impeccable community spaces and prosocial school settings.

Needs Assessment: Every community shared concerns about the increased number of people experiencing homelessness and the limited (perceived) efforts on the part of city officials to address the issue. Most, if not all, participants expressed sincere, sympathetic sentiments towards the people experiencing homelessness and called for their cities to provide more housing and wrap-around services to mitigate the costs and potential dangers of having large numbers of people on the streets.

In relation to water resources, communities would like to encourage one another to move away from bottled water by implementing new educational outreach campaigns and installing water bottle filling stations that are more accessible and properly maintained. Community members felt that municipal water agencies and water management groups could be more active in assisting with conservation efforts, including subsidies for installing devices at home, monitoring water use, and drought tolerant landscaping. Finally, improving green spaces and using community-based events or intentionally designed community spaces received strong support within the sessions, especially as it relates to opportunity for environmental education and demonstration sites.

Chapter 4 Evolving Solutions

4.1 Technical Assistance and Criteria for Projects

One of the unique features of the SAWPA DCI program is that efforts to engage with the community not only identify needs and strengths, it also enables project partners to develop criteria to prioritize and fund projects that address issues related to water resource management. WRPI, in consultation with SAWPA, developed an approach to manage project applications that includes a web-based application and management system that can be shared with evaluators. Using this interface, applicants can select project types that support activities related to user need assessments, capacity building community including supporting project lead agencies, project planning, construction and K-12 education. Ranking of applications will be focused on identifying the proposed projects direct and indirect benefits to a DAC, its alignment with SAWPA One Water One Watershed (OWOW) goals, support of the CA State Water Plan and benefits to historically underrepresented communities (i.e. tribal and homeless).

Project evaluators will be presented with a summary report of the above information about a project. Evaluators will then enter their review and recommendation for inclusion in the DAC IRWM plan. If two or more reviewers recommend inclusion, the project advances. These recommendations will then be presented to the SAWPA Board of Directors for approval of inclusion. Once a project has been approved by the SAWPA Board a secondary evaluation will be performed. The secondary evaluation will be largely automated but will require the evaluation team to research certain project components. For example, if a school district board is identified as a lead agency, they should be contacted to confirm that they are able to pass an authorizing resolution. Considerations during the second evaluation process will include the following:

- Geographic Location of Project.
 - Meets MHI requirement for DAC programs (MHI Census).
 - Geographically dispersed.
- Number of persons / connections benefiting.
- Percent of the benefited population below MHI.
- Critical water quality, water supply or flooding issue (health, safety, welfare).
- Estimated project cost.
- Potential funding sources.
- Funding / sustainability post DWR DACIP funding.
- Degree of alignment with listening session analysis (UCI analysis)
- Demonstration / verification of lead agency or program sponsor appropriateness and support.
- DWR approval of the project for DACIP funding (if other funding sources are identified).

The secondary evaluation will allow for the approved projects to be sorted or ranked based on any of the secondary criteria. For example, evaluators could sort the projects based on cost, low to high. An evaluator could sort the projects based on percent of the affected population meeting the MHI threshold, critical water supply need and high alignment with the listening session analysis. The secondary criteria can also be weighted to support evaluation of different project types and suitability for various funding

sources. This will allow for flexibility over time and allow the criteria to be weighted based on various funding source requirements.

4.1.1 SAWPA Technical Assistance Criteria and Project Evaluation

The following Criteria have been approved by the DCI program's Technical Advisory Committee (TAC) and the Department of Water Resources (DWR). All projects must meet all six criteria in order to be considered eligible for funding:

1. Serve members of disadvantaged or underrepresented communities as identified by the DWR mapping tool, or as established through alternate means such as a Median Household Income (MHI) survey or by direct identification as approved by DWR. Examples of agreed-upon communities eligible for DCI TA funds (that may not be reflected in the DWR mapping tool) include Tribal Nations and Communities, as well as people experiencing homelessness.
2. Address a need or utilize a strength identified in the Community Water Ethnography Report of the Santa Ana Watershed (Strength and Needs Assessment). Note that until the Report is available (October 2019), applicants may consider the strengths and needs themes below as a placeholder:
 - Strength: Community Engagement and Active Citizenship
 - Strength: Community Resilience and Diversity
 - Strength: Community Trust, Cultural Identity, and Mutual Support
 - Strength: Mutual Water Company Relationship Management and Funding
 - Strength: Outreach through Public Education
 - Strength: Reliable Access to Drinking Water, But Not Necessary to Affordable, High-Quality Water
 - Strength: Water Quality and Recycled Water
 - Need: Access to Information About Water Quality
 - Need: Communication between Community Members and Water Managers
 - Need: Disconnect between Agencies and the Public
 - Need: Housing Policies to Address Homelessness, Water Costs, and Vulnerabilities of Renting Publics
 - Need: Increased Collaboration between Agencies
 - Need: Mistrust of Tap Water and/or Community Distrust
 - Need: Public and Private Green Space
 - Need: Regulatory Compliance and/or Water Rates
 - Need: Relationship between Conservation and Rates
 - Need: Septic Contamination Need: Technical, Managerial and Financial Capacity
 - Need: Water Infrastructure Maintenance
3. Include a project/program sponsor that demonstrates engagement and readiness to receive the support and assistance if the project is offered TA funding.
4. Meet at least one of the objectives outlined in Section 3 of the 2018 OWOW Plan Update as indicated below and demonstrates a general understanding of the OWOW Integrated Regional Water Management Planning:
 - Achieve resilient water resources through innovation and optimization.

- Ensure high-quality water for all people and the environment.
 - Preserve and enhance recreational areas, open space, habitat, and natural hydrologic functions.
 - Engage with members of disadvantaged communities and associated supporting organizations to diminish environmental injustices and their impacts on the watershed.
 - Educate and build trust between people and organizations.
 - Improve data integration, tracking, and reporting to strengthen decision making.
5. Provide the following information regarding their project prior to DCI Program Technical Assistance Committee (TAC) review:
- Project sponsor name and contact information
 - Project location
 - Estimated schedule
 - Scope of work
 - Project cost
 - List of project deliverables
 - Grant amount requested
6. Describe how measurable improvements will be achieved in the technical, managerial, or financial capacity of the project sponsor.

Eligible Projects/Program may include:

1. Community Capacity Building
 1. Technical Needs Assessment
 2. Organization Support
 3. Public Liaison/Promotora
 4. Water Operator Training
2. K-12 Initiatives
 1. Curriculum Development
 2. General Educational Material
 3. Presentations for Youth
 4. Youth Events/Field Trips
 5. Teacher Training
3. Project Development Activities
 1. Technical Feasibility and Financial Analysis
 2. Project Development Support
 3. Site Assessments (e.g. MHI survey)
 4. Feasibility Report
4. Pre-Construction Activities
 1. Preliminary Engineering Services
 2. Water and Energy Audits
 3. Pilot Studies
 4. CEQA Support

It is anticipated that approximately 75% of the available TA grant funding will be directed to projects or programs that reflect technical project development and pre-construction activities. This is not an exhaustive list of eligible TA projects. TA projects that do not fall under one of the categories listed above may be considered on a case-by-case basis (SAWPA Criteria, 2019).

4.2 Community Based GIS Toolkit

A long term goal of the project is to educate the community regarding listening session finds, build a geographic based online mapping tool so that community members can learn about water resources across the basin and lastly, so that project partners can work with water agencies and community organizations to identify resource deficiency. Throughout the project, the CSU WRPI team collaborated with colleagues at Cal Poly Pomona and CSU Northridge to consolidate existing data into the online mapping tool (i.e. toolkit) and create new visual tools so users can understand the spatial context of water related topics and issues. This effort assist in addressing a central goal of the project to inform and empower those living and residing in disadvantaged communities to take an active role in decisions made within their communities related to current and future water resource management. Below are several examples of how this toolkit can be used to inform disadvantaged communities.

Water District Boundaries and Identifying DACs

In an effort to assist water agencies and providers with more information regarding their customers and residents, the GIS Toolkit was used to query the percent of DACs and Severely DACs within each provider's service boundary, as well as that provider's source of water (Appendix C). For example, the Hemet City Water District boundary contains 78% DACs and 63% SDACs with their primary water sources coming from the Eastern Municipal Water District, the Lake Hemet Municipal Water District, and a well course. Information such as this, coupled with the demographic data by DAC and SDAC, may assist water providers in understanding more about community needs so that they can design more comprehensive water resource plans and management strategies that meet the needs of their customer base. This may include outreach efforts designed specifically for a community to document their needs so that they can be included in the decision making processes related to current and future water resource sustainability.

Water Quality Reports

Water Quality Report provides a convenient access to obtain the annual Consumer Confidence report each provider submitted to the State. The GIS toolkit can provide access to the latest, as well as archival, reports which highlight the number of water quality testing stations associated with wastewater treatment plant effluent, number of samples that exceeded state and federal standards and an overall ranking of the sites annual water quality. An example of this information is displayed in Figure 10 for the City of Upland.

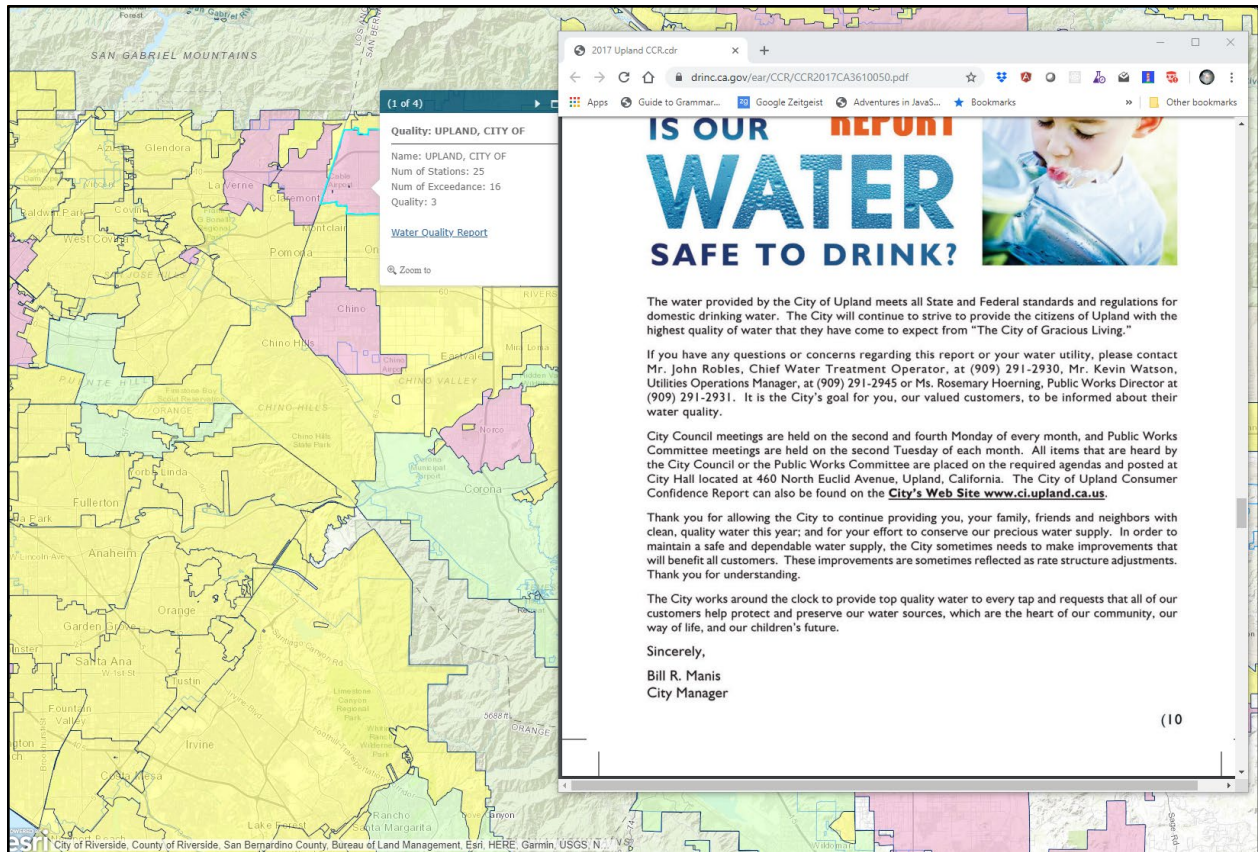


Figure 10. GIS Toolkit displaying a water report related to the City of Upland.

Available K-12 Education Programs

In addition to regulatory reports, the toolkit also canvass provider sponsored educational and outreach programs and maintains a central repository of them. This serves both as an inventory of available programs for consumers and also as a peer experience sharing amongst the providers. Not necessary to ignite the competitive spirit of local agencies, this repository allows quick references to what others have done in various outreach, in-community activities, and educational programs. Figure 11 illustrates the 20 K-12 programs at Elsinore Valley MWD. Program descriptions and, sometimes, material and artifacts, are available to download. Many of the pamphlets and posters are really fascinating and informative.

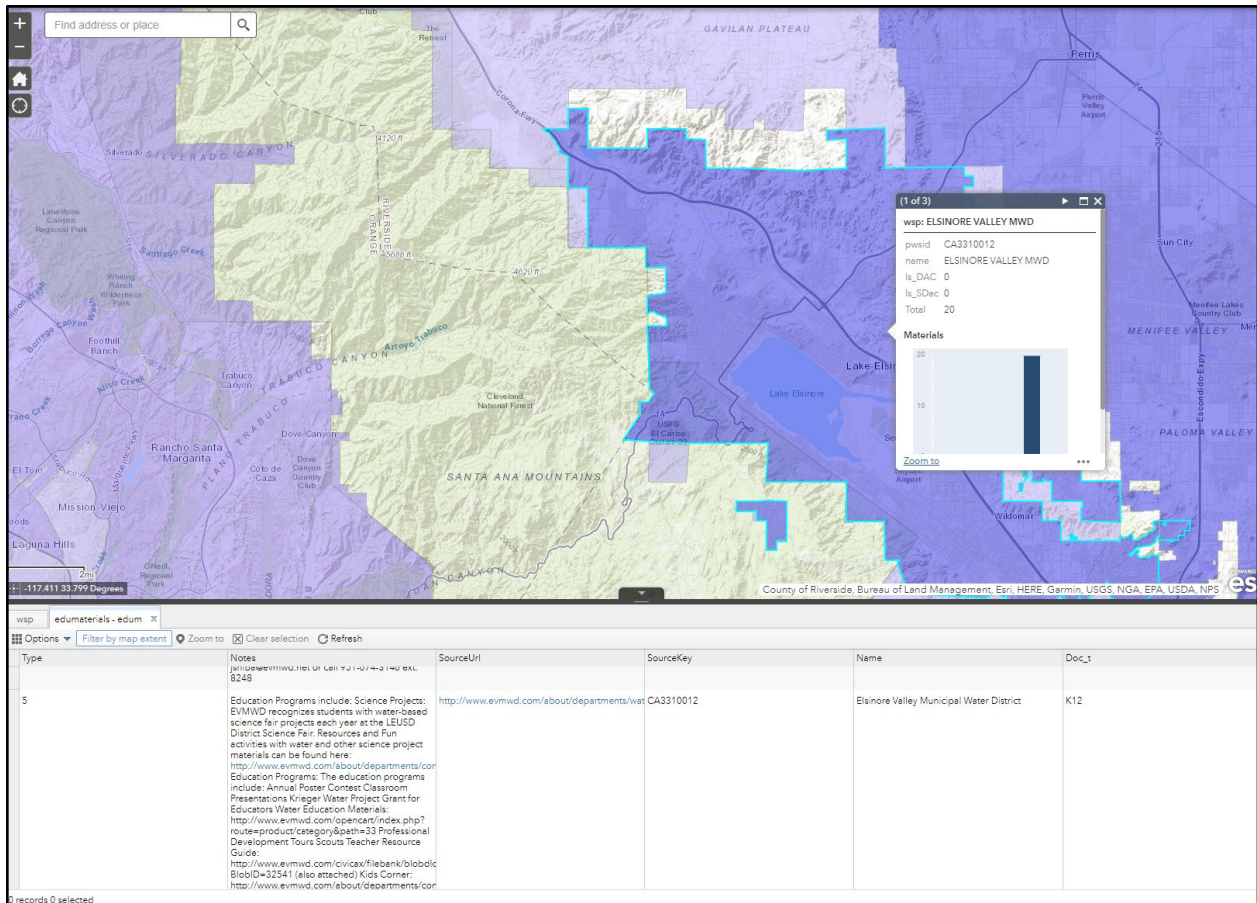


Figure 11. GIS Toolkit Illustrating the 20 K-12 programs provided by the Elsinore Valley Municipal Water District.

The GIS Toolkit will always be evolving as new data emerges and needs of the community, regulatory agencies, water districts and decision makers are identified. This process ensures that stakeholders across the SAR basin are informed and aware of the various resources in their communities. When deficiencies are identified, the toolkit can also serve as a platform to support the inclusion of additional data so that all stakeholders are empowered to play an active, participatory role in ensuring community resources, especially water resources, are adequate for current and future generations. Such an approach will enable communities across the watershed to learn from each other, share resources and collectively work towards the common goals highlights in the watershed's IWRM plan.

References

- Brooks, Emily, Simone Popperl, Valerie Olson. (2018). SAWPA Project Analysis Report.
- Brown, Greg ; Strickland-Munro, Jennifer ; Kobryn, Halina ; Moore, Susan A. (2017). Mixed methods participatory GIS: An evaluation of the validity of qualitative and quantitative mapping methods *Applied Geography* (79)153-167
- Bureau of Applied Research in Anthropology (AIIA) (2018). *American Indian Social Impact Assessment*. Report No. ANA 032-126 (Per-02). Riverside: 2007. Accessed on August 3, 2018 from https://www.riversideca.gov/utilities/about-rpu/pdf/current-projects/Appendix_G_American_Indian_Social_Impact_Assessment.pdf
- California Department of Water Resources (DWR). (2018). "Economically Distressed Areas Mapping Tool." Accessed August 20, 2018. <https://gis.water.ca.gov/app/edas/>
- California Office of Environmental Health Hazard Assessment (OEHHA) (2018). "CalEnviroScreen 3.0" Accessed on October 3, 2018 from <https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-30>
- California Water Association (CWA) (2019). "About" Accessed on March 2, 2019 from <http://www.calwaterassn.com>
- California Rural Water Association (CRWA) (2019). "About" Accessed on March 11, 2019 from <https://calruralwater.org>
- Fenelon, James (2019, April 30). Email Correspondence by Jennifer Alford. Defining Tribal, Native, and Indigenous Communities for the Santa Ana Watershed Project Authority (SAWPA) Disadvantaged Involvement Program. California.
- Jankowski, Piotr (2009). "Towards participatory geographic information systems for community-based environmental decision making" *Journal of Environmental Management* (90) 6, 1966-1971.
- Olson, Valerie (2019, April 29). Email Correspondence by Jennifer Alford. Defining Community for the Santa Ana Watershed Project Authority (SAWPA) Disadvantaged Involvement Program. California.
- Santa Ana Watershed Project Authority (SAWPA) (2018). "OWOW Report 2018 Chapter 3 (2010)" Accessed August 17, 2018 from http://www.sawpa.org/wp-content/uploads/2014/01/3.0-Watershed-Setting_tc_11-20-2013_FINAL1.pdf
- Santa Ana Watershed Project Authority (SAWPA) (2019). "Disadvantaged Communities Involvement Program Project Funding Criteria" Accessed on August 20, 2019 from <https://sawpa.org/owow/dci-program/technical-assistance/criteria/>
- United States Census (2018) "Factfinder" Accessed October 2, 2018 from https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_16_5YR_B19001&prodType=table

United States Geological Survey (USGS) (2018) "Santa Ana Basin" Accessed August 20, 2018 from https://ca.water.usgs.gov/sana_nawqa/

University of Pittsburgh (2019). "Understanding Census Geography" Accessed March 5, 2019 from <https://pitt.libguides.com/uscensus/understandinggeography>

Water Education Foundation (WEF) (2018). "Santa Ana River" Accessed August 19, 2018. <https://www.watereducation.org/aquapedia/santa-ana-river>

Appendix A Partnership Profiles



The Santa Ana Watershed Project Authority (SAWPA) is a joint-powers authority composed of five member agencies. As the Regional Water Management group for the Santa Ana River Watershed, SAWPA oversees a variety of collaborative programs, including the implementation of the Integrated Regional Water Management (IRWM) Proposition 1 Grant program and the Disadvantaged Community Involvement (DCI) Program.

Services:

- Community Water Internship
[Paid internship](#) for undergraduate and graduate students from colleges and universities in the watershed. This program, facilitated jointly with WRPI, aims to build the capacity of local water agencies to engage with disadvantaged and underrepresented communities.
- Trust the Tap
Multi-lingual, [multi-media informational campaign](#) focused on spreading awareness about the value and safety of tap water in communities that have historically mistrusted their tap water or relied on bottled water.
- [Translation Services](#)
On-call translation services available for public sector and nonprofit partners in the watershed. Services can cover the translation of water-related public meetings and documents.



Founded in 2008 and composed of more than 250 experts from throughout its 23 campuses, the California State University's Water Resources and Policy Initiatives (WRPI) develops water management solutions through research, partnerships, education, and training, for the community, faculty, and students.

WRPI collaborates with SAWPA to administer the goals and objectives of the Proposition 1 DCI program. In this program, WRPI plays numerous roles including administering an internship program for students to gain real-world experiences in water research and governance, developing and analyzing the geographic characteristics of communities within the Santa Ana River Watershed, and project partnership identification. Additionally, WRPI played a role in developing and implementing community listening sessions, which included working with Tribal and Native leaders, through the development of the CSU WRPI Native Listening Team, to ensure that these communities were accurately represented and included in this process.

The Department of Anthropology at UC Irvine is recognized as a national leader in ethnographic-research design and community engagement. It houses the Center for Ethnography, which supports innovations in collaborative ethnographic research, and the Community Knowledge Project, which supports community organizations in building local knowledge for health and social justice projects. Additionally, UCI is home



to Water UCI, an initiative supporting interdisciplinary research on water science, technology, management, and policy.

resources.

UCI’s primary task was to design an ethnographically-informed research instrument that satisfy particular constraints: one that borrowed an ethnographer’s training, tools, and techniques, but one that could also operate, successfully, under a limited time frame and with limited



Incorporated in 1990, California Rural Water Association (CRWA) has emerged as the State’s leading association dedicated to providing on-site technical assistance and specialized training for rural water and wastewater systems. Tapping into the expertise of experienced water and wastewater professionals, CRWA’s governing Board of Directors, administrative staff, and technical field specialists work in concert to offer CRWA members an expansive range of essential programs and member services.

When a system and its staff need help developing a new rate schedule, understanding ever-changing and complex government regulations, or updating operator certification requirements, CRWA is ready with assistance. The nature of CRWA’s mission allows for quality working relationships between rural water and wastewater systems. As a result, CRWA’s role in the DCI Program was to perform strengths and needs assessments for mutual water companies serving disadvantaged communities in the Santa Ana River Watershed.



Local Government Commission

Leaders for Livable Communities

The Local Government Commission (LGC) works to build livable communities and enhance local leadership by connecting leaders with innovative programs and network opportunities, advancing policies through participation at the local and state level, and implementing solutions as a technical assistance provider and advisor to local jurisdictions. With roots in California and a national reputation, LGC offers innovation, information, and partnership opportunities for local and

regional champions dedicated to building resilient communities that integrate environmental, social, and economic priorities into civic engagement.

- LGC’s role in the DCI Program is to engage local elected officials in assessing their community’s strengths and needs, and provide education to those officials about water-related challenges facing disadvantaged communities in their jurisdiction. Finally, LGC presents leaders with possible strategies for addressing those challenges specific to their communities. For this program, LGC has conducted interviews with elected members from eight different cities within the Santa Ana River Watershed.

Services:

- Technical Assistance:

- [Funding Navigation Tool](#): Offers the most prominent funding opportunities for local governments and communities. Resources are categorized into seven “Project Types” including Active Transportation, Drinking Water, Local Street Repair, Parks, Public Transit & Shared Mobility, Stormwater, and Wastewater Management.
- [Bringing Together Water and Land Use](#)



CivicSpark is a Governor’s Initiative AmeriCorps program dedicated to building capacity for local governments to address community resilience issues. Each year, two CivicSpark Fellows are placed at SAWPA to support the DCI program. Fellows work on several elements of the program including drafting portions of the Ethnography Report, managing the Community Water Internship program with WRPI, and kickstarting SAWPA’s On-Call Translation Service.



CALIFORNIA STATE UNIVERSITY
FULLERTON™

The Center for Internship & Community Engagement at Cal State Fullerton CICE develops reciprocal partnerships with community organizations, public agencies, and industry that offer opportunities for students to learn through service and/or work experiences relevant to their studies. We facilitate and support the work of faculty in engaged teaching, learning and scholarship. CICE also coordinates community engagement resources and procedures for the University.

CSUF conducted community outreach to strategically identify community partners to host ethnographically-informed listening sessions. In collaboration with CSUSB and UCI, CSUF facilitated sessions throughout Orange County.



Established in 2001, The Newkirk Center for Science and Society aims to improve science's response to community needs and to increase the effective uses of scientific information for the benefit of society. The Center focuses on the interaction between science and society, including the role of society in the production

of scientific knowledge and technological systems and artifacts and the effects of scientific knowledge on society. It seeks to explore and think critically about the process by which scientific information is communicated to the public and policy-makers. It fosters the use of science to enhance the environment, education, health care, public infrastructure, and justice. The Center carries out its mission through support of research, workshops, and public events. The Community-based Research Initiative (CbRI) at the Newkirk Center founded in 2018 conducts, studies, and trains people about community-based research practices and pedagogy.

The CbRI conducted 12 two-part community listening sessions during Year Two. Each listening session consisted of a conversation with representatives from disadvantaged communities from across the Santa Ana watershed. CbRI staff then followed up with Listening Session participants through 4 Community

Feedback and Dialogue Sessions. The CbRI is responsible for the development of a pilot train the trainer based on CbRI Community Listening Sessions and a manual.

Appendix B: Non-Profit Organizations Contacted

ORGANIZATION	COMMUNITY TYPE/DESCRIPTION	CITY	COUNTY
--------------	-------------------------------	------	--------

Alzheimer's Family Center	Dementia Patients	Huntington Beach	Orange
America on Track	Children/Families	Santa Ana	Orange
American Cancer Society		Riverside	Riverside
Art & Creativity for Healing, Inc.	Various/Art	Laguna Hills	Orange
Asian American Resource Center (AARC)		San Bernardino	San Bernardino
Assistance League of Capistrano Valley, Inc.	Children/Families	San Juan Capistrano	Orange
Assistance League of San Bernardino		San Bernardino	San Bernardino
Banning Cultural Alliance		Banning	Riverside
Big Brothers Big Sisters of Orange County	Youth	Santa Ana	Orange
Big Brothers Big Sisters of the Inland Empire		Riverside	Riverside
Boys and Girls Club of Garden Grove	Children/Families	Garden Grove	Orange
Boys and Girls Club of Tustin	Youth	Tustin	Orange
Braille Institute	Visually Impaired	Anaheim	Orange
Buena Park Meals on Wheels	Seniors	Buena Park	Orange
C.A.S.A (Court Appointed Special Advocates for Children) of San Bernardino County		Colton	San Bernardino
CareerWise	Homeless	Fullerton	Orange
Caterina's Club	Children/Families	Anaheim	Orange
Center for Healthy Neighborhoods		Fullerton	Orange
Centro Comunitario de Educacion	Pre-K-Adult Learning Center	Santa Ana	Orange
Children's Bureau of Southern California		Los Angeles	Los Angeles
City of Anaheim Community Services	Various	Anaheim	Orange
Coast to Coast Foundation	Homeless	Yorba Linda	Orange
Community Action Partnership of San Bernardino			San Bernardino
Community Autism Now		San Clemente	Orange

Concern America	international development and refugee aid	Santa Ana	Orange
Creative Identity	Therapeutic music and expressive arts for adults with intellectual and developmental disabilities	Anaheim	Orange
El Centro Cultural de Mexico	Latina/o; Various	Santa Ana	Orange
Epilepsy Support Network of Orange County	Support for Adults/Children w. Epilepsy	Costa Mesa	Orange
F.A.C.E.S.	Children/Families	Fullerton	Orange
Families Forward	Homeless/Families	Irvine	Orange
Family Service Association of Redlands		Redlands	San Bernardino
Family Support Network	Children with Special Needs	Fullerton	Orange
Feeding America: Riverside/ San Bernardino (Inland Empire)		Riverside	Riverside
Food Finders		Lakewood	Los Angeles
Foothill Family Shelter		Upland	San Bernardino
Foster Care Auxiliary of Orange County	Foster Youth and Families	Anaheim	Orange
Free Wheelchair Mission	Providing Wheelchairs to those in developing countries	Irvine	Orange
Friendly Center	Children/Families	Orange	Orange
Future Leaders of Our Community- See Notes		Irvine	Orange
Giving Children Hope	Children/Families	Buena Park	Orange
Goodwill Industries of Orange County California	Adults with Disabilities	Santa Ana	Orange
Grandma's House of Hope		Santa Ana	Orange
H.O.P.E	Families	Garden Grove	Orange
Habitat for Humanity of OC	Various	Santa Ana	Orange
Hart Community Homes		Fullerton	Orange
Helping Hands Pantry		San Bernardino	San Bernardino

Higher Ground	At Risk Youth/Families	Yorba Linda	Orange
IERCD Inland Empire Resource Conservation District			Riverside
Illumination Foundation	Homeless Population	Irvine	Orange
Inland Empire Waterkeeper	Water	Riverside	Riverside
Jamboree Housing Corp.	Affordable Housing-Non-Profit Builder	Irvine	Orange
Laura's House	Domestic Violence Victims	Garden Grove	Orange
LGBT Center OC	LGBTQ Community	Santa Ana	Orange
Meals on Wheels - SeniorServ	Seniors	Anaheim	Orange
MECCA Multi-Ethnic Collaborative of Community Agencies	Underserved, multicultural communities	Santa Ana	Orange
Mercy House - Bridges			
Mercy House - The Orchard	Housing	Santa Ana	Orange
National Association for The Advancement of Colored People (NAACP)		Riverside	Riverside
OASIS Center International	Youth	Santa Ana	Orange
OC Food Access Coalition	Nutritionally Vulnerable	Santa Ana	Orange
OCAPICA	Asian; Pacific Islander	Costa Mesa	Orange
OCCCO		Anaheim	Orange
OPARC		Montclair	San Bernardino
Orange County Coastkeeper	Water/Ecology	Costa Mesa	Orange
Orange County's United Way	Various	Irvine	Orange
Orangewood Foundation	Youth	Santa Ana	Orange
Pacific Islander Health Partnership (PIHP)		Santa Ana	Orange
Pacific Lifeline: A Shelter for Women and their Children		Upland	San Bernardino
Pathways of Hope	Hungry and Homeless	Anaheim	Orange
Peppermint Ridge	Disability	Corona	Riverside
Project Life Impact		San Bernardino	San Bernardino

Project MotiVATe	Vietnamese American Yotuh	Garden Grove	Orange
Renewable Farms	Unspecified	Anaheim	Orange
Riverside Area Rape Crisis Center (RARCC)		Riverside	Riverside
San Bernardino Community Service Center		San Bernardino	San Bernardino
Serve the People, Inc.	Various	Santa Ana	Orange
Share Our Selves Corporation	Homeless	Costa Mesa	Orange
Socio-economic Uplift, Literacy, Anthropological and Developmental Services (SULADS)	Native American Families	Beaumont	Riverside
Stand Up for Kids- Orange County *See Notes	Youth	Irvine	Orange
The Cambodian Family	Refugee/Immigrant Families	Santa Ana	Orange
The Carolyn E. Wylie Center for Children, Youth and Family		Riverside	Riverside
The Community Assistance Program (CAP)	Food Pantry	Moreno Valley	Riverside
The Ecology Center	Ecology	San Juan Capistrano	Orange
The San Bernardino City Mission		Highland	San Bernardino
The Youth and Family Wellness Center (TYFWC)		Perris	Riverside
Thomas House Family Shelter		Garden Grove	Orange
Time For Change Foundation		San Bernardino	San Bernardino
Tiyya	families of refugees, immigrants, and displaced Americans	Santa Ana	Orange
Uncommon Goods			San Bernardino
Unidos Por La Musica		Ontario	San Bernardino
United Nations of Consiousness		San Bernardino	San Bernardino
Vietnamese American Cancer Foundation	Vietnamese Community	Fountain Valley	Orange
Waste Not OC Coalition		Orange	Orange
Western Youth Services	Youth	Santa Ana	Orange

Whittier First Day	Homeless and At Risk Individuals	Whittier	Los Angeles
WISE Place	Homeless Women	Santa Ana	Orange
Young Visionaries Youth Leadership Academy		San Bernardino	San Bernardino
Youth Action Project		San Bernardino	San Bernardino
Youth Hope Foundation		Redlands	San Bernardino

Appendix C DACs and SDACs within Water Provider Boundaries (Example)

Name	Pop	Hh_Total	Hh_DAC_perc	Hh_SDAC_per c	Source of Water
Banning City	29965	10350.87	0.610276935	0.46649594	BEAUMONT CHERRY VALLEY WD, Well
Eastern Municipal Water District	512711	227716.6	0.443622305	0.32727478	METROPOLITAN WATER DIST. OF SO. CAL., Well
Elsinore Valley Municipal Water District	142264	37101.44	0.395528485	0.28251912	EASTERN MUNICIPAL WD, Well, WESTERN MWD
Hemet City Water Department	20212	10454.89	0.781686852	0.63478834	EASTERN MUNICIPAL WD, LAKE HEMET MWD, Well
South Mesa Water Company	9851	4091.965	0.552640842	0.42812412	Well, YUCAIPA VALLEY WATER DISTRICT
Home Gardens County Water District	3033	621.9745	0.656133405	0.53545687	CORONA- CITY OF, RIVERSIDE- CITY OF
Idyllwild Municipal Water District	2500	348.1131	0.515905191	0.38283918	FERN VALLEY WD, PINE COVE WATER DISTRICT, Well
Jurupa Community Services District	106907	28888.35	0.310252387	0.21993752	CHINO BASIN DESALTER AUTH. - DESALTER 1, CHINO BASIN DESALTER AUTH. - DESALTER 2, NORCO- CITY OF, RUBIDOUX COMMUNITY SD, Well
Lake Hemet Water District	50001	16388.36	0.578301044	0.44523769	EASTERN MUNICIPAL WD, Well
Norco City	27160	7357.678	0.27321814	0.19574621	CHINO BASIN DESALTER AUTH. - DESALTER 2, CORONA- CITY OF, JURUPA COMMUNITY SD, Well, WESTERN MWD (ARLINGTON)
Nuevo Water Company	6000	1091.214	0.532523542	0.41343399	EASTERN MUNICIPAL WD, Well
Perris City Water Department	9000	2195.026	0.637781209	0.45238983	EASTERN MUNICIPAL WD
Pine Cove Water District	1000	150.8807	0.464043587	0.32700988	IDYLLWILD WATER DISTRICT, THOUSAND TRAILS IDYLLWILD - MHC, Well

Appendix D Examples of GIS Database Toolkit Tabular Data

Question for SAWPA Database

- Total number of SAPs 93, SAWPA has 109 agencies listed on their web site, the others are wastewater and irrigation districts
- Total number of SAPs as DAC 22
- Total number of SAPs as SDAC 6
- Total number of SAPs within 5% of DAC 13 (i.e., 45 to 50% of the hh are DAC)
- Total number of SAPs within 5% of SDAC 6 (45 to 50% of hh is SDAC)
- Total number of SAPs as DAC with less than 10,000 connections 15, including the 5 below
- Total number of SAPs as SDAC with less than 10,000 connections 6, including the 3 below
- Total number of SAPs as DAC with less than 1000 connections 5
- Total number of SAPs as SDAC with less than 1000 connections 3
- Range of the number of connections for all SAPs min 4, max 137,037, avg 18,928
- Range of the number of connections for all DAC / SDACs. min 22, max 49,080, avg 7,985