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Los Angeles

Thirsty by Design

Regulating Water Access in the Coachella Valley

A dissertation submitted in partial satisfaction of the
requirements for the degree Doctor of Philosophy
in Urban Planning

by

Jessica Bremner

2022

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ABSTRACT OF THE DISSERTATION

Thirsty by Design

Regulating Water Access in the Coachella Valley

by

Jessica Bremner

Doctor of Philosophy in Urban Planning

University of California, Los Angeles, 2022

Professor Vinit Mukhija, Chair

In the Coachella Valley, issues of water access are spatial in nature. Residents of the Eastern Coachella Valley experience water insecurity, while residents and visitors of the Western Coachella Valley have access to water for both potable and non-potable purposes. My dissertation takes the spatial inequality of water access between the two regions as a foundation for inquiry. I ask: How did the Coachella Valley's spatial inequality in water access develop, deepen, and become exacerbated? I answer this question using the extended case method with water access in the Coachella Valley as my case. I use spatial analysis to examine the geographic patterns of water access over time, situating them within the institutional and water source context of the Coachella Valley. I analyze policy and archival documents to understand three conjunctural eras of spatial inequality in water access. I start with early United States settler colonialism in the late 1800s in the Coachella Valley. I then examine regional government

formation for water management from the early 1900s to mid-century. Finally, I analyze contemporary land and water use policies that currently exacerbate spatial inequality in water access. I find that United States settler colonial policies were used by early settlers to dispossess Coachella Valley Indigenous communities of land and water, developing spatial inequality in water access. This spatial inequality, first presented as a racialized checkerboard spatial pattern between Indian/public and non-Indian/private land, deepened with the 1918 formation of a regional government to manage water provision and distribution, the Coachella Valley Water District. The water district, designed to grow the agriculture industry, established a center/periphery pattern of water access based on use where access to agricultural water was found in the periphery and access to domestic water was built in the region's urban core. Today, regional county land use and water district regulations exacerbate both spatial patterns. Their growth for growth policies (that require new private development to expand public infrastructure provision) pursue peri-urbanization through luxury tourist developments. In doing so, they increase socio-economic disparities and decrease geographic proximity between those who have access and those who lack access to water.

The dissertation of Jessica Bremner is approved.

Anastasia Loukaitou-Sideris

Ananya Roy

Helga M. Leitner

Vinit Mukhija, Committee Chair

University of California, Los Angeles

2022

TABLE OF CONTENTS

Chapter 1 Introduction	1
Centering the Coachella Valley.....	7
Dissertation Structure.....	10
Chapter 2 Literature Review and Theoretical Framework	15
Spatial Inequality.....	16
Water Access and Water Dispossession.....	23
Theoretical Framework	30
Interlocking Systems of Oppression.....	31
Racial Capitalism.....	32
Chapter 3 Research Design.....	35
Spatial Analysis.....	38
Contemporary Water Access Data and Analysis.....	38
Plumbing Data Analysis	40
Plumbing Data Limitations.....	48
Archival and Document Analysis	52
COVID-19 Research Constraints and Positionality	55
Chapter 4 Mapping Spatial Inequality in Water Access in the Coachella Valley.....	60
Introduction	60
The Contemporary Shape of Inequality	66
Physical Access Issues: Small Water Systems Consolidation.....	66
Water Quality and Issues of Water Reliability	69
Water Use as an Additional Characteristic of Water Access	73
Where Plumbing Completeness is Lacking	78
Three Patterns of Spatial Inequality in Water Access	78
Conclusion.....	96
Chapter 5 Developing a Racialized Checkerboard of Spatial Inequality	99
Introduction	99
Settling Coachella	102
Early Colonial Regimes in California.....	103
Early Colonialism in Coachella.....	104
Implementing United States Settler Colonial Neutral Land Policies	105
From Naturally to Socio-Politically-Driven Unevenness	125
Diversion and Grabbing: Water Dispossession in the Western Coachella Valley	126
Aquifer Overdraft: Water dispossession and insecurity in the Eastern Coachella Water	132
Conclusion.....	144
Chapter 6 Regional Government’s Tactics of Exclusion and Dispossession.....	146

Introduction	146
Forming a Regional Government: the Coachella Valley County Water District.....	147
Uneven Development as an Outcome of Expanding Water Sources and Services.....	150
Allocation as Dispossession: Whitewater Adjudication.....	150
Tapping the Colorado River for Growth	152
Preventing Access by Refusing Infrastructure: Colorado River Distribution	157
Deepening Spatial Inequality by Adding Domestic Water for the Tourist Industry.....	165
Introducing a new pattern of spatial inequality	174
Conclusion.....	176
Chapter 7 How Retreat Urbanism Exacerbates Spatial Inequality	178
Introduction	178
Eastern Coachella Valley’s Growing Disparity in Water Access	181
Thermal, Oasis, and Disadvantaged Communities.....	182
A Surf Lagoon in the Desert.....	188
Planning, Contesting, and Approving Urban Growth	191
Planning Land Use and Disparity	191
The Public’s Role in New Development Approvals.....	194
Exacerbating Spatial Inequality in Water Access with Growth for Growth	197
Exacerbating Water Quality and Scarcity.....	202
Growth for Growth Policies	209
Changing the Pattern of Spatial Inequality	221
Conclusion.....	224
Chapter 8 Conclusion.....	227
Introduction	227
Findings.....	229
Theoretical Contributions.....	233
Future Research.....	235
Policy Implications.....	236
Appendix A: Maps Addendum.....	240
Demographic Changes Over Time.....	240
Water Quality Contaminants	246
References	251

List of Figures

Figure 3-1 Census Tract Geographic Changes Over Time	43
Figure 3-2 Margin of Error for Aggregated Regional Counts of Plumbing Completeness	51
Figure 4-1 Coachella Valley.....	62
Figure 4-2 Coachella Valley Water Agencies	63
Figure 4-3 Small Water Systems Unconnected from CVWD Public Infrastructure in the ECV..	67
Figure 4-4 Public Water Systems with Well Water Quality Violations between 2010 and 2020.	71
Figure 4-5 Wells with Arsenic Detected above MCL 10 mg/L	72
Figure 4-6 Water Use in the Coachella Valley by Typology and Water Agency	75
Figure 4-7 Water Use by Coachella Water Agencies, Gallons per capita per day.....	76
Figure 4-8 Water Use by Coachella Water Agencies, Gallons per capita per day.....	77
Figure 4-9 Percent of Occupied Housing Units Lacking Complete Plumbing 1960-2019	80
Figure 4-10 Percent of All Occupied Housing Units in the Coachella Valley Lacking Complete Plumbing 1960-2019	81
Figure 4-11 Regional Change in Occupied Housing Units Lacking Complete Plumbing 1960-2019	83
Figure 4-12 Regional Change in Occupied Housing Units Lacking Complete Plumbing by Incorporation 1960-2019	84
Figure 4-13 Water Sources for Occupied Housing Units 1960-1990	85
Figure 4-14 Number of Occupied Housing Units Lacking Complete Plumbing by Census Tract 1960-2019.....	94
Figure 4-15 Occupied Housing Units Lacking Complete Plumbing by Census Tract and Region 1960-2019.....	95

Figure 5-1 1856 Plat of Township 4 South, Range 4 East by John La Croze (location of Palm Springs and Agua Caliente Reservation).....107

Figure 5-2 Close-up of Township 6 South, Range 8 East from 1856 Survey of the Coachella Valley showing three sections labeled as Indian Rancherias in present day Thermal 108

Figure 5-3 The Coachella Valley’s Checkerboard of Public Domain and Private, Southern Pacific Railroad Company Land 111

Figure 5-4 Eastern Coachella Valley 1856 Surveyed Indian villages and 1876 Executive Order Reservations 117

Figure 5-5 Coachella Valley 1856 Surveyed Indian villages and 1876 and 1877 Executive Order Reservations 118

Figure 5-6 Commission Selection for Torres-Martinez Reservation following the 1891 Act for the Relief of the Mission Indian 123

Figure 7-1 Kohl Ranch and Notorious Mobile Home Parks 179

Figure 7-2 Housing Growth in the Coachella Valley 1960-2019..... 190

Figure 7-3 Documented Project Support from Developer 198

Figure 7-4 CVWD Water and Sewage Mains and Consolidation Project Connections.....216

Figure A-1 Percent of Population Working in Agriculture 240

Figure A-2 Percent of Population that Identifies as Hispanic 241

Figure A-3 Percent of Population that was Foreign-Born..... 242

Figure A-4 Percent of Population Living Below Poverty 243

Figure A-5 Percent of Households Living in Mobile Homes..... 244

Figure A-6 Percent of Households with Individual Wells as Water Source 245

Figure A-7 Wells with Perchlorate Detected above MCL 6 UG/L 246

Figure A-8 Wells with Uranium detected above MCL 20 pCi/L247

Figure A-9 Wells with Nitrate Detected above MCL 10 MG/L248

Figure A-10 Wells with Chromium, Hexavalent Detected above HBCL 20 MG/L249

Figure A-11 Wells with 1,2,3 TCP Detected above MCL 0.005 UG/L250

List of Tables

Table 3-1 United States Census and American Community Survey Data44

Table 3-2 Change in Coachella Valley Census Tracts from 1960-201946

Table 3-3 Count of Occupied Housing Units Lacking Complete Plumbing in Relation to Census
Tract Counts51

Table 4-1 Water Source for Housing Units Across Regions87

Table 4-2 Percent of Total Occupied Housing Units and Occupied Housing Units Lacking
Complete Plumbing in the Coachella Valley89

Table 4-3 Descriptive Statistics of Regions90

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BIOGRAPHICAL SKETCH

Jessica Bremner received a bachelors degree in Latin American Studies from Tulane University and masters degrees in Latin American Studies and Urban Planning from the University of California, Los Angeles. She was the planning director at the non-profit design firm Kounkuey Design Initiative before pursuing her doctorate in urban planning at the University of California, Los Angeles. Her research interests lie at the intersections of spatial justice, gender, housing, participatory practices, and democracy. Her most recent work examines the processes that shape the spatial inequality of water access in the Coachella Valley.

Chapter 1 Introduction

In 2010, after years of neglect, Pueblo Unido Community Development Corporation (Pueblo Unido CDC)¹ took over management of the unpermitted St. Anthony Trailer Park in the Eastern Coachella Valley, two hours east of Los Angeles. Residents had successfully sued their previous landlord over the presence of arsenic in their drinking water and as the park's new owner, Pueblo Unido CDC looked to alleviate their water access issues (Associated Press & Flaccus, 2010). For over forty years, the Park had relied on a private well for domestic water access; lacking consolidation with any of the region's five major public water systems. Pueblo Unido CDC intended to upgrade the hundred household trailer park's dilapidated housing and neglected water and sanitation infrastructure, connecting it to the regional water district's main lines. With the help of Riverside County, the organization installed a reverse osmosis system as a temporary, low-cost solution to filtering out the naturally occurring arsenic from the park's water source. Unfortunately, today, the park continues to lack consolidation with public water infrastructure and arsenic is still found in St. Anthony's well water at levels higher than standards set by the Environmental Protection Agency.

The water contamination and water access issues that residents of St. Anthony face are not isolated incidents in the Coachella Valley. In 2011, over 200 small and six large unpermitted trailer parks in the Eastern Coachella Valley housed low-income residents on unincorporated Riverside County land and the Torres-Martinez Reservation (Brown, 2011). Each of these trailer

¹ Working in collaboration with Pueblo Unido CDC and the residents of St. Anthony in 2011 was my first encounter with water issues in the Coachella Valley (see more on this in the positionality section of Chapter Three).

parks relied on privately-operated well water that accessed the same groundwater conditions as St. Anthony. One park located on Torres-Martinez individually-allotted reservation land, known as Duroville after its owner Harvey Duro, was famously appointed a receiver in 2009 and ordered closed in 2013 by United States District Judge Stephen G. Lawson due to the health and safety concerns for the over 4,000 residents (Hu, 2013). A decade later, in January 2021, Leadership Counsel for Justice and Accountability (LCJA), a legal aid and advocacy-focused nonprofit organization, filed a lawsuit on behalf of the over 1,000 residents of a second park located on Torres-Martinez allotted tribal land, the Oasis Mobile Home Park. LCJA sued the Park's owner citing "unsafe and unhealthy living conditions" and "drinking water at Oasis (provided by groundwater wells and a distribution system owned by [the] Defendants) [that] is contaminated with arsenic at levels nearly ten (10) times the drinking water standard" (*Juntos por un Mejor Oasis v. Scott Lawson*, 2021). These ongoing conditions of water contamination and lack of potable water access are not experienced or distributed evenly within the Coachella Valley.

The Western Coachella Valley, unlike the eastern part of the region, is world-renowned. It is nick-named the "playground of the presidents" because of the numerous United States presidents who have visited over the last half a century. It is considered a place of retreat from urban life for millions of people who visit annually to play in the desert. It is also home to the resort city of Palm Springs and over 100 golf courses that drive the Valley's image and dream of leisure.

Yet, this play and leisure offered by the Coachella Valley to its global tourists remains out of reach for the majority of the 400,000 people who live there. Almost half of the Valley's residents live below the 200 percent federal poverty line and 18% live below the federal poverty

line (U.S. Census Bureau, 2019g; USC Price, 2017). Residential barriers to accessing leisure amenities are made worse by a regional disparity in water access between residents of the Eastern Coachella Valley, who lack access to healthy potable water, and residents and guests of the Western Coachella Valley, whose water access extends beyond potable water to crystal-clear swimming pools and verdant golf courses.

In the Coachella Valley, inequality in water access has an overtly visible east/west spatial pattern. Residents of the Eastern Coachella Valley experience water insecurity. They lack multiple characteristics of water access (Jepson, 2014) including physical and reliability due to groundwater contamination and subsequent lack of filtration of the arsenic present. Residents and visitors of the Western Coachella Valley have access to water for both potable and non-potable purposes. My dissertation takes the spatial inequality of water access between the eastern and western regions of the Coachella Valley as a foundation for inquiry. I ask: How did the Coachella Valley's spatial inequality in water access develop, deepen, and become exacerbated?

Until recently, both scholars and practitioners minimized water access and insecurity issues in the United States (Meehan, Jepson, et al., 2020). Scholarship on water access was often focused to isolated and localized community (and often rural) challenges. One reason is that regulations guiding water quality and sustainability at the federal (for example the Clean Water Act of 1972 and the Safe Drinking Water Act of 1974) and state (for example California's Sustainable Groundwater Management Act) levels of government greatly improved potable water access in the United States over the last fifty years. As a result, global development reports present a "myth" of universal access in the United States and other high-income countries (Meehan, Jepson, et al., 2020). Yet, today, approximately 250,000 households live without complete plumbing facilities in the country (U.S. Census Bureau, 2020c). Recent scholarship has

identified six “myths” regarding water in Canada and the United States that mask issues of water insecurity in both countries (Meehan, Jepson, et al., 2020). Recent accounts of water contamination in Flint, Michigan; Jackson, Mississippi; and the Watts neighborhood in Los Angeles, California, extended droughts in the Southwest, and impending extreme weather due to climate change have reinvigorated the importance of addressing water access in the United States for academic scholarship and policy consideration.

In addition, the COVID-19 global pandemic brought about a resurgence of attention on sanitation and public health. Public health professionals predict a future with more frequent pandemics, due to increasing urbanization and subsequent human/nature interaction, and safe water access plays a key role in prevention. In the United States water access issues, despite past and recent policy changes addressing them, continues to be related to socio-economic, health, environmental, and spatial inequality.

This dissertation research joins a growing body of scholarship in the United States invested in analyzing disparities in water access and insecurity (Meehan, Jepson, et al., 2020). Recently, scholarship has shown that water access issues in the United States exhibit patterns of spatial unevenness (Deitz & Meehan, 2019). Yet, the majority of literature on water access continues to lack geographic perspectives investigating water insecurity’s spatial patterns (Deitz & Meehan, 2019; Meehan, Jepson, et al., 2020). However, even when spatial patterns to water access unevenness are revealed, the scale of analysis requires foregrounding demographic conditions of households (Deitz & Meehan, 2019; Meehan, Jurjevich, et al., 2020; Pierce & Gonzalez, 2017), while foregoing investigation into the processes at play that produce the spatial inequality in the first place. In addition, scholars have called for more research on the “legal, political, and socioeconomic dynamics that produce and maintain conditions of water insecurity”

(Meehan et al., 2020, p. 10). My research project addresses this gap in water access literature by using a spatial approach to understand: 1) the geography of and 2) the processes that shape inequality of water access in the Coachella Valley.

In examining the processes that develop, deepen, and exacerbate spatial inequalities, I also extend water dispossession literature, which focuses on water rights, grabbing, diversion, contamination, and allocation as dispossession typologies. I identify two additional underrepresented forms of water dispossession: 1) aquifer overdraft, the managed depletion of groundwater by private users rendering it unavailable, and 2) exclusion, government refusal to follow legal obligations to provide water access.

Using a geographic perspective to water access requires linking water access literature to that on spatial inequality. Spatial inequality scholarship focusing on water tends to center residential exclusion from or proximity to safe and reliable water and water infrastructure. As a result, water access in spatial inequality literature is studied through household and community demographic characteristics, built environment features, or spatial relation to other households. And it is characterized through the challenges of environmental injustice and municipal exclusion at the micro-geographic scale.

This dissertation analyzes spatial inequality in water access at the regional scale, which is largely missing from the literature on spatial inequality (Anderson, 2007; Ong & Gonzalez, 2019; Tickamyer, 2000). When the regional scale is used as a site of inquiry in spatial inequality scholarship, spatial inequalities are most often described through macro-economic frameworks. Rather than focus solely on macro-economic frameworks, I examine the ways in which United States settler colonialism interlocks with capitalism and is enacted on the ground through local, regional, and federal policies and actors. I use this scale to address and challenge a frequently

posited solution to spatial inequality – the regional government. I highlight how regional government, instead of resolving the negative externalities of fragmented jurisdictions, becomes ineffectual at equitable infrastructure distribution when institutional values are embedded in racial hierarchy and market-oriented ideals.

I do this by applying the extended case method to my case – water access in the Coachella Valley. I use spatial analyses to examine the patterns of geographic unevenness in water access characteristics overtime. I use archival and policy document analysis to analyze three conjunctural eras, spanning roughly 150 years of spatial inequality production. Through the three conjunctural eras I explain how spatial inequality in water access developed, deepened, and became exacerbated in the Coachella Valley.

I find that United States settler colonial policies were used by early settlers in the Coachella Valley to dispossess the Cahuilla, the region’s original inhabitants, of land and water, developing spatial inequality in water access. This spatial inequality, first presented as a racialized checkerboard spatial pattern between Indian/public and non-Indian/private land, deepened with the 1918 formation of a regional government, the Coachella Valley Water District, to manage water provision and distribution. The water district, designed to grow the agriculture industry, established a center/periphery use-based pattern of water access where agricultural water access was found in the periphery and domestic water access was built in the region’s urban core. Today, Riverside County land use and Coachella Valley Water District regulations exacerbate both spatial patterns. Their growth for growth policies, that require new private development to expand public infrastructure provision, pursue peri-urbanization through luxury tourist developments. As a result, their policies, and the approved new luxury

developments, increase socio-economic disparities and decrease geographic proximity between those who have access and those who lack access to water.

Centering the Coachella Valley

This dissertation centers the Coachella Valley as the object of study for understanding processes that produce spatial inequality in water access. The Coachella Valley is a region composed of incorporated, unincorporated, and Indian reservation land sitting at the geographic periphery of Los Angeles. Despite its physical and political marginality, the Coachella Valley is a central site of production in the Southern California region and helps to sustain social reproduction throughout the United States. Unlike megacities, global cities, and shrinking cities, places like the Coachella Valley are rarely the focus of conventional urban planning studies in the United States. Until recently, scholars have equated cities with the urban, using them as the focal point for inquiry into and development of theories of urban change and processes.

Here, the urban is defined as a specific spatial unit – the city or its upscaled version, the metropolis/mega-city – and universal category (Brenner & Schmid, 2015). And the city itself was fixed by definitions derived from arbitrary population sizes, densities, or administrative classifications that separated the urban from the non-urban (Brenner & Schmid, 2015). By using the city as the site of inquiry for theorizing urban change and processes and paying less attention to peripheral places surrounding these central cities, theories describing urbanization processes remain incomplete.

While understudied in the United States, places that fall outside of centralized urban areas, and that go by many names, such as the periphery, the margin, the hinterlands, the fringe, the peri-urban, are important places for understanding urbanization. When centered in spatial inequality literature rural, peri-urban, or peripheral places are examined in relation to the urban,

incorporated, or central city places they are adjacent to. Rather than take this more often used inter-regional approach, this dissertation examines spatial inequality intra-regionally attending to regional governance and government structures as well as larger structural processes.

More recently, scholars reacting to city-centric urban theory have called for new epistemologies of urbanization that are theorized from places outside of the city or consider entanglements between the city/non-city. Concepts such as “extended urbanism,” “planetary urbanism,” “the metabolic city,” “assemblage,” the “suburban planet,” and “peri-urbanization” grapple with the gaps in urban theories from inattention to urbanization in the suburbs, urban fringe, peripheries, unincorporated areas, the peri-urban, and the rural (Anderson, 2007; Bartels et al., 2020; Brenner et al., 2011; Brenner & Schmid, 2015; Keil, 2020; Monte-Mór & Castriota, 2018; Swyngedouw, 1996). Others have argued that a transnational comparison that thinks across “seemingly unlikely” fringe places may “prompt theoretical reflection and reveal a more general set of processes” (Ranganathan and Balazs 2015, 406). These concepts are responses to the changing concentration and extension of urbanization outside of city boundaries throughout the world today.

To better understand contemporary urban change, scholars are calling for a centering of peripheral places in today’s urban theories. Previously, dichotomies between the city and the rural, urban and environment, or city and suburb tended to reflect the existing built environment. Today’s urbanizing world defies these traditional binaries (Brenner & Schmid, 2015; Keil, 2020; Monte-Mór & Castriota, 2018). They recognize that when theories on urban processes and change use marginal places as sites of inquiry, new patterns of urbanization and spatial inequality are illuminated, disrupting the stronghold of old patterns. For example, scholarship on unincorporated areas in the United States has foregrounded regional differences in urban change,

pointing out that they fail to follow the white flight paradigm of urban growth (Anderson, 2007). Others argue that this growing body of scholarship refutes the universality of urban patterns such as “rural-to-urban migration; expanding population levels in big cities; the concentration of investments and economic capacities within dense population centers; the diffusion of urbanism as a sociocultural form into small and medium-sized towns and villages; or the spreading of similar, 'city-like' services, amenities, technologies, infrastructures or built environments across the territory” (Brenner & Schmid, 2015, p. 169).

The peri-urban is one of a variety of concepts scholars have found useful to describe places outside of the city. Peri-urban spaces offer a dynamic mix of urban and rural that challenge the traditional binary between the two (Bartels et al., 2020). They are distinct from suburban and exurban places and literature because they describe areas that are less dependent on cities than the former typologies (Leitner et al., 2022). More than areas transitioning from rural to urban, peri-urban spaces instead offer urban processes that involve multiple actors located in multiple geographic scales (Bartels et al., 2020; Leitner et al., 2022). These peri-urban spaces and processes are also place-specific, generated from a unique set of geographic, social, and institutional contexts (Friedmann, 2016) As such, the processes of peri-urban(ization) produce unevenness and inequalities, which are all in “a dynamic transition” (Bartels et al., 2020, p. 1242). My dissertation research adds to this emerging literature in the United States by centering Coachella Valley and providing a case of peri-urbanization (Bartels et al., 2020). As such, my research adds to a growing body of literature (Carpio, 2019; De Lara, 2018) aimed at understanding spatial production in and through the outer lands of Los Angeles.

Dissertation Structure

The dissertation is structured through the following three parts. First, I provide a framework for the dissertation. I start with a literature review, I describe my research design, and I map the geography of spatial inequality in water access and its institutions and water sources. Then, I explore how the spatial inequality in water access developed, deepened, and exacerbated during three conjunctural eras. Finally, I conclude the dissertation by describing the ways in which spatial inequality in water access in the Coachella Valley extends existing presumptions on the causes and solutions of spatial inequality. Taking the case of the Coachella Valley, I recommend policy actions that urban planners and policymakers can take to address existing spatial inequalities and prevent future ones.

Following this introduction, Chapter Two reviews literature on spatial inequality, water access, and water dispossession. The chapter describes how I use racial capitalism, and the concept of interlocking systems of oppression, as the theoretical framework structuring my analyses. This is followed with a presentation of my research design in Chapter Three.

In Chapter Four, I map 1) the geography of Coachella Valley's spatial inequality in water access, examining how it has changed over time, and 2) the water institutions and water sources that undergird water access. I examine multiple characteristics of water access including physical access and reliability. I also add the additional characteristic of water use, rarely attended to in literature on water access, to analyze contemporary and longitudinal patterns in the spatial inequality in water access. I find that spatial inequality in water access is not new, but rather is longstanding. Water access geography highlights patterns to the region's spatial inequality including disparities between eastern and western regions and concentrations in particular

communities. I used these patterns to identify the three conjunctural eras that are analyzed in the following three chapters.

Chapter Five explores how federal land use and state water rights policies shaped water access during the early United States colonial settlement of the Coachella Valley. It examines land allotment, reservation creation, and simultaneous white settlement in the Coachella Valley at the end of the 1800s and beginning of the early 1900s. During this era, a racialized spatial inequality in water access developed from 1) federal and state policies that transformed water into property and 2) white settler water diversion and overdraft that created water scarcity on tribal land. I examine how federal land use policies constructed a racialized checkerboard of tribal and non-tribal land intertwining with state water rights policies to enable land and water dispossession by white settlers. I argue that these policies inscribed racial hierarchies onto the land and dispossession that created a spatial inequality in water access in the periphery of the east and west regions and between White and indigenous owned land. I find that the spatial inequality of water access in the Coachella Valley developed from the racialization and capitalist production of land that prioritized white settler industrial use of land and water for tourism and agriculture.

In Chapter Six, I explore how water infrastructure developed along the two axes of industrial and domestic water access during the conjunctural era of regional government formation for water management. The Coachella Valley Water District (CVWD) formed in 1918 by local farmers to acquire new and protect existing water sources for agricultural production. With the CVWD, they created a regional government for water management with a mandate to respond to industrial and economic growth. When the district entered the domestic water market

at mid-century, it created a dual system of water infrastructure and provision, prioritizing and protecting industrial use (agriculture and leisure) over residential use of water.

While regional government is often argued as the scale of government at which inequity is best addressed, the formation of CVWD demonstrates that equitable development is not inherent to the regional scale. Instead of equitably distributing water infrastructure throughout the Coachella Valley, its founders designed CVWD to regulate water to prioritize infrastructure needs, development, and expansion that serves and is guided by the industrial needs for both domestic and non-domestic water use. In doing so, the spatial inequality in water access deepened into a pattern of east/west and center/periphery, overlaying the earlier racialized checkerboard.

Chapter Seven analyzes how contemporary spatial inequality in water access is exacerbated by regional government's pro-growth development policies and strategies. I use the 2019-2020 Riverside County Board and Planning approval of the Thermal Beach Club in the Eastern Coachella Valley to analyze how regional planning regulations and water management are exacerbating the region's spatial inequality in water access. Their policies incentivize peri-urbanization led by luxury tourist developments. These scattered sites are changing the existing spatial inequality in water access and deepening its disparity. I demonstrate how a "growth for growth" policy creates dependency on high-income developments expanding into the peripheral Eastern Coachella Valley to enable water infrastructure expansion. I call this peri-urbanization process, retreat urbanism. Retreat urbanism's new, high-end developments are built adjacent to communities lacking access to potable water. They increase proximity and disparities between who has access to water and who doesn't. Dependency on luxury tourism is creating a situation where access to regional water district infrastructure becomes harder to reach for existing low-

income families and low-income housing developments. Here, government agencies manage spatial inequality in water access by maintaining economic and urban growth as primary goals of land use and water planning.

Finally, the dissertation concludes by outlining the theoretical contributions of the study and recommendations for future policy. Throughout the dissertation chapters, I find that spatial inequality in water access is not new, but rather is longstanding and is shaped by the intersection of geography, land use policies, racial formation, and industrial pursuits. I show that spatial inequality in water access: 1) developed during the United States settler colonialism creating a spatial pattern of a racialized checkboard of tribal/non-tribal land, 2) deepened during the mid-century into an east/west, center/periphery pattern, delineated by industrial and domestic use and accompanying policies, and 3) is exacerbated by today's pro-growth policies that create dependency on high-end private development for infrastructure extension and changing the spatial pattern by increasing adjacencies between those who have access and those who lack access to water.

By using racial capitalism as a framework, I demonstrate how poor water access in the Coachella Valley is not just random or a natural case of water scarcity. Instead, poor water access is a case of institutionalized water inequality that exhibit spatial patterns and have racial and class dimensions. Spatial inequality in water access is designed and implemented by government policies that uphold settler colonialism, are market-oriented, and reproduce racial hierarchies. As such, resolving spatial inequalities in places like the Coachella Valley necessitates taking space and social relations into account together. Creating spatial equity requires addressing institutions' structural embeddedness in capitalism, settler colonialism, and racial hierarchies. Governments and communities must construct institutional changes and

policies from the ground up and sustain them through daily practice to address socio-structural *and* physical issues at the local level.

Chapter 2 Literature Review and Theoretical Framework

This literature review links spatial inequality, water access, and water dispossession scholarship. Studying spatial inequality clarifies how social inequalities become inscribed in space. And, in turn, how spatial inequalities deepen social inequalities. It illuminates “issues of scale and measurement; issues of comparative advantage and disadvantage; issues of meaning, control, and construction” within social inequalities (Tickamyer 2000, 809). Spatial inequalities often appear as variations in social well-being because of an area’s attractiveness to dominant forms of economic production (D. B. Massey, 1994). And they are easily recognized as the economic, racial, or gendered segregation of space or in the distribution and siting of industry.

Scholars have found that spatial inequality in water access follows policy implementation or institutional actors embedded in structural racism through redlining, siting of amenities and services, underbounding, and creative extraction (Aiken, 1987; Anderson, 2007; Balazs Carolina et al., 2011; Purifoy & Seamster, 2020; Ranganathan & Balazs, 2015; Rothstein, 2017). This literature helps explain how racialized spatial inequality is not just path dependent, but systematically pursued through law. Some people are active actors in shaping spatial inequalities. State efforts to enforce control and racial hierarchy also influence how scholars understand space and how it is socially constructed. Rather than a natural occurrence, the presence of spatial inequality indicates government’s failure to regulate market forces and abandon cultural structures that uphold socio-economic, racialized, and spatial hierarchies.

I start this chapter with an overview of spatial inequality scholarship. I introduce how scholars research and explain spatial inequalities at different scales. And I articulate the role scholars attribute to regional governments in alleviating spatial inequalities. I then turn to literature on water access, describing its characteristics. I present how water dispossession is

connected to water access issues. I locate the gaps my research attempts to address in each set of literature.

I end this chapter with a discussion of the theoretical framework. I use racial capitalism and the concept of interlocking systems of oppression to frame how I analyze the production of spatial inequality in water access in the Coachella Valley. Racial capitalism describes the way in which capitalism exploits and creates value through culturally and socially constructed differences. The concept of racial capitalism is an example of how structural forces interlock. Spatial inequality literature discusses both racial oppression and capitalist production as causes of spatial inequalities. A dominant view of spatial inequality scholarship regards capitalism as the determining system for spatial construction (Massey 1993 discussing Harvey). However, past spatial inequality scholarship largely explores the two structural oppressions or racial hierarchy and capitalism through siloes rather than as interlocking forms of domination.

Spatial Inequality

Explanations of spatial inequality are closely tied to capitalism and racial hierarchy. The literature on spatial inequality is vast, ranging from the macro-scale of the globalized world to the micro-scale of neighborhoods and households. As a result, the cause of spatial inequality is often attributed to different processes including uneven development of cities and regions as an outcome of globalized capitalism and residential segregation or mismatch due to racially-restrictive or market-restrictive institutional policies or capitalist competition and industry location.

The concept of spatial inequality helps explain the co-constitutive relationship between spatial and socioeconomic inequalities. However, space and social inequality were once treated as separate entities. This is, in part, due to how space was conceived. In both Western practice

and academic scholarship, space was treated as a container; something to be divided and occupied (Blomley, 1998; Porter, 2010). The spatial turn in academia has helped to reshape how scholars understand space. Today, space is articulated as a social process (Ford, 1994; Lefebvre et al., 1996, 1996; D. Massey, 2004; Soja, 2010; Tickamyer, 2000). As a result, academics and practitioners are paying closer attention to the ways in which space is shaped by and shapes socioeconomic inequalities.

Spatial inequalities are found throughout the world at multiple geographic scales, within and between municipalities, regions, states, and nations. Once they have taken physical root, they are difficult to dismantle (Ford 1994; Goldberg 1993; Haas 1981; Soja 2010). However, spatial inequalities change over time, as they are the outcomes to changes in the geographical distribution and requirements of production (Massey 1994) and to human agency and institutions (Tickamyer, 2000).

The majority of scholarship on spatial inequalities focuses on macro or micro geographic scales. At the macro-level scale scholars use a macro-economic approach to analyze causation. Researchers explain spatial inequalities as the uneven development between or within nations or mega-regions; outcomes of a global capitalism-based economy. With this understanding, scholars make the claim that human produced geographies will always create and have always created spatial inequalities through uneven development (Massey 1994; Soja 2010). As critiqued by geography and planning scholar Edward Soja (2010), this type of spatial inequality is often thought of as the normal or expected outcome of differential development and an accepted result of individual freedom of choice. This view describes society as a totality where all structures are subsumed under capitalism (Harvey 1973).

Scholars looking at the micro-scale, or the municipal and neighborhood level, approach spatial inequality through the lens of housing economics, municipal incorporation, racial segregation, and environmental justice. They define it as residential segregation or the juxtaposition, proximity, or separation between people and amenities. At this scale, spatial distribution is most often measured statistically and analyzed using aggregate demographic data. Government policies are examined to understand their effects on residential segregation and infrastructure distribution as spatially inequitable outcomes of built environment development.

Scholars researching at the micro-scale find that local, state, and federal government policies and boundaries cause spatial inequalities. They argue that local, state, and federal government housing and land use policies that restrict development causes household segregation by income (Glaeser, 2017; Glaeser & Gyourko, 2003; Lens & Monkkonen, 2016; Manville, Lens, et al., 2020; Manville, Monkkonen, et al., 2020). Others argue that this type of spatial inequality that segregates high from low-income households is a result of industry agglomeration and workforce access to education (Rodríguez-Pose & Storper, 2020). Scholars see jurisdictional boundaries reproducing and reinforcing pre-existing residential segregation and community disinvestment (Aiken, 1987; Anderson, 2007; Ford, 1994; Mukhija & Mason, 2013). As such, they examine the role municipal fragmentation plays in spatial inequalities between incorporated and unincorporated areas (Aiken, 1987; Anderson, 2007; Mukhija & Mason, 2013; Purifoy, 2019). Consequently, the racial poor become geographically and politically peripheral, living within physical and imaginary margins (Goldberg, 1993). Here, jurisdictional boundaries, racist policies, market-restricting policies, individual choices, or supply and demand market forces are considered causes of spatial inequality. For this reason, scholars approaching analyses

at the micro-scale most often use the lens of segregation or the difference in proximity between people and amenities, services, or negative externalities to study spatial inequality.

Issues of spatial inequality of water access are generally studied by assessing residential proximity to public infrastructure. Residential proximity to amenities as a measurement of spatial inequality requires examining the distribution of positive amenities and negative externalities (Ong & Gonzalez, 2019). Scholars have found that neighborhoods composed of non-white racial groups have a greater chance of living next to a land use or infrastructure network that compromises individual health and the neighborhood environment (Bullard & Wright, 1993; Ong & Gonzalez, 2019).

Examining the causes of this, scholars have found that jurisdictions actively exclude households from accessing their public services, such as water. Underbounding describes the racially-motivated municipal exclusion of adjacent unincorporated areas. Here, municipalities selectively annex or exclude unincorporated areas into infrastructure provision. They base their selection criteria on racial demographics and household desirability (Aiken, 1987; Anderson, 2007). Scholars also find that municipalities, white places, in the United States also leverage water rights policies and management to devalue and dispossess adjacent unincorporated, black towns of water through creative extraction (Purifoy & Seamster, 2020). Scholars examining underbounding to understand spatial inequality and disinvestment in mostly rural areas in the South and Southwest have found that communities facing this type of exclusion are predominantly Black or Latino (Aiken, 1987; Anderson, 2007; Mukhija & Mason, 2013). Additionally, scholars argue that in the water sector, institutional fragmentation “leading to regulatory and coverage gaps, sectoral failures, and institutional erasures that perpetuate

inequality and household water insecurity” alternatively allows for self-determination and at the same time reproduces uneven power relations, ripe for exploitation (Meehan et al., 2020, p. 8).

Scholars analyzing proximity to amenities debate the cause of residential location and population mobility into and out of metropolitan areas. Some scholars argue that individuals “vote with their feet” (Tiebout, 1956). They contend that households have the freedom and ability to “shop” for a place of residence. However, not all households can move freely from city to city. Scholars have found that non-white racial groups confront large spatial mismatches (lack of proximity between residence and job) (Ong & Gonzalez, 2019). In addition, industry specialization produces an agglomeration of jobs and high wages that is differentiated throughout space. Scholars found that larger cities have greater access to amenities, higher wages, and higher incomes (Kemeny & Storper, 2012).

Whether individuals “vote with their feet” or industries create agglomerations of jobs and amenities, cities competing for both industry *and* people also create micro-scale spatial inequality. Competition is generated between communities because of perceived land-use potential (Molotch, 1976). And cities compete to attract residents as well as businesses to gain the required conditions for growth (Molotch, 1976; Fischel, 2001). In this way, the competition between municipalities produces spatial inequalities between cities (and between neighborhoods within cities) creating winners that offer better housing, more jobs, and attractive amenities and losers that lack good, high-paying or safe jobs and have more producers of negative externalities and have poorer housing stock.

Research on micro-scale spatial inequalities illustrates how municipalities and jurisdictions create spatial inequalities purposefully or inadvertently when enacting on local, state, and federal regulations. As a result, scholars propose policy changes as solutions to these

spatial inequalities. Because solutions are focused on government regulations, scholars debate at which scale of government policies address issues of equity while also representing the interests of residents.

Multi-scalar governments are structured into jurisdictions from local to global. These jurisdictions are nested and overlapping, and regulations between scales often remain uncoordinated (Valverde, 2009). These complicated governance structures call into question the role of the central government (Kettl, 2000). Their multiple geographic scales create tensions within democratic rule and representation – particularly, in determining what government scale best represents people and their interests.

It is often thought that local government, which is closest to the people, is also closest to deeper democratic rule (Norris, 2001). One reason, scholars argue, is that local community and central state priorities are in tension (Moulaert et al., 2005). Regional government, positioned between central and local governments, is often argued as the scale that is best suited for producing equity.

Regional government is both a centralization and decentralization strategy. In a centralized government, the central state (or top-level jurisdiction) holds political power and authority, making policy through top-down implementation (Termeer et al., 2010). Decentralization restructures decision-making authority moving it vertically from the central (national) government to lower-level governmental units (regions, states, cities) that remain accountable to the central government (Meinzen-Dick & Knox, 1999). Positioned between the local and federal government, regional government centralizes policymaking from the local level and decentralizes it from the federal.

In this way, regional government attends to the convergence of decentralized land use policies with jurisdictional growth and fragmentation (Bowe, 1968). It can increase mutual responsibility, linkages, and economic and functional efficiencies between citizens, political actors, and jurisdictions (Feiock, 2007; Macleod & Goodwin, 1999). Because of this, scholars argue that regional government can address municipal negative externalities and spillover effects (Ford, 1994; Norris, 2001).

Scholars argue that regional government is particularly suited to address land use policymaking. For example, regional government and governance can address the exclusionary and antidemocratic practices of local zoning (Feiock, 2007; Bowe, 1968; Ford, 1994; Frug, 2002). They have found that places are less segregated by income, where state governments have more power over land use decision-making (Lens & Monkkonen, 2016). They contend that it is a better scale for land use regulations because 1) the federal government does not have the ability to reform land use laws and 2) local government contains too many mechanisms for blocking reform and does not account for negative externalities impacting adjacent jurisdictions (Glaeser, 2017).

They suggest a variety of regulations at the regional government level to address spatial inequalities. Suggested policy changes include democratically-elected, regional-level institutions or regional citizenship to address regional concerns and increase citizen decision-making (Ford, 1994; Frug, 2002). They emphasize deregulation and suggest that if policies were less racist or less restrictive of the market, there would be less spatial inequality (Manville, Lens, et al., 2020; Manville, Monkkonen, et al., 2020; Rodríguez-Pose & Storper, 2020; Rothstein, 2017).

However, these regulatory solutions to spatial inequality are critiqued for failing to account institutional embeddedness in the racial state (Pulido, 2016) and racial liberalism

(Ranganathan, 2016). For example, environmental justice policies are designed to address racism and waste as negative externalities rather than central mechanisms of racial capitalism (Pulido, 2017). Additionally, environmental rights activism must counter liberalism's race-based rights frameworks (Ranganathan, 2016). As such, they fail to produce meaningful change that would require disrupting the operations of industry, the political system, and the state (Pulido, 2017).

This dissertation, and specifically Chapter Six, contributes to the spatial inequality and regional government literature by examining how spatial inequality in water access is deepened under the purview of regional government. The dissertation specifically addresses the promise of regional government as a solution to spatial inequality by examining how the Coachella Valley Water District manages water across its service area that includes both incorporated and unincorporated communities. In doing so, the regional government scale of this research also demonstrates that unincorporated water insecurity issues goes beyond the predatory and exclusionary nature of adjacent municipal. Instead, the case of water management under the Coachella Valley Water District's regional governance demonstrates that the regional scale is ineffectual when the values underlying policy (in this case, embedded in structures of settler colonialism and racial capitalism) produce spatial inequalities. When institutional values prioritize industry, racial hierarchy, and market-based thinking they produce uneven development, negating the regional government scale's ability to address fragmentation its negative externalities and power relations.

Water Access and Water Dispossession

Water access is a multidimensional concept. It is "defined by the capacity to obtain water for consumptive purposes, including physical accessibility, affordability, and reliability" (Jepson, 2014, p. 113). And, it encompasses proximate water use quality and quantity characteristics and

multi-level modes of power that enable one's capacity to benefit from water (Ranganathan & Balazs, 2015). Water access also serves as a tool for understanding housing conditions. Research on and from the Global South often uses water access as a proxy for housing quality. When water access is studied in the United States, scholars assess it as an outcome of engineering or regulatory failure by examining the health and environmental justice issues of water quality, water reliability, or water connection (Deitz & Meehan, 2019; Jepson, 2014; Ranganathan & Balazs, 2015). In focusing on these outcomes, research often lacks spatial and processual analyses. However, scholars have recently begun to address this gap by turning their attention towards water issues in the United States (Balazs Carolina et al., 2011; Deitz & Meehan, 2019; Jepson, 2014; Pierce & Gonzalez, 2017; Pulido, 2016; Ranganathan, 2016; Ranganathan & Balazs, 2015).

Scholarship on water access in the United States is often aimed at measuring infrastructure availability at a regional or macro-level scale. It is generally defined as the presence of indoor plumbing and water service with scholars identifying the aggregate number of households and people lacking those services. However, these measurements are often aspatial (Deitz & Meehan, 2019). Arguing for the need to adopt a geographic perspective to water issues, Shiloh Deitz and Katie Meehan (2019) demonstrate that the incompleteness of plumbing in the United States has a distinct geography with sociodemographic characteristics that vary across space. Studying water access through measurements of infrastructure is also critiqued for obscuring the complex characteristics of water access (Jepson, 2014). Likewise, in her study on colonias in Texas, Wendy Jepson (2014) explained how water security must go beyond the measurement of complete plumbing in the United States. By focusing on the household level, Jepson demonstrated that households connected to water continue to face issues of water security

due to physical capacity, cost, quality, and reliability. Additionally, a number of scholars have recently looked at water access in California identifying issues related to costs (Deshazo et al., 2016), housing typology (Pierce & Gonzalez, 2017), and chemical contaminants (Balazs et al., 2012; Balazs Carolina et al., 2011). Even with this emerging research, geographic perspectives of water access in the United States, and California, are still limited. This dissertation adds to this literature by applying a spatial lens to issues of water access in the Coachella Valley.

This dissertation also adds to water access literature by putting it into conversation with scholarship on water dispossession. Dispossession is central to both capitalism and settler colonialism. Commonly defined as the action of depriving someone of a good that they possessed; dispossession is an act and a process (Devine & Ojeda, 2017). Under settler colonialism, it served as a foundational step towards developing global capitalism. Colonial dispossession involved the taking of Native land, bodies, and resources, while destroying indigenous relationships between people and the more than human. The two processes of dispossession that undergird capitalism include 1) primitive accumulation and its ongoing maintenance through 2) accumulation by dispossession. Here, primitive accumulation refers to the enclosure of the commons, communally owned and managed land, resources, and assets, and the separation between producers and their means of production. While accumulation by dispossession describes the ongoing privatization, commodification, or devaluing of land, assets, and resources, regardless of previous ownership.

Dispossession replaces cultural relationships to land and water. In their place, hierarchical differences are established using the violence of racializing and gendering bodies and land. These hierarchies are then applied to uphold both capitalist and colonial structures

(Federici, 2004; McCreary & Milligan, 2021; Mies, 1986; Pulido, 2016, 2017; Roberts, 2008).

Today, colonialism and capitalism continue enjoined in the United States.

Capitalocentric² explanations of spatial inequalities fail to capture structural interlocking between capitalism, racial hierarchy, and colonialism. When scholars study spatial inequality through the lens of capitalism, they overemphasize how capital physically changes urban space. In doing so, they miss the intertwining of land and water. Likewise, literature on colonial dispossession also disproportionately focuses on land grabbing. However, water dispossession was equally important to form, maintain, and expand settler colonial states and capitalism (Curley, 2021).

Water dispossession involves the “loss of access to and control of the use, management and custodianship of water” (Hartwig et al., 2020, p. 104873). Scholars have identified several typologies of water dispossession, including water privatization, grabbing, rights, allocation, settlements, and industrial contamination (Bakker, 2013; Curley, 2019, 2021; Perreault, 2013; Roberts, 2008; Swyngedouw, 2005). When communities lose access to and control of water, they also lose their ability to control and manage their local territory (Hidalgo et al., 2017). In this way, water and land (and their dispossession) are always interlinked.

Dispossessing water through privatization (or accumulation by dispossession) involves transforming previous communal management, ownership, and organization through government intervention into private ownership or control (Swyngedouw, 2005). Privatization of water governance includes the introduction of market principles to the management of water systems,

² A concept first described by Gibson-Graham, “capitalocentrism names the way that a diversity of economic relations are positioned as either the same as, a complement to or the opposite of, subordinate to, or contained within 'capitalism'” (Gibson-Graham, 2016, p. 193).

such as economic efficiency, a need for full cost recovery through revenue, and the transformation of a water user to a customer (Roberts, 2008). Commodification seeks to express the value of water in economic terms (Roberts, 2008).

Water rights are a government mechanism used to accomplish privatization. In the United States, individuals, companies, governments, and tribal organizations can file for and are given the rights to use surface, riparian, and ground water. But water rights are not equal between differentially racialized people. For indigenous communities, water rights may restrict how and for what purpose water is used. This limits their capacity to practice cultural traditions, sustain life, and enable sovereign rule.

In the United States, water rights are established under two regulations: Riparian Rights or the Doctrine of Prior Appropriation. Riparian rights, adopted widely throughout the United States, are a feature of English common law that gives rights to water use based on land ownership (Hundley, 2001). Gaining rights to a stream under riparianism requires owning land adjacent to the desired water source. The water remains in the public domain while rights are given for its use for domestic needs (Hundley, 2001).

Riparian rights were the prevailing system in the eastern United States. As the United States acquired land in the West, California helped establish a second mechanism for acquiring water rights. The Doctrine of Prior Appropriation, or the Arid Region Doctrine, allocates water rights based on first use (Hundley, 2001). This principle emerged from California's "first in time, first in right" frontier culture. It held that the first to use the water source gained rights over the amount used. This new type of water right made water quantifiable. Rights were established for the inches of water put into use by a claimant (C., 1922; Curley, 2019).

With prior appropriation, claimants gained the right to divert and use the water; acquiring water as a property. Similar to other types of personal property, water rights could be accumulated and sold (Hundley, 2001). Rights remain with a claimant as long as the water is put to beneficial use. When rights holders stop using water, their claim on the water ends. Prior appropriation prioritizes use over equity and justice when determining who receives water rights and how much water those rights govern.

Riparianism and prior appropriation ignored indigenous water practices and denied them the ability to claim water rights under Western law. Indigenous Peoples in the United States did not gain water rights until the early 1900s. The 1908 Supreme Court decision *Winters v. United States* (Winter's Rights) established Indigenous access to water by recognizing water rights for federal lands (Curley, 2021). Winter's Rights provide legal guidelines for the water quantity from a particular source that "belongs" to a reservation. This decision held federal land as the superior water rights claimant (Curley, 2019, 2021). Through Winter's Rights, reservations, as federal lands, inherited priority water rights over settler claims to riparian water use.³ However, it restricted indigenous water rights to reservation boundaries and limited water use to fulfilling the purpose of the reservation (Curley, 2019).

Water rights enable further typologies of dispossession. They are often accompanied by water allocation, granted to both individuals and companies. Allocations establish set quantities of use for water rights holders. Once water is in use by industry, water dispossession can occur through contamination (Perreault, 2013). Contamination of water renders it unusable to

³ More recently, the 2017 decision in the *Agua Caliente v. Coachella Valley Water District and Desert Water Authority* case reemphasized federal water rights as superior to state water rights, while at the same time expanding those water rights to groundwater (Bass, 2018).

downstream communities. It becomes another form of enclosure as water is removed from the public sphere (Perreault, 2013). In this sense, water rights and allocation in contemporary settler colonial societies encloses indigenous water use in two ways (Curley, 2019). First, it limits indigenous water use to set quantities, enclosing indigenous cultural traditions that emphasize communal use (Bakker, 2013; Hartwig et al., 2020). Second, it renders the water unusable through industrial contamination (Perreault, 2013).

Settler colonial governments also use water settlements to dispossess water. Settlements are used to resolve conflicting claims and competition between tribal governments and local settler colonial jurisdictions. Through settlements, indigenous nations can gain their rights to water (Curley, 2019). However, the established water rights place conditions on use and quantity. They limit indigenous water use to allocated inches, ensuring only enough to fulfill the productive purpose of the reservation.

Water settlements can legitimize contemporary and historic water grabbing. They often legalize water diversions that preceded colonial governance (Curley, 2021). These water settlements not only limit future growth for tribes, but allow unrestricted expansion of settler cities (Curley, 2021). They are considered “among the last enclosures of Indigenous resources on the continent” (Curley, 2019, p. 63). These enclosures physically restrict water access and change cultural understandings and governance within Indigenous water practices (Curley, 2021).

These typologies of water dispossession are common to both capital accumulation and colonial control. No matter the typology of water dispossession at play, dispossession creates geographic unevenness in water access. Under both colonial and capitalist systems, water dispossession ensures that water security for some will always create water insecurity for others

(Hidalgo et al., 2017; Roberts, 2008). Because water insecurity is a socio-political and historical relationship it reproduces differentiation and hierarchical relations of gender, race, and class (Hidalgo et al., 2017; Roberts, 2008). Scarcity in settler colonial states results from protecting settler, State, and industry water security over indigenous use (Curley, 2019; Roberts, 2008). It follows then that contemporary water security relates to historical patterns of colonial water rights distribution (Hidalgo et al., 2017). This chapter adds to water dispossession literature by identifying aquifer overdraft as a pernicious and systematic but understudied typology of dispossession and shows how land dispossession intertwines with water dispossession through the interlocking of settler colonialism and capitalism.

Theoretical Framework

As my primary theoretical framework, I use racial capitalism, a concept that describes the interlocking between the two structural oppressions. It is an intervention into theories of capitalism, first articulated by Black scholars from the Americas and Africa such as Eric Williams, Aime Cesaire, Franz Fanon, Cedric Robinson, Robin D.G. Kelley, Ruth Wilson Gilmore, Angela Davis, and Clyde Woods. Racial capitalism is also a critique of Marxist theories of capitalism that ascribe capitalism as a totalizing system and class as the most significant oppressive hierarchy for people. It is related to the broader concept of interlocking oppressions, also developed by Black scholars and activists, that describe all systems of domination as co-constitutive rather than subsumed by one or another. Because spatial inequality is often described as a result of capitalism *or* racism, using racial capitalism as a theoretical framework adds to the literature by identifying the ways in which actors and policies interlock the two structures to produce spatial inequality in water access.

Interlocking Systems of Oppression

In 1977 the Combahee River Collective a group of Black Feminists wrote and distributed “The Combahee River Collective Statement” (1978). In their statement, the Collective introduced the idea that systems of oppressions are interlocking – meaning that systems of oppression are integrated and co-constitutive. By focusing on their own oppression as black women, the Collective found they were unable to separate the racial and class oppression they experienced from sex oppression. In their statement they argued that the most pressing politics should be the struggle against and an integrated analysis of major systems of oppression. Feminist scholars have continued to expand the concept of interlocking, which describes systems of oppression as neither subsumed under one guiding principle of domination, nor operating separately from one another.

Scholars such as bell hooks, Patricia Hill Collins, and Kimberlee Crenshaw have each expanded the concept of interlocking oppressions⁴ by elucidating the ways in which systems of domination: 1) are rooted in Western philosophy, 2) form a matrix of domination, and 3) should not be viewed as separate from one another (Crenshaw, 1991; Hill Collins, 2000; hooks, 2014). Interlocking systems of oppression, also described as a matrix of domination, explains the way in which domination is organized and how it operates as the overarching structure of social organization (Hill Collins, 2000). This framework suggests that systems of oppression interlock differentially. Matrices differ temporally and spatially, but the concept itself defines the

⁴ Initially scholars used both interlocking and intersecting to describe how systems of oppression operate. However, the terms have different implications: intersection implies the meeting at a particular point – for example, the individual body; interlocking considers oppressions as tied to each other, integrated and inseparable. As the concept of intersectionality has risen in prominence, it is often more commonly used in the place where interlocking may have been previously referred.

interlocking nature of oppressions as a universal organizing structure (Hill Collins, 2000). The concept of racial capitalism is a simplified example for understanding how the matrix of domination framework functions.

Racial Capitalism

Racial capitalism describes how racial hierarchy is an essential, interwoven, and organizing structure of capitalism that was required for and has been present since its emergence. Black scholars in the middle of the twentieth century, grappling with Marxist omissions of the role slavery played in forming the capitalist economy and, for Caribbean and African scholars, decolonization processes, expanded the concepts of slavery, colonialism, and capitalism. They intervened in crucial ways to demonstrate how capitalism, colonialism, and slavery are linked. They deconstructed race and racial processes, creating the foundations for theories of racial capitalism, racialization, and race as a social construct. These early scholars illuminated interlocking between racism, capitalism, and colonialism through racial difference between and racialization of white and black bodies.

Caribbean scholars were key in demonstrating the ways in which capitalism, racism, and colonialism are interlocking. It is no surprise, as colonization in the Americas began in the Caribbean. The English, Spanish, French, and Dutch were responsible for the colonization of the many islands of the Caribbean. With colonization, European countries authorized various forms of enslavement. Exhausting indigenous populations (experienced most acutely in the Caribbean through death), the Atlantic slave trade was used to create captive labor that supported European capitalist development founded in the extraction of American resources and African labor.

In *Capitalism & Slavery*, Trinidadian scholar Eric Williams (1944) centered the West Indies in the history of colonialism and demonstrated that slavery and the slave trade were

techniques of capital and profit creation. He traced the evolution of labor from white servitude in England to ‘Negro slavery’ in the Americas as one that was profit-and property-driven rather than on the rationalizations of racial inferiority/subhuman or climate-based labor structures.

In *Discourse on Colonialism*, first published in 1955, Martinique scholar Aimé Césaire (Césaire & Kelley, 2000) also deconstructs previous concepts of colonialism and capitalism. He argued that colonialism dehumanizes man. Critiquing enlightenment’s narrow and racist concept of humanism, he argued that capitalism is incapable of procuring rights for ‘all men.’ For Césaire, colonialism implicates everyone in its project to create human relations of domination and submission; the colonizer’s position is one of policing and control. Adding to this, Frantz Fanon, in *The Wretched of the Earth* (Fanon, 1968), argued that the Marxist economic analysis requires remodeling, in that it is not solely based around class, but rather class and race are entwined.

Later, Cedric Robinson’s *Black Marxism* (2000), first published in 1983, decenters Marxist history from Europe to the “periphery,” colonial territories. He demonstrated how capitalism evolved into a modern system, he names racial capitalism that was dependent on slavery and imperialism. His work has become the foundation for scholars examining the relationship between racial hierarchy and capitalism (such as Ruth Wilson Gilmore’s work on the intersection of land use, the carceral system, capitalism, and racial hierarchy and Laura Pulido’s on environmental racism).

Today, scholars have extended the concept of racial capitalism. They define it as capitalism’s exploitation of culturally and socially constructed differences (Lowe, 2015; Pulido, 2016). They argue that under racial capitalism Black and other non-white bodies and land are devalued to advance capitalism and to produce value for white spaces and places (Ponder, 2021;

Pulido, 2016; Purifoy & Seamster, 2020; Robinson, 2000). This devaluation has been ongoing for centuries. Here, racism is not simply reduced to class, but fundamental to capitalism. As Laura Pulido puts succinctly, “just as the spatial fix is fundamental to capitalism, so too is human difference” (Pulido, 2016, p. 7).

By using racial capitalism as my key theoretical framework, my research addresses this gap in the literature when explaining the processes that create spatial inequalities by paying attention to the intensity at which racial hierarchy is used to promote capitalist production at different points in time and by demonstrating how both are made actionable through land and water use and policy. Using racial capitalism as a framework requires me to be attentive to multiple structural oppressions when analyzing the case study and its three conjunctural eras. Where spatial inequality literature tends to focus on capitalism’s effects, racial capitalism necessitates understanding how capitalism and racial hierarchy interlock to shape space and how space deepens existing socioeconomic inequalities. In addition, the Coachella Valley is home to five Cahuilla tribes, which suggests that settler colonialism is a third structure at play. Such that, settler colonialism interlocks with both capitalism and racial hierarchy in ways that are unique to the place. As I explored each conjunctural case I examined the ways in which policies and actors work within and drive capitalist production, racial hierarchy, and settler colonial logic to racialize space and create spatial unevenness in water access. Key to the way I use this framework is through the mode of analysis, what I examine in the data, and with the understanding that at different points in time and in different places the intensity and interlocking of structural oppressions vary.

Chapter 3 Research Design

This dissertation uses water access in the Coachella Valley as a case study in spatial inequality. To answer my research question on how spatial inequality in water access developed, deepened, and exacerbated in the region, I employ the extended case method to understand the larger forces shaping on-the-ground particularities of water access in the Coachella Valley (Small, 2009). As such, extensions in my case study analysis include 1) ethnohistorical engagement from the late 1800s to present day (DeMallie, 1993); 2) reconstructing existing theories of spatial inequality and racial capitalism (Buroway, 1991); and 3) extending across jurisdictional and geographical scales from local to federal. As explained below, I operationalize these extensions using three conjunctural eras when spatial inequality was produced in the Coachella Valley. I use the three conjunctural eras and the extended case method to avoid the limitations in generalizability with single-case selection (Mukhija, 2010). The conjunctural approach allows me to analyze the particulars of the Coachella Valley in relation to the general structural forces across space and time (Leitner & Sheppard, 2020).

The case, the Coachella Valley, covers a large territory, around 1,200 square miles, and time frame, roughly 150 years from early United States settler colonialism to today. As such, I structure the case first by situating spatial inequality geographically and over time. To do so, I analyze census data on plumbing from 1960-2019 and present-day water quality and use data within the framework of water sources and institutions that shape water in the Coachella Valley. I then use this spatial analysis to determine which conjunctural eras to engage with at a deeper

level. Finally, I use the three local conjunctural eras (Leitner & Sheppard, 2020) to explain how spatial inequality in water access developed, deepened, and exacerbated.

The first conjuncture examines roughly 1875 through the late 1910s. During this period federal land and state water policies enacted by white settlers during early United States settler colonialism led to Cahuilla land and water dispossession throughout the Coachella Valley. Dispossession created indigenous water insecurity and the corralling of indigenous communities into bounded spaces. Land and water dispossession developed a checkerboard pattern of spatial inequality in water access. At the same time, it created a stronghold for the agricultural industry and helped a tourist industry emerge.

The second conjuncture explores the era of regional government formation, set up to manage water for these two industries. Founded in the late 1910s, the Coachella Valley Water District was designed to protect and expand the region's water sources for agriculture. A mid-century boom in water infrastructure followed with the explicit directive of industrial growth. CVWD deepened indigenous water scarcity by excluding tribal land from water provision. CVWD's management of Colorado River and groundwater sources for industrial use altered patterns of spatial inequality in water access throughout the region. It created a dual water management system between irrigation and domestic use that was spatially configured between the agricultural periphery and growing urban center.

The study closes with the third conjunctural era, analyzing contemporary peri-urbanization processes in the Eastern Coachella Valley. Today, regional government, pursuing growth for growth policies that require new private development to extend infrastructure, is exacerbating water scarcity and access issues. They approve construction of luxury tourist developments adjacent to mobile home parks whose residents drink water contaminated with

arsenic. And these developments and their approval, which are designed around water use for play, ignore regional water scarcity issues, multi-decade mega droughts affecting the region's water sources, and climate change's effect on California's water supply. Instead, they create hyper-local socio-economic and water access disparities.

Extending my case on water access in the Coachella Valley theoretically, temporally, and spatially, in relation to the society at large (Small, 2009), required a mixed-methods approach using multiple data sources including policy and archival documents, evidence from lawsuits, and demographic and water infrastructure data. First, to understand the geography of contemporary spatial inequality, I map and analyze multiple characteristics of water access including physical access, water reliability, and water use. Then, I spatially map physical water access overtime using plumbing data from the United States census to examine the longevity of geographic patterns in spatial inequality. Mapping water access revealed patterns of spatial inequality that helped me identify the study's three conjunctural eras. Within each conjunctural era, I examine how government processes have considered and addressed the spatial nature of inequality by using document analysis to examine policy and archival documents. Throughout the analysis process, I explore the ways in which the systems of racism and capitalism are interlocking, how this affects the construction of spatial inequality, and how local, regional, and federal policies and actors are co-constitutive of these systems. In the sections that follow I first describe the methodology for spatial analysis, I then turn to how I used archival and policy document analysis, before ending the chapter by describing my research constraints due to COVID-19 and positionality.

Spatial Analysis

I use two data sets to examine contemporary and longitudinal spatial inequality in water access. First, I use contemporary data on the physical access, water quality, and water use characteristics. Second, I use United States census data on plumbing completeness to examine water access longitudinally. Finally, I use the patterns in spatial inequality examined through contemporary and longitudinal water access data to identify which conjunctural eras to examine.

Contemporary Water Access Data and Analysis

To analyze contemporary water access, I examine three data sets on physical water access, water reliability, and water use.

First, I use Coachella Valley Water District consolidation reports to examine physical water access. Coachella Valley Water District is the regional government responsible for water management for the majority of the Coachella Valley including the use and distribution of water from the Colorado River. These reports surveyed disadvantaged communities (DACs) in the district's service area. They identified and mapped small water systems in the Eastern Coachella Valley that relied on private wells instead of CVWD's public water infrastructure network. They also calculated the number of connections, people being served by each system, and the consolidation cost for each small water system. I use document analysis to put the findings from this report in relation to water quality and use data.

Second, I map two water quality data sets using Geographic Information Systems (in particular, QGIS). Water quality data illuminates water access' reliability characteristic as water contamination threatens user reliability. California collects and monitors water quality data at well locations for major and minor public water systems. Public water systems (systems serving over 25 people per day) in California are required to self-report the presence of chemicals to the

State Water Board, while the EPA is responsible for monitoring water quality on tribal land. A limitation to understanding the prevalence of water quality issues is that water quality tests for private well systems that serve less than 25 people per day do not have the same reporting requirements and thus data for these smaller systems is less available. In 2000, the State Water Board created the Groundwater Ambient Monitoring and Assessment (GAMA) Program to produce a comprehensive, state-wide groundwater monitoring program. The GAMA Program is a multi-departmental collaboration. Datasets on groundwater quality come from local, state, and federal agencies (California State Water Resources Control Board, 2022). In addition, the State Water Board tracks water quality violations for public water systems throughout the state.

I collected and cleaned data from the Environmental Protection Agency (EPA) and the California State Water Resources Control Board (State Water Board) data on groundwater contamination. I mapped GAMA groundwater contamination data on the six constituents the state uses to analyze water needs statewide – nitrate, arsenic, hexavalent chromium, uranium, 1,2,3 trichloropropane (1,2,3 TCP), and perchlorate. I collected, cleaned, and mapped all water quality violations reported to the state from 2012 to 2020 in the Coachella Valley.

Finally, I collected, cleaned, and mapped (using QGIS) water use data from the Coachella Valley's 2020 Regional Urban Water Management Plan filed jointly by the six major public water systems in the Coachella Valley: CVWD, Desert Water Agency, Indio Water Authority, Coachella Water Authority, Mission Springs Water District, and Myoma Dunes Mutual Water Company. Each water supplier providing water to over 3,000 connections or 3,000 acre-feet each year is required to prepare an urban water management plan every five years under California's Urban Water Management Planning Act of 1983 (Water Systems Consulting, Inc., 2021). Plans assess water source reliability over a 20-year time frame and how the operator will manage water

shortages and meet targeted water use reductions. Each water agency reports on the amounts of water used by residential and commercial customers and overall per capita water use for the water agency. This data set helps to complicate understandings of water access by adding system-wide use and distribution to the more commonly studied physical and reliability characteristics defining water access.

Plumbing Data Analysis

To examine the temporal and spatial magnitude and change in physical characteristics of access, I collected, cleaned, aggregated, statistically analyzed, and mapped in QGIS decennial census data from 1960 to 2000 and American Community Survey (ACS) five-year estimates from 2006 to 2019 on plumbing completeness.⁵ I use census tract level data as the unit of analysis, the smallest unit available for comparison in the region throughout this time period. Census tracts provide more spatial nuance and specificity than more commonly used Public Use Microdata Area for less populated regions, like the Coachella Valley (Deitz & Meehan, 2019;

⁵ The U.S. Census Bureau has collected data on plumbing completeness since 1960. The survey question asks respondents to answer the following:

Does this house, apartment, or mobile home have –

- a. Hot and cold running water? Yes/no
- b. A bathtub or shower? Yes/no
- c. A sink with a faucet? Yes/no
- d. A stove or range? Yes/no
- e. A refrigerator? Yes/no

Plumbing completeness is then determined by whether an occupied housing unit lacks one or more of the piped water characteristics: 1) hot or cold running water, 2) bathtub or shower, or 3) a sink with a faucet.

The definition for plumbing completeness has changed slightly over time. The 1960 and 1970 census had separate questions for hot and cold water and determined plumbing completeness based on the lack of one or more qualities of plumbing. In 1980 plumbing completeness was defined as for exclusive use, which has continued through present day. Census 2000 requirements for complete plumbing were for the home to have hot and cold piped water, a flush toilet, and bathtub or shower. The question on plumbing completeness was transferred to the American Community Survey (ACS) in 2005 when it replaced the long-form decennial census. The ACS does not require a flush toilet but does require hot and cold running water and a bathtub or shower to be considered complete.

Pierce & Gonzalez, 2017), while also corresponding geographically with contemporary Riverside County jurisdictions. This sixty-year period marks a national increase in water access and quality in the United States that resulted from the passing of the federal Clean Water Act of 1972 and the Safe Drinking Water Act of 1974.⁶

In addition to census data on plumbing completeness, I examine socio-demographic characteristics including race, housing typology, poverty level, immigration, water source, and employment in industry type (see table 3-1). Demographic indicators were chosen based on previous scholarship on spatial patterns of water access and plumbing in the United States, which found that Hispanics, low-income residents, and residents living in mobile homes are more likely to live in a housing unit lacking complete plumbing in California (Deitz & Meehan, 2019; Pierce & Gonzalez, 2017). Analyzing census and ACS demographic data alongside plumbing data provide details on where and in what demographic contexts housing units lack plumbing completeness. I use decennial census data for the ten-year increments between 1960 and 2010 for population, race, and housing unit count and for 1960 and 1970 water source and 1980 plumbing completeness counts. I use decennial census sample-based data for plumbing completeness,⁷ units in structure (which identifies mobile homes), ratio of income to poverty level,⁸ foreign-born population, and employment in industry counts for the ten-year increments between 1960 and 2000 and for water source for 1980, and 1990. I use 5-year ACS estimates for plumbing

⁶ The Clean Water Act regulates the discharge of pollutants into waters in the United States. The Safe Drinking Water Act protects the quality of drinking water by setting minimum health-related standards for water systems.

⁷ For all Census and ACS years between 1970 and 2019, plumbing completeness is available for occupied housing units. For the 1960 census plumbing completeness is only available for the aggregate of occupied and vacant housing units.

⁸ Poverty measurements were developed after the 1960 census. Therefore, there is no Poverty Level data for the 1960 census.

completeness, units in structure (which identifies mobile homes), ratio of income to poverty level,⁹ foreign-born population, and employment in industry counts for the following periods: 2006-2010, 2011-2015, and 2015-2019. Finally, I use the ACS 5-year summary for race, population, and housing unit counts for 2011-2015 and 2015-2019. All census, ACS, and geographic boundary data were acquired through the National Historic Geographic Information System (Manson, Steven et al., 2020).

Comparisons over time between ACS and short and long-form decennial census are available for the data analyzed here due to limited changes in survey questions over time. However, there are differences in data collection between the two. The ACS data is collected over a 5-year period while the decennial census collects data for the year of collection providing more current data. Using 5-year ACS surveys contributes to smoother trends over time but is less able to capture major changes. The data I am currently using has one overlapping year (2015) due to the use of the 5-year estimates for the 2011-2015 and 2015-2019 periods to avoid the unreliability of 2020 data and data collection due to the COVID-19 pandemic. Currently, the overlapping year means that the 2011-2015 and 2015-2019 periods share 2015 sample data, which reduces precision of comparison. Finally, comparing census data over time requires grappling with changes to geographic boundaries for census tracts.

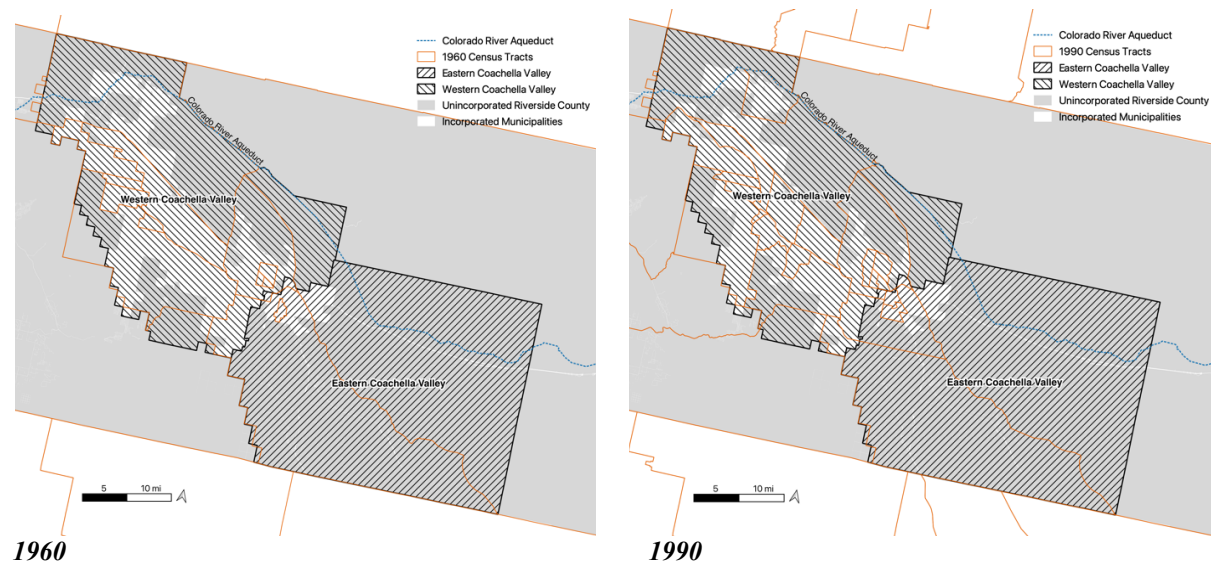
Between 1960 and 2019 census tract boundaries changed as tracts became smaller geographically and more numerous in the Coachella Valley (see table 3-2). Although the boundaries of census tracts have changed over time, census tracts that run along the administrative border between Eastern and Western Riverside County have remained relatively

⁹ Poverty measurements were developed after the 1960 census. Therefore, there is no Poverty Level data for the 1960 census.

stable over time (see figure 3-1). For example, in 1970 Eastern Coachella Valley census tracts consisted primarily of one tract for all unincorporated areas and two tracts for the city of Coachella. While these tracts have been divided into smaller areas over the years, the census tracts themselves primarily follow the border between Eastern and Western Coachella. This not only allows me to analyze plumbing completeness spatially by census tract, but also regionally by aggregating census tracts within the Western and Eastern Coachella regions and between incorporated and unincorporated areas.

Figure 3-1

Census Tract Geographic Changes Over Time (County of Riverside, 2015; Manson, Steven et al., 2020)



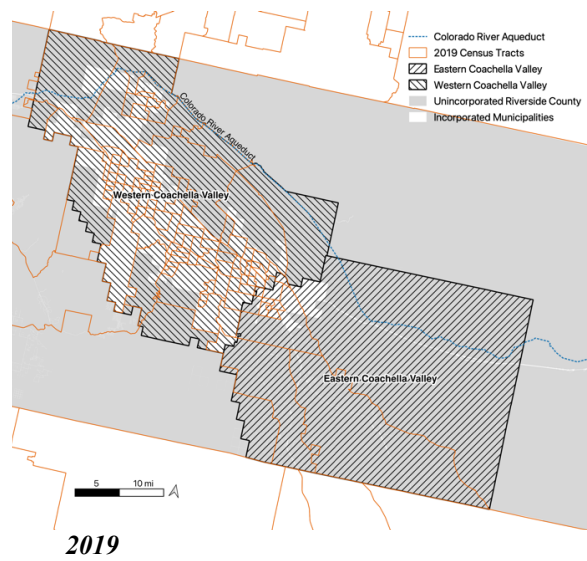
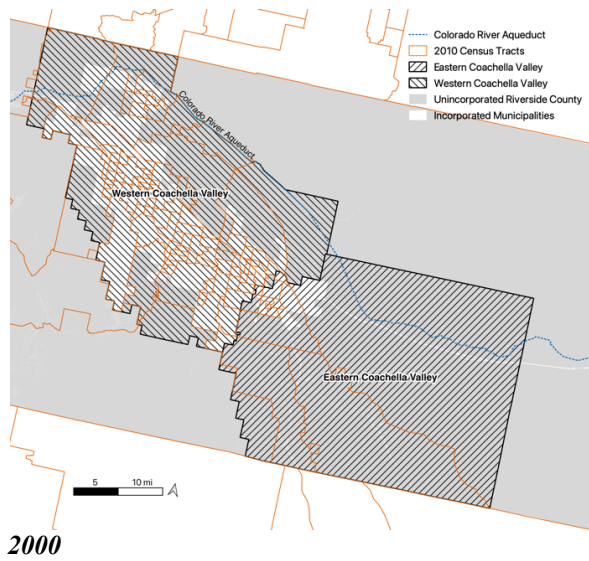


Table 3-1

United States Census and American Community Survey Data

<i>Year</i>	<i>Full Count Decennial Census</i>	<i>Sample-Based Census</i>
1960	Persons Race Tot. Puerto Rican or Spanish Surname Housing Units	Plumbing Facilities Water Source Employed Civilians Foreign-Stock Persons Occupied Trailers by Type
1970	Persons Race	Plumbing Facilities Water Source Ratio of Income to Poverty Level Nativity by Country of Origin Spanish Indicator Occupation Employed Persons Type of Structure Occupied Housing Units
1980	Persons Race Persons of Spanish Origin Housing Units Plumbing Facilities	Water Source Ratio of Income to Poverty Level Occupation Employed Persons Industry Employed Persons Units in Structure Nativity and Place of Birth
1990	Persons Race Hispanic Origin by Race Housing Units	Plumbing Facilities Source of Water Ratio of Income to Poverty Level Occupation Employed Persons

	Units in Structure	Industry Place of Birth
2000	Total Population Race Housing Units Hispanic Origin by Race	Plumbing Facilities Ratio of Income to Poverty Level Industry Units in Structure Nativity
<i>Year</i>	<i>Full Count Decennial Census</i>	<i>5-Year Summary ACS</i>
2006-2010	Population Total Race Housing Units Hispanic Origin by Race	Plumbing Facilities Ratio of Income to Poverty Level Industry by Occupation Units in Structure Nativity
2011-2015	N/A	Population Total Race Housing Units Hispanic Origin by Race Plumbing Facilities Ratio of Income to Poverty Level Industry by Occupation Units in Structure Immigrant Population
2015-2019	N/A	Population Total Race Housing Units Plumbing Facilities Ratio of Income to Poverty Level Industry by Occupation Units in Structure Period of Entry by Nativity and Citizenship

Table 3-2*Change in Coachella Valley Census Tracts from 1960-2019* (Manson, Steven et al., 2020)

Year	Census Tracts	Median Occupied Housing Units	Mean Occupied Housing Units
1960	13	1,285	1,342
1970	17	1,787	1,306
1980	22	2,084	2,370
1990	22	3,605	3,960
2000	71	1,492	1,642
2006-2010	103	1,455	1,511
2011-2015	103	1,538	1,570
2015-2019	103	1,596	1,713

I analyze the data using a multi-step process. First, I coded census tracts for each year with regional (Eastern or Western Coachella Valley) and jurisdictional classifications (incorporated or unincorporated) and place names. I used Riverside County's Community Area Plan Maps to identify whether census tracts were 1) in the Coachella Valley¹⁰ and 2) in the Eastern or Western Coachella Valley Area Plans (County of Riverside, 2015). For census tracts that overlapped both area plans, I classified the census tract based on which region contained over 50% of the tract. I used boundary data for places (census data for places include both incorporated places and census designated places, which include unincorporated communities) from each year to determine whether 1) the census tract was over 50% contained by incorporated boundaries and 2) the name of the places contained within the census tract. For census tracts that contained incorporated and unincorporated places, I classified the census tract based on which composed over 50% of the tract.

¹⁰ Census tracts that are partially contained in the area plans but lack development as identified through arial satellite imagery

Next, I calculated the portion of occupied housing units¹¹ lacking complete plumbing¹² in each census tract. I also calculated descriptive statistics for race, Hispanic population, foreign-born population, ratio of income to poverty level, mobile homes, and industry of individual employment for each census tract. I then aggregated data for five regions: the Coachella Valley, the Eastern Coachella Valley, the Western Coachella Valley, unincorporated Coachella Valley, and incorporated Coachella Valley (see figure 4-1). I calculated new margin of errors for each variable and region (Eastern Coachella Valley, Western Coachella Valley, incorporated Coachella Valley, and unincorporated Coachella Valley). After aggregating data, I calculated the portion of occupied housing units lacking complete plumbing and the descriptive statistics for each region. In addition, I calculated statistical significance for counts in tracts and regionally aggregated data.

Finally, I visualized the spatial distribution of occupied housing units lacking plumbing by creating two types of choropleth maps (statistical thematic maps) using QGIS. First, I created a choropleth map that showed the spatial distribution of the proportion of occupied units lacking complete plumbing by census tract (see figure 4-9). Second, I created a choropleth map that showed the spatial distribution of the proportion of total occupied housing units lacking

¹¹ The census survey tracks both the number of overall housing units and the number of housing units that are occupied. Occupied housing units are housing units that are occupied year-round (and occupied at the time of the survey) and do not consider housing units that are vacant or serve as seasonal or migrant homes.

¹² Census data provides two tabular columns for plumbing for occupied housing. The first column provides estimated counts for occupied housing units with complete plumbing. The second column provides estimated counts for occupied housing units lacking complete plumbing. In addition to this, the 1970 census provided full count data by persons in occupied units, the 1980 census provided full count data for occupied housing units, vacant housing units, and by tenure (owner or renter occupied), and the 1990 census provided sample data for plumbing by housing unit as well as by race of householder by housing unit and by housing typology. In addition, both census sample data and ACS estimates provide plumbing data for all housing units and occupied housing units only.

plumbing based in each census tract (see figure 4-10). In addition, I created choropleth maps for each demographic characteristic (see figures A-1 through A-6).

Plumbing Data Limitations

Census and American Community Survey data on plumbing completeness is the most comprehensive data source on access to piped water connections in the United States. Nevertheless, undercounting and statistical reliability pose challenges to using census data in the Coachella Valley and on plumbing. Census undercounting is prevalent throughout the United States in less populous rural areas and areas with large immigrant and non-white residents. Although the Coachella Valley consists of both denser urban areas and less populous peri-urban and rural areas, there is a relatively small population sample size. In addition, the Coachella Valley has large migratory and immigrant populations. The demographic challenges of this region suggest chronic undercounting for census survey data. As such, my analysis provides a floor to understanding physical water access issues, suggesting that they are greater than indicated by plumbing completeness counts.

There are limitations to calculating and comparing the magnitude of plumbing over time due to the different nature of sampling data between the census and ACS. Decennial census surveying aims for 100% counts of the United States population, race, and housing units. Data on plumbing completeness for occupied housing units are estimates taken from 20% samples for all years (with the exception of 1980, which used a full count for plumbing completeness). The American Community Survey five-year period samples approximately 1 in 9 households (U.S. Census Bureau, 2018) creating estimates with a margin of error at 90 percent confidence intervals, a smaller sample size than the long-form census. American Community Survey five-year estimates provide more data precision, statistical reliability, and data availability for

geographic areas with less than 65,000 people than single-year and three-year estimates and are the only ACS estimates available for geographies with less than 20,000 people such as census tracts (U.S. Census Bureau, 2018). However, the low overall counts for housing units lacking complete plumbing contributes to margin of errors that are near to or greater than the estimated counts. This results in a lack of statistical significance between census tracts that have low counts of occupied housing units lacking complete plumbing (for example: plumbing completeness census tract data for the ACS 5-year sample for 2006-2010 had a margin of error between 72 and 187, while the actual counts for occupied housing units lacking plumbing ranged between 0 and 150) (U.S. Census Bureau, 2010e). Aggregating data to larger geographic regions, as I do, can assist in improving statistical reliability for less populous areas (U.S. Census Bureau, 2018).

I find low statistical reliability in the ACS sample data for occupied housing units lacking complete plumbing in each survey year between the Eastern and Western Coachella Valley and between incorporated and unincorporated regions. In addition, the 2006-2010 ACS data had high margins of errors for all occupied housing units lacking complete plumbing data counts, suggesting little statistical reliability, undercounting in the Eastern Coachella Valley, and overcounting in the Western Coachella Valley.

However, I find statistical significance between the Eastern and Western Coachella Valleys for occupied housing units lacking complete plumbing counts in the 2011-2015 survey (U.S. Census Bureau, 2015d). I also find statistical significance between the ACS 5-year estimates from 2011-2015 and 2015-2019 for occupied housing units lacking complete plumbing counts in the Eastern Coachella Valley (U.S. Census Bureau, 2015d, 2019f). I find statistical significance between occupied housing units lacking complete plumbing counts in the incorporated and unincorporated Coachella Valley for the 2011-2015 and 2015-2019 ACS 5-year

estimates. Further, I find that occupied housing units lacking complete plumbing counts for the census tracts encompassing the Oasis, Thermal, and Torres-Martinez communities were statistically significant from all other census tracts in the 2011-2015 ACS 5-year estimate. I find that the occupied housing units lacking complete plumbing counts for this census tract were statistically significant from all census tracts with occupied housing units lacking complete plumbing counts under 16 for the 2015-2019 ACS 5-year estimate.¹³ For the demographic data I collected, I found all ACS data to be statistically significant each survey period between Eastern and Western Coachella Valley and between incorporated and unincorporated regions. Examining statistical significance for occupied housing units lacking complete plumbing for ACS survey periods reveals that 1) Western Coachella Valley counts are unreliable and 2) the greater counts of occupied housing units lacking complete plumbing in the Eastern Coachella Valley are statistically significant and most likely undercounted.

¹³ I find that there was no statistical significance between any census tracts for 2006-2010 ACS data. And this census tract was the only tract to have statistical significance in comparison with other census tracts for plumbing in 2015-2019 ACS data. For the 2011-2015 ACS there was one additional census tract that was statistically significant from other census tracts with counts of occupied housing units lacking plumbing under three. This census tract was also in the Eastern Coachella Valley, containing the communities of Mecca and North Shore.

Figure 3-2

Margin of Error for Aggregated Regional Counts of Plumbing Completeness (U.S. Census Bureau, 1960-2019)

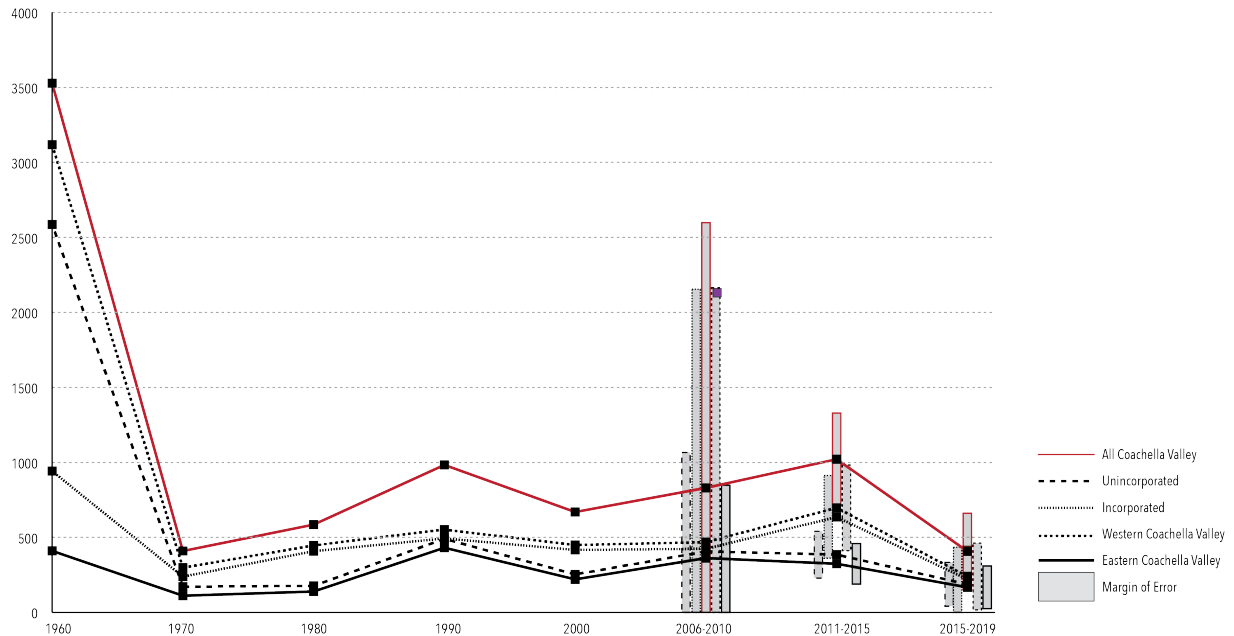


Table 3-3

Count of Occupied Housing Units Lacking Complete Plumbing in Relation to Census Tract Counts (U.S. Census Bureau, 1960-2019)

	Total # of Census Tracts	Total # Census Tracts with HU Lacking Plumbing	% of Census Tracts with HU Lacking Plumbing	Median HU Lacking Plumbing Count	Mean HU Lacking Plumbing Count	Highest Count in Tract HU Lacking Plumbing
1960	13	13	100%	246	343	1337
1970	17	17	100%	12	27	80
1980	22	21	95%	18	27	175
1990	22	20	90%	22	33	227
2000	71	39	54%	4	9	123
2006-2010	103	32	31%	0	8	150
2011-2015	103	43	41%	0	10	189
2015-2019	103	26	25%	0	4	80

Archival and Document Analysis

What we know about history comes primarily from those who conquered, remained in power, and ensured that their experiences were documented and entered into official records. Dispossession is rarely documented as anything more than a natural right by those doing the dispossessing. So how then do we know when dispossession is occurring and what its effects are? And how do we do this in a place like the United States where agents of settler colonialism have attempted at every turn to eliminate the dispossessed – the Indigenous¹⁴ of North America? To understand and answer how the spatial inequality in water access developed, deepened, and exacerbated in the Coachella Valley, I searched for and analyzed sites of refusal, contestation, and challenges to the “natural” progression of United States settlement in the region.

Official archives provide a surprisingly rich source for tracing water dispossession during early United States colonialism in the Coachella Valley. The taking and use of water in California, whether through diversion of riparian water ways or pumping of groundwater, required government filing and documentation to ensure settler acquisition through water rights. Throughout the state, this led to voluminous amounts of litigation over who had the rights to use which water source. As wards of the federal government, California tribes could adjudicate in court, worked with white allies, and entreated federal agents to protect their water rights. The prevalence of legal contestations over water use and rights between settlers and the federal government (on behalf of the tribes) in the 1800s and early 1900s provides a base for

¹⁴ Throughout the dissertation I use various names for the first inhabitants of the Coachella Valley. I use tribal names when referring to specific tribes, Cahuilla when referring to the collective tribes of the Coachella Valley, Indigenous when referring to first inhabitants collectively in California or the United States, and Indian when referring to United States settler colonial classifications of people, land, water, and jurisdictions.

understanding water dispossession during California settler colonialism. Appeals by government officials in alleviating indigenous water scarcity also provides ample official record of water dispossession. Meanwhile, processes used by local and federal governments to implement land use policies and eliminate indigenous sovereignty provides record for the direct contestation between California tribes and United States settlers over water access.

Despite these relentless and continuous attempts at erasure by government and settlers alike, Indigenous communities continue to exist and thrive in the United States. Today, in the Coachella Valley, five Cahuilla tribes own, occupy, and use land, practice cultural traditions, and contest settler colonialism. They have continued to litigate over their water and land rights and have established their own documentation of their history, refusing colonial definition. For example, one member of the Agua Caliente Tribe of Cahuilla Indians, Rupert Costo and his wife Jeannette (Cherokee) even ensured that their records entered the official record. The Rupert and Jeannette Costo papers were donated to and are held by the Tomás Rivera Library at the University of California, Riverside containing printed material, film, and photographs dedicated to rights of the American Indian with a concentration on California Indians. The Agua Caliente tribe has also continually ensured that their counternarrative is heard and recognized. Over the last century, they have published counternarratives to their mainstream portrayal established by Palm Springs government officials and boosters. Today, their cultural center and archives are located centrally in downtown Palm Springs.

Likewise, contestation provides a fruitful starting point for finding evidence of dispossession and spatial inequality during the Coachella Valley County Water District's

(CVCWD) formation.¹⁵ The district's acquisition of Colorado River water was rife with controversy. The process of funding construction of and bringing Colorado River through the Coachella Branch of the All-American Canal faced opposition from nearby Imperial Valley and other Western states with interests in the river's water. The river's subsequent distribution and CVCWD's expansion of services to domestic water was equally disputed.

These contestations were documented publicly. The local newspaper, The Desert Sun, covered the district's expansion and system consolidation, board proceedings, water rights disputes, and canal construction. Federal hearings on the Colorado River rights, Coachella canal construction, and tribal land disposition document federal and state representative policy values that influenced federal and local water management. The text of federal and local regulations governing CVCWD and the Colorado River's water further articulate the principles used for enabling water distribution and access.

Finally, contestation, takes center stage in contemporary peri-urbanization in the Coachella Valley. The planning process for the Thermal Beach Club is well documented through public planning documents and video recordings, newspaper articles, company websites, and advocacy organizations' external relations and media. Meeting minutes, planning staff recommendations, the project's application, and project documents are all available online to the public as part of the public hearing records. Riverside County Board of Supervisor meetings are recorded and available to watch online. Regular Riverside County Planning Commission

¹⁵ The Coachella Valley County Water District and the Coachella Valley Water District are the same entity. The agency dropped "County" from its name in the second half of the twentieth century. I refer to the district with the name used during the time period under analysis. Thus, in Chapter Six I use Coachella Valley County Water District and in Chapter Seven I use Coachella Valley Water District.

meetings are also video recorded and made public online.¹⁶ I used nonparticipant observation to analyze public proceedings' video documentation. I analyzed the written public comments included in all planning documents for each agenda item of the public hearing.

I use document analysis to examine the papers, images, videos, and maps contained in official and community archives and policy documents for each of the conjunctural eras. I coded documents using a semi-inductive coding process. I used the program, ATLAS.ti, to assist in document coding. I started with a set of codes based on my research question and theoretical engagement with racial capitalism and settler colonialism such as water scarcity, race, labor, capital value – water, role of water, and settlement. I then added to these codes as I went through the documents and further concepts presented themselves. Following this, I thematically analyzed the coded data, I compared interpretations of events by different parties, and I used theoretical sampling for further data and document selection (Bowen, 2009). I used this analysis to discover patterns in the data that illuminated how spatial inequality in water access developed, deepened, and is exacerbated in the Coachella Valley.

COVID-19 Research Constraints and Positionality

As COVID-19 spread globally, I was a month away from beginning dissertation research far from the Coachella Valley in São Paulo, Brazil. Government restrictions for federally funded travel required cancelling my move scheduled for March 31, 2020 and rethinking the dissertation research and questions.¹⁷ This original project used an ethnographic approach centered on

¹⁶ However, the September 25, 2018 Planning Commission meeting, at which the Thermal Beach Club gained approval, was not recorded and only meeting minutes and agenda documents are publicly available for the meeting.

¹⁷ I had received funding for this previous research project through the Fulbright-Hays Doctoral Dissertation award.

participant observation. Doing research during COVID-19 required adaptability in research methods and data acquisition *and* a reconsideration of research methods that required physical presence, contact, and physical and emotional strain on communities disproportionately affected by the pandemic. The COVID-19 lockdown in the United States and Los Angeles, serendipitously forced me to return my attention back to the Coachella Valley where I had worked for almost seven years prior to starting the doctoral program at UCLA.

In January 2011, as a planner for the non-profit design firm, Kounkuey Design Initiative (KDI), I first encountered the Eastern Coachella Valley's water contamination issues when collaborating with Pueblo Unido CDC and residents of the St. Anthony Trailer Park on a small public space intervention at the park. There, the executive director of Pueblo Unido CDC took us to the communal water tap and demonstrated the reverse osmosis system he had installed to filter out the naturally occurring arsenic from the well water. At the time, this reverse osmosis system was one of the first low-cost filtration systems in operation in the Valley. Pueblo Unido CDC was working with other small trailer parks throughout the Eastern Coachella Valley to employ similar filtration systems for their residents.

From 2011 to 2017, I worked in the Eastern Coachella Valley communities at St. Anthony and in North Shore and Oasis on designing and constructing new public spaces. To accomplish my work, I navigated Riverside County, Coachella Valley Water District, and Desert Recreation District planning and water use regulations to get a new 5-acre park permitted and built in North Shore. During this time, on behalf of KDI, I worked on regional issues with other Coachella Valley non-profit organizations as part of California Endowment's Building Healthy Communities (BHC) initiative. Together, we began work on issues of equity in and access to transportation and the monitoring of environmental degradation throughout the Eastern

Coachella Valley. Some of these organizations were prominent voices in the public debate over the approval of the Thermal Beach Club including Alianza (which was developed out of the BHC work) and Leadership Counsel for Justice and Accountability.

In addition to working with communities and advocacy organizations throughout the Eastern Coachella Valley, I have enjoyed throughout the years in the Western Coachella Valley's tourist offerings. I have stayed in Palm Springs and La Quinta at small motels, resorts, and second home rentals. I have swum in their pools to cool off from long days of play and work. I have also worked at one of the area's most prominent tourist gatherings – the Coachella Valley Music Festival, while supporting a female-led small business collective from North Shore selling burritos as a food vendor. With these women, and over the course of two weekends, I worked from 5am until well past midnight preparing food and taking food orders just outside the festival gates to sanctioned campers and festival goers. I slept in my car overnight in the parking lot over a couple miles walk away. And, through this work, I ensured that the women made a profit from their business when many of our competing food vendors did not.

While I have worked in the Eastern Coachella Valley, I have not lived there. This dissertation project comes out of the time I spent observing and learning in the Eastern Coachella Valley, struggling to understand the conditions of disinvestment in the Eastern Coachella Valley, and questioning why and how all levels of government make discriminatory and unjust policy and funding choices are made at all levels of government for this area. I identified the issues of spatial inequality and of water access based on my experience working in the region and by taking cues from the equity demands of local organizations. Early on as I switched my dissertation research from São Paulo to Coachella, I vetted my research question and inquiry about water access with people who I had collaborated with in the Eastern Coachella Valley

including at KDI and Pueblo Unido CDC and within the Riverside County government. These conversations and my experience working with residents in the Eastern Coachella Valley crystalized the need to foreground the local policy mechanisms and processes that affect the day-to-day experiences of residents and threaten their very existence through exclusion and negligence.

My research commitments to understanding structural and institutional processes effects on everyday lives commonly pairs with ethnographic approaches and participant observation. However, the COVID-19 pandemic made in-person, “on-the-ground” research legally, physically, and morally untenable for me. Legally, at the start of COVID-19, UCLA instated regulations that curbed in-person research. Physically, Southern California was experiencing a lockdown, requesting physical distance between places, and closing public and private spaces to congregation. Putting my health and other people’s health at risk by conducting in-person participant observations or interviews made little ethical or rational sense. Morally, in-person and internet-conducted (such as Zoom interviews) research, which would add unnecessary strain, with communities whose already precarious living situations were exacerbated with the onset of COVID-19 was out of the question to me. These research constraints, however, led me to a mixed-methods approach and creativity in accessing data to answer my research question, particularly with the use of archival data.

At the start of the pandemic, not only was in-person research with communities unavailable, but within institutions as well. Archives and libraries in the United States had closed to visitors. To wait out these closures I started my research with publicly available digital data including from the United States Census, United States Federal Archives, Supreme Court litigation documents (such as the Agua Caliente case over groundwater rights against CVWD

and the Desert Water Authority), the United States Bureau of Land Management, the Huntington Library, California Public Archives, digitized archives of the Desert Sun, Riverside County policies and planning documents, and the digital footprints of advocacy organizations (including social media, email newsletters, and websites). Eventually, I was able to visit archives in person to access water resource collections and the Rupert and Jeannette Costo Papers at UC Riverside, the collection at the Palm Springs Historical Society, and Hilton H. McCabe Papers at University of Southern California. Unfortunately, by the time these institutions opened to visitors in the Fall of 2021, I had moved across the country for personal reasons. This limited the time I could spend at each of the archives. In addition, the Agua Caliente archives were unavailable during my research period due to the ongoing construction of the tribe's new cultural plaza and museum.

The intimate knowledge I built around the actors of the Coachella Valley and the place itself during the seven years I spent working there helped me to be judicious in identifying and analyzing documents throughout the research period. My hope is that this research will help the region's policymakers and advocacy organizations better understand the issues of water access residents face and how to alleviate them.

Chapter 4 Mapping Spatial Inequality in Water Access in the Coachella Valley

Introduction

The depiction of the Coachella Valley described by advocates, government representatives, and journalists alike compares the scarcity in the Eastern Coachella Valley (ECV), of wealth, water, energy, housing, and jobs, for example, with the abundance experienced in the Western Coachella Valley (WCV). The west is a wealthier and whiter area, while the east is poorer, a primarily Mexican immigrant and Mexican American area lacking water infrastructure. In the ECV, bottled water is dropped off daily to over four hundred families cut-off from clean water infrastructure (Olalde, n.d.). Conversely, in the WCV residents and tourists are gaining access to more water resources for play and leisure (Beckett, 2022). As a result, inequality in the Coachella Valley is widely represented spatially through the boundaries and regions of east and west. However, my analysis of contemporary water access characteristics and longitudinal plumbing completeness demonstrates that spatial inequality is more nuanced than simply an east-west divide. Spatial inequality in water access in the Coachella Valley is longstanding and exhibits three spatial patterns: regional differentiation, distinctions between incorporated and unincorporated areas, and concentrated water poverty.

The Coachella Valley is at the geographic margins of the Los Angeles metropolitan region. It is a place that is imagined as and shaped for play, music, recreation, and modernism. But for those living and working in the Coachella Valley the reality of life is less luxurious. It is instead one of duality, where tourism and agriculture shape land and opportunity, poverty and wealth, and water access.

This duality is shaped through natural and political boundaries. Political boundaries are determined by municipal, regional, and federal policy. Jurisdictions in the Coachella Valley include nine cities, five tribal reservations, and unincorporated county land. In 2000, the Riverside County General Plan revision delineated the eastern and western sides of the Coachella Valley into separate planning areas: Eastern Coachella Valley (ECV) and Western Coachella Valley (WCV). Prior to the revision, the General Plan did not have a countywide land use map for unincorporated areas nor an area plan that included the Coachella Valley (Riverside County 2015). Today, the Riverside County General Plan divides the Coachella Valley into Western and Eastern plans of similar size (650 and 670 square miles, respectively, shown in figure 4-1) (County of Riverside 2016a and 2016b). The Coachella Valley's natural boundaries are formed by the San Jacinto, Santa Rosa, and San Bernardino Mountain ranges. It serves as the catchment area for the Whitewater River Watershed. Below, lies an aquifer that is shared across both eastern and western regions.

The Coachella Valley has four primary water sources: 1) ground water (accessed through wells that serve both individual households and large water agencies), 2) Colorado River water (accessed through the Coachella branch of the All-American Canal for industry irrigation and aquifer replenishment), 3) California State Water Project water allocations, and 4) recycled water. These water sources are governed by federal, state, and regional regulations. A constellation of five water agencies, working together under the Coachella Valley Water Management Group (Coachella Valley Water District, Desert Water Agency, Coachella Water Authority, Indio Water Authority, and Mission Springs Water District), are responsible for the majority of domestic and industrial water provision in the Valley (Water Systems Consulting, Inc., 2021).

Figure 4-1

Coachella Valley (Riverside County Area Plans, 2020; U.S. Census American Community Survey 2015-2019)

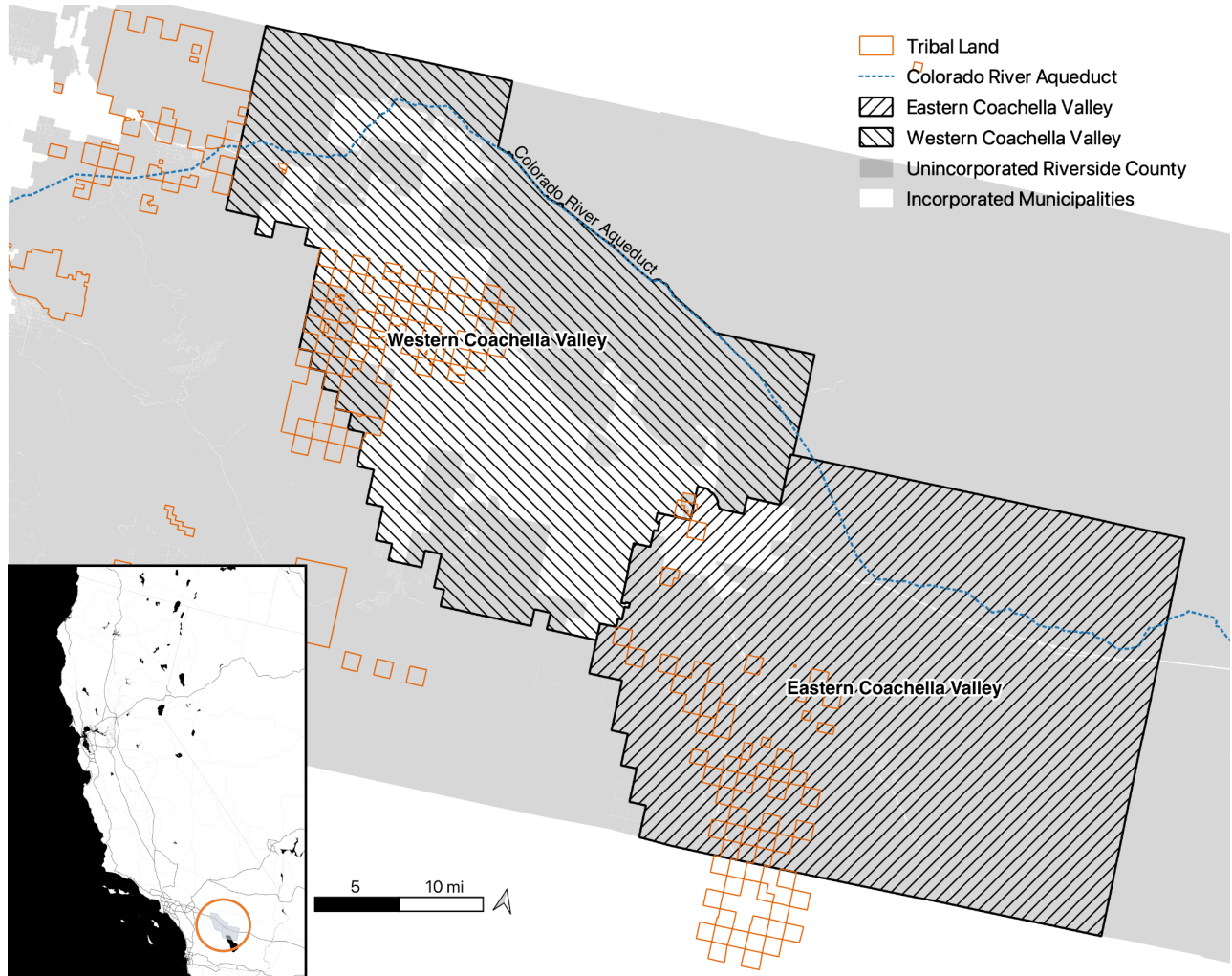
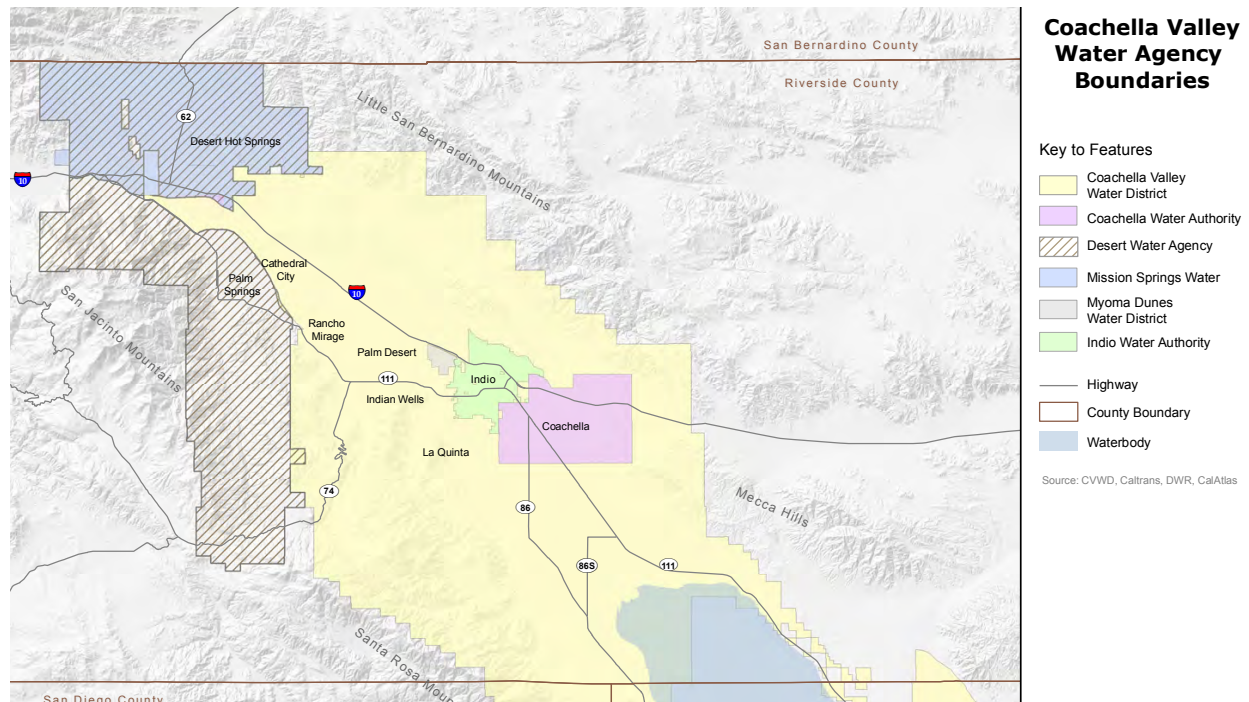


Figure 4-2

Coachella Valley Water Agencies (Water Systems Consulting, Inc., 2021)



When I first started working in the ECV, in 2011, local activists were coalescing around three water access-related challenges: 1) the lack of local representation on Coachella Valley Water District’s board, 2) closing the mobile home park, Duroville, in Thermal and relocating its residents, and 3) consolidating water infrastructure at the St. Anthony Trailer Park in nearby Mecca. Each of these issues represented elements of inequality in water access, prevalent throughout the ECV. Community activism showed that this inequality had a regional and peripheral spatial pattern. Here, the peripheral, unincorporated ECV lacked access to water, while water in the WCV remained abundant and accessible to residents and tourists alike.

The largest water provider in the Coachella Valley is the Coachella Valley Water District (CVWD). In 2011, the CVWD’s Board of Directors was composed of individuals connected to the agriculture industry. The five Board members held at-large seats. Using the California Voting

Rights Act of 2001, advocates argued that residents of the ECV, who endured low wages, few housing options, and poor water quality and access, lacked appropriate representation on the board (James, 2013). Their advocacy was successful. CVWD changed their board structure from five at-large seats to five region-based seats, which now includes District 5 representing the ECV. The new structure resulted in the 2014 election of the first CVWD board member, Cástulo R. Estrada, to represent ECV residents.

Lack of representation in the government entity responsible for water provision was compounded by lack of potable water. The plight of residents living in one of two trailer parks (Duroville and St. Anthony) is representative of the access issues facing hundreds of households in unincorporated ECV. At Duroville, located on Torres-Martinez Desert Cahuilla allotment land, residents lacked safe drinking water. Challenges to water access brought about activist involvement in shutting down the park and putting it into state receivership. Subsequently, a new mobile home park was built with Riverside County funding to relocate its residents. However, the replacement park, Mountain View Estates, with only 180 homes, was not sufficiently large enough to house all residents. Like Duroville, residents of St. Anthony Trailer Park lacked access to clean potable water. In fact, the well water at St. Anthony was found to have naturally occurring arsenic at levels exceeding healthy limits, and a reverse osmosis system was installed to decrease contamination. The 100-household park had recently completed a transfer of ownership to a local housing organization – Pueblo Unido Community Development Corporation (Pueblo Unido CDC). As part of the transfer in ownership, Pueblo Unido CDC had filed permits with Riverside County to update the park with permanent housing and connect it to CVWD water and sewer infrastructure.

In the last decade, the ECV has experienced few resolutions to the area's water issues. The ECV's hoped-for domestic water infrastructure improvements have been slow to arrive, even with a representation on the CVWD board. Today, activists are working with residents to close a second mobile home park, the Oasis Mobile Home Park, due to issues of water access. Residents and advocates have sued the owners of the Oasis Mobile Home Park, also on Torres-Martinez allotment land, due to uninhabitable living conditions. They also successfully lobbied for \$30 million in funding for relocation housing from the 2021 California State Budget (Perez, 2021). In addition, CVWD identified 109 small water systems in the ECV in need of consolidation with their domestic water system (Huang et al., 2018). These are systems that supply water to over 4,000 people in the ECV, some of which rely on unpermitted well systems, others are in areas with high levels of arsenic in the groundwater. Despite 40 years of progressive federal and state policies regulating safe and healthy water access and water rights, households in the ECV continue to lack access to water.

This chapter examines the spatial characteristics of water access inequality in the Coachella Valley. First, I map contemporary spatial characteristics of water access inequality including physical access, water reliability, and water use. I then map census data on plumbing completeness (a measure of the physical characteristic of water access) from 1960-2019 to visualize the geography of inequality in water access over time. Mapping spatial inequality in water access in the Coachella Valley demonstrates that it is not new, but longstanding. It illustrates three-related patterns of spatial inequality. I find that there are east-west distinctions and disparities in water consumption; discernable differences between the incorporated, center and the unincorporated, periphery of the Coachella Valley; and concentrated communities with longstanding water poverty.

The Contemporary Shape of Inequality

Water access issues in the ECV are readily apparent. They are covered in local and national media (Esquivel, 2015; Olalde, n.d.; Perez, 2021; Pons, n.d.; Wick, 2019). And residents and local advocates have pursued solutions to these challenges for decades. Comparing ECV resident experiences in accessing water to those of resident and tourists in the WCV highlights a spatial inequality in water access that follows a west-east regional pattern. To verify and provide a more detailed understanding of the spatial characteristics of inequality in water access in the Coachella Valley, I map contemporary water access. Using physical accessibility, water reliability, and water use data I illustrate that contemporary spatial inequality in water access is characterized by disparities between those with and without water access who are disproportionately concentrated in the ECV.

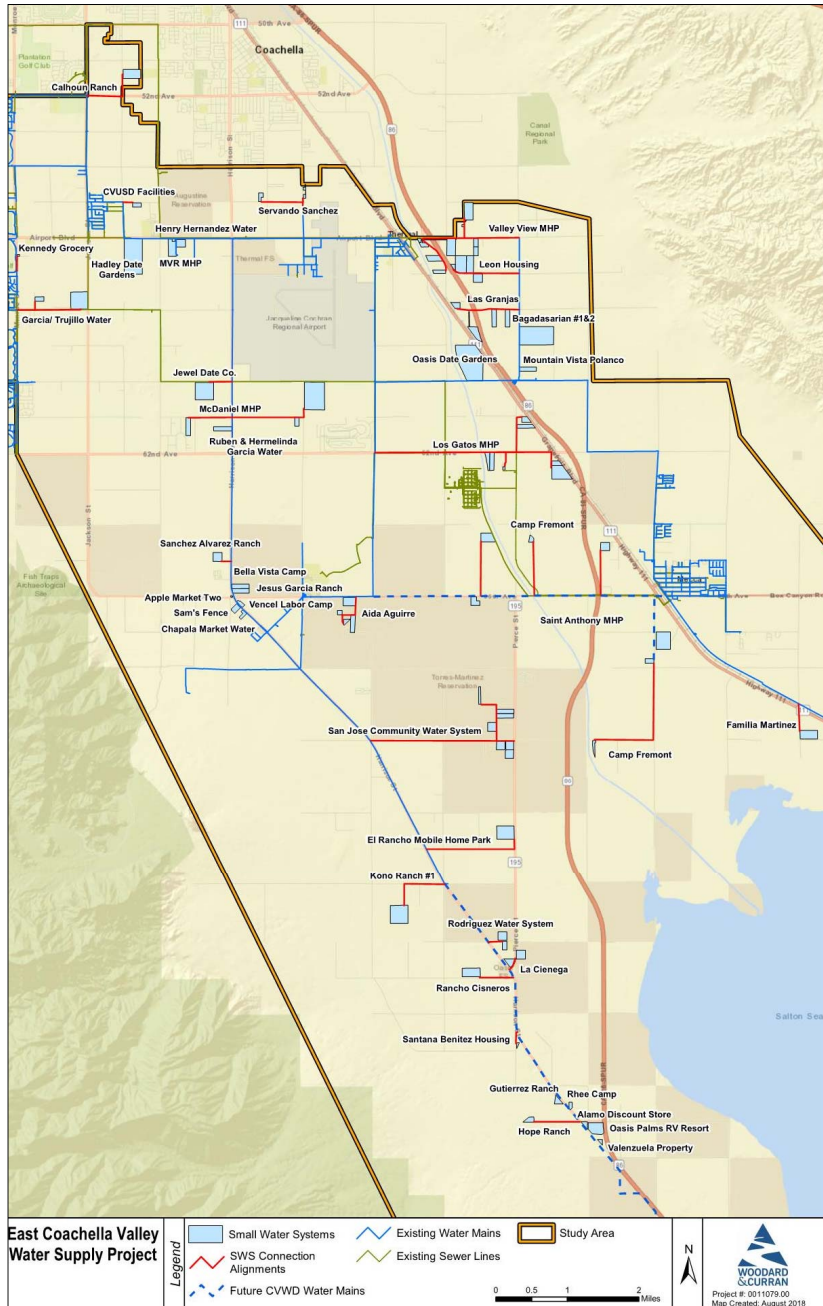
Physical Access Issues: Small Water Systems Consolidation

Over the last few years, the CVWD began to address water access issues in the ECV. As advocates have noted for the last two decades, many water issues residents face result from the continuing lack of service connections to the public system's water infrastructure (Rumer, 2022). CVWD estimates that over 10,000 residents, the majority living in the ECV, rely on private wells that fail to meet state code for drinking water (Rumer, 2022). According to CVWD's Board Member Estrada, prior to the formation of the taskforce, "CVWD's philosophy has long been not to serve people who are not customers of the district" (Rumer, 2022, A06). In 2017, CVWD announced they were forming a Disadvantaged Communities Infrastructure Task Force to ensure "access to safe affordable drinking water" to residents in their service area (*Disadvantaged Communities Infrastructure Task Force | Coachella Valley Water District - Official Website*, n.d.; Rumer, 2022). One of the first undertakings of the new task force was to map disadvantaged

communities in the district's service area and assess financial and physical feasibility for system consolidation (see figure 4-3).

Figure 4-3

Small Water Systems Unconnected from CVWD Public Infrastructure in the ECV (Lopezcalva et al., 2018)



The California Department of Water Resources defines disadvantaged communities (DACs) as those with an annual median income of less than 80% of the statewide annual median income (Lopezcalva et al., 2018). In 2017 and 2018, CVWD mapped DACs and existing water and sewer infrastructure in its service area (Huang et al., 2018; Lopezcalva et al., 2018). In addition, it surveyed and mapped communities that relied on local private wells for their drinking water; what are referred to at state and local levels as small water systems.

CVWD found 109 small water systems that relied on private wells in the ECV (Huang et al., 2018). Thirty-seven percent of all households in this area lack complete plumbing (Manson, Steven et al., 2020; U.S. Census Bureau, 2019f) Of these, 83 were known systems to CVWD, the Coachella Valley Regional Water Management Group (CVRWMG), and Riverside County Department of Environmental Health (County) (Huang et al., 2018; Lopezcalva et al., 2018). The remaining 26 systems were identified through aerial photo analysis and community input. Due to data capacity, CVWD contractors only analyzed the 83 systems identified by government agencies for consolidation for the Eastern Coachella Valley Water Supply Project. These 83 systems, in need of consolidation into the CVWD public potable water infrastructure (see figure 4-3), serve 1,011 service connections or an estimated 4,044 people (Huang et al., 2018).

CVWD consolidation reports show that in the ECV's unincorporated areas of Thermal, Mecca, and Oasis, 18.3% of the population rely on private wells, lacking consolidation with public infrastructure for domestic water (Huang et al., 2018). In addition, fourteen of the 83 small water systems were non-compliant with county permitting (Huang et al., 2018). And, in a community with over a third of the population living below the poverty line and 80% of households with income levels below the average median income, the cost to consolidate through private funding remains out of reach. Estimated costs to connect these systems ranges between

\$24,000 and \$9,487,000, or approximately \$9,720-\$455,000 per service connection (Huang et al., 2018; Lopezcalva et al., 2018). Publicly funded extensions to all systems will also take years to accomplish as the total cost for all consolidation projects totals over \$74 million.

Water Quality and Issues of Water Reliability

While these communities have physical water access by using private wells, their water is anything but reliable. Water reliability is impacted by different factors and measured by whether a household can dependably access their potable water source. Factors that may affect reliability include the quality of water (for example, whether it is contaminated with a substance that affects potability), the distribution of water from its source (for example, whether water distributors shut-off water, failing to provide water to a household), and the functioning and maintenance of infrastructure that allows for consistent delivery of water. Water reliability for households lacking connections to public infrastructure supplied by one of the five public water districts is mostly determined by water quality, infrastructure maintenance, and access to electricity due to the use of private wells for sourcing water. For residents in the Coachella Valley, water reliability issues stemming from poor water quality are the most consequential as using contaminated water negatively impacts the health of users. I use data on the presence of contaminants in groundwater from 2002-2011 provided by the GAMA program¹⁸ and California Water Board Violation data from 2010 to 2020 to assess water reliability.

Data on water quality violations reveals that only two public water systems in the Coachella Valley recorded violations between 2012 and 2020 (see figure 4-4) (State Water Resources Control Board, 2022a). Both public water systems are in unincorporated ECV and

¹⁸ The GAMA Program is a multi-departmental collaboration. Datasets on groundwater quality come from local, state, and federal agencies (California State Water Resources Control Board, 2022).

unconnected from the public water infrastructure. Both water systems serve approximately 300 people each and have multiple violations for each year. Serving 314 residents, Oasis Gardens, in Oasis, had 19 violations over the same period for arsenic levels above the EPA's regulatory standards of a maximum contaminant level (MCL) of 10 milligrams per liter (State Water Resources Control Board, 2022a). The St. Anthony Trailer Park in Mecca had 36 violations for arsenic levels between 0.16 and 0.25 mg/l in the water that was provided to approximately 325 residents (State Water Resources Control Board, 2022a). In addition to these violations, CVWD identified 9 unconnected small water systems exceeding MCL for arsenic (estimated population of 506), 5 exceeding MCL for fluoride (estimated population of 344), one exceeding MCL for coliform (estimated population of 12), and one system exceeding MCL for hexavalent chromium (estimated population of 20) (Huang et al., 2018).

State GAMA data confirms that without proper filtration the 109 small water systems serving the ECV face high levels of arsenic and other contaminants above the maximum contaminant level (MCL) in their drinking water. In addition, data on the six constituents the state uses to analyze water needs statewide – nitrate, arsenic, hexavalent chromium, uranium, 1,2,3 trichloropropane (1,2,3 TCP), and perchlorate – shows that the presence of these chemicals is spatially unequal (State Water Resources Control Board, 2022b).

Figure 4-4

Public Water Systems with Well Water Quality Violations between 2010 and 2020 (State Water Resources Control Board, 2022a)

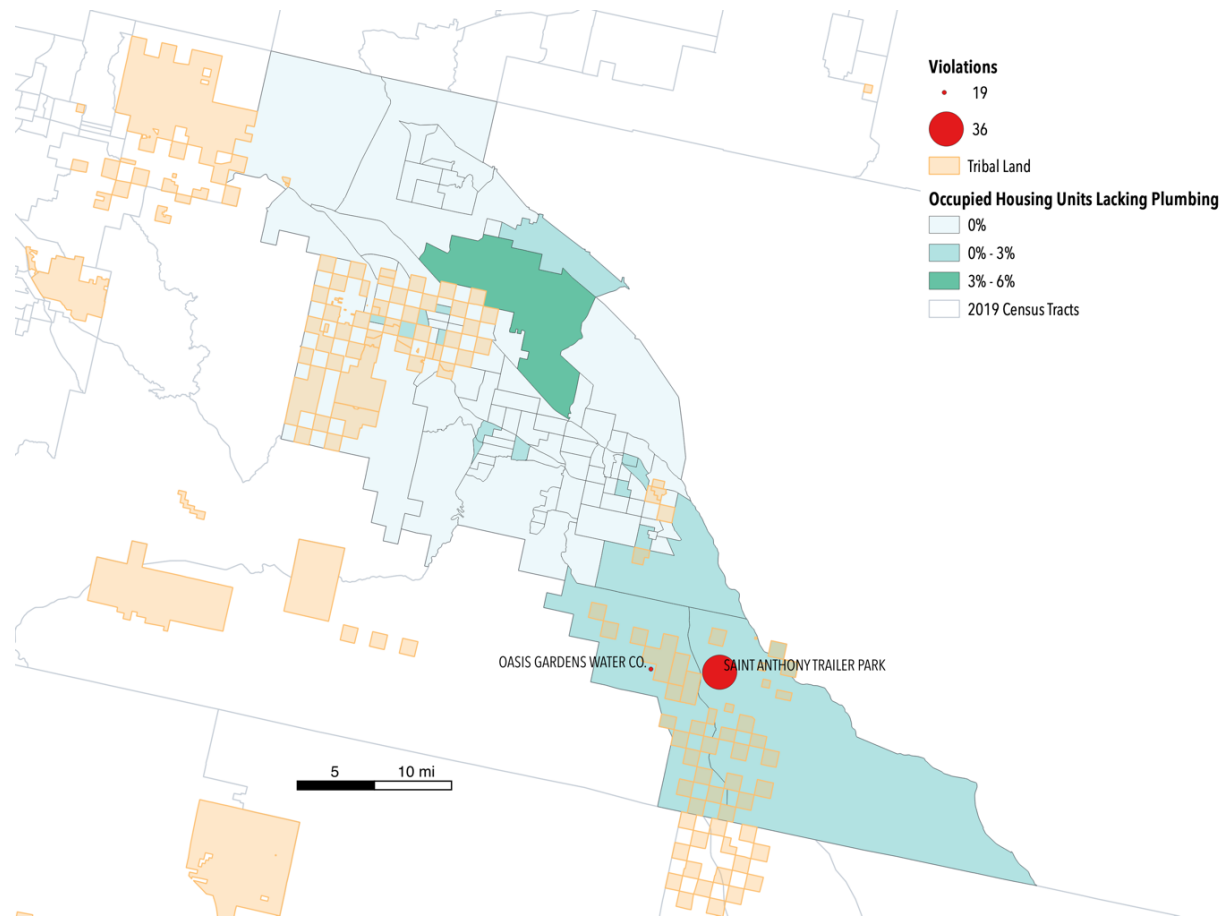
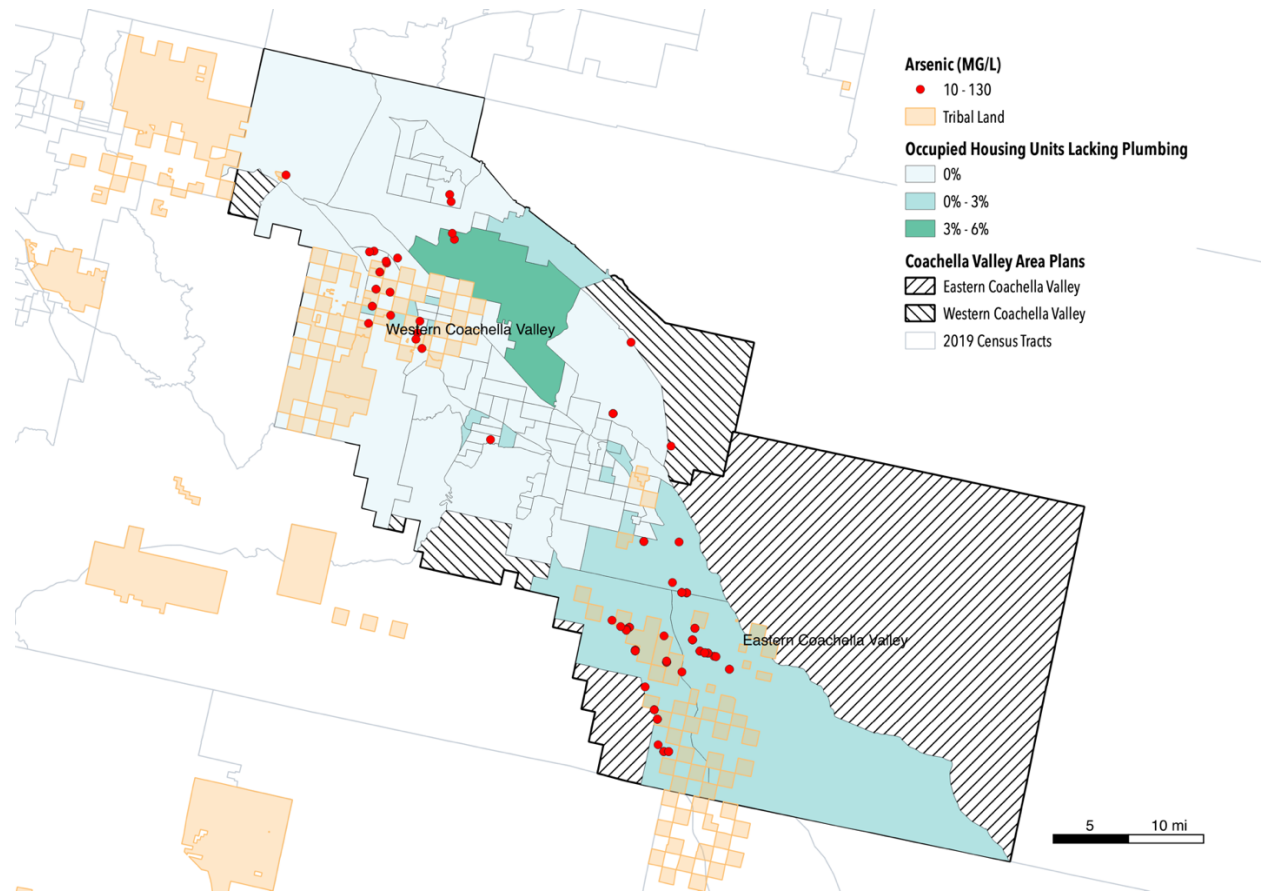


Figure 4-5

Wells with Arsenic Detected above MCL 10 mg/L (State Water Resources Control Board, 2022b)



Arsenic was found to contaminate the highest percentage of wells in the Coachella Valley. It was found above MCL in 11% of wells tested in the Coachella Valley, the majority of which are in the ECV (see figure 4-5). Perchlorate was also found in wells (1.2% of all wells tested) only in the ECV, while Uranium (3.9% of all wells tested), Nitrate (4.04% of all wells tested), and Chromium¹⁹ (5.75%% of all wells tested) were found scattered in the WCV and Coachella Valley (see Appendix figures A-7 to A-11. 1,2,3 TCP was found in wells throughout the Valley, showing no spatial pattern (see Appendix figure A-11).

Water Use as an Additional Characteristic of Water Access

Groundwater in the Coachella Valley serves domestic, commercial, and industrial uses while the Colorado River Water provides water for agriculture and groundwater replenishment. In addition to data on water reliability and physical accessibility, I analyze use data from the six largest public water systems in the Coachella Valley: CVWD, Desert Water Agency, Indio Water Authority, Coachella Water Authority, Mission Springs Water District, and Myoma Dunes Mutual Water Company. I use data from the jointly filed 2020 Regional Urban Water Management Plan. While water use is not generally considered a parameter of water access, I use this data to show how water is distributed unevenly throughout the Valley and contributing to the spatial inequality in water access.

Data from the 2020 Regional Urban Water Management Plan²⁰ reveals that water used for the agriculture and tourist industries, uses over 70% of all water resources in the Coachella

¹⁹ However, the State Water Resources Control Board is currently undergoing a lowering of the MCL for Hexavalent Chromium from 20 to 10 MG/L.

²⁰ Water use data in the Regional Urban Water Management Plan does not include data on water use from private wells that serve industrial or residential sites.

Valley, far exceeding the amount of water used for potable, residential purposes (see figure 4-6). In the Coachella Valley a small number of customers are using the greatest amount of water. CVWD is the sole provider of Colorado River water. It has 1,200 customers connected to Colorado River water, covering 75,000 acres, and only 20 recycled water customers (Water Systems Consulting, Inc., 2021).²¹ However, they serve over 110,000 connections for their groundwater system. In fact, only 17% of all water served from groundwater by the six districts in the Coachella Valley is used for domestic, non-irrigation purposes. Water use data illustrates a clear prioritization of water use for the agriculture and tourist industries and an uneven water use between industry and residential types.

Additionally, water use data shows further unevenness in access. District per capita use varies (see figure 4-8) and is spatially unequal (see figure 4-7). Unsurprisingly, CVWD, with the largest service area of 640,000 acres and over 110,000 municipal service connections (Water Systems Consulting, Inc., 2021), uses the most amount of water of the six districts (see figure 4-8). Per capita use across districts varies between 141 gallons per capita per day and 406 gallons per capita per day. Per capita numbers include both permanent residential use and, for the Desert Water Agency and CVWD, seasonal use.²² An estimated 15% of CVWD, 21% of Desert Water Agency, and over 30% of Myoma Dunes Mutual Water Company water customers were seasonal in 2020. The Desert Water Agency, serving the Palm Springs area has the second highest per capita use of all the districts at 406 gallons per capita.

²¹ The main focus of the recycled water program is to serve golf courses and HOA non-domestic water use (Water Systems Consulting, Inc., 2021).

²² Seasonal users include those whose permanent residency is outside of the Coachella Valley but live in the Coachella Valley during the winter months, those who own a second home in the Valley and use for short-term stays, and hotel/motel/resort and mobile home park visitors (Water Systems Consulting, Inc., 2021).

Figure 4-6

Water Use in the Coachella Valley by Typology and Water Agency (Water Systems Consulting, Inc., 2021)

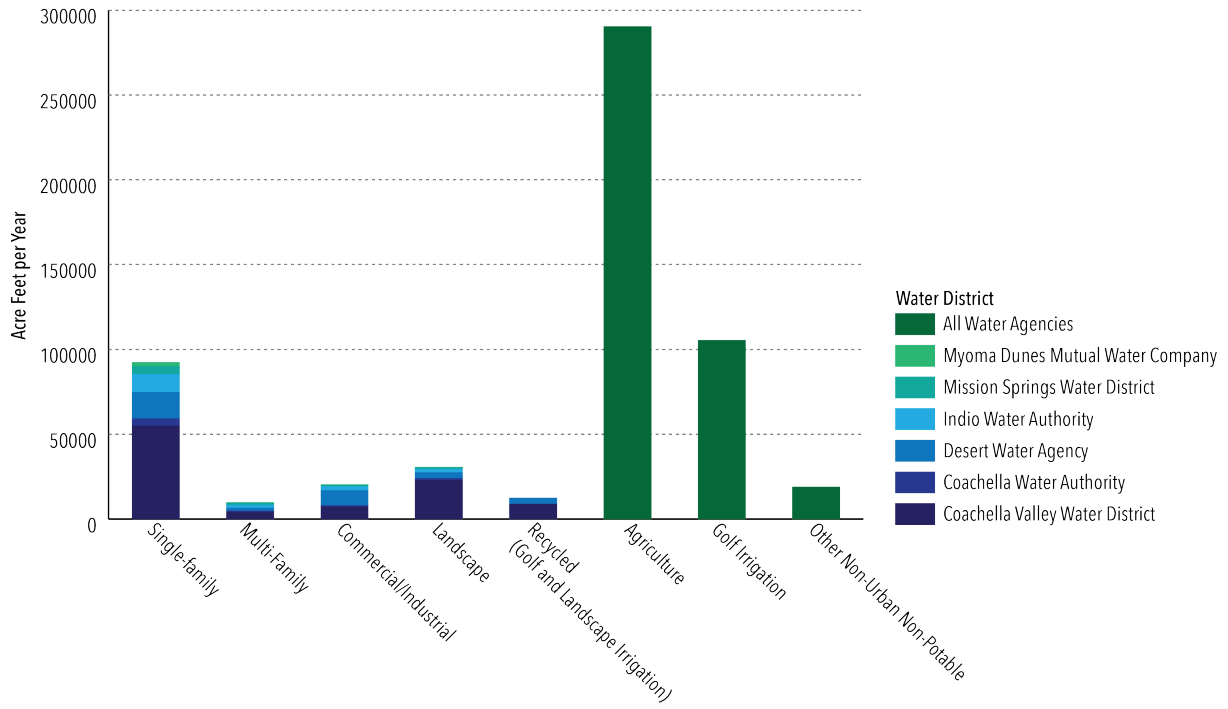


Figure 4-7

Water Use by Coachella Water Agencies, Gallons per capita per day (Water Systems Consulting, Inc., 2021)

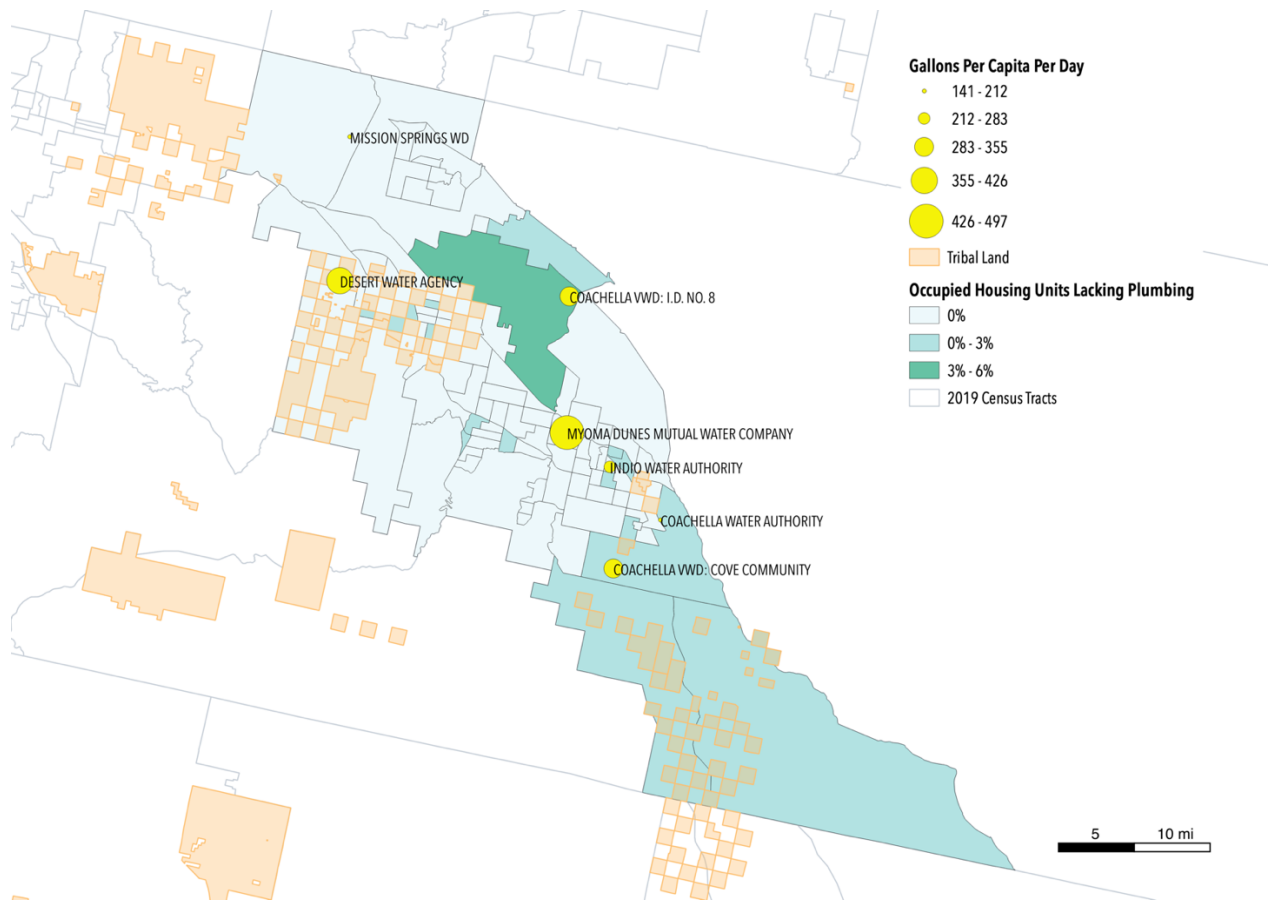
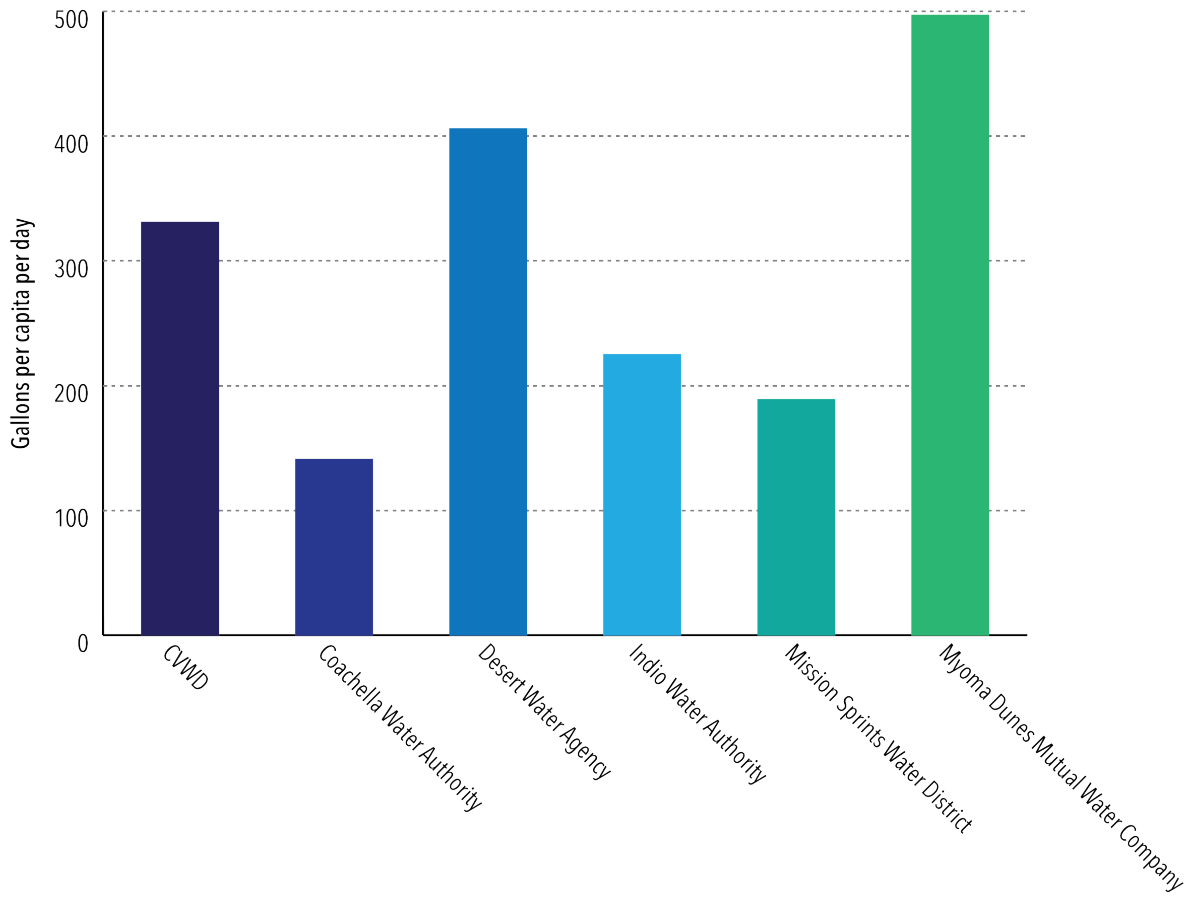


Figure 4-8

Water Use by Coachella Water Agencies, Gallons per capita per day (Water Systems Consulting, Inc., 2021)



This is four times the per capita amount of water used by the Coachella Water Authority, the institution that serves the only incorporated city in the ECV. Myoma Dunes Mutual Water Company has the highest per capita water use of the six districts with 497 gallons per capita per day. It attributes this high per capita rate to turf irrigation, swimming pools, and an underrepresentation of the service population due to over 30% of housing documented as seasonal (Water Systems Consulting, Inc., 2021). The two water agencies serving the western periphery (Mission Springs Water District) and eastern municipality (Coachella Water

Authority) have the lowest per capita use rates. The water use differences between districts points to the presence of differing regulations concerning household water use and conservation, water use for industry, water rates, and water use for landscaping.

Analyzing multiple water access characteristics indicates that it is spatially unequal in the Coachella Valley. Households in incorporated and unincorporated Western and incorporated Eastern areas have more reliable and better physical water access than those in unincorporated ECV. In unincorporated ECV, many households lack complete plumbing and physical access to public potable water infrastructure. This leaves their water access limited to private wells, contaminated with constituents that exceed maximum contaminant levels set by the EPA. These include two contaminants, arsenic and perchlorate, that are rarely found outside of the ECV.

Where Plumbing Completeness is Lacking

Mapping contemporary water access leads to a further inquiry regarding the Coachella Valley: How long have inequalities in water access between east and west existed and has this pattern remained constant? To examine whether contemporary water access issues are recent or were present in previous decades, I use census data on plumbing as a proxy for the physical dimensions of water access. I analyze the number of occupied housing units lacking plumbing completeness, what Deitz and Meehan (2019) call plumbing poverty, for each census tract in the Coachella Valley over a 60-year period. Understanding spatial inequality over-time reveals that it is longstanding; follows regional spatial patterns between east and west and the incorporated, center and unincorporated, periphery; and creates concentrated communities of water poverty.

Three Patterns of Spatial Inequality in Water Access

Analysis of complete plumbing data for the Coachella Valley from 1960 to 2019 shows that regional disparities in access to water are not recent but have persisted over the last 60 years.

Mapping plumbing completeness reveals three related patterns of spatial inequality. First, it demonstrates that spatial inequality in water access occurs between the east and west, where the ECV houses a disproportionate number of households lacking complete plumbing. Second, in both eastern and western regions, access to complete plumbing is disproportionately lacking in peripheral, unincorporated areas. Third, water poverty is concentrated and longstanding.

Longitudinal analysis draws attention to one community in the Coachella Valley – Oasis – that has disproportionately lacked complete plumbing for the last sixty years.

Results from mapping the percent of occupied housing units lacking complete plumbing (see figure 4-9) and the percent of all occupied housing units in the Coachella Valley lacking complete plumbing (see figure 4-10) for each tract exposes the spatiality of unequal distribution. Figures 4-9 illustrating the percent of occupied housing units lacking complete plumbing from 1960-2019 show three regions with consistently higher portions of occupied housing units lacking complete plumbing for each survey year: 1) unincorporated census tracts in the Eastern Coachella Valley, 2) northern unincorporated areas of the Western Coachella Valley, and 3) a small central area in the incorporated region of Palm Springs. Figure 4-10 illustrates the percent of total occupied housing units in the Coachella Valley lacking complete plumbing. They reveal a spatial clustering of census tracts burdened with high portions of all housing lacking plumbing in the peripheral, unincorporated, and eastern regions. Looking across the region longitudinally, this spatial clustering does not remain static. Rather, it ebbs and flows, concentrating around two areas: Desert Hot Springs, in the western region, and the Oasis/Thermal and Northshore/Mecca communities, in the eastern region.

Figure 4-9

Percent of Occupied Housing Units Lacking Complete Plumbing 1960-2019 (Manson, Steven et al., 2020; U.S. Census Bureau, 1960-2019)

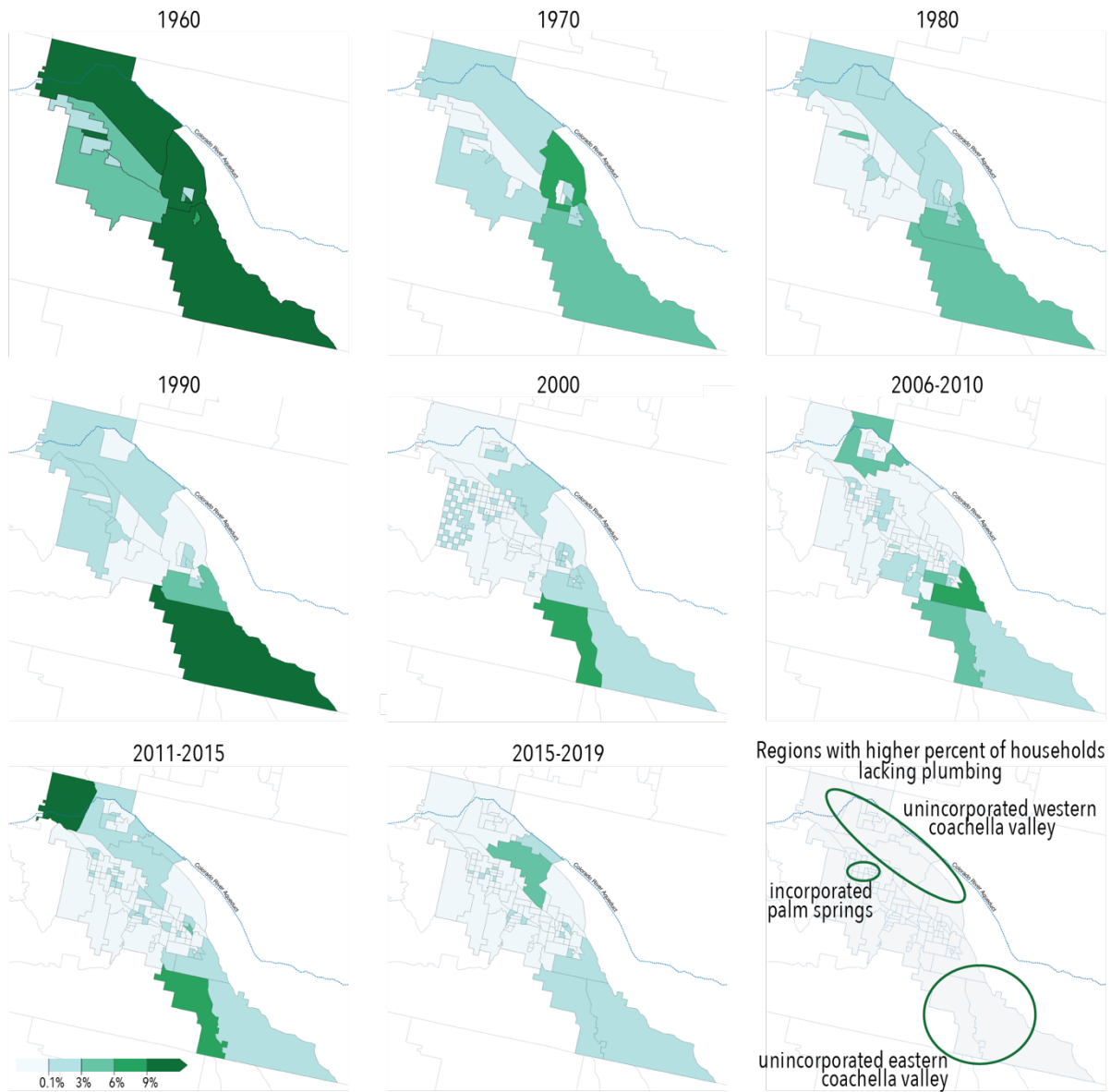
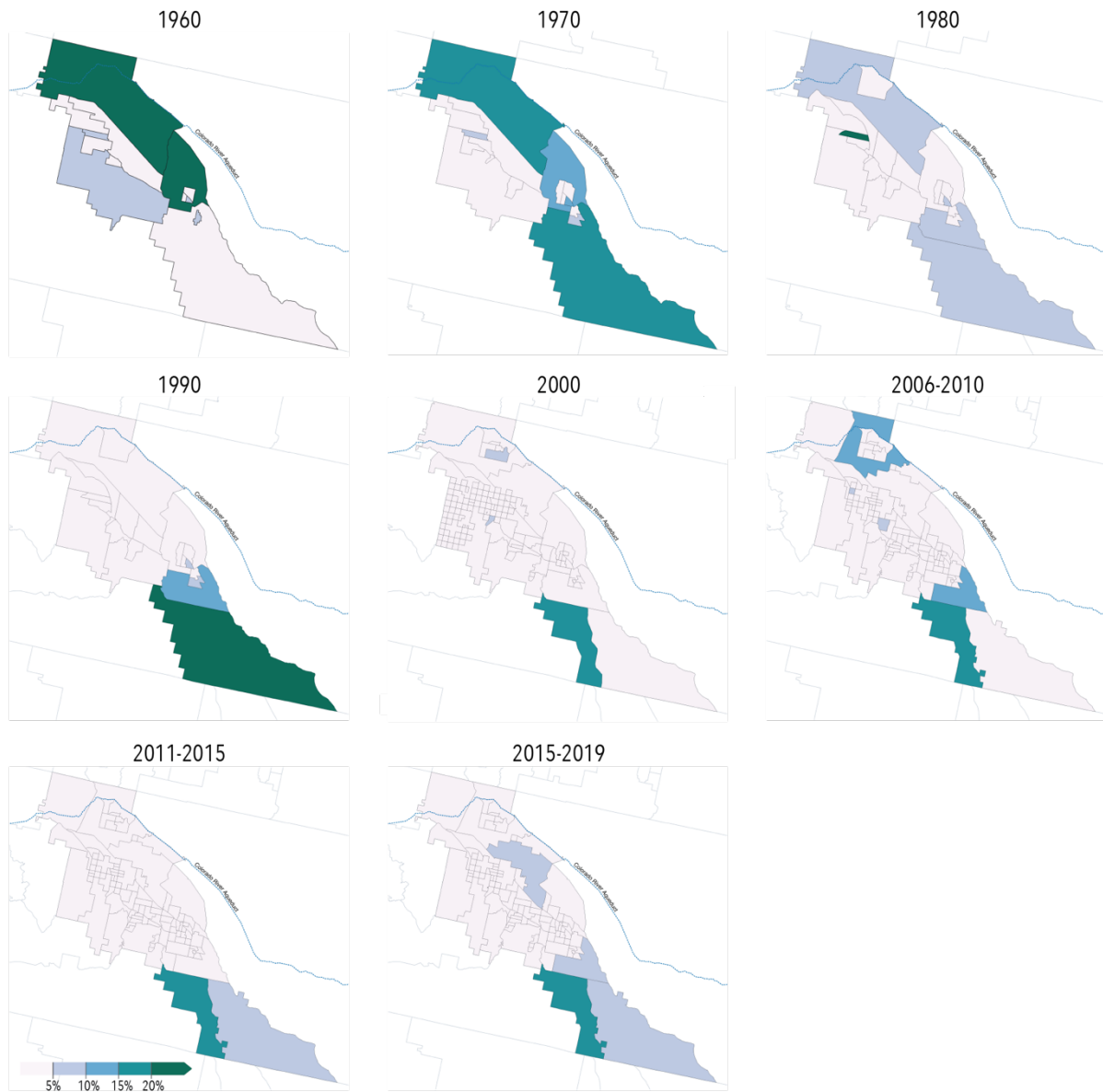


Figure 4-10

Percent of All Occupied Housing Units in the Coachella Valley Lacking Complete Plumbing

1960-2019 (Manson, Steven et al., 2020; U.S. Census Bureau, 1960-2019)



Water Access Issues are Longstanding

Examining the physical characteristics of plumbing completeness longitudinally, I find that issues of water access in the Coachella Valley are longstanding. For the last 50 years, the number of housing units lacking complete plumbing has not decreased below 1970 counts. However, the number of occupied housing units lacking complete plumbing has fluctuated. Between the 1960 and 1970 census survey years, I find a significant decrease in the number and percent of housing units lacking complete plumbing. This coincides with the period of rapid water infrastructure consolidation when CVWD entered the domestic water market in 1961 (see Chapter Six). However, from 1970 to 2019, there was little decrease in the absolute number of occupied housing units lacking complete plumbing in the Coachella Valley.

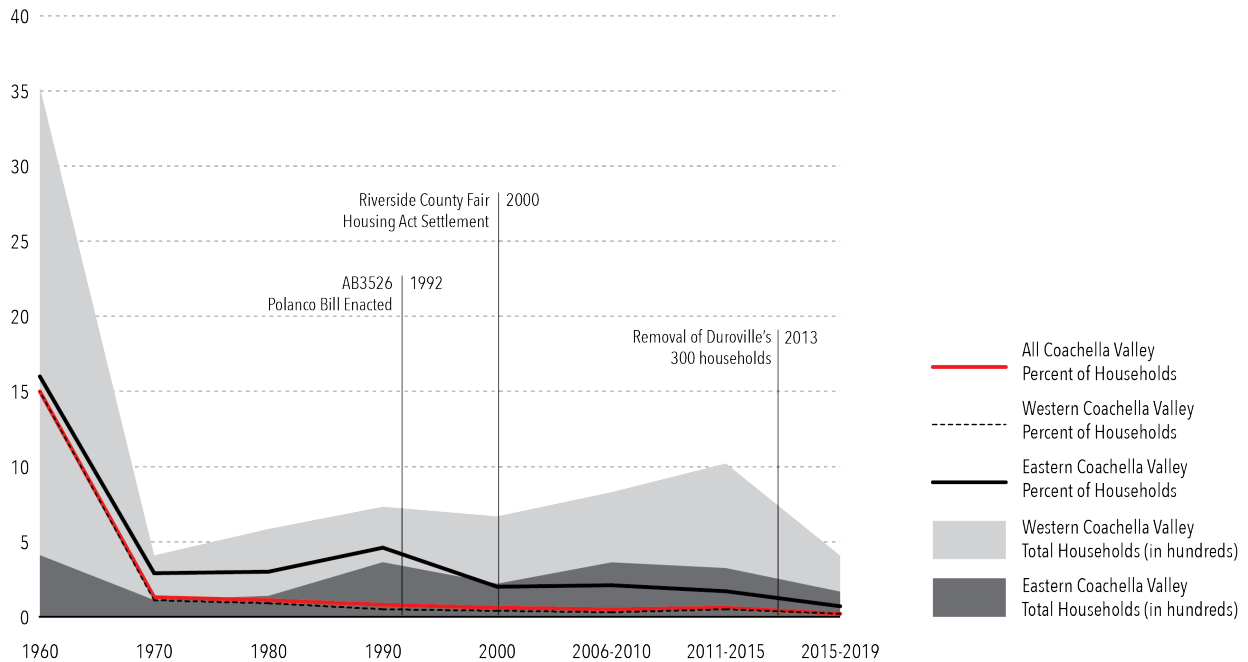
In fact, between 1970 and 1990 and then again between 2000 and 2011-2015, the number of households lacking complete plumbing increased. Figures 4-11 and 4-12 illustrate fluctuations in the number and percent of occupied housing units lacking complete plumbing in the Coachella Valley from 1960 to 2019.

In 1960, 3,528 housing units lacked complete plumbing throughout the Coachella Valley. Between 1960²³ and 1970 there was a 762% decrease in the number of housing units lacking complete plumbing. This decrease occurred prior to the passing of the 1972 Clean Water Act and the 1974 Safe Drinking Water Act, pointing to changes at the local or regional level as the source of decline. In 1961, CVWD entered the domestic water market acquiring a failing water system for a subdivision in the WCV.

²³ Census data for plumbing for the 1960 survey includes both occupied and vacant housing in plumbing counts, whereas plumbing data for all other survey years only provides counts for occupied housing units.

Figure 4-11

Regional Change in Occupied Housing Units Lacking Complete Plumbing 1960-2019 (U.S. Census Bureau, 1960-2019)



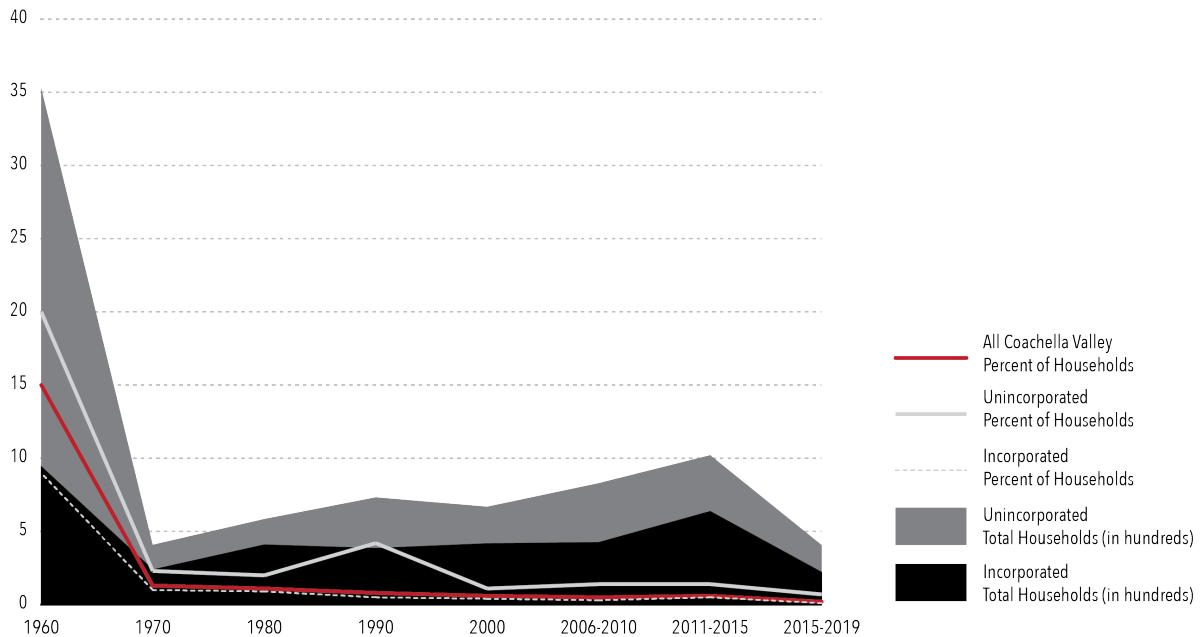
For the next decade, the district aggressively expanded domestic water provision by buying private small water systems that supplied domestic water to the area's growing seasonal housing. This dramatic decrease between 1960 and 1970 is most likely due to CVWD's consolidation of small water systems between 1961 and the early 1970s (see Chapter Six for a detailed analysis of this period).

Census data on water sources also points to consolidation as the reason for the steep decrease in housing units lacking plumbing. The census collected data on water sources for the 1960-1990 survey periods (see figure 4-13 and table 4-1).

Figure 4-12

Regional Change in Occupied Housing Units Lacking Complete Plumbing by Incorporation

1960-2019 (U.S. Census Bureau, 1960-2019)

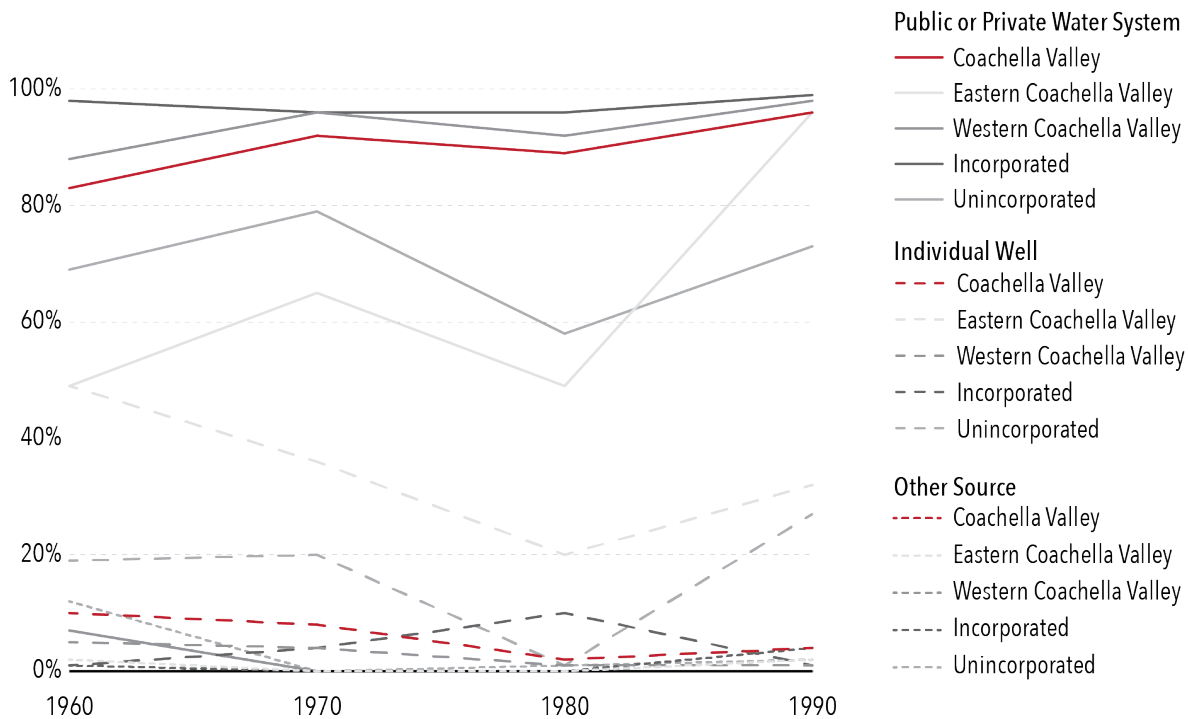


Survey enumerators counted whether the water source for occupied housing units came from 1) public or private water company, 2) private well, or 3) some other source. Water source data reveals a high prevalence of wells throughout the eastern and unincorporated areas of the Coachella Valley.

In 1960, only 83% of occupied housing units in the Coachella Valley (and 49% and 88% in the eastern and western regions, respectively) received water from a public or private water company. In 1970, this number increased to 92% Valley-wide and 65% and 96% in the eastern and western regions, respectively. As CVWD water provision expanded, water users most likely moved off private well water and onto consolidated public infrastructure.

Figure 4-13

Water Sources for Occupied Housing Units 1960-1990²⁴ (U.S. Census Bureau, 1960-1990)



No public water company provided domestic water service in the Coachella Valley prior to 1961. Water for households who had piped infrastructure accessed it from either rapidly deteriorating infrastructure from private companies or from individual wells. This means that the 83% of households whose water source was from a water company in 1960, received it from a private company. However, domestic water provision changed from private to public companies in the 1960s. In the 1960s, CVWD began acquiring private companies' water infrastructure, expanding their domestic water infrastructure to over 10,000 connections by 1973 (Crider, 2018). In addition, in 1961, the Desert Water Authority was established as a special district to

²⁴ The U.S. Census Bureau stopped collecting information on water sources after 1990.

provide water in the Palm Springs area of the WCV. With the entrance of public water companies into domestic water service, water access and infrastructure experienced improvements throughout the Coachella Valley (Crider, 2018).

However, in 1990, only 68% of housing units in the ECV received their water from a public or private water system, while 98% of the WCV was served by public or private water systems (U.S. Census Bureau, 1990h). Despite a regional mandate to provide water throughout both eastern and western regions, CVWD data from consolidation reports shows that it continues to lack piped water infrastructure and service to a large portion of their territory. Plumbing data suggests that this infrastructure has seen little extension since 1990. CVWD data confirms that over 4,000 people in the ECV are in need of consolidation (U.S. Census Bureau, 1990).

After 1970, the number of occupied housing units lacking complete plumbing in the Coachella Valley did not decrease. In 2019, the absolute number of occupied housing units lacking complete plumbing in the Coachella Valley was only two housing units less than in 1970. However, the percent of occupied housing units lacking plumbing has decreased due to increases in total housing units across the Valley. Between 1970 to 2019 the percent of housing units lacking plumbing decreased from 1.3% to 0.2%, a number lower than the 0.4% lacking complete plumbing nationally and in California (U.S. Census Bureau, 1970c, 2019f). However, this decrease was neither constant nor consistent. The number of occupied housing units lacking complete plumbing increased by 140% between 1970 and 1990 and by 52% between 2000 and 2010-2015, decreasing after each of these periods by a subsequent 30% and 60%, respectively (U.S. Census Bureau, 1970c, 1990f, 2000e, 2015d).

Table 4-1*Water Source for Housing Units Across Regions (U.S. Census Bureau, 1960-1990)*

	1960		1970		1980		1990	
	Public or Private Water System	Well (Drilled or Dug)	Public or Private Water System	Well (Drilled or Dug)	Public or Private Water System	Well (Drilled or Dug)	Public or Private Water System	Well (Drilled or Dug)
Coachella Valley	83%	10%	92%	8%	89%	2%	96%	3%
Eastern Coachella Valley	49%	49%	65%	36%	49%	12%	68%	32%
Western Coachella Valley	88%	5%	96%	4%	92%	1%	98%	1%
Incorporated Coachella Valley	98%	1%	96%	4%	96%	1%	99%	1%
Unincorporated Coachella Valley	69%	19%	79%	20%	58%	7%	73%	27%

These periodic increases and decreases in the number of occupied housing units lacking complete plumbing was experienced differently throughout the region and between census tracts and indicates a relationship to historic patterns of informal housing construction and removal.

Eastern and Unincorporated Coachella Valley are Overburdened with Households that Lack Water Access

Longitudinal analysis also reveals that the ECV and unincorporated areas consistently held a disproportionate amount of housing units lacking complete plumbing. Surprisingly, I find that a greater number of occupied housing units lacking complete plumbing were in the WCV

than the ECV (see figure 4-11). However, the percent of occupied housing units lacking complete plumbing in the ECV was more than double that in the WCV and in the Coachella Valley (see table 4-2). I also found this same pattern between incorporated and unincorporated regions (see figure 4-12 and table 4-2). Incorporated areas of the Coachella Valley had more occupied housing units lacking complete plumbing than unincorporated areas. However, the percent of occupied housing units lacking complete plumbing was greater in unincorporated areas than in incorporated and in the Coachella Valley region.

The ECV and unincorporated areas are overburdened with households that lack access to water. In 2015-2019, only 13% of the Coachella Valley's occupied housing units were in the ECV (U.S. Census Bureau, 2019b). But 41% of the Coachella Valley's occupied housing units lacking complete plumbing were in the ECV. Similarly, 46% of the region's occupied housing units lacking plumbing were in unincorporated areas, however only 14% of occupied housing units were located there. The disproportionate numbers of households lacking complete plumbing in the ECV and unincorporated areas has remained consistent from 1960 to present day.

These differences are also reflected in regional demographics. Examining the percent of population that is Hispanic, living below the poverty line, or immigrant, the percent of housing units that are mobile homes, and the percent of working individuals in farming/agriculture or accommodations/food service industries provides a clearer picture of regional disparities and their socio-spatial characteristics. The regions of the Coachella Valley that are overburdened by occupied housing units lacking complete plumbing (Eastern Coachella Valley and unincorporated Coachella Valley) were more Hispanic, had a higher percent of its population living below the poverty line, higher percentages of housing units that were mobile homes, and a

larger percent of individuals working in the agriculture industry than the Coachella Valley (see table 4-3 and Appendix A figures A-1 through A-5).

Table 4-2

Percent of Total Occupied Housing Units and Occupied Housing Units Lacking Complete Plumbing in the Coachella Valley (U.S. Census Bureau, 1960d, 1960f, 1970g, 1970c, 1980d, 1980a, 1990f, 1990b, 2000e, 2000f, 2010e, 2010b, 2015d, 2015b, 2019f, 2019b)

	1960	1970	1980	1990	2000	2006-2010	2011-2015	2015-2019
Coachella Valley								
% Occupied Housing Units Lacking Complete Plumbing	15%	2%	1.1%	0.8%	0.6%	0.5%	0.6%	0.2%
Eastern Coachella Valley								
% Occupied Housing Units Lacking Complete Plumbing	16%	3.8%	3%	4.6%	2%	2.2%	1.7%	0.7%
% Occupied Housing Units in Coachella Valley	15%	13%	9%	9%	9%	11%	12%	13%
% Total Occupied Housing Units Lacking Complete Plumbing	11%	27%	24%	50%	33%	44%	32%	41%
Western Coachella Valley								
% Occupied Housing Units Lacking Complete Plumbing	15%	1.7%	0.9%	0.5%	0.4%	0.3%	0.5%	0.2%
% Occupied Housing Units in Coachella Valley	85%	87%	91%	91%	91%	89%	88%	87%
% Total Occupied Housing Units Lacking Complete Plumbing	89%	73%	76%	50%	67%	56%	68%	59%
Incorporated Coachella Valley								
% Occupied Housing Units Lacking Complete Plumbing	9%	2%	1%	0%	0%	0%	0%	0%
% Occupied Housing Units in Coachella Valley	55%	76%	83%	90%	81%	82%	84%	86%
% Total Occupied Housing Units Lacking Complete Plumbing	47%	58%	70%	52%	62%	51%	62%	54%
Unincorporated Coachella Valley								
% Occupied Housing Units Lacking Complete Plumbing	20%	2%	2%	4%	1%	2%	1%	1%
% Occupied Housing Units in Coachella Valley	45%	24%	17%	10%	19%	18%	16%	14%
% Total Occupied Housing Units Lacking Complete Plumbing	53%	42%	30%	48%	38%	49%	38%	46%

Table 4-3

Descriptive Statistics of Regions (U.S. Census Bureau, 1960g, 1960b, 1960e, 1960a, 1970f, 1970a, 1970d, 1970g, 1980e, 1980c, 1980h, 1980b, 1980f, 1990a, 1990e, 1990g, 1990i, 1990c, 2000b, 2000a, 2000c, 2000h, 2000d, 2010a, 2010d, 2010f, 2010g, 2010c, 2015a, 2015c, 2015g, 2015f, 2019g, 2019a, 2019h, 2019c)

	1960	1970	1980	1990	2000	2006-2010	2011-2015	2015-2019
Coachella Valley								
% Hispanic	27%	27%	30%	39%	46%	52%	53%	51%
% Population Immigrants	32%	13%	16%	23%	27%	25%	27%	24%
% Population Below Poverty	N/A	12%	13%	15%	17%	17%	21%	18%
% Housing Units Mobile Homes	8%	12%	14%	17%	15%	1.4%	10%	10%
% Working in Farming and Agriculture	27%	14%	9%	10%	6%	4%	5%	4%
% Working in Accommodations and Food Service	N/A	N/A	N/A	N/A	N/A	11%	13%	13%
Eastern Coachella Valley								
% Hispanic	60%	65%	82%	89%	92%	93%	94%	92%
% Population Immigrants	45%	21%	22%	7%	51%	39%	44%	26%
% Population Below Poverty	N/A	23%	24%	28%	33%	29%	34%	26%
% Housing Units Mobile Homes	6%	18%	9%	26%	26%	0.5%	20%	16%
% Employed in Farming and Agriculture	63%	46%	40%	42%	32%	17%	22%	14%
% Employed in Accommodations and Food Service	N/A	N/A	N/A	N/A	N/A	7%	10%	9%
Western Coachella Valley								
% Hispanic	18%	17%	21%	30%	38%	43%	45%	43%
% Population Immigrants	27%	11%	14%	16%	22%	22%	23%	24%
% Population Below Poverty	N/A	11%	11%	13%	14%	14%	18%	17%
% Housing Units Mobile Homes	8%	11%	14%	16%	14%	1.5%	2%	9%
% Employed in Farming and Agriculture	11%	5%	6%	5%	2%	2%	1%	3%

% Employed in Accommodations and Food Service	N/A	N/A	N/A	N/A	N/A	12%	14%	13%
Incorporated Coachella Valley								
% Hispanic	24%	24%	28%	36%	44%	50%	52%	50%
% Population Immigrants	29%	11%	15%	19%	25%	24%	26%	24%
% Population Below Poverty	N/A	12%	12%	14%	15%	15%	20%	18%
% Housing Units Mobile Homes	9%	10%	9%	12%	9%	1.7%	6%	6%
% Employed in Farming and Agriculture Industries	6%	9%	7%	7%	3%	2%	3%	2%
% Employed in Accommodations and Food Service Industry	N/A	N/A	N/A	N/A	N/A	12%	14%	13%
Unincorporated Coachella Valley								
% Hispanic	30%	35%	40%	61%	54%	58%	57%	57%
% Population Immigrants	34%	17%	16%	4%	32%	29%	30%	26%
% Population Below Poverty	N/A	14%	17%	25%	24%	22%	23%	21%
% Housing Units Mobile Homes	6%	21%	35%	57%	38%	0.1%	30%	33%
% Employed in Farming and Agriculture	44%	31%	20%	38%	19%	12%	16%	15%
% Employed in Accommodations and Food Service	N/A	N/A	N/A	N/A	N/A	9%	10%	9%

Concentration of Housing Units Lacking Complete Plumbing

Examining the lack of complete plumbing by census tract provides an exacting picture of the spatially unequal distribution occurring throughout the Coachella Valley. Occupied housing units lacking complete plumbing are not equally distributed among census tracts. In addition, lack of plumbing was most prevalent in a single area in the Coachella Valley. The census tract in the ECV, containing the Torres-Martinez Reservation and Thermal and Oasis communities, had a higher count and percent of occupied housing units lacking complete plumbing than the rest of the region for every census survey period (except for 1980) (see figure 4-14). Although the geography of the census tract area narrowed over time, its spatial marginalization – in

unincorporated ECV, peripheral to the incorporated, center of the Coachella Valley, remained unchanged.

In addition, between five and eight census tracts contained over 50% of the Coachella Valley's occupied housing units lacking complete plumbing and at least one census tract had over 18% of all occupied housing units lacking complete plumbing during each census year (see figure 4-14 and 4-15). From 1960 to 1980 the census tract with the highest portion of housing units lacking complete plumbing was in the WCV. In 1960, the census tract for the unincorporated Desert Hot Springs area held 37% of all housing units lacking complete plumbing. In 1970, 21% of all occupied housing units lacking complete plumbing were in this same census tract. In 1980, 30% of all occupied housing units lacking complete plumbing could be found in a census tract in the Palm Springs area. However, in each survey period, except for 1980, 18% to 31% of all occupied housing units lacking complete plumbing were in the census tract containing the ECV communities, Torres-Martinez Reservation, Oasis and Thermal. In addition, this census tract had the highest amount of housing units lacking complete plumbing in each survey year except for 1960 and 1980.

A small portion of census tracts are responsible for the majority of occupied housing units lacking complete plumbing. In 1960, two census tracts were responsible for 59% of housing units lacking complete plumbing. In 1970, 76% of occupied housing units lacking complete plumbing were in only five of the Valley's 17 census tracts. In 1980 and 1990, 65% of the units were found in five and six, respectively, of the total 22 census tracts. In 2000, 51% of all occupied housing units lacking complete plumbing were in only 8 of the 71 census tracts. In 2006-2010, 57% of occupied housing units lacking complete plumbing were in 6 census tracts,

while in 2011-2015, 47% of occupied housing units lacking complete plumbing were in 7 census tracts, and in 2015-2019, 53% of units were found in only 6 of the same 103 census tracts.

Unlike regional demographics, census tracts with occupied housing units lacking complete plumbing are heterogeneous (see figures A-1 to A-5 in Appendix A). For example, in 2000, 100% of census tracts with the highest counts of occupied housing lacking complete plumbing in the ECV were occupied by Hispanic residents and in the WCV by white residents. Data from the 1990 census shows that for two of the six census tracts with the highest counts of occupied housing lacking complete plumbing, 0% of housing units were mobile homes, while for the other four census tracts over 50% of housing units lacking complete plumbing were mobile homes.²⁵ The heterogeneous character of census tracts in the Coachella Valley counters earlier scholarship on water access that offers more homogeneous demographic characteristics of households lacking piped water infrastructure (Deitz & Meehan, 2019; Pierce & Gonzalez, 2017) lacking piped water infrastructure (Deitz & Meehan, 2019; Pierce & Gonzalez, 2017).

²⁵ Unfortunately, this type of disaggregation is not consistent nor available across census survey periods for census tract-level geographies.

Figure 4-14

Number of Occupied Housing Units Lacking Complete Plumbing by Census Tract 1960-2019

(U.S. Census Bureau, 1960-2019)

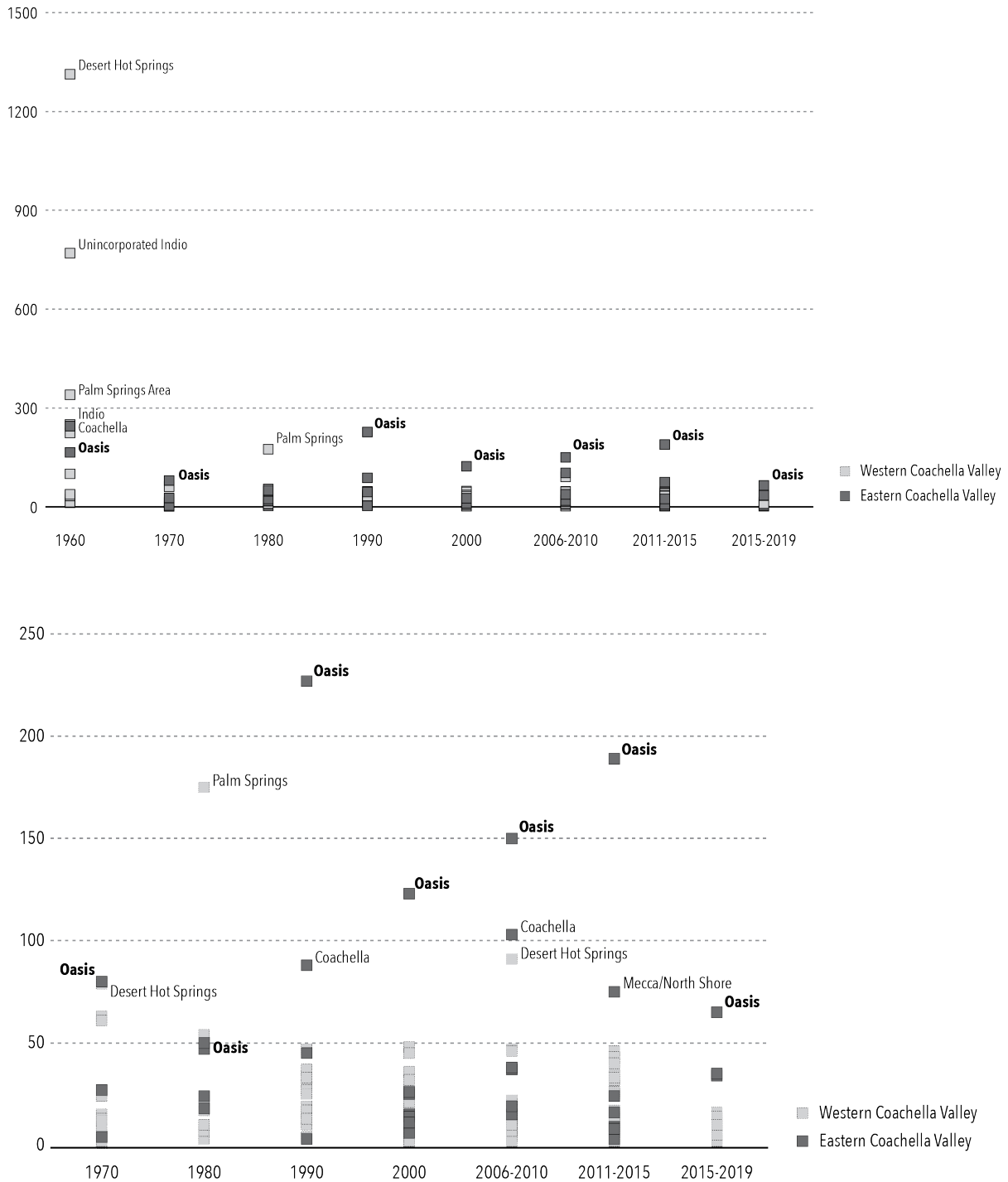
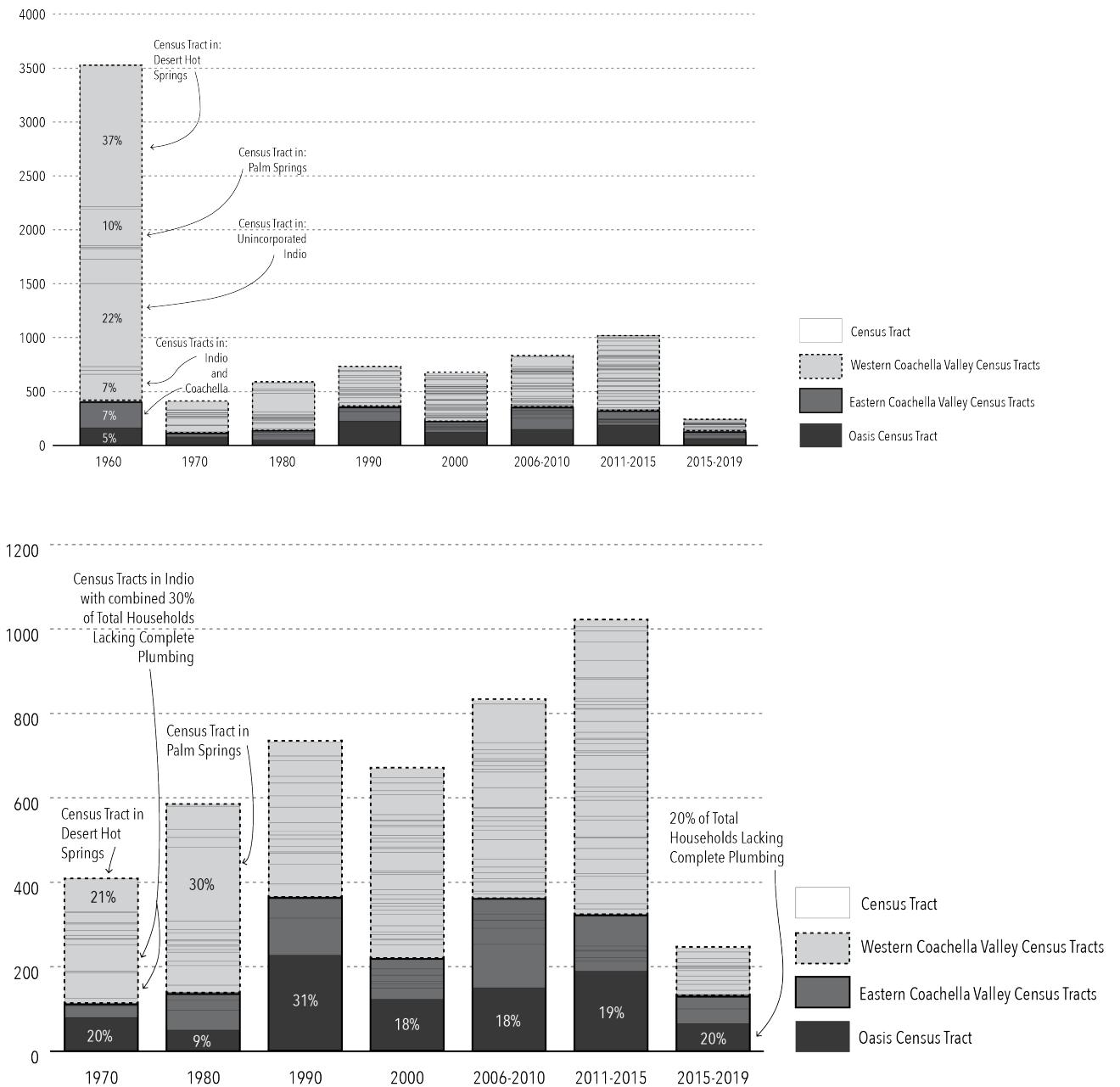


Figure 4-15

Occupied Housing Units Lacking Complete Plumbing by Census Tract and Region 1960-2019

(U.S. Census Bureau, 1960-2019)



Conclusion

The spatial analysis of inequality in water access led me to understand that the water issues I witnessed when I started working in the Coachella Valley were not new. Instead, water access issues are longstanding. The analysis revealed that water access inequality had spatial, racial, and class dimensions. Large disparities in water access exist in the Coachella Valley, and there are three-related patterns to spatial inequality in water access. There are regional differences between east-west and incorporated-unincorporated areas; the ECV and the unincorporated periphery are disproportionately affected by water access issues; and there are concentrated communities of water poverty in unincorporated ECV and WCV. The findings from this spatial analysis showing concentration, regional difference, and disparity indicate conjunctural eras to examine how spatial inequality developed, deepened, and is exacerbated.

Longitudinal plumbing data shows longstanding concentrations of households in the peripheral, unincorporated areas of the ECV that face greater issues of water access than the rest of the Valley. Residents in the Thermal and Oasis communities on Riverside County and Torres-Martinez Reservation land lack clean, potable, and connected water access, and their concentrated water poverty is longstanding.

This pattern indicates a conjunctural era that requires a historical approach in understanding how the specific geography of this place developed. These concentrated communities of water poverty are located on both Riverside County and Torres-Martinez Reservation land. This checkerboard land configuration suggests that the historical conjunctural era began at the origins of this spatial construction. As such, the first conjunctural era analyzes early settler colonialism in the Coachella Valley to examine how spatial inequality developed.

I find major differences in water use and physical access between eastern and western regions. Regional groundwater use changes the levels of the aquifer and affects the ability of private well users to tap into groundwater. Regional unevenness in water access and water use points to institutional infrastructure and regulatory unevenness in regional governance.

In most of the Coachella Valley, water infrastructure and provision are regulated by the regional government agency, CVWD. Yet, despite spanning incorporated and unincorporated and eastern and western regions, the water infrastructure within CVWD jurisdiction was and continues to be developed unevenly, leaving hundreds of families lacking complete plumbing and access to public water infrastructure. This necessitates that the second conjunctural era be attentive to a deepening unevenness between regions, and requires examining the formation of the CVWD to understand how differences between regions emerged under the regional government's purview.

Finally, I find that disparities in water access exist across multiple characteristics including water reliability (groundwater contamination), water use, and physical access (plumbing completeness and public water infrastructure consolidation). Water use consumption provides the clearest example of water access disparities. In the ECV, the presence of arsenic in groundwater is one of the most pressing issues for residents today. Over 4,000 residents face precarious water access sourced from private wells, whose owners often lack the capacity to monitor water quality or treat contaminants. Further complicating their water access is the high per capita water use in wealthier, incorporated areas and water use for industrial purposes. Regional groundwater use changes the levels of the aquifer and affects the ability of private well users to tap into groundwater. This means that users who rely on private wells, not only face

groundwater contamination but greater depths at which they must tap into the aquifer. And in times of overuse, they are the first households to experience the drying up of wells.

These disparities indicate a third conjunctural era that analyzes how water use exacerbates spatial inequalities in access. The contemporary period's luxury tourism expansion into the ECV communities with the greatest water scarcity, Thermal and Oasis, provides a case for examining how these disparities are taking place. In particular, the Thermal Beach Club development process, its debates on water access and use, and the regulatory bodies and policies at work, is central to this conjunctural era.

Mapping the spatial inequality in water access in the Coachella Valley confirms the lived experiences of ECV residents. It illustrates that water access is spatially unequal, where households in the peripheral ECV face multiple barriers to water access. It demonstrates that these issues and spatial inequality are not new, but longstanding. However, the geography of spatial inequality in water access does little to indicate how it developed, deepened, or exacerbated. The following chapters examine three conjunctural eras to understand how three-related patterns of spatial inequality in water access came to be.

Chapter 5 Developing a Racialized Checkerboard of Spatial Inequality

Introduction

Accessing water was a primary concern for pre-contact Cahuilla, the original inhabitants of the Coachella Valley.²⁶ They lived in patrilineal bands of 100 to 200 people scattered in villages throughout the Coachella Valley (Dayton Shaw, 1999; Kray, 2009; Madrigal, 2005; Patencio & Boynton, 1943). They located these villages near reliable water sources. Beginning in the late 1800s, United States settler colonial regulations incentivized white settler dispossession of Cahuilla water, water governance, and water access. From this, a racialized checkerboard pattern of spatial inequality in water access developed between Indian and non-Indian land.

Spatial inequality in water access existed in pre-colonial Coachella Valley. Natural water flows differentiated across the region. In the Western Coachella Valley, stream water ran through the canyons in the San Jacinto Mountain Range and into the valley floor. In the Eastern Coachella Valley, small springs dotted the arid land, hidden within the Palm Tree groves. These differentiated water flows encouraged Indigenous innovation, ingenuity, and adaptation in water access that allowed thriving livelihoods for thousands of years. This nature-driven spatial inequality in water access is best represented in the experiences of the Western Coachella Valley's Agua Caliente Band of Cahuilla Indians (Agua Caliente) and the Eastern Coachella Valley's Desert Cahuilla.

²⁶ Scholars dispute whether the pre-contact Cahuilla population reached anthropologist Lowell Bean's estimates of 5,000 to 6,000 persons or anthropologist Alfred L. Kroeber's lower estimate of 2,500 persons (Dayton Shaw, 1999). Data collected by the Spanish in 1770, estimated approximately 2,500 Cahuilla (Patencio & Boynton, 1943). Their number reduced to 800 by 1910 (Patencio & Boynton, 1943).

The Agua Caliente have occupied Western Coachella Valley since time immemorial. Their water sources were diverse. Springs in San Jacinto's canyons, streams running down into the valley floor, and hot springs at the foot of the mountains provided potable water. Agua Caliente Chief, Francisco Patencio, in his stories of the Palm Springs Indians (1943), describes water coming and going, streams were abundant at first and later ran dry, and earth moved and water disappeared.

The Agua Caliente used water for drinking and agriculture. They made their homes near mountain springs in the summer in the Tahquitz, Andreas, and Chino Canyons. There they stored water throughout the year in ollas with narrow-mouthed openings or tightly woven Tule mats. During the summer, when the Tahquitz went dry the women lowered jugs to store water in a gorge called *Pa cale*, meaning water tank (Patencio & Boynton, 1943). In the winter, they moved to the foot of the San Jacinto Mountain range. On the valley floor, a hot spring provided water for drinking and medicine.

The area's water sustained diverse plant and animal life. The Agua Caliente gathered plants such as mesquite, yucca, cactus, desert agave, screwbean, and acorn and pinyon seeds for food (Dayton Shaw, 1999; Patencio & Boynton, 1943). They raised crops from seed, growing squash, corn, melons, and beans in their gardens (Patencio & Boynton, 1943). They irrigated their crops by building open water ditches lined with stones by "the grandfathers and great-grandfathers of the oldest people of our tribe" (Patencio & Boynton, 1943, p. 56)

Several bands of Desert Cahuilla have lived since time immemorial across the Valley near the Salton Sea. Low-land villages in pre-contact Eastern Coachella Valley included Indian Wells, Indio, Cabazon, Augustine, LaMesa, Torres, Martinez, and Alamo (Smith, n.d.). In the Eastern Coachella Valley, Desert Cahuilla found water by locating Palm trees at a place they

called *Cov in ish*, or low or hollow place (Patencio & Boynton, 1943). There was groundwater at *Cov in ish* and a spring that slowly dried. The water table in the Eastern Coachella Valley along the lower end of the alluvial fans was high and water abundant (Lando & Modesto, 1977).²⁷ At times, the water table increased to the point of significantly changing the surrounding land. For example, its land having become too swampy for occupation, the village *Temal Wakhish* adapted to the increasing water table by moving the village (Lando & Modesto, 1977).

As the spring died, the Desert Cahuilla hand dug a well ten feet deep (Smith, n.d.). Women walked into the well collecting water with ollas to bring back to their villages (Patencio & Boynton, 1943; Smith, n.d.).²⁸ They hand dug the wells so that “one side had steps going down to the water. Then often that one side was dug out slant-ways for the animals to go down to drink” (Patencio & Boynton, 1943, p. 58).²⁹ Desert Cahuilla dug numerous wells to maintain their water security. Wells served as a source of drinking water and irrigation. At the settlement *Puichikiva*, they irrigated agriculture by hand using water taken out of the wells in containers (Lando & Modesto, 1977). Ruby E. Modesto, member of the Desert Cahuilla A’wilem ‘dog’ clan, recalled the plants her grandmother cultivated in her irrigated garden including “chia and one of the necessary grasses for basket making, deer grass” (Lando & Modesto, 1977, p. 107).

Nature-based spatial inequality in water access led to Indigenous innovation in water management. They moved their villages, constructed irrigation ditches, and hand-dug wells.

²⁷ An 1856 United States’ surveyor’s report indicated a water table 10-12 feet below the surface (Lando & Modesto, 1977).

²⁸ Settler oral history locates the well within the Whitewater Storm Channel, north of Highway 111 and East of the Miles Avenue Intersection (Coachella Valley Water District, 1968).

²⁹ This Indigenous practice in accessing water was unknown by settlers in other parts of the United States (Smith, n.d.).

Unevenness and unpredictability in water sources failed to create water insecurity for the Indigenous communities of the Coachella Valley. Instead, Cahuilla addressed differentiated water access with mobility, ingenuity, and communal access.

However, the onset of United States settler colonialism brought about a socio-politically produced spatial inequality in water access that entangled with this naturally differentiated one. United States settler colonial land and water regulations intertwined. As state agents, industry, and settlers implemented policies on the ground, they created consequential and racialized water scarcity through simultaneous land and water dispossession. From dispossession and scarcity, a pattern of spatial inequality in water access developed over the Valley's natural unevenness. Settler colonial policies and actors designed a checkerboard of racialized Indian and non-Indian land and water.

This chapter traces the techniques of land and water dispossession during United States settler colonialism in the Coachella Valley to explain how socio-politically-driven spatial inequality in water access developed. I analyze archival material to describe how it developed through the interlocking of United States settler colonialism with capitalist production. Following this introduction, I discuss United States settler colonial water and land use regulations that facilitated indigenous water and land dispossession. I then examine how a manufactured spatial inequality in water access developed from Indigenous land and water dispossession and white settlement at the turn of the 20th century.

Settling Coachella

When the United States signed the Treaty of Guadalupe Hidalgo in 1848, acquiring the Western territories from the Mexican Republic, they brought to California a particular brand of settler colonialism. Searching for gold and land, United States settler invasion drastically

transformed water and land relations for Indigenous Peoples and Californios. Settlers leveraged United States federal land policies and state water rights to profit from new land and water use. Federal land policies divided and disposed California land for settlement and production. However, settlers found that they needed water and water rights to profit from California land. Leveraging federal land policies and state water laws, settlers and industries dispossessed indigenous of land and water throughout the state.

Early Colonial Regimes in California

California, unlike most of the United States, underwent three successive periods of colonization. Spanish missionization and colonialism crept into California after 1769. Settler colonial rule continued under the Mexican Republic from the 1820s until the state was acquired by the United States in 1848. Following annexation, the United States government hastily moved to occupy California with new settlers and new industries.

Congress passed the California Private Land Act on March 3, 1851, three years after signing the Treaty of Guadalupe Hidalgo. The Act transferred lands lacking established claims under the Spanish or Mexican governments into the public domain (“1851, March 3 - California Private Land Act, Ch 40, p. 631-634,” 2016). This Act differed from past methods and Indigenous lands were taken without mutual agreement or payment. In a 1906 report, Indian Agent Kelsey protested that:

The United States has always recognized, and the Supreme Court has held, that the Indians have a right to occupy the land, which right is termed the Indian right of occupancy, a right which can be cancelled only by mutual agreement. All Indian lands in the United States, except in a portion of California, have been acquired by the

Government of the United States, and acquired only by payment therefor. (Kelsey, 1906, p. 4).

In addition to stealing land, the federal government refused to uphold earlier agreements between California Indigenous Peoples and the Spanish and Mexican regimes regarding land and citizenship (Akins & Bauer, 2021). They denied them United States citizenship and voting rights and legalized violence against them (Akins & Bauer, 2021). The California State Legislature's "Act for the Government and Protection of Indians in 1850" legalized Indian slavery and indentured servitude and authorized federal control over Indian land (Akins & Bauer, 2021; Kray, 2009). State sanctioned policies between 1850 and 1851 funded and authorized militias bent on Indigenous extermination (Akins & Bauer, 2021). The violence of the gold rush and early statehood, considered a genocide by scholars and Indigenous Peoples, reduced California's Indigenous population from roughly 150,000 to 30,000 people (Akins & Bauer, 2021).

Early Colonialism in Coachella

Europeans first set foot in the Coachella Valley in the late 1700s. Spanish records contribute the first European expedition through the Valley to Captain Juan Bautista de Anza, who passed through on his way to Tucson between 1774 and 1776 (Coachella Valley Water District, 1968; Dayton Shaw, 1999). However, contact with the Spanish increased in the 1800s after they completed an *assistencia* ("subsidiary chapel") near San Bernardino (Kray, 2009). As a result, Fathers and their superintendents, called *Kis-se-an-o* meaning the first Christian Indians, regularly entered the Valley (Patencio & Boynton, 1943). They entreated the Desert Cahuilla to end their custom of creation, provided Christian teaching, solicited Indigenous labor, and brought, often unwillingly, Cahuilla children to the missions for cultural erasure (Kray, 2009; Lando & Modesto, 1977; Patencio & Boynton, 1943). These cordial and violent encounters

altered the Cahuilla way of life but left their land untouched. Many Indigenous People in the Coachella Valley adopted Christian religious practices and Spanish names (Dayton Shaw, 1999). They began to ride horses, use tools such as horse-drawn plows, and learned ranching practices (Dayton Shaw, 1999; Patencio & Boynton, 1943).

During both Spanish and Mexican colonial regimes, Cahuilla moved their villages and changed their political practices to resist colonization. They used the mountain ranges to strategically escape colonial agents. This high position allowed them to watch for strangers and, when needed, hide in the caves and cracks of the canyon cliffs (Patencio & Boynton, 1943). They altered their political formation to combat the physical and cultural violence of Spanish and Mexican colonialism. Unifying militarily under chiefs (or captains/“capitanes”), centralized government helped create an organized resistance against Spanish missionization, Mexican rule, and individual ranchers (Kray, 2009). However, in resisting, their new centralized leadership shifted power into a hierarchical order within the formerly patrilineal tribes (Kray, 2009). United States settler colonialism further chipped away at remaining cultural traditions and land relations by dispossessing Cahuilla of land and water.

Implementing United States Settler Colonial Neutral Land Policies

After winning the Revolutionary War, the newly formed United States government passed the Land Ordinance of 1785 to help manage its new territory. The Land Ordinance responded to eastern and southern chaotic settlement by requiring regulated and orthogonal surveys for the country’s western territory (Dayton Shaw, 1999; Land Ordinance of 1785, 1785). The intent of the Land Ordinance went beyond imagining land as regulated evenness. The land surveys would assist the federal government in selling the new territory to satisfy military

claims, settle non-landed citizens, and recover the financial costs of war (Land Ordinance of 1785, 1785).³⁰

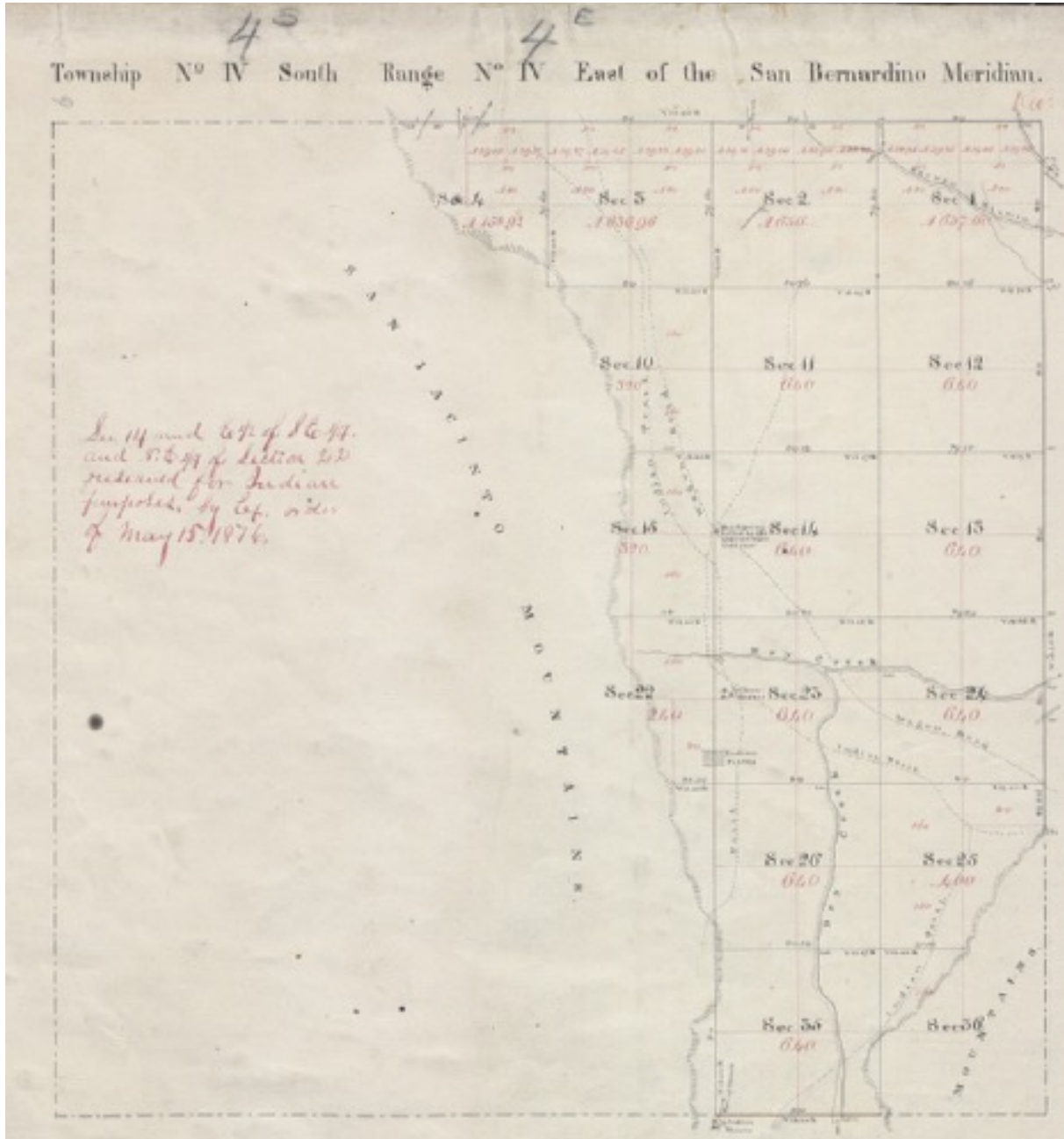
Fair disposition required equal, orthogonal land division that could be replicated easily by each state's appointed surveyor. The policy directed that surveyors divide and number territories into six-square miles, drawing north-south, east-west right-angled lines. Surveyors numbered territories into townships composed of thirty-six one-mile squares, or 640 acres (see figure 5-1). Surveyors measured territories with chains, marked trees with "chaps," detailed plats with water courses, mountains or "other remarkable and permanent things," and described distances to mines, salt springs, salt licks, and mill seats (Land Ordinance of 1785, 1785). Across the western United States, surveys combined evenness in land division with an abstraction of each territory's context.

The United States government conducted the first official survey of the Coachella Valley in 1855 (Dayton Shaw, 1999; Kray, 2009; La Croze, 1856; Lando & Modesto, 1977). Surveyors mapped approximately eighteen full and partial townships. They plotted Indian Rancherias, Fields, Houses, Trails, and Wells, depicting them with dashed lines, triangles, concentric circles, and hashed squares (see figure 5-2). The Valley appears almost vacant in the surveys. The landscape included infrequent markings for dry creeks, wagon trails, and mesquite thickets. However, the surveyor's markings remove the context of place and fix the Cahuilla in space.

³⁰ Post-survey, the secretary at war could select land to satisfy any military claims. The treasury would subsequently sell whole or fractions of townships at a public venue. Sections of the townships as well as portions of any surveyed gold, silver, lead, and copper mines would be reserved for the United States government (Land Ordinance of 1785, 1785).

Figure 5-1

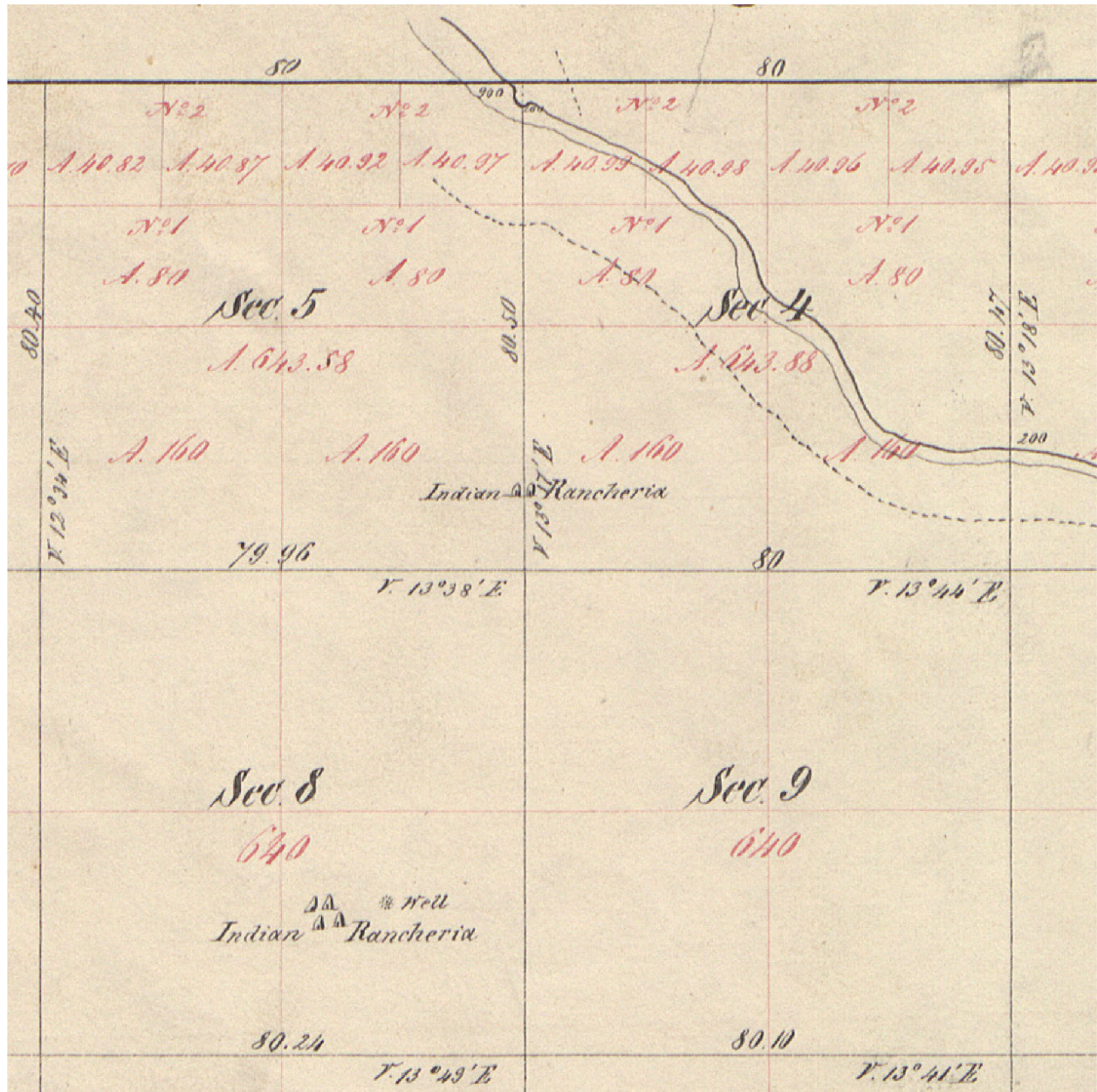
1856 Plat of Township 4 South, Range 4 East by John La Croze (location of Palm Springs and Agua Caliente Reservation) (La Croze, 1856)



Note: Notation on map states, "Sec 14 and E 1/2 of S.E. 1/4, and N.E. 1/4 of Section 22 reserved for Indian purposes. By Of. Order of May 15 1876."

Figure 5-2

Close-up of Township 6 South, Range 8 East from 1856 Survey of the Coachella Valley showing three sections labeled as Indian Rancherias in present day Thermal (Hays, 1856)



Designing a Checkerboard

Surveyors mapped California during a national era of state consolidation and economic expansion. The mid-1800s paired a western gold and land rush with an eastern Civil War. On each side of the country the federal government implemented various tactics to keep the Union intact. One way it accomplished this was congressional acts that incentivized transcontinental railway construction connecting eastern and western territories (Coachella Valley Water District, 1968). The 1862 Pacific Railway Act³¹ served the dual purpose of 1) providing the financial resources to construct transcontinental railway and telegraph services to transport goods, people, and communication from Sacramento to the Missouri River and 2) disposing the recently surveyed land along the routes (Pacific Railway Act, 1862). Accomplishing the second mandate, the 1862 Act granted land to railroad corporations for rail right-of-way, construction operations, and recouping the cost of construction. Consequently, for the Coachella Valley, the 1862 Pacific Railway Act, financed the Southern Pacific Railway construction.

The Southern Pacific Railroad Company was organized in 1865 to construct railways connecting San Francisco to San Diego and Los Angeles to New Orleans (Coachella Valley Water District, 1968). Route surveys conducted in 1872 identified Coachella Valley's, present day, Indio as the halfway point between Los Angeles and Yuma, Arizona (Mendenhall, 1909). The railway line's eventual orientation ran through the center of the Valley floor, from the Southwestern edge of the San Gorgonio pass and through the Valley, hugging the San Jacinto Mountain range before crossing the region diagonally in a southeastern direction (Warren, 1855).

³¹ Subsequent amendments incorporated stipulations for the Northern Pacific, Atlantic and Pacific, and Southern Pacific Railways.

By 1879, Southern Pacific Railway trains could complete the journey between San Francisco and Yuma (Coachella Valley Water District, 1968; Mendenhall, 1909).

With construction complete the federal government granted half of the Coachella Valley to the Southern Pacific Railroad Company (see figure 5-3). Following the stipulations of the 1862 Pacific Railway Act, the federal government removed odd-numbered sections within ten to twenty miles of the railroad lines from the public domain granting the land to the railroad company (Pacific Railway Act, 1862).³² Even-numbered sections of each township remained in the public domain. In the Coachella Valley, the Southern Pacific Railroad Company was the sole recipient of land grants under the 1862 Act.³³ The stipulations of the Act, the Valley size, and the orientation of the railway line created a checkerboard of public and private land that covered the entire region.

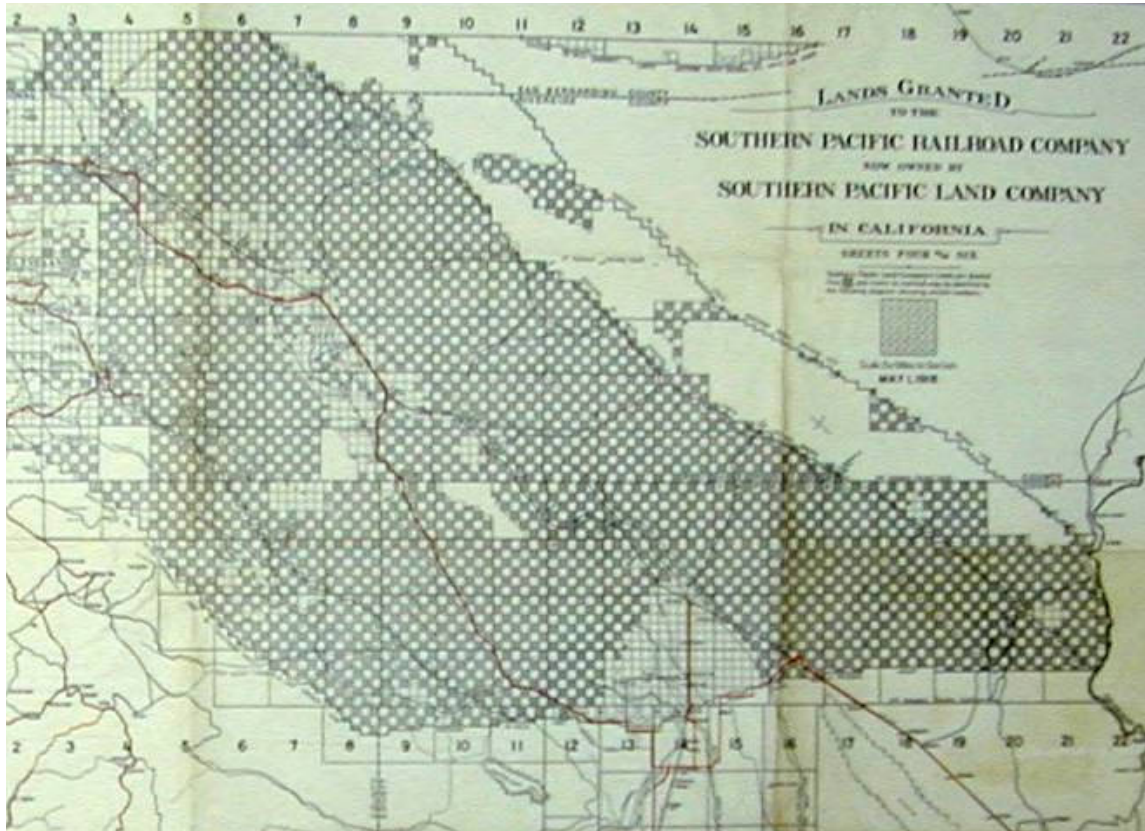
The 1862 Pacific Railway Act added a second layer of land dispossession to the federal government's taking under the California Private Land Act. While transferring the land to public domain had dispossessed the Cahuilla on paper, railroad land grants dispossessed land by making it private property. It put physical dispossession into action. The Act required the railroad company to expand capitalism and colonial settlement by selling their newly acquired land on the market. Public land also became available for conversion to private property.

³² Odd-numbered sections of a township were transferred to railroad company ownership on the completion of each forty consecutive miles (Pacific Railway Act, 1862).

³³ Prior to this land grant, and beginning with statehood, the entirety of the Coachella Valley was deemed public domain under the 1851 California Private Land Act as no previous claims existed for private rights or title to land in the region under the Spanish or Mexican colonial regimes.

Figure 5-3

The Coachella Valley's Checkerboard of Public Domain and Private, Southern Pacific Railroad Company Land (Southern Pacific Land Company, 1918)



Railroad land sales provided the impetus for white settlement and land speculation in the Western Coachella Valley. Early settlers bought large landholdings from the railroads for subdivision, land speculation, and resale in what is now Palm Springs. This land, adjacent to the Agua Caliente village, proved optimal for land speculators. It was situated near the hot springs and canyon streams that the Agua Caliente depended on for spiritual, domestic, and agricultural water use. White settlers saw an opportunity to market, sell, and settle the desert land, hot springs, and canyon streams. With railroad land, they established a new town that catered to health tourism.

In 1880, William Van Slyke and Matthew Byrne began to buy land around the Agua Caliente village. They started by buying land directly from Agua Caliente band member Pedro Chino, who cultivated ten acres of land near the hot spring that, unbeknownst to him, had been granted to and was owned by the Southern Pacific Railroad (Lec & Gabbert, n.d.). In 1884, they expanded their operations, joining W.R. Porter to form the Palm City Land and Water Company (Lec & Gabbert, n.d.). They surveyed, subdivided, and platted seventy-two acres in section 15, township 4, range 4 for their proposed Palm City (Lec & Gabbert, n.d.). They sold few lots. Abandoning their venture, they sold large portions of their holdings to another settler, John Guthrie McCallum, in 1885 (Lec & Gabbert, n.d.).

Generally considered the first white settler of Palm Springs, McCallum helped lead the charge of both land speculation, water diversion, and real estate development. McCallum had moved to San Bernardino in 1882 from San Francisco in search of a dry, warm place for his oldest son John, who was weakened by typhoid (McManus, 1957). There, he became the interim Indian Superintendent for Southern California in 1883 (Dayton Shaw, 1999; McManus, 1957). Pearl McCallum McManus favorably described her father's relationship with the Western Coachella Valley's Agua Caliente Band of Cahuilla Indians in a 1957 article in the Palm Springs Villager. She said:

Historically, one cannot separate the desert from the Indians or the Indians from the desert, and my father, a friendly man, loved both. The Indians trusted him for he knew them intimately, their traits and their problems. My father always said that if there ever was a point of justice for the Indians, the Indians should be given the benefit of the doubt. Many say that our Indians were never more happy and healthy than under my father's administration (McManus, 1957, p. 35).

McManus' memories of her father as Indian Superintendent contradict Indian Bureau reports on the conditions of the Agua Caliente and, later, the land and water dispossession McCallum completed during his tenure (*The Indian Land Zoning Controversy in Palm Springs*, 1976). A report, entitled "Palm Springs Complications," written to the Commissioner of Indian Affairs, noted that McCallum had operated in a way where his interests were promoted over those of the Indians (*The Indian Land Zoning Controversy in Palm Springs*, 1976). As Indian Superintendent, McCallum, derelict in his duties, used his knowledge of the Agua Caliente Reservation to buy the land around it strategically. As a result of his actions, the Department forced him to resign as Indian Superintendent. By then, he had acquired the surrounding land with the best water access.

Later, McCallum partnered with three investors from San Francisco (O.C. Miller, H.C. Campbell, and James Adams) to found the Palm Valley Land and Water Company (Lord Tennyson, 2010; *The Indian Land Zoning Controversy in Palm Springs*, 1976). From 1885 to 1887, the company acquired between 5,000 and 6,000 acres at \$2.50 an acre from the Southern Pacific Railroad Company (Lord Tennyson, 2010; *The Indian Land Zoning Controversy in Palm Springs*, 1976). In 1887, they held an auction for 137 parcels, selling \$50,000 worth of land by promoting it as "perfect climate, wonderful scenery, pure mountain water, the earliest fruit region in the state" (Lord Tennyson, 2010). During this same period, McCallum purchased 1,767 acres adjacent to the Agua Caliente Reservation in what would later be the heart of Palm Springs (Lord Tennyson, 2010).

Led by McCallum and his fellow speculators, the checkerboard of public and private land stimulated white settlement in the Western Coachella Valley. At the same time, additional

federal policies disposed public domain land in the Valley, first by creating reservations to confine the Cahuilla tribes and then by expanding white settler homesteading.

Indian Reservations and Individual Allotments

Federal-level executive orders and legislation in the late 1800s established reservations, followed by individual tribal land allotments in seemingly equal size to land acquired by United States citizens under various homesteading acts. However, the tribal allottees lacked the freedom of private property owners to manage and profit from land as private property. Indigenous Peoples remained wards of the federal government. They neither owned the land outright nor could manage it without federal government oversight. The regulatory guise of neutrality and equality belied the racial hierarchy under United States settler colonialism that devalued Indigenous Peoples and their relations to land, water, and economy.

The federal government did not finalize Indian reservations in California until forty years after statehood. Failed attempts to ratify treaties with and make reservations for individual tribes from 1852 to 1871 left Indigenous Peoples continually vulnerable to settler and government violence. They endured direct attacks on their villages and forced removal to four consolidated reservations created by the Four Reservations Act of 1864. Understanding the precarious nature of their living situations, some Indigenous Peoples argued for expanding reservations to protect their lands. Federal agents sent reports to Washington D.C. documenting their declining conditions. In 1874, Special Agent John Ames sent reports to Washington D.C., describing that land and water access was needed for Indian survival. He reported that:

The great difficulty...arises not from any lack of unoccupied land, but from lack of well-watered land. Water is an absolutely indispensable requisite for an Indian settlement, large or small. It would be worse than folly to attempt to locate them on land destitute of water, and that in sufficient quantity for purposes of irrigation. (*Agua Caliente Band of*

Cahuilla Indians' Memorandum of Points and Authorities in Support of Motion for Summary Judgement on Phase I Issues, 2013, p.3)

Responding to Indian Agency reports, between December 27, 1875 and May 29, 1902, eight presidents set aside land from the public domain for Southern California's Mission Indians (The Indian Office, 1902). But in the process, they also greatly reduced indigenous territory.

In 1875, President Grant signed the first executive order designating reservations for Mission Indians. He assigned single township sections for nine tribes within the San Bernardino base and meridian (The Indian Office, 1902). Subsequently, President Grant signed an executive order on May 15, 1876 reserving land for Indigenous Peoples in Coachella (The Indian Office, 1902). Using the 1850s surveys, President Grant's executive order reserved six sections³⁴ for the Agua Caliente, Torros, Cabezon, and three unnamed villages (The Indian Office, 1902). With this presidential order, Grant reduced the Desert Cahuilla's territory to six square miles (or 3,840 acres) dispossessing them of land, water, and livelihood.

These initial reservation allocations were insufficient for sustaining indigenous life in the Coachella Valley. Indian Agents continued to send reports to D.C. entreating the federal government for action. They faulted government use of surveys for inadequately delineating reservation land:

All the reservations made in 1876, and that comprises nearly all now existing, were laid off by guess, by the surveyor in San Diego, on an imperfect county map. These sections, thus guessed at by the surveyor, were reported by the Commissioner to the Interior

³⁴ In addition to Section 14, the Agua Caliente were given partial ownership over Section 22 and Township 7 south, range 8 east, section 16 was subsequently returned to the public domain through an executive order on May 3, 1877 (The Indian Office, 1902).

Department, set aside by Executive order, and ordered to be surveyed. When the actual survey came to be made, it was discovered that in the majority of cases the Indian villages intended to be provided for were outside the reservation lines, and that the greater part of the lands set apart were wholly worthless. (*S. Exec. Doc. No. 15*, 1885, p. 7)

In addition to the negligent allocation process, the federal government failed to give notice or legal documents to tribes regarding reservations:

It was pathetic, in our visits to village after village, to hear the Indians' request reiterated for this thing – "a paper to show to the white men where their lands were"...In no single instance had the reservation lines ever been pointed out to them. (*S. Exec. Doc. No. 15*, 1885, p. 7)

The Desert Cahuilla reservation's six one-mile squares failed to take into account its approximately 560 highly mobile members expansive occupation of the Coachella Valley (Jackson, 1883). Captain J. G. Stanley, a former Indian agent reporting on the conditions of the Desert Cahuilla for Special Agents of the Commissioner of Indian Affairs Helen Jackson and Abbot Kinney, described the area as:

A vast amount of desert land...spots in it have been occupied by [the Desert Cahuilla] for hundreds of years where wheat, corn, melons, and other farm products can be grown. There is very little running water, but water is so near the surface that it can be easily developed. The Indians appear to know nothing of any lands being set apart for them, but claim the whole territory they have always occupied...At present there are eight villages or rancherias, each with its own captain, but all recognizing old Cabezon as head chief. (*S. Exec. Doc. No. 15*, 1885, p. 30)

Figure 5-4

Eastern Coachella Valley 1856 Surveyed Indian villages and 1876 Executive Order Reservations

(Hays, 1856a, 1856c, 1856b, 1856d, 1856e, 1856f, 1856l, 1856g, 1856h, 1856i, 1856n, 1856j, 1856o, 1856o, 1856k, 1856m, 1856p; The Indian Office, 1902)

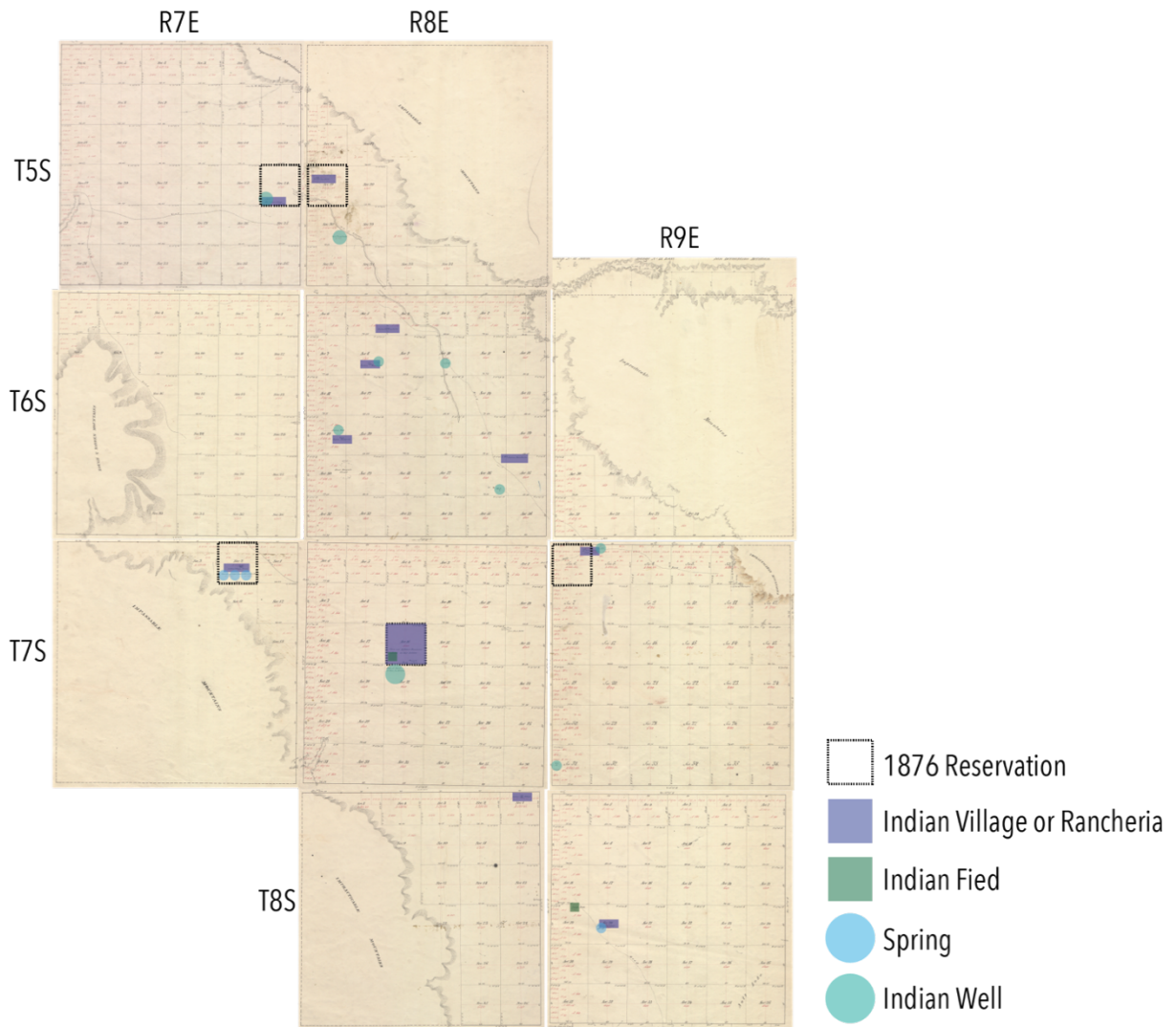
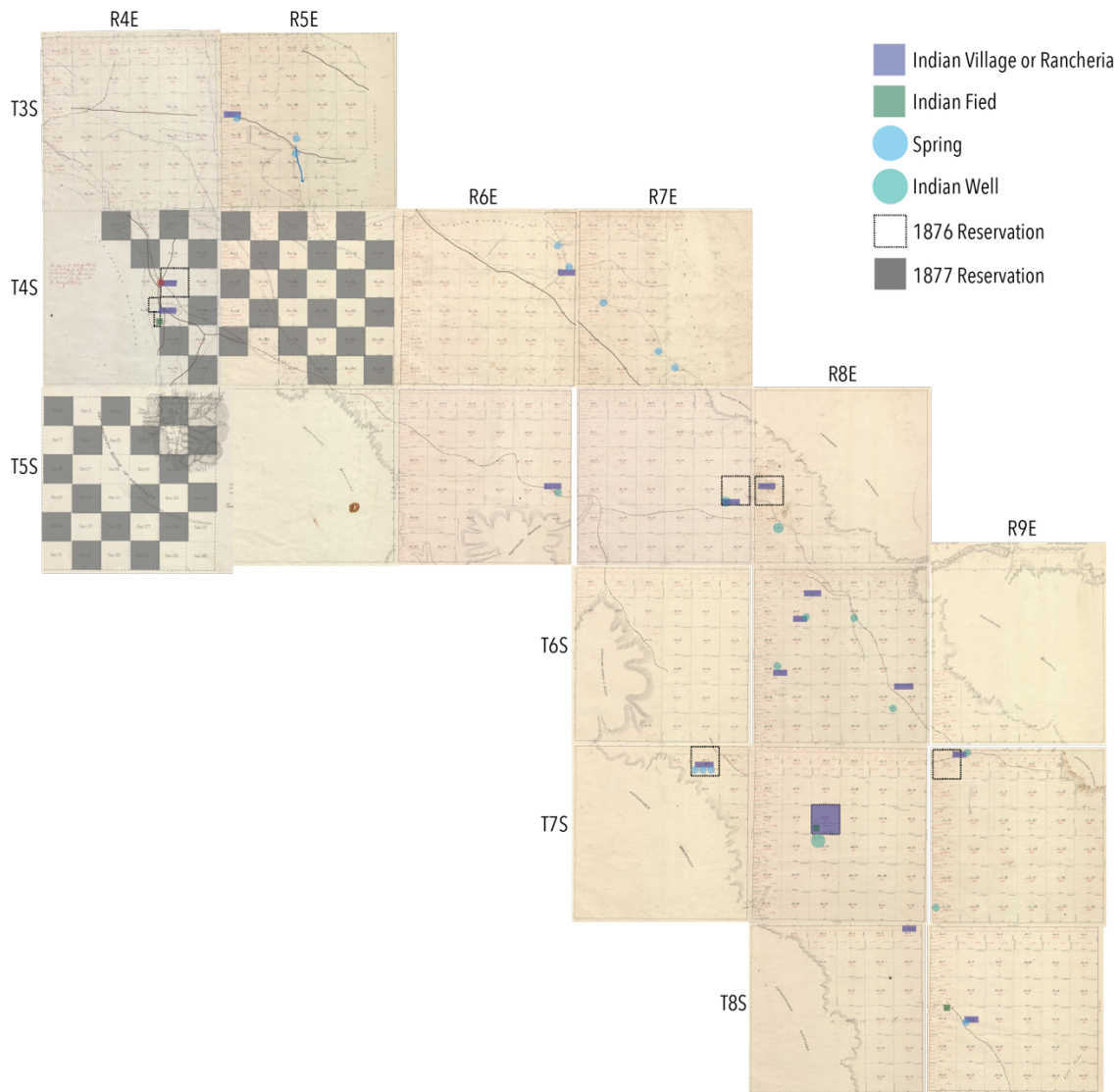


Figure 5-5

Coachella Valley 1856 Surveyed Indian villages and 1876 and 1877 Executive Order

Reservations (Hays, 1856a, 1856c, 1856b, 1856d, 1856e, 1856f, 1856l, 1856g, 1856h, 1856i, 1856n, 1856j, 1856o, 1856o, 1856k, 1856m, 1856p; The Indian Office, 1902)



Surveyors had noted Indian villages or rancherias on eleven sections of eight different townships (see figures 5-4 and 5-5). However, the 1876 executive order located Eastern Coachella Valley reservations on only five sections, each with survey indications for an Indian well or spring.

Despite surveyors marking multiple villages within a single township, the executive order consolidated the villages within townships.³⁵

Miniscule land appropriation deteriorated quality of life for Indigenous Peoples throughout California. An 1884 Senate Committee on Indian Affairs Report, described the Mission Indians as “sadly neglected by the Government, and their condition is one that brings nothing but reproach upon those to whom they have been accustomed to look for the preservation of their rights” (*S. Exec. Doc. No. 15*, 1885, p. 2). Most reservations did not provide enough land for self-sufficiency. In the Coachella Valley, reservation size demanded higher density land occupation for the Desert Cahuilla than white settlers. As a result, the federal government expected over 500 Eastern Coachella Valley Cahuilla to live and survive on four square-mile sections. Federal homesteading acts allowed for United States citizens, and their families, to settle on a quarter of a square-mile section. For comparison, Cahuilla reservations had densities of 140 people per section while settlers could expect densities of four households per section.

In addition to their small size, the reservations did little to protect California’s Indigenous Peoples from further land dispossession. Lacking legal notice and visible boundaries, settlers invaded reservations across the state. Jackson and Kinney reported:

Stray settlers have been going in upon reservation tracts. This is owing to the lack of boundary definitions and marks as aforesaid, also to the failure of the surveys to locate the reservations so as to take in all the ground actually occupied by Indian villages. Thus, in many instances, the Indians' fields and settlements have been wrested from them and

³⁵ On May 3, 1877 section 16 in township 7 south, range 8 east was restored to the public domain leaving four sections reserved for the Eastern Coachella Valley’s Desert Cahuilla (The Indian Office, 1902).

they in their turn have not known where they could, or could not go. There is not a single reservation of any size which is free from white settlers. (Jackson, 1883, p. 8)

In addition, homesteaders used federal law to claim reservation land.³⁶ Jackson and Kinney wrote that:

Lands occupied by Indians or by Indian villages are filed on for homestead entry precisely as if they were vacant lands. This has been more than once done without the Indians receiving any warning until the sheriff arrived with the writ for their ejection. (Jackson, 1883, p. 12)

To further enable white settler encroachment, in 1887 congress passed the Dawes Act (also known as the General Allotment Act) to divide reservations into plots for individual ownership, agricultural production, and grazing (The Dawes Act, 1887). It decreased reservation land holdings by returning surplus, unallotted land to the public domain for sale to white settlers (Gates, 1936). It proposed equal access for individual tribal members to the amount of land promised to settlers under the Homestead Act, while at the same time assimilating them into the nation's individual property rights regime. This seemingly neutral land distribution offered 160 acres to any race. Instead of evenness it created a racialized system of public land distribution between non-Indians and Indians, dispossessing Indigenous cultural relations to land at the same time.

³⁶ The Homestead Act of 1862, like the Pacific Railway Act, offered even and widespread distribution of public lands, this time to individual settlers rather than railroad companies. Each citizen was able to settle on one-quarter section of a surveyed township, equal to 160 acres of public land (*Homestead Act (1862)*, 2021). Land acquisition was only available to heads of households older than the age of twenty-one who were citizens of the United States. They were required to settle and cultivate the land. They could either work the land for five years and receive title for free or pay \$1.25 per acre after six months of occupancy and minimal improvements (*Homestead Act (1862)*, 2021). Indigenous Peoples were denied access to the Homestead Act as they were not citizens of the United States, but wards of the federal government.

The allotment process was rife with issues. Allotments also required ratification by congress, which they often failed to do. Another primary challenge was the lack of available public land in California. Kelsey noted this in his 1906 report, “by the time the Indian allotment act was passed in 1887, there was no land left to allot, except in the extreme northern and eastern parts of the State” (Kelsey, 1906, p. 8). Allotting agents, intimidated by the California terrain, resorted to using maps for selecting land (Kelsey, 1906). This process resulted in the allotment of quarter-acre sections throughout the state that lacked access to water (Kelsey, 1906). When Indian allotments did have access to water they faced the continued threat of water dispossession. As reported by Kelsey:

No provision seems to be made for protecting an allottee after he has received the allotment either in the use of the land itself, or what is more important, the water supply when there is one. As it stands now, anyone can jump an Indian’s allotment, and there seems no practical remedy, or anyone can move the fence over onto the Indian’s land, or divert his water, and it is not even a misdemeanor. (Kelsey, 1906, p. 10).

Indigenous Peoples and federal Indian agents protested the insufficient allocation of reservation land and its subdivision into individual allotments. For almost a decade after initial reservation delineation, advocates and legislators attempted to pass a bill for the relief of the Mission Indians. Ultimately, the United States government passed the Act for the Relief of Mission Indians in 1891. It created a new commission that was responsible for selecting land to set aside as reservations for each Mission Indian band and village. Each reservation was to include and patent the land occupied and possessed at the time.

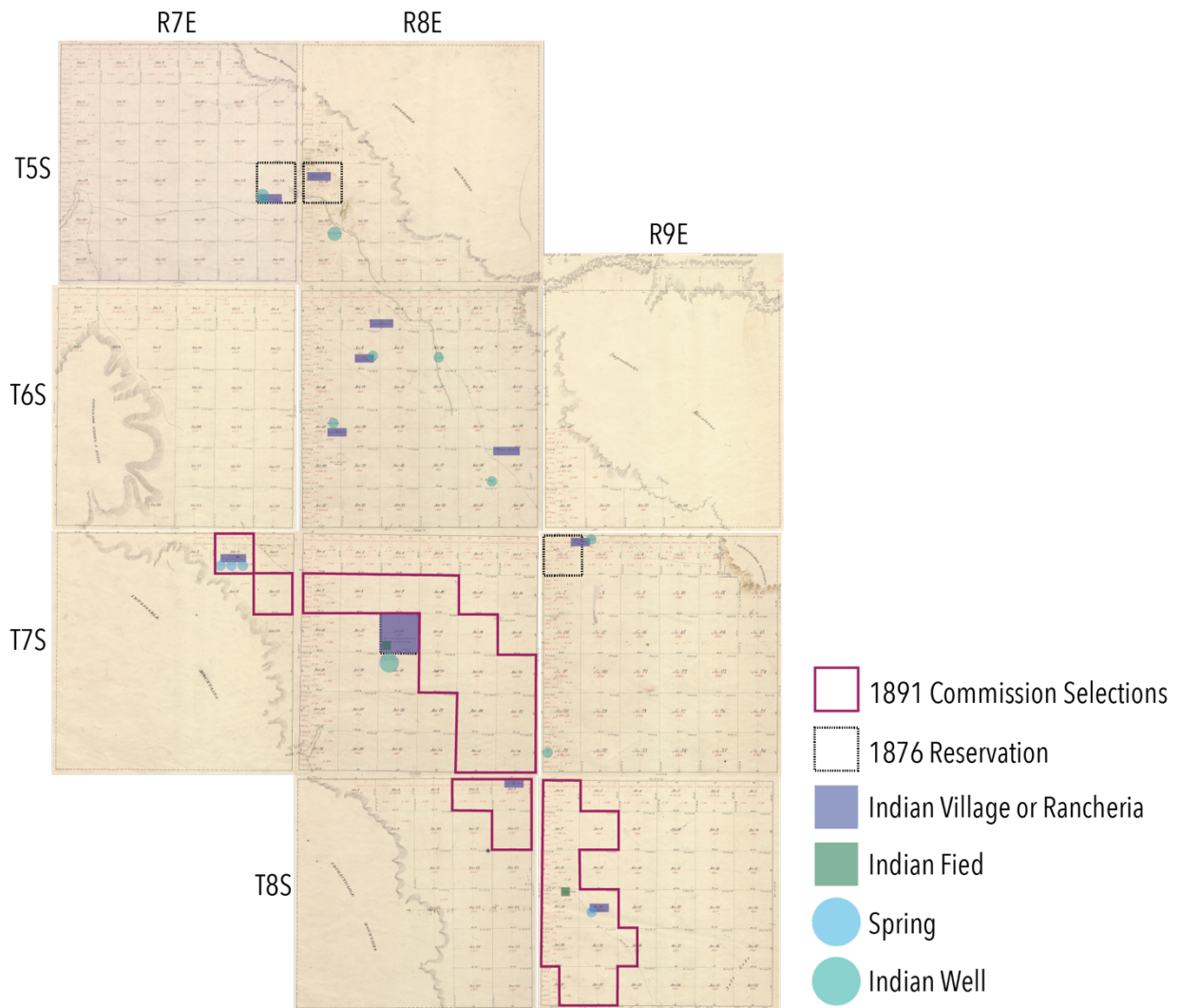
In Western Coachella Valley, Indian agent advocacy and interests helped to extend the Agua Caliente Reservation from a single section to 60,000 acres with an Executive order in 1877

(see figure 5-5) (*S. Exec. Doc. No. 15*, 1885; The Indian Office, 1902). In the Eastern Coachella Valley, Desert Cahuilla received additional land under the 1891 Act. However, expansion was limited to the Torres and Martinez Reservations. The commission selected an additional 33 sections for the Torres Reservation (see figure 5-6) (*S. Doc. No. 54*, 1898). However, as late as 1898 their land remained unpatented (*S. Doc. No. 54*, 1898). In an 1897 report investigating why the commission's selection had not yet been patented, Special Allotting Agent Patton noted that the Torres were occupying a single section (section 16 in township 7 south, range 8 east) (*S. Doc. No. 54*, 1898). Patton described the tribe living on two rancherias near both an artesian and Indian well (*S. Doc. No. 54*, 1898). He found both their land and water access limited. The artesian well was discovered "choked with sand" requiring "a cost of several thousand dollars" to return the flow to the well (*S. Doc. No. 54*, 1898). Eventually, the Torres and Martinez Reservations were combined and expanded to over 24,000 acres after follow-up reports and surveys of the area demonstrated a larger need for land and water (Torres-Martinez Desert Cahuilla Indians Claims Settlement Act, 1996; *S. Doc. No. 54*, 1898; Southern California Tribal Chairmen's Association, 2022). However, most of the land was quickly rendered unusable when the Salton Sea flooded, covering their land in water that remains today (Torres-Martinez Desert Cahuilla Indians Claims Settlement Act, 1996).

Reservation formation racialized Coachella Valley's land. Land in the checkerboard was characterized as Indian or non-Indian. Alternating Indian and non-Indian one-mile squares overlaid the already established public and private ownership pattern. However, the two types of land varied significantly. Indian land, also referred to as trust land because it is held in trust by the federal government, is regulated by federal stipulations that restrict(ed) the selling, trading, and leasing of the land as well as its use as collateral for mortgages (Akee, 2009).

Figure 5-6

Commission Selection for Torres-Martinez Reservation following the 1891 Act for the Relief of the Mission Indian



At the same time, Southern Pacific Railroad Company land (and public, non-trust land), with fee-simple status, could be sold, traded, leased or mortgaged by the owner without additional federal government oversight (Akee, 2009; Kray, 2009). Unevenness created a hierarchy between Indian trust and private, fee-simple land based on the real estate investments and capital

gains that could be made from each (Akee, 2009; Kray, 2009).³⁷ As a result, non-Indian land was rendered more valuable than Indian trust land because owners could realize the land's full potential as a commodity on the real estate market.

160 Acres (or more) For All: The Desert Land Act

Coachella Valley's checkerboard changed dramatically when the federal government made public land available to homesteaders in 1885 (Coachella Valley Water District, 1968). That same year, Patrick Gale, the Valley's first homesteader, settled near the city of Indio in Section 23. The Valley's first homesteader acquired his land through the Homestead Act's successor, the Desert Land Act. It gave the land poor an additional opportunity for land ownership and increased the size of land holdings for settlers from 160 acres available under the Homestead Act to 640 acres (or from $\frac{1}{4}$ section to one section) for a husband and wife (Act for Sale of Desert Lands, 1877).

In the arid lands of the Coachella Valley, the 1877 Desert Land Act had a much greater effect on the region's settlement than its predecessor. Its central stipulation for settling on land (and purpose of the act itself) was the reclamation of Western land through irrigation. But irrigating arid land was no easy task. The Act's early language necessitated finding land near riparian water sources by tying land claims to water rights law. The Desert Land Act stipulated that conducting water onto claimed land depended on prior appropriation (C., 1922). This forced settlers to look for land near water sources that lacked water rights claims and incentivized the

³⁷ In his 2009 paper comparing the contemporary value difference in fee-simple versus trust land, political economist Randall Akee found that the value of homes on Agua Caliente land was less than the value of homes on fee-simple land. Further, he found that the real estate built on trust land was qualitatively different than that built on fee-simple land, with more apartments, condos, and smaller units and less hotels than fee-simple land, and in worse, deteriorating condition (Akee, 2009).

diversion of streams for the purpose of irrigation (Ganoë, 1937). However, settlers and state government had created a system of water rights that had dispossessed almost all of California's streams and rivers by 1877 (G., 1936). This left little available stream water for land entries under the Desert Land Act when passed. Individuals faced often insurmountable financial barriers to building and maintaining the necessary structures for water diversion to irrigate land (Ganoë, 1937).

The Coachella Valley proved a fertile ground for individual desert land entries with its abundant groundwater, arid land, and dispossessed Indigenous population. Desert Cahuilla's hand dug wells demonstrated to white settlers that water could be found in the seemingly dry region. As a result, individuals settling on land throughout the Coachella Valley did not initially require the large amounts of capital needed for water diversion. Instead, they could rely on artesian wells to access groundwater for irrigation. By 1920, the majority of patented land in the Coachella Valley were desert entries between 80 and 320 acres (*Hearings before the Committee on Irrigation of Arid Lands House of Representatives Sixty-Sixth Congress on the Bill to Assist in Increasing the Productive Agricultural Area of the Imperial and Coachella Valleys, Calif., and for Other Purposes*, 1920). They appropriated Indigenous Peoples' water ingenuity to dispossess them.

From Naturally to Socio-Politically-Driven Unevenness

Water dispossession processes differed between the Western and Eastern regions of the Coachella Valley. In the Western Coachella Valley, water dispossession was accomplished by speculators and settlers through diversion. Water dispossession in the Eastern Coachella Valley, occurred as settlers built wells under the Desert Land Act, depleting the aquifer to irrigate land. On both sides of the Valley water dispossession led to indigenous water scarcity. Using different

mechanisms for dispossession settlers in the Western and Eastern regions created the same pattern of spatial inequality in water access, limiting indigenous access and expanding settler access.

Diversion and Grabbing: Water Dispossession in the Western Coachella Valley

In Western Coachella Valley, settlers used the traditional techniques to dispossess the Agua Caliente tribe of their water. Arriving in the late 1800s, settlers were quick to secure water supplies for their land using stream diversion, water grabbing, and filing for water rights. To do so, they ignored the Agua Caliente tribe's prior water use, rights, and claims. Settlers knew that without water, their land was useless and thus unprofitable. Pearl McManus summarizes this sentiment when discussing her father John McCallum's approach in the Palm Springs area, "Father knew that if the desert was to bloom and grow, that water, water and more water was the only answer" (McManus, 1957, p. 36). Railroad land surrounding the Agua Caliente village provided a coveted opportunity for settlers searching for desert land in the Coachella Valley. Its proximity to hot springs and several mountain streams provided easy water access. As a result, white settlers bought land from the Southern Pacific Railroad Company and dispossessed the Agua Caliente's primary water sources. Settlers cut the reservation off from water access, creating contestation over water use and rights that would last until the mid-twentieth century.

When white settlers arrived in the Western Coachella Valley, the primary water sources for the Agua Caliente came from the Tahquitz and Andreas Creeks (Bauer, 1918; McManus, 1957; Patencio & Boynton, 1943). The Agua Caliente had harnessed the Tahquitz Creek by building an irrigation ditch for agricultural water supply to their village on the valley floor. Had they been white, the Agua Caliente irrigation ditch would have been a respected signal of prior appropriation to the Tahquitz Creek water. However, facing the need to secure their own reliable

water source, settlers ignored the Agua Caliente's prior use of local water sources, even when it was well documented (Kelsey, 1906, p. 22).

Settlers filed for water rights wherever they found the Agua Caliente's reliable water sources. They took advantage of 1) the tribe's refusal to accept settler colonial land and water policies and 2) the differences between United States settler colonial water rights that prioritized private property and Indigenous water relations, which held water in common.

Settlers filed multiple times for water rights to the Tahquitz Creek and other Western Coachella Valley water sources. In 1888, McCallum claimed water rights with the state for the Tahquitz canyon and Whitewater River and used his company to construct and provide irrigation systems for both sources, selling water to other settlers (*History of Tahquitz Irrigation by Cahuilla Indians 1880*, 2011; McManus, 1957). In 1909, the son of the developer Ralph Rogers filed for Tahquitz water rights and used his company, the Mineral Park Land Company, to build a ditch to irrigate a newly staked-out subdivision on Section 23 (*History of Tahquitz Irrigation by Cahuilla Indians 1880*, 2011).³⁸ To irrigate Section 35, Van Slyke and Byrne of the Palm City Land and Water Company filed for water rights in 1885 for the Palm Creek, Middle Creek, and Rincon Canon (Lec & Gabbert, n.d.). B.B. Barney filed for rights to the Andreas Creek in 1893, intending to use the water for his development called Garden of Eden on Section 35 (Bauer, 1918).

Securing reliable water for agricultural production and land speculation required more than acquiring rights to water sources. Continuing to ignore Agua Caliente water use, settlers

³⁸ The filing on the stream occurred after Ralph Rogers had diverted the Agua Caliente water supply onto Section 23, cutting the tribe off from their water in 1908 (*History of Tahquitz Irrigation by Cahuilla Indians 1880*, 2011).

diverted the Tahquitz and Andreas Creeks onto their own land. Diversion, a common practice of dispossession, caused widespread water insecurity for indigenous communities throughout California. Noting its use, Kelsey wrote:

Many cases have been reported to your special agent where white men have deliberately diverted a stream of water from the Indian with full knowledge of the Indian's priority of right, but secure in the knowledge that the Indian was helpless, and that the offence could be committed with impunity. The Indian could do nothing but watch his trees die and his garden dry up, and be forced to abandon his holding. (Kelsey, 1906, p. 11)

McCallum, as Indian Superintendent, used his intimate knowledge of the Southern California indigenous tribes to find water to divert. His first action was looking to the Whitewater River as a source. According to his daughter, "[a]fter much investigation he commissioned J.P. Lippincott, the noted engineer, to study the various canyons, and survey the supply that could be brought to Palm Springs and irrigate the thousands of acres of desert land" (McManus, 1957, p. 36). McCallum employed the Agua Caliente to build a nineteen-mile channel from the river to his land (McManus, 1957; *The Indian Land Zoning Controversy in Palm Springs*, 1976). In her account, early settler Nellie Coffman describes the Whitewater River as the "first supply of permanent water available for colonization purposes" (Coffman, n.d.).

Bringing water from the Whitewater River to the Palm Springs settlement required passing through the Agua Caliente Reservation. The Superintendent of Indian Affairs allowed the use of reservation land for the channel. In exchange, the tribe could buy 27 inches of water annually (Patencio, 1914). The tribe constructed its irrigation ditch that brought the Whitewater River water from the channel to its farmland.

Even with physical access, white settlers contaminated Whitewater River water, making it unusable for the Agua Caliente. The United States government had appointed a white farmer to maintain the ditch on behalf of the tribe. However, under his watch, the ditch was neglected and contaminated (Patencio, 1914). The tribe's village was downstream from five white families. It found "dead chickens, cats, and other refuse in the ditch the water of which we have to drink and use for cooking purposes" (Patencio, 1914, p. 3). At other times, the Agua Caliente did not receive any water from the ditch. In summer months, due to water levels, white settler water use depleted the amount of water left for the Agua Caliente tribe, its crops died and its cattle went without water (Patencio, 1914).

By 1895, the tribe no longer received water from the ditch. Ten years later, Agua Caliente tribal member, Francisco Patencio wrote to the President of the United States, imploring for help in the matter. Patencio, describing the situation, wrote:

When for a cause unknown to us the water was taken from us, and we have ever since been denied the right to use it unless we pay in cash for every inch we use. We have appealed to every Sept. of Indian affairs, who has been sent to us since the water was taken from us in 1895, to recover the water for us, but they not only do nothing in this direction but ignore and treat us in a manner as if we were not creatures deserving of some notice and consideration. (Patencio, 1914, p. 2)

White settlers further dispossessed Agua Caliente water sources when they appropriated the Tahquitz irrigation ditch. The first to divert the Tahquitz Creek was Frank Vandeventer in 1870 (Coffman, n.d.; Lec & Gabbert, n.d.). Along with his diversion, Vandeventer, who managed the pony coach station, allowed his cattle to damage the Agua Caliente's irrigation

ditch and gardens. Later settlers replicated this damage, constructing five additional diversions (Indian Defense Association of Santa Barbara, 1924).

The Palm Springs townsite grew around Agua Caliente's Tahquitz ditch. Each of the five diversions were built upstream from the reservation. Like the Whitewater River ditch, the Agua Caliente Reservation not only received the last of the water flow, but the water was often contaminated with dirt and garbage from people and livestock who crossed the open ditch (Indian Defense Association of Santa Barbara, 1924). The water the tribe eventually accessed was inadequate in amount and quality for domestic and irrigation use.

The Agua Caliente used their little political power available to them to fight for their water rights. They advocated for themselves when encountering local representatives of the Department of the Interior and federal agents reporting on the Mission Indian conditions. They wrote letters directly to the President of the United States and white advocates such as the Indian Defense Association (Dady, 1935; Indian Defense Association of Santa Barbara, 1924; Patencio, 1914).

As "caretakers," Indian agents were required to secure water rights for the Agua Caliente. They entered into water settlements with the white settlers who had filed for water rights on their primary water sources, trading easements for water inches. They settled a contract with B.B. Barney, who had patented water rights to Andreas Creek. Like the settlement with Whitewater River channel easement, agents secured a 20-foot right-of-way through the reservation for Barney's irrigation pipeline (Bauer, 1918). Barney exchanged one inch of water for every six acres of land the pipeline crossed, totaling 100 acres or 16 2/3 inches (Bauer, 1918). The United States government eventually bought the rights to the Andreas Creek from Barney in 1907 after he failed to maintain water use and thus his water rights. Water rights at Tahquitz were first

settled in negotiations between 1909 and 1911. The settlement contract gave the tribe the first 40 miner's inches and the second 40 to six white settlers (Bauer, 1918; Office of Indian Affairs, 1911). Each of these settlements restricted tribal water access to allocated inches. As wards of the government, the tribe itself did not receive water rights to these water sources. Instead, each water settlement gave water rights to the United States federal government, which on behalf of the tribe, managed the rights and the water.

Agua Caliente and Indian Agent actions asserting reservation water access were met with white settler counter-resistance. When the government tried to build an alternative irrigation ditch from the Tahquitz to the reservation without passing through settler land, white settlers protested the project in Washington D.C. and successfully prevented its construction (Indian Defense Association of Santa Barbara, 1924). They delayed signing Tahquitz water rights settlement for more than two years. In their correspondence between each other and to government inspectors, Palm Springs' settlers expressed their moral outrage in losing water rights to the Agua Caliente tribe they felt were theirs.

In his letters to Mrs. Edmund Mitchell regarding the settlement, Welwood Murray writes, "While we well nigh despair of justice from the zealots of Government, we feel sure that in any court of equity our case would be clear an favorable to us, hence we will not allow of being despoiled" (Murray, 1910). Organizing around the issue, they wrote to each other about the "wrongs and hardships" they experienced by the Indian Agent's actions and the government's "favoritism to the Indians at the expense of the white settlers" (Mitchell, 1910c). They believed that the tribe was oversupplied in water and that the two decades of white settler water use should be prioritized (Mitchell, 1910c, 1910a, 1910b; Murray, 1910). Even after agreeing to and signing the Tahquitz water settlement, white settlers failed to deliver the appropriate amount of

water to the Agua Caliente tribe (*11pg (Proposed) Articles of Agreement between Indian Affairs Superintendent John Dady & Palm Springs Chamber of Commerce Re: Indians, Land & Water Rights*, 1940). As a result, the Agua Caliente continued to face water insecurity well into the 1940s.

Water rights were applied racially. Settlers re-characterized Agua Caliente water use outside of beneficial use and ignored their prior appropriation. Although the Agua Caliente used water for agriculture, their indigeneity made their use less valuable and legible as legitimate. Meanwhile, white settler water use for agriculture was considered more valuable and deserving of water rights. Racialization of acceptable water use supported indigenous water dispossession, which led to indigenous water scarcity and, following land ownership, a checkerboard of non-Indian water access and Indian lack of water access. Likewise, the checkerboard spatial inequality in water access exacerbated their growing impoverishment by fixing the Agua Caliente in place, making them susceptible to upstream settler water use and contamination, and destroying their ability to be self-sufficient through agriculture and village mobility.

Aquifer Overdraft: Water dispossession and insecurity in the Eastern Coachella Water

The United States opened up even-numbered sections in the Coachella Valley for homesteading in 1885 (Coachella Valley Water District, 1968). Under the Desert Land Act, settlers had filed land claims on a large portion of the sections in the Eastern Coachella during the first year of land availability (Mendenhall, 1909). However, the Eastern Coachella Valley, unlike the Western Coachella Valley, lacks reliable surface water. Development was stymied by the difficulty and cost of drilling wells and the railroad's continued ownership of odd sections (*H.R. Exec. Doc. No. 96*, 1892; Mendenhall, 1909).

Geographic advantage was also key to expanding development in the Eastern Coachella Valley. In the early 1900s, the most fertile sections of soil in the region were found south of Eastern Coachella Valley's, Indio (Mendenhall, 1909). Over thousands of years, alluvium from surrounding mountain ranges combined with silts supplied by the Colorado river to create artesian water conditions. Even with small amounts of rainfall³⁹ and intense summer heat, the Valley's large drainage area created a large underground water supply. Eastern Coachella Valley, lying at the low end of the drainage basin, was the natural recipient of the Valley's rainfall and aquifer. Initially, accessing the aquifer proved difficult.

Needing water for employees and travelers, Southern Pacific Railroad engineers were tasked with searching for reliable water sources. The railroad came up with numerous proposals to secure more reliable access, including running a pipeline from the town of Thousand Palms. They experimented with various ways to sink wells in the desert basin, having failed with ordinary rigs due to the thick strata of fine sand found throughout the Valley floor (Mendenhall, 1909). In 1888, the railroad's engineers successfully drilled small artesian wells at their Thermal and Coachella stations and, six years later, in 1894, they completed a deep well in Mecca (Mendenhall, 1909). They successfully drilled their first hydraulic well in 1900 in Indio, reaching a depth of 500 feet in 17 hours and at a comparative cost to digging an ordinary well (Mendenhall, 1909). Indio's hydraulic well diminished the cost barriers to well digging and thus water access, putting an end to slow growth in the Eastern Coachella Valley.

The railroad, USDA, and local boosters supported Eastern Coachella Valley growth. The Railroad Company served as a backer of local boosters. For the company, area growth meant

³⁹ Rainfall estimates from 1878 to 1905 suggest that 20% of the region had a yearly rainfall of five to twenty-five inches (Mendenhall, 1909).

railroad use by future farmers and new tourist travel (City of Coachella, 2019). Trains on the Southern Pacific Railroad were sent east to the Midwest to attract settlers with exhibits of California produce (Coachella Valley Water District, 1968). The USDA experimenting with date cultivation successfully transplanted date shoots in 1903 near the Walters station (City of Coachella, 2019). The USDA followed this by collaborating with the University of California on an experimental date garden near the station in 1904 (City of Coachella, 2019; Du Bry, 2004). Capitalizing on this new agricultural product and feat, early real estate developers converted the Valley into a Middle Eastern fantasy. They renamed Walters to Mecca in 1904. And they promoted dates and the desert as a paradise for small family farmers (City of Coachella, 2019; Du Bry, 2004).

The growth reflected both the successful marketing strategies and individual settler success in irrigation and agricultural production. Jason L. Rector, was the first recorded settler to make a permanent home in the city of Coachella after moving to the Valley to work for the Southern Pacific Railroad (City of Coachella, 2019). In April 1900, Rector and his brother successfully drilled a well. They used the well water to irrigate a twenty-five-acre tract, planting it with barley, wheat, cantaloupes, watermelons, and sugar beets (City of Coachella, 2019). Their easy success in accessing water and growing crops encouraged other settlers to take advantage of the region's fertile soil, profitable farming, and seemingly abundant water. Over 100 artesian wells pock-marked the Valley two years after the Rector's irrigated their land (City of Coachella, 2019; Crider, 2018). By 1907, over 400 settler wells pumped groundwater from the aquifer (Mendenhall, 1909).

Settlement, land reclamation, irrigation, and subsequent, settler profit-making depended on reliable and abundant groundwater presence. However, unregulated groundwater use rapidly

depleted Coachella Valley's aquifer. Water in the aquifer had accumulated over thousands of years (Mendenhall, 1909). Each yearly rainfall added enough water to balance natural artesian pressure and evaporation (Mendenhall, 1909). However, with over 400 wells pumping groundwater, federal agents recorded that "the artesian areas have shrunk 35 per cent in the past ten or twelve years as a result of intense development" (Mendenhall, 1909, p. 35).

Facing a shrinking aquifer, early settlers quickly dug wells at deeper depths. Attracted to a brother-in-law's account of the money he made growing and selling melons, Otho Moore's family arrived in Indio in 1898 when he was six (Coachella Valley Water District, 1968). He recalled cheap land and artesian water flowing from their well (Coachella Valley Water District, 1968). But these water conditions did not last long. "Later when more wells were drilled and the artesian pressure quit," he said, "we bought a White and Middleton engine, dug a pit about 18 feet deep and installed a horizontal pump" (Coachella Valley Water District, 1968, p. 37). He went on to note that:

As wells were drilled in the lower valley, our wells around Indio went down. My family brought in a sand bucket and drilled a larger well and installed a pump. This happened to all wells in this end of the valley. As land developed further down the valley, the farther down we had to go for water. Soon, there were no artesian wells at Coachella, where the railroad had drilled a well in what is now Cantaloupe Avenue (Highway 111). It was (also) costing more money to pump with gas and electric motors, which came in with electricity after 1913. (Coachella Valley Water District, 1968, p. 55)

Despite the lowering water table, development continued and irrigation expanded. Wasteful settler irrigation practices included: unlimited well drilling, allowed and encouraged by the Desert Land Act, wells left uncapped by settlers, letting water flow uncontrolled and

knowingly wasting water through lack of use and evaporation, and; poor irrigation methods and poorly constructed reservoirs and ditches (Mendenhall, 1909). Well-depths increased to 500 feet by 1909 (Coachella Valley Water District, 1968; Mendenhall, 1909). However, real estate boosters continued to use water access as a major selling point. For example, in a 1914 map of the Coachella Valley, the France Investment Company advertised real estate services by marketing an “abundance of pure artesian water,” government experiment stations for dates, high yields of alfalfa, and sweet potatoes’ net profit per acre (France Investment Company, 1914). By 1918, the cultivated area had increased to 8000 acres (Coachella Valley Water District, 1968).

Water use across the valley was reckless, drilling remained unregulated and profuse, and lowering water levels were ignored by those hoping to encourage land sales and growth. Aquifer depletion did little to slow agricultural growth in the area. Instead, it was treated as surmountable by using gas (and later electric) powered pumping. Criticizing local practices, a government report hoped that higher costs to access water would decrease wasteful water practices. The report’s author wrote, “[h]uman nature can not be trusted to value or to manage well that which costs little. Therefore, artesian waters will be wasted and pumped waters will be used with care in the same area” (Mendenhall, 1909, p. 38). Unfortunately, pumped waters proved to have a minimal effect on valley-wide water depletion. It created water insecurity throughout the region and water scarcity for Indigenous Peoples.

Eastern Coachella Valley Cahuilla found themselves trapped in place by a combination of reservation regulations and a lack of capital. Reservations limited their land access and capacity to access water. Pre-colonial Desert Cahuilla had hand-dug wells, which settler aquifer overdraft had dried up. They moved their villages as water flows changed. However, mobility was curbed

by land dispossession's checkerboard of private/public property and bounded by reservation delineation.

In 1883, government agents reported only one water source remaining of the eleven springs or wells marked in the 1850s maps of the Coachella Valley. They wrote, “[f]rom the best information that we can get this is all barren desert land, with only one spring in it. These Desert Indians are wretchedly poor, and need help perhaps more than any others in Southern California” (Jackson, 1883, p. 35). In 1897, Agent Patton found one non-functioning artesian well on the Torres Reservation (*S. Doc. No. 54*, 1898). Their water access was reported to have marginally improved in a 1909 ground water report of Indio (Mendenhall, 1909). The report listed a single bored well, one artesian well with a depth of 500 feet, nine hydraulic wells, and one remaining hand-dug well with a depth of 18 feet on the Torres Reservation and not a single well on any of the other four reservations (Mendenhall, 1909).

Settlers disproportionately accessed water. In 1910, one well served roughly 50 Desert Cahuilla (Jackson, 1883; Mendenhall, 1909; U.S. Census Bureau, 1910). At the same time, one well existed for every five settlers (of the 2,088 recorded in the Indio, Thermal, and Palo Verde townships) (Jackson, 1883; Mendenhall, 1909; U.S. Census Bureau, 1910). Not only did the Desert Cahuilla lack physical access, but they were also expected to share water with significantly more people than their settler neighbors.

This inequality in water access between settlers and Cahuilla intensified into water scarcity. Desert Cahuilla became unable to alleviate water scarcity themselves. At the turn of the century, only two to three of the seven reservations in the Eastern Coachella Valley had artesian wells (Kelsey, 1906). With their wells, settlers successfully reclaimed between 4,000 and 5,000 acres of land (Crider, 2018; Mendenhall, 1909). Proliferating settler agriculture reduced available

groundwater and aquifer levels. This, in turn, demanded digging deeper and using gas and electric pumps to bring water to the surface. The cost of drilling wells ranged between \$200 and \$3,000 each or about a dollar a foot for labor and casing of the well (Mendenhall, 1909). Under these conditions, accessing water was capital-intensive. However, Cahuilla were unable to make money through agricultural production because their allotments were too small and lacked water access. Their only recourse was to enter the wage labor market where the money they made was insufficient to pay for the cost of construction and subsequent maintenance of the wells needed for water access. Lacking water for their land, Cahuilla resorted to labor in settler agricultural fields adjacent to their lands. There, water access was uninhibited, and they could earn a small amount of money. An example from the report documents:

One of the Indians, unable to farm an acre of his own land, now operates a large Ranch for a white man on land contiguous to, or overlapping the reservation, and is paid 100 a month for this expert service. (*Preliminary Report on Visit to Certain Missions Indian Bands and Reservations*, 1930, p. 2)

This left them wholly dependent on the federal government to fund and provide water access.

In a letter dated August 20th, the Chief and Captains of four Eastern Coachella Valley reservations implored their state representative, Senator Hiram W. Johnson, for help. They wrote,

We, the Indians of Coachella Valley in Riverside County, California, we are making this petition for want of more water on the reservations, the wells that were drilled many year are now gone dry, many Indians on the reservations have no water now, at Cabazon reservation, the Indians that raised onions this season lost there well because that could

not pay for the power bill on account of losing money on the crop the power been cut off next year the Indians won't be able to farm anymore. (Pete et al., 1928)

The letter described both Cabazon and Torres Reservation wells as dry. At Torres, the reservation lacked the power to procure water, instead using a hand pump for access. Their letter, asking for help, invoked the federal government's responsibilities to them as wards, protested and refused the government's land allotment process, and requested the restoration of communal ownership of their lands. They argued that it would "relieve us from great oppression alleviate our unhappiness and will enable us to enjoy that measure of Justice to which we are entitled as wards of the United States government" (Pete et al., 1928).

Unfortunately, their letter did little to resolve their situation. Instead, federal agent neglect and abuse exacerbated water scarcity. Two years later, in 1930, a report on the Mission Indians found that none of the Desert Cahuilla reservations had enough land or water to support agricultural production (*Preliminary Report on Visit to Certain Missions Indian Bands and Reservations*, 1930). The authors of the report found the Torres-Martinez reservation to be completely arid, lacking water. The wells were "too shallow for the present water level, or equipped with machinery which, in some cases is broken, and in other cases produces [an inadequate] flow" (*Preliminary Report on Visit to Certain Missions Indian Bands and Reservations*, 1930, p. 2). However, water was accessible on reservation land that two different government entities had taken for their own agricultural production. The report documented, "twenty perfectly watered acres, which have been taken from the Indians, ten acres being farmed by the Government farmer, and ten, according to this farmers statement, being used as a Date experiment station by the Department of Agriculture" (*Preliminary Report on Visit to Certain*

Missions Indian Bands and Reservations, 1930, p. 2). In addition, immediately outside of the reservation, wells were producing abundant amounts of water to 200 acres for white settler use.

Ongoing government neglect had exacerbated Desert Cahuilla water scarcity. The report documented that the Chief of the Torres, Joe Pete had informed them that the Indian agent had not visited the reservation in 32 years and the government farmer for two. The authors reported:

We saw the evidence of past cultivation and present total starvation for water. We saw the eight acres of cotton planted last year, from which only two bales had been realized; and the farmer, Mr. Humberger, confirmed the statement of the Indians that the ruin of this crop had been due to his own discovery, too late, that the pumping machinery was broken, and could not be repaired by the Government official delegated to that work, in time for the watering of the crop. (*Preliminary Report on Visit to Certain Missions Indian Bands and Reservations*, 1930, p. 2)

The report continued to articulate how the government farmer had taken advantage of his position while also failing to serve his wards:

The Government farmer obviously is not teaching the Indians to farm arid land. He stated to us that it was among his duties to transfer the sick Indians to the Saboba Hospital mentioned below. His knowledge of the facts of the reservation was vague, or he divulged it but vaguely, he informed us that his own salary came from the crops which he reaped on this land belonging to the Indians. The Indians stated that he rendered no services. (*Preliminary Report on Visit to Certain Missions Indian Bands and Reservations*, 1930, p. 2)

The allotment process also created inter-tribal conflict over water use. The federal government had financed and constructed wells on the reservations to be used in common by

tribal members (Captains of the Reservations, 1929). However, allotment's destruction of communal land holdings paved the way for a similar conversion of water from communal to private property. The conflict over the land allotted to August Lomas⁴⁰ illuminates intra-tribal water access obstruction. Lomas was one of 25 named members of the Martinez Reservation who desired allotted land (Pete, 1928). From 1925-1929, he was the subject of correspondence from Chief Joe Pete to allies at the Indian Welfare Association and federal government representatives from the Justice Department and Department of Interior. Having come into the possession of 40 acres of tribal land through a contested allotment process, Lomas had created water insecurity and limited water access for surrounding families by informally leasing his land.

Allotted land was held in trust by the federal government and tribal members were required to receive approval from the federal government for any land lease. Torres-Martinez tribal members had found that Lomas had unpermitted leases with two different men, in succession. First, he leased the land at \$400 per year to a "colored man" (Pete, 1926a). A second lease to a "Mexican man" followed (Pete, 1926a).⁴¹ Neither of the leases were official and Lomas and his tenants had used the pretense of hired labor to justify their land use and occupation (McNabb, 1926; Pete, 1926b). At conflict was the way in which Lomas, his brother, and the two tenants restricted tribal water access and the role that allotment had played in furthering tribal water insecurity.

⁴⁰ Also written as Loomis in letters concerning the matter.

⁴¹ The descriptions of August Lomas' tenants alludes to the differential land access that non-white racialized people faced. And precedes contemporary use of tribal land for farmworker housing in the face of lacking access on private land.

Five families lived near and used the well on Lomas' land prior to allotment . After Lomas received his allotted land, he withheld access to the well. In one letter from Chief Joe Pete, he described how Lomas and his brother:

Would not let no Indian have the water, August and his Brother are the only one's using this well. Joe Reyes used this water be for 3 days and now they have shut it [off] on him. And Cincio Lopez who used the same water for two days and thats shut [off] on him.

In another letter written that same year, Chief Joe Pete describes how Lomas' tenant was also restricting tribal water use:

We have fine that the land & water has been rented out by August Loomis in the Reservation. The man that was there in that place said by August that he was a hired man but we fine that he wasn't. From now on we don't want no one to lease land in the Reservation the Mexican is on the place now and using all the water to himself. We want you to look this matter up soon as you can can because we Indians got to have the water this spring it is nearly planting time now. (Pete, 1926)

By restricting access to tribal well water, Lomas and his tenant exacerbated already existing tribal scarcity that had resulted from too few wells and white settler aquifer depletion.

The well on Lomas' land was not the only one available to the Torres-Martinez. However, the remaining wells provided insufficient water. "We have another well but it is not enough every Indian uses this well every 23 day[s] to one man and there are five Indians using this well," Chief Joe Pete wrote, imploring for help in freeing the well from Lomas' restrictions . This conflict also demonstrates how Cahuilla faced differential expectations for water use. The federal government expected communal use of wells on Indian land. But a single family or farm expected sole use of a well on their land. Not only did the spatial inequality in water access come

from physical inaccessibility between Indian and non-Indian land, but also from the uneven expectations of well use between Indian and non-Indians.

Leases on reservations enabled water monopoly. August Lomas was not the only Desert Cahuilla tribal member who leased their land to non-tribal members. Other informal leases included on the Torres-Martinez Reservation between Ambrosio Costello and the white farmer named Fred T. Aitken and one on Alex Jim's allotment in Coachella (Captains of the Reservations, 1929; McNabb, 1926; Pete, 1926).

Allotment allowed for the individual leasing and profit-making of tribal members. However, tribal leaders protested allotments because they caused water insecurity and the destruction of communal relations. Protesting the allotments and the accompanying restrictions to water access, the captains of the reservations of Cabazon, La Mesa, Toro, and Martinez described their issue with Jim's lease:

Alex Jim an Indian of Coachella, rented his land to a Mexican. He claims he has 40 acres and trust patents issued him. We are now talking about the well water, being drilled by the government many years ago for the other Indians to use it Now this allotment takes this one well aw[a]y from other Indians. (Captains of the Reservations, 1929)

In their 1929 letter to Mr. Goodrich, the captains of the four reservations summarized their position, stating:

We have protested against allotment by petition. All we want is to move out all Mexicans who are on the reservations farming because we allow that no one is allowed on Indian reservation where the United States government provided water for the use of the Indians only. (Captains of the Reservations, 1929)

Unfortunately, the federal government did little to address tribal entreaties.

Although the Eastern Coachella Valley had plenty of water, access was unavailable to the Desert Cahuilla. Settlers dispossessed water by overusing groundwater and producing aquifer overdrafts. Their wells dry, Desert Cahuilla depended on federal government help, but encountered neglect. This resulted in water scarcity and lack of access for Desert Cahuilla. In a place of water abundance, Desert Cahuilla experienced a racialized checkerboard of spatial inequality in water access where Indian land lacked access and non-Indian land had access. This spatial inequality in water access further impoverished the Desert Cahuilla by curbing their ability to use the land for agriculture either for self-sufficiency or profiting from export.

Conclusion

Federal land policies interacting with state water rights encouraged settler dispossession of indigenous land and water sources. Seemingly neutral policies, that surveyed Western territory, granted land to railroad companies, and provided land access to settlers, interacted with policies of racial hierarchy (limiting tribal land through reservations and allotments) and water rights that privatized water. Enacting these policies on the ground, settlers and government agents reconfigured land and water in the Coachella Valley for white settlement and industry formation. These land and water policies were designed from an objective abstraction of on-the-ground conditions and for national growth and expansion. They were sold as equal and neutral and structured to support a seemingly equal and neutral capitalist system.

However, these policies were not neutral. Instead, they operated within an arena of racial hierarchy and power. Settler colonialism interlocked with capitalism, enforcing a racial hierarchy where Indigenous Peoples and their land and water use were inferior to white settlers. Neutral land policies and water rights prioritized white settler use, rights, and profit-making. Enacting

these policies, settlers and government agents created a checkerboard of public and private land that was racialized into Indian and non-Indian land.

Water dispossession went hand-in-hand with this incentivized land dispossession. To cultivate land in the arid Coachella Valley, settlers dispossessed water through water rights, settlements, diversion, and overuse. They left the Cahuilla without water. Cahuilla in both the Western and Eastern Coachella Valleys had neither the financial nor political capital to compete with white settlers. Instead, they faced growing water scarcity and insecurity.

Spatial inequality in water access developed from settler dispossession. The pattern of spatial inequality took the checkerboard shape of public and private, Indian and non-Indian land. Water scarcity induced by water dispossession led to a checkerboard of equally racialized water access. Cahuilla, living on public, Indian land, lacked water access; in contrast, settlers, on private, non-Indian land, had unrestricted water access.

Spatial inequality in water access not only restricted water access on Indian land, but it also deepened socio-economic disparities between Cahuilla and white settlers. Water access and dispossession allowed white settlers to extract value from the, equally dispossessed, land. Settlers used their water access in Western Coachella Valley to subdivide and sell land at a profit and create resort retreats for visiting city dwellers. Lacking water access and the ability to equally profit from their landownership, the Agua Caliente tribal members were forced to end their self-sufficiency agricultural practices and labor for white settlers in and outside the area. In the Eastern Coachella Valley, white settlers used their water access to grow and profit from an agricultural industry, excluding the Desert Cahuilla from entrance. Instead, Desert Cahuilla struggled to survive under new conditions of depravity due to spatialized water inequality.

Chapter 6 Regional Government's Tactics of Exclusion and Dispossession

Introduction

By the late 1910s, white settlement in the Coachella Valley had created water insecurity throughout the region. Settlers had dispossessed the Cahuilla of land and water and their cultural relationships with both. To do so, they secured water rights to the few streams available and depleted the aquifer through overdraft. Spatial inequality in water access developed from water dispossession and scarcity. It followed the racialized checkerboard pattern of public, Indian and private, non-Indian land. Surviving early United States settler colonialism, the remaining Cahuilla lacked access to water while their new settler neighbors expanded their access.

The Coachella Valley County Water District (CVCWD),⁴² “was formed in 1918 to protect and conserve local water sources” (*About Us | Coachella Valley Water District - Official Website*, 2022). Enabling its mandate, the new agency secured rights to the Colorado River and a federally constructed canal (the Coachella Branch of the All-American Canal). However, water from this new water source would not be distributed equitably. Instead, Colorado River water distribution to the Coachella Valley was designed only to serve industrial agricultural production. The district expanded its purview a half century after its establishment, adding domestic water to its responsibilities. The regional government and its new water services and sources did little to alleviate the spatial inequalities in water access that had developed at the turn of the century. Instead, its policies, prioritizing industrial and economic growth, deepened it.

⁴² Today, the agency is called the Coachella Valley Water District, having dropped “County” from its name.

Chapter Six examines how spatial inequality in water access deepened alongside the regional government's water management. Following this introductory section, the three subsequent sections analyze the formation of the CVCWD, how expanding water sources and service produced uneven development, and how prioritizing industry deepened spatial inequality in water access. Often seen as a salve for spatial inequality, the case of water access in the Coachella Valley demonstrates how institutional priorities or values matter more than the regional government scale when addressing spatial equity. Here, the regional government reserved water access for economic growth and industry, which deepened existing spatial inequalities. New east/west and center/periphery spatial patterns of inequality in water access overlaid the existing racialized checkerboard pattern between Indian and non-Indian land.

Forming a Regional Government: the Coachella Valley County Water District

Water rights controlled water distribution in California during early United States settler colonialism. Riparianism and prior appropriation rights enabled settler claims and theft of surface water sources throughout the state. Newspaper reporters in 1886 “found that a relatively small number of people had filed appropriation claims on nearly all California’s rivers and often for several times more water than was available” (Hundley, 2001, p. 99). To resolve the state’s water scarcity and monopoly, small farmers and lawmakers proposed community-controlled irrigation districts.

The Wright Irrigation District Act, passed in 1887 and named for the Modesto lawyer who proposed it, was designed to stem land and water monopoly and encourage localism, small family farms, and laissez-faire ideals (Hundley, 2001). The Wright Act initiated the formation of various types of water agencies throughout the state. It allowed residents to create a special government district for water distribution within a locally determined boundary. New districts

included an elected board of directors. And gave them the ability to issue bonds, raise funds, and purchase land and water rights. Once formed, water rights were transferred from private individuals or corporations to the irrigation district.

Unfortunately, districts organized under the new legislation had high rates of failure (Hundley, 2001). Opposition from large landholders, constituent reliance on court rulings regarding water rights, policy restrictions on bond interest rates, and local ignorance of good irrigation practices contributed to the difficulty in keeping irrigation districts in operation. In addition, the Wright Act did not include appropriate levels of state supervision over these new districts (Hundley, 2001; Legislative Analyst's Office, 1922). By 1925, only seven districts formed during the law's first ten years had survived (Legislative Counsel Bureau, 1925). However, new amendments made after 1909 changed and strengthened the law, resulting in the formation of irrigation districts at a rapidly increased rate.

State legislators had passed amendments stipulating different types of irrigation districts including the Water Storage District Act (1921), the Water Conservation District Act (1923), the County Water District Act (1913), the Water District Act (1913), and the Water Commission Act (1913). Each of these districts held varying powers for acquiring, distributing, and governing water resources. Communities could choose between the different district types, and based their decision on which best fit their local water and control needs. However, general provisions governing all irrigation acts transformed water from private to public property. The law declared appropriated water a public use, subject to the regulation and control of the state.

In 1917, less than one percent of land in the Coachella Valley was actively cultivated (Coachella Valley Water District, 1968). New water sources were needed to maintain reliable water and profit. In accordance with the County Water District Act, residents of the Coachella

Valley presented their petition to form CVCWD to the Riverside County Board of Supervisors on December 5, 1917 (Coachella Valley Water District, 1968; Crider, 2018). They had held mass meetings in Palm Springs, Thermal, Mecca, Cabazon, and Coachella (Coachella Valley Water District, 1968). Seventy-eight men and women signed the petition and appointed a committee to develop a proposal for protecting their water sources from diversion (Coachella Valley Water District, 1968). Led by Dr. S.S.M. Jennings, the committee concluded that a County Water District would be the best organizational structure to protect their water. To the Riverside County Board of Supervisors, they claimed that it could protect water sources from “encroachment by outside syndicates proposing to tap the stream flows” (as cited in (Coachella Valley Water District, 1968, p. 4). They proposed a valley-wide jurisdiction for the new water district and held an election on January 9, 1918, where 324 citizens voted in favor and 49 voted against establishing the new regional government agency.

Immediately after formation, CVCWD hastily began to protect existing water sources in and acquire new sources outside of the Valley. CVCWD and its board gained the powers to buy, lease or sell property; construct, purchase or lease waterworks, including canals and reservoirs; acquire water rights for irrigation and power; and store water for future use. To help them gain water rights and construct new waterworks CVCWD could exercise eminent domain, enter into contracts with the federal government, borrow money and incur indebtedness, issue bonds, and levy taxes on property owners within its jurisdiction. CVCWD used these new powers shortly after residents voted in favor of the agency. On October 16 of that same year, the district filed for water rights on all unappropriated waters of the Whitewater River (Coachella Valley Water District, 1968; Crider, 2018). The next year, in 1919, CVCWD entered into a contract with the federal government to survey canal routes to bring water from the Colorado River to the

Coachella Valley (Crider, 2018). With both actions, CVCWD used water dispossession to increase water for the area's agricultural interests.

Uneven Development as an Outcome of Expanding Water Sources and Services

“With the bringing of Colorado river water to the Coachella Valley, a vast agricultural empire is in the making. The resort and agricultural developments are growing closer together year by year. Within the next decade the two will be joined to form an area comparable to the Salt River Valley surrounding Phoenix.” (Jaynes, 1949)

Coachella Valley's farmers designed CVCWD to prioritize agricultural industry use in its water management and governance. Its board was composed of farmers who directed water provision towards irrigating the Eastern Coachella Valley. As such, it filed for rights to the Western Coachella Valley's Whitewater River to protect the region's natural aquifer recharge and manually direct water east. Contracts between the district and the federal government for Colorado River conveyance made its industrial growth values law.

Allocation as Dispossession: Whitewater Adjudication

One of CVCWD's first actions as a new irrigation district was to claim water rights on the Western Coachella Valley's Whitewater River. The river system was central to replenishing the Valley's aquifer. In 1918, CVCWD filed with the state for all unappropriated water rights to the Whitewater River.

Early settlers had appropriated the Whitewater River and the Tahquitz and Andreas Creeks for their own use in the late 1800s. Previously, the river and its creeks provided centuries of reliable water to the Palm Springs area. The Agua Caliente harnessed the Tahquitz and Andreas Creeks with stone irrigation channels that fed their agriculture at the foot of the mountain range. But settlers diverted water from tribal irrigation channels, hired tribal members to build new channels connecting the Whitewater River to the Palm Springs village, and filed for

water rights on all surface water that made up the Whitewater River system. Diverting water and transforming it into property through rights claims, settlers created water scarcity for the tribe.

The Agua Caliente tribe's water scarcity was deepened by CVCWD's new claims on its water. CVCWD's petition for all unappropriated water rights to the Whitewater River system triggered the California Department of Public Works' Division of Water to study and determine the quantity of water for each of the prior appropriator (*Agua Caliente Band of Cahuilla Indians v. Coachella Valley Water District: Complaint for Declaratory and Injunctive Relief*, 2013). The 1922 report found that the United States had prior appropriation rights to the system's Tahquitz and Andreas Creeks on behalf of the Agua Caliente Reservation.

On April 23, 1928 the Division of Water Rights recorded its "Order Determining and Establishing the Several Rights by Appropriation to the Use of the Waters of the Whitewater River Stream System," allocating allotments of water to each rights holder (Whitewater River Adjudication Proceedings, 1928). The state agency determined that the United States was entitled to divert water from the Hathaway Creek, Potrero Creek, Mission, Creek, Tahquitz Creek, and Andreas Creek for Morongo, Mission Creek, and Agua Caliente Indian Reservations' domestic, stock watering, power development, and irrigation purposes.

It partially upheld Agua Caliente priority rights. It set the start of their rights on January 1, 1893 for the Andreas Creek and April 26, 1884 for the Tahquitz Creek; dates when settlers had filed claims on their water. But it dispossessed the Agua Caliente of water by establishing a water allocation that limited the quantity available to the tribe to just 8,000 acre feet per year. This amount of water diminished the tribe's irrigation capacity to only 40 to 50 acres out of the reservation's 10,000 available for agriculture (Indian Defense Association of Santa Barbara, 1924).

The state agency's adjudication of water rights to the river system's streams limited Agua Caliente's water access. The state agency disregarded the Agua Caliente's water use before white settlement. And it restricted the tribe's allocation to an amount that, according to the Winter's Rights supreme court ruling, was sufficient to fulfill the reservation's purpose. In their 1924 "Suggestion," responding to the adjudication proceedings on behalf of the tribe, the federal government wrote, referring to the Agua Caliente's Tahquitz Creek water use, that, "it is known that these lands were irrigated by them as early as 1835 and practically continuously since that time to the year 1914" (as quoted in *Agua Caliente Band of Cahuilla Indians v. Coachella Valley Water District: Complaint for Declaratory and Injunctive Relief*, 2013, p. 9).

Dispossessing the reservation's water allowed CVCWD to secure new water sources for Eastern Coachella Valley's agriculture. Through the state's adjudication, CVCWD gained over 110,00 acre feet per season to protect and grow the approximately 8,000 acres under cultivation by farmers (Coachella Valley Water District, 1968; Whitewater River Adjudication Proceedings, 1928). Although CVCWD prioritized water use for agricultural irrigation, it did not extend its mandate to tribal land. It dispossessed the tribes of water and economic participation in favor of settler use, deepening the spatial inequality in water access between Indian and non-Indian land.

Tapping the Colorado River for Growth

The Colorado River naturally snakes through the southwestern United States and into northwestern Mexico before emptying into the Gulf of Mexico. During extreme flooding, or when carrying large amounts of silt, the river would temporarily and naturally divert from Mexico and back into the United States through the Imperial Valley, filling the Salton Sink and forming the Salton Sea. Harnessing the river for use in the United States became an important endeavor for settler colonial communities adjacent to its watershed.

In the 1890s, a United States settler and former United States Reclamation Service engineer, Charles R. Rockwood, constructed the first manmade diversion of the Colorado River into Imperial Valley (Crider, 2018). Rockwood built the Alamo Canal mostly through Mexico using the dry bed of the Alamo River wash. He gained access to the right of way after establishing the Mexican corporation, La Sociedad de Irrigación y Terrenos de Baja California, S.A., and agreeing to share the canal water with Mexico. Rockwood hoped the canal would create “a lucrative farming industry that would supply and deliver harvested crops and vegetables via the Southern Pacific Railroad to large population centers back east” (as quoted from the Imperial Irrigation District website in Crider, 2018, p. 22). Indeed, the Alamo canal supported Imperial Valley’s rapid growth as the population ballooned from almost zero in 1900 to 50,000 in 1915 (Crider, 2018).

However, the long and circuitous route into and through Mexico meant that Imperial Valley farmers had little control over the water amount and quality available for their agricultural production. In 1918, the Imperial Valley had produced crops valued at more than \$30,000,000 (*Hearings before the Committee on Irrigation of Arid Lands House of Representatives Sixty-Sixth Congress on the Bill to Assist in Increasing the Productive Agricultural Area of the Imperial and Coachella Valleys, Calif., and for Other Purposes*, 1920). However, these profits were susceptible to the river’s fluctuating water supply, Mexican control of the stream, and the unreliable maintenance of the Alamo Canal (Crider, 2018; *Hearings before the Committee on Irrigation of Arid Lands House of Representatives Sixty-Sixth Congress on the Bill to Assist in Increasing the Productive Agricultural Area of the Imperial and Coachella Valleys, Calif., and for Other Purposes*, 1920). To improve the precarious water supply precarity, Imperial Valley farmers, followed quickly by Coachella Valley agricultural stakeholders, concluded it necessary

to build a new canal that bypassed Mexico, diverting the Colorado River at a location within the United States (Crider, 2018). The bid for this All-American Canal leveraged the federal government's 1902 Reclamation Act and California's Irrigation District Acts.

Congress passed the Reclamation Act in response to decreasing Western water resources for increasing settlement. Western states lacked precipitation. At the same time, new settler water demand exceeded natural water supply. Meeting settler demand required implementing properly engineered and constructed irrigation projects (Bureau of Reclamation, 2018).⁴³ They needed water infrastructure that could carry water at large scales for agricultural production. A key argument in the Act's passing was the belief that the program would encourage settlement through family farms. The Act created a revolving loan that funded land reclamation. The sole purpose of the fund was to construct and maintain irrigation "for the storage, diversion, and development of waters for the reclamation of arid and semiarid lands" in the Western states (The Reclamation Act, 1902, p. 31).

Imperial and Coachella Valley growers seized on the Reclamation Act's prioritization of westward and agricultural industry expansion. Using state law, they created irrigation districts, which allowed them to take advantage of the Act's reclamation fund. They argued that the All-American Canal was necessary to prevent existing profitable agriculture from suffering and becoming fallow and regional growth from stymying (*Hearings before the Committee on Irrigation of Arid Lands House of Representatives Sixty-Sixth Congress on the Bill to Assist in Increasing the Productive Agricultural Area of the Imperial and Coachella Valleys, Calif., and*

⁴³ The Western States and territories of the Reclamation Act include: Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Utah, Washington, and Wyoming (The Reclamation Act, 1902).

for Other Purposes, 1920). Referring to the Imperial and Coachella Valleys, the Secretary of the Interior wrote, “[a]s irrigation in this country is practiced practically throughout the year and crops are raised during the entire period, the land would nevertheless have ample supply to produce certain crops sufficient for a profitable investment and enable the landowner to meet the obligations which will accrue under this bill” (*Hearings before the Committee on Irrigation of Arid Lands House of Representatives Sixty-Sixth Congress on the Bill to Assist in Increasing the Productive Agricultural Area of the Imperial and Coachella Valleys, Calif., and for Other Purposes*, 1920, p. 7). Supporters of the canal claimed it would cultivate an additional 200,000 acres in the Imperial Irrigation District and an additional 300,000 acres in the Coachella Valley. They used the power of those districts to lobby their federal-level representatives and senators to approve the All-American Canal’s federal funding and construction.

The Reclamation Act empowered the two irrigation districts to divert and dispossess Colorado water. The path to accessing the water was more bureaucratic. Between 1918 and 1947, CVCWD entered into five separate contracts with the federal government to fund and construct the All-American Canal and its Coachella Branch (Chenoweth, 1959). CVCWD’s board started its quest for Colorado River water by approving \$5,000 in 1919 to support a survey for a canal route (Coachella Valley Water District, 1968; Crider, 2018). In 1921, a contract under the Kincaid Act provided a survey for the canal route that would bring water into the Coachella Valley (Crider, 2018). Congress authorized the All-American Canal construction financing with the 1928 Boulder Canyon Project Act (Crider, 2018). However, its contract for canal construction was not signed until 1934 due to conflicts between CVCWD and the Imperial Irrigation District (IID) (Crider, 2018).

Central to the dispute was the contract's provision that required CVCWD to partner with IID. The partnership was supported by the district's board and the United States Bureau of Reclamation (Crider, 2018). They believed the partnership made canal construction more cost effective. Engineers for the district estimated a cost savings of \$22 per acre. However, a group of Coachella Valley farmers disapproved of the single contract between the districts and the federal government. They believed partnering with IID would lead the Coachella Valley to an inferior status with junior water rights.

The farmers also decried the funding mechanisms for construction. The contract outlined that Coachella Valley landowners could face the risk of losing their property if any landowners defaulted on their tax payments. The contract tied them to landowners in the Imperial Valley whose lack of tax payments would cause IID to seek bankruptcy twice in the 1930s. To protect their land and water interests, Coachella Valley voters recalled the district's board members and replaced them with ones who supported a separate contract between CVCWD and the federal government for the Coachella Branch of the All-American Canal.

On October 15, 1934, CVCWD signed a contract with the federal government for \$38.5 million to build the Imperial Dam and the All-American Canal (Crider, 2018). Construction on the 123-mile canal for the Coachella Branch started in August 1938 and was not completed in June 1948 (Crider, 2018; Water Systems Consulting, Inc., 2021). Construction on its underground water distribution system started in 1948 (Water Systems Consulting, Inc., 2021). Completed in 1954, the system distributed water to over 78,000 acres through 500 miles of concrete pipeline (Crider, 2018). Water from the Colorado River arrived in the Coachella Valley in 1949, 30 years after the CVCWD first took the necessary steps to acquire the water source for

the region (Crider, 2018). However, Colorado River water would take another couple of decades to reach Indian land and the Western Coachella Valley.

Preventing Access by Refusing Infrastructure: Colorado River Distribution

In pursuit of federal funding and approval, state interests divided the Colorado River water rights among themselves. The 1922 Colorado River Compact (the Compact) between Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming divided the Colorado River Basin into a lower and upper systems (Colorado River Compact, 1922). It allocated the river's waters to the seven states and ignored prior tribal water use (Curley, 2021).⁴⁴ It dispossessed the Colorado River's Indigenous users by excluding them from the Compact.

The Compact, signed by governor-appointed commissioners from each state, allocated each of the basins 7,540,000 acre-feet of water per year exclusive to beneficial consumptive use (Colorado River Compact, 1922). The estimated 15 million acre-feet of the Compact overallocated the river's water. It articulated that the main purpose of the Compact and the apportionment was "to secure the expeditious agricultural and industrial development of the Colorado River Basin" (Colorado River Compact, 1922, article 1). The Compact failed to recognize prior use of the Colorado River, despite tribal reliance on the waters for daily use in multiple states throughout the Basin (Curley, 2021). It made them "both less than the authority of the state governments and not a part of the state's inherent water interest" (Curley, 2021. p. 714).

⁴⁴ The amount of water allocated to the Coachella Valley would not be specified nor finalized until 2003 with the Quantification Settlement Agreement between the Coachella Valley Water District, Imperial Irrigation District, the Metropolitan Water District, San Diego County Water Authority, the State of California, and the United States, Department of Interior. The Quantification Settlement Agreement establishes the amount of water each of the districts would receive from California's allocation of the Colorado River under the 1931 Seven Party Agreement (Crider, 2018). Under this agreement, CVWD has third priority position water rights to the first 3.85 million AFY allocated to California following the Imperial Irrigation District (Water Systems Consulting, Inc., 2021).

Cahuilla exclusion from Colorado River water access was ratified and partially alleviated through the 1928 Boulder Canyon Project Act, the 1931 Boulder Canyon Project Agreement, and the 1934 contract that federally funded the Coachella Branch and allocated the Colorado River water to various parties within the seven states. The contracts between CVCWD and the Bureau of Reclamation congressionally ratified California's share of the Colorado River water rights. It gave the Coachella Valley third-priority rights to Colorado River water. And it delineated the land within the CVCWD that could be served by Colorado River water.

In 1928, congress approved the Boulder Canyon Project Act. The Act further articulated how Colorado River water and its accompanying infrastructure projects would be used by each of the seven states. The Act included the authorization of the All-American Canal to bring water to the Imperial and Coachella Valleys. This was followed by the 1931 Boulder Canyon Project Agreement that apportioned California's water rights to the Colorado River between the Palo Verde Irrigation District, IID, CVCWD, the Metropolitan Water District of Southern California, the Cities of Los Angeles and San Diego, and San Diego County. The agreement gave third priority rights to "Imperial Irrigation District and other lands under or that will be served from the All-American Canal in Imperial and Coachella Valleys to not exceed 3,850,000 acre feet per year" (Boulder Canyon Project Agreement, 1931). Neither tribes nor the federal government received allocations or water rights to the Colorado River within this early legislation.

However, CVCWD's 1934 contract with the Bureau of Reclamation partially recognized Cahuilla water use and rights to the Colorado River water. The contract delineated the Coachella Valley's water rights by outlining the district's allocation and the area within its jurisdiction where water could be used. The contract created Improvement District 1 (ID 1) within the CVCWD's territory. ID 1 encompassed a total area of 137,000 acres, 76,000 of which were

irrigable (Coachella Valley Water District, 2020). It covered most of the East Valley and the northern part of the West Valley (north of today's Highway 10) (Water Systems Consulting, Inc., 2021). The contract stipulated that Colorado River water conveyed to the Coachella Valley be used for potable and irrigation purposes within the ID 1 territory (Crider, 2018). ID 1 left out most of the Western Coachella Valley, including the Palm Springs area and the Agua Caliente Reservation. It reserved the majority of Colorado River water for the Eastern Coachella Valley, creating a regional unevenness in access between east and west.

Inclusive of ID 1 was both Indian and non-Indian irrigable land. Tribal land included in the service area were three Desert Cahuilla reservations: Torres-Martinez, Cabazon, and Augustine. Each of these reservations held potentially irrigable land if serviced by the Colorado River water, including: 7,739 acres at the Torres-Martinez Reservation, 607 at Augustine, and 1,803 at Cabazon (*Comments of Bureau of Indian Affairs*, 1957). For tribal communities and the federal government, the inclusion of reservations within the 1934 contract obligated CVCWD to provide tribal access to Colorado River water by constructing irrigation distribution lines to their land. However, CVCWD refused to build a distribution system that included the reservations (*Comments of Bureau of Indian Affairs*, 1957; "Saund Discloses Plans for Pumping Irrigation Water to Indian Lands," 1959). This deepened the spatial inequality in water access between Indian and non-Indian land in the Eastern Coachella Valley by excluding the Desert Cahuilla from water infrastructure access.

Aquifer depletion and water scarcity continued to grow on tribal land during the 30 years it took to receive Colorado River water. Coachella Valley's agricultural production expanded during those years. The acres under cultivation in the region had almost doubled from 11,500 to 19,000 between 1918, when CVCWD was formed, and 1949, the year after water from the

Colorado River arrived in the Coachella Branch (Crider, 2018). While aquifer overdraft had initiated the formation of Coachella Valley's new irrigation district, it did little to stop increased settler groundwater pumping. In 1947 over 100 new wells were drilled, providing supplemental water to existing farmland or wells for new farmland (Crider, 2018). Agricultural growth relying on groundwater and, without additional water sources, had rapidly decreased the aquifer even further (Crider, 2018). In 1948, the Chief Engineer and Manager of the CVCWD, J.H. Snyder, wrote in the year's annual fiscal report:

The threat of real disaster due to absolute failure of water in wells is greater now than at any time in the history of the Valley. It is estimated at this time that there are 25,000 acres of ground under actual cultivation in Coachella Valley. With a water supply adequate for only 9,000 to 11,000 acres, the seriousness of the excess uses are readily apparent. (as quoted in Crider, 2018, p. 41)

For non-Indian land in the Valley, the arrival of the Colorado River water alleviated overdraft concerns and expanded agricultural production and profits. Between 1947 and 1954, cultivated acres in the Coachella Valley increased from 19,725 to 50,446 (Crider, 2018). Not only did the acres put into production increase, but also the value of crops and vacant desert land. Per acre crop income tripled from \$154 in 1940 to \$480 in 1954 (Crider, 2018). Meanwhile, 'raw desert land' started at a value of \$25 per acre in 1940 and increased to \$250 per acre in 1954 (Crider, 2018). Reporting on the effects of the Colorado Water on land and crop values, CVCWD wrote how it was indicative of "the magic touch of irrigation where the application of water can bring a crop income of \$500 per acre from land otherwise unproductive and worthless even for grazing" (as quoted in Crider, 2018, p. 42).

Managing the Colorado River water, CVCWD created uneven development throughout the Coachella Valley. This uneven development was based in agricultural production. Land with access to canal water could maintain and expand agricultural production. Colorado River access meant that cultivation was possible on land lacking groundwater access. This water access also increased land values for already producing and uncultivated desert land. And canal access increased the profitability of land. It created a regional economic boom (total gross crop income increased from \$2.5 million in 1940 to \$24.6 million in 1954 (Crider, 2018)) for some and further entrenched poverty for others.

A reporter writing an article for the Palm Springs Villager in 1948 documented their visit to the Torres-Martinez Reservation, calling it “squalor bred of poverty” (Morris, 1948, p. 1).⁴⁵ In the article, Torres-Martinez tribal member Eleanor Levy discussed their situation. She was quoted saying:

‘All of this land used to be ours,’ says Eleanor, waving an arm that encompasses the date gardens far off to the west and the tops of the mountains to the east. ‘But now all we have is this piece of land and some of us have the forty acres that the government gave us to

⁴⁵ In 1948, the County of Riverside’s Health Department gained permission from the federal government to clean up what they considered undesirable conditions on the reservations within their jurisdiction, including those near Indio and Cabezon (“County Acts to Clean Up Indian Lands Health Officer Is Given Authority to Enforce Rules,” 1948). The County had “contended that non-Indian squatters on reservation lands created the major sanitation problem” (“County Acts to Clean Up Indian Lands Health Officer Is Given Authority to Enforce Rules,” 1948). To resolve the issue, the County sought control over health and safety conditions on the reservations, including access to potable water. Decades of limited water access on reservation land, combined with federal government regulations on and control of land leasing, had impoverished tribal members. As the Valley grew, tribal land also became a cost-effective refuge for residents who could not afford or access non-tribal land (because of race and income). As a result, the lack of water access on reservations affected the living conditions of both tribal members and their tenants. For an in-depth history of the contestation in Western Coachella Valley between the Agua Caliente Tribe of Cahuilla Indians and the City of Palm Springs over the conditions in the reservation’s Section 14 see Ryan M. Kray’s dissertation, *Second-Class Citizenship at a First-Class Resort: Race and Public Policy in Palm Springs* (2009).

farm. But we have no water and we have no machinery and so we have no farms.

(Morris, 1948, p. 1)

The article's author found that a single water tap provided potable water to all tribal members, who shared a tin cup and a "one-cylinder pump that moves barely enough water to provide the base household needs of the fifty-odd Indians" (Morris, 1948, p. 1). The author found this water access "quaint and picturesque" (Morris, 1948, p. 1). Their plight, which the tribe argued resulted from federal government failure, was promised resolution by the local government's assurance they would share the incoming canal water (Morris, 1948). Despite local government promises to the Torres-Martinez, CVCWD refused to construct irrigation pipelines to their lands.

Federal action was needed to force CVCWD into providing infrastructure equity between Indian and non-Indian land. The federal government spent 20 years negotiating with CVCWD to extend the distribution system to reservation land (Saund, 1958). Congress passed several bills to resolve the situation. However, CVCWD refused to comply. A key impasse was the financing of the service lines.

The Bureau of Indian Affairs reported that:

Negotiations with the district under the 1950 act were unsuccessful because the district was unwilling to assume the financial obligation involved in extending the system to the Indian lands even though the government guaranteed the payment of assessments against the Indian lands to cover the construction costs. (*Comments of Bureau of Indian Affairs*, 1957, p. 139)

CVCWD representatives alluded to this future conflict in a 1949 congressional deposition for congressional bill H.R. 4584 that proposed system extension to tribal land. Chief Engineer and General Manager of CVCWD, J.H. Snyder, acknowledged tribal water depravity in his

deposition statement, stating that “Indian lands have stood static for a long time. The wells which were drilled have gradually dried up, until there is no longer a source of water” (*Deposition of Lands on the Cabazon, Augustine, and Torres-Martinez Indian Reservations in California*, 1949, p. 28). However, the district valued market-based return on investment over indigenous water security. Snyder’s stance on irrigation construction financing illuminated this when he told the committee that “[t]he prime thing in this bill is that these Indian lands are to repay on the same basis as the private lands within the district...The Indian lands shall be treated exactly the same as those in private ownership.” (*Deposition of Lands on the Cabazon, Augustine, and Torres-Martinez Indian Reservations in California*, 1949, 28). Insisting on equal treatment in payment between Desert Cahuilla and private land, CVCWD ignored the differential land value and capacity for production between the two types of land. Instead, the district upheld settler colonial values of private property and market-based thinking, deepening existing spatial inequality between Indian and non-Indian land by excluding Indian land from Colorado River water access.

CVCWD’s refusal to provide tribal land with canal water was combined with its refusal to pay tribal landowners for using their land to lay a distribution pipeline. In comments regarding a bill, “for the consideration of an irrigation distribution system and drainage works for restricted Indian lands within the Coachella Valley County Water District,” proposed in 1957 by Congressman Saund, Assistant Secretary of the Interior, Roger Ernst, discussed this new attempt at land dispossession. He relayed that:

Some of the drainage works for the distribution system that is now administered by the district have been constructed by the district on Indian lands without obtaining the necessary rights-of-way, and the bill authorizes the secretary to take such rights-of-way and to convey them to the district after the district has paid the Indian owner reasonable

compensation therefor. This authority will resolve a source of friction between the Indians and the district that has existed for some time. (*Comments of Bureau of Indian Affairs*, 1957, p. 140)

To prevent future land theft, the proposed bill also stipulated that CVCWD's use of eminent domain required full payments to the tribe or tribal members.

The bill helped to resolve past land theft and extend irrigation onto tribal land. However, the Torres-Martinez remained opposed to its stipulations. In Congressman Saund's account, he discussed changes he made to the bill due to tribal contestation. Chronicling the bill's passage, he wrote in the *Calexico Chronicle*:

Early this year, two of the tribes -the Augustine and Cabazon- made their decision to support the bill and requested me to seek its enactment. But the tribal chairman of the Torres-Martinez Tribe maintained his opposition. To resolve misunderstandings, I arranged a special meeting between the Torres-Martinez chairman and officials of the Coachella Valley County Water District. The tribal representative still continued to oppose the bill. I conveyed this information to the Interior Committee chairman and the Bureau of Indian Affairs, and it was decided to amend the bill so that the Torres-Martinez lands were not included in the bill's scope, but that members of the tribe could request construction of irrigation and drainage works later if they wished to do so. (Saund, 1958)

The bill, H.R. 9239, became law at the end of the 85th congress in 1958. It instructed the construction and consolidation of an irrigation distribution and drainage system on the Cabazon, Augustine, and Torres-Martinez Reservations to the existing CVCWD system. Taking into consideration the Torres-Martinez opposition, it required that:

Irrigation and distribution system and drainage works shall be constructed on the Torres-Martinez Indian Reservation only upon the request of the Indian owners of the lands to be irrigated thereby and a determination by the Secretary of the Interior that the construction of the irrigation distribution system and drainage works is economically feasible. (An Act to Provide for the Construction of an Irrigation Distribution System and Drainage Works for Restricted Indian Lands within the Coachella Valley County Water District in Riverside County, California, and for Other Purposes, 1958, p. 968).

Having failed to resolve the disagreement with the Torres-Martinez chairman, the tribe was left out of the bill. Instead, the law required 1) requests from individual tribal members for consolidation and 2) vetting of financial and economic feasibility before construction. The bill passed and groundbreaking for irrigation lines began in 1960 for over 10,000 acres on the Cabazon and Augustine Reservations in the Eastern Coachella Valley (“2,200 Acres of Indian Lands Opened Augustine, Cabazon Reservation Lands Slated for Leasing,” 1960; “Saund Discloses Plans for Pumping Irrigation Water to Indian Lands,” 1959). However, in accordance with the new law and their opposition, infrastructure was not extended onto the Torres-Martinez Reservation at that time.

Deepening Spatial Inequality by Adding Domestic Water for the Tourist Industry

Until the 1960s, CVCWD only provided water for agriculture. This water came from a single source, the Colorado River. During a congressional visit, the general manager of CVCWD, Lowell Weeks, presented testimony on the Valley’s water sources. Weeks stated that while farmers in the district pumped approximately 60,000 acres of groundwater in 1958, “[w]e, as a district, do not pump any underground water from the underground. This is by private wells, Private companies, mutual water companies” (Chenoweth, 1959, p. 26). Two years later, in

1961, having acquired the Palm Desert Water Company, its wells, and storage facilities, CVCWD began pumping groundwater to serve 700 new domestic water customers (Crider, 2018).

Rapid growth in the Coachella Valley during the mid-twentieth century pushed CVCWD into the domestic water business. As farmers in the Eastern Coachella Valley were busy forming CVCWD and acquiring new water sources, settlers in Palms Springs, having lost Whitewater River water to the district, abandoned agricultural production. Referring to contestation over the use of the Tahquitz Canyon water between the Agua Caliente tribe and early Palm Springs settlers, a 1939 letter from Gairant Humpharys described the area's change from agriculture to leisure:

Six landowners were recognized at that time as being entitled to use water, and all of them owned farms... It was a farming community and, as evidenced by the contract, the domestic use was small. Since the time that contract was made the resort city of Palm Springs has come into existence, and most of the land for which the parties to that contract were entitled to use water has been included within the City of Palm Springs, and has been subdivided for residential and business purposes. The landowners no longer use Tahquitz Creek water for domestic purposes, and have not done so for a long time.

The present use of that water so far as the non-Indians are concerned is principally for the irrigation of lawns and shrubs. (Humpharys, 1939, p. 2)

While their original water use was primarily for agricultural purposes, these early settlers, including John McCallum, Dr. and Mrs. Coffman, and Welwood Murray and his wife Elizabeth, had arrived in the Palm Springs area attracted to its potential as a tourist destination for healing (Kray, 2009). The Murrays had built Palm Springs' first hotel, the Desert Inn, in 1886 (Dayton

Shaw, 1999). In 1909, the Murrays transformed the Inn's focus from health and recuperation to leisure and retreat. The Inn:

Combined informality with cabin-style accommodations, offered childcare and schooling, touted Indian fiestas and horseback riding as possible entertainments, and possessed a swimming pool and parking lots. The stucco-faced, mission style building graced with red-tile roofs and palm trees. (Dayton Shaw, 1999, p. 81)

Early resort development in Palm Springs used caricatures of local indigenous communities and a fictional Spanish colonial past for tourist entertainment while creating indigenous water scarcity.

Growth in the Palm Springs area was boosted by encouraging visitors from Los Angeles to visit both the Western and Eastern sides of the Valley. A 1905 article in the Los Angeles Times recommended visitors take the train to Palm Springs and tour the adjacent canyons on burro and mule (City of Coachella, 2019). In Indian Wells, they were encouraged to seek "a spot [with] the romantic loveliness of which I have never seen surpass in any part of the world" before traveling to Coachella with a "wealth of greenery" and "the Indian reservations of the Torres and Martinez, nooks of the so-called desert that for natural beauty might be the park lands of a rich man's country home" (City of Coachella, 2019, p. 88).

By the 1920s, the area's popularity as a tourist destination had increased. A single winter season could bring up to 30,000 visitors to Palm Canyon (Dayton Shaw, 1999). Assessing the area's water access, the Department of Interior also concluded that the land's potential lay in tourism. In his 1924 letter, Department of the Interior Supervising Engineer, H.K. Palmer, analyzing the conditions of the Agua Caliente Reservation, predicted the area's tourist-led growth, writing:

The Agua Caliente Reservation contains 31,200 acres, nearly all of which is unsuitable for agricultural purposes, either because it is located on the rocky slopes of the mountains or because the soil is almost pure sand. It is located east of Mt. San Jacinto, which is 10,000 feet high, and is protected by it from the prevailing westerly winds, which makes it an ideal location as a winter and health resort. It is, therefore, likely that the region around Palm Springs will never be devoted to agriculture, but will become one of the principal resorts in Southern California. (Palmer, 1924, p. 3)

This growth was quickly realized. Resorts opened throughout the western side of the Coachella Valley including the La Quinta Hotel in 1926, El Mirador Hotel in 1928, the Racquet Club of Palm Springs in 1934, and the Desert Spa in 1940 (City of Coachella, 2019). A 1936 report regarding irrigation for the Agua Caliente Reservation noted that:

The town of Palm Springs has, in the last few years, become a popular winter resort, and the Palm Valley Water Company found a ready market for this water for domestic purposes, but it certainly could never be used economically for irrigation. (*Report in Answer to Office Letter of 5-18-1936 Irrigation 9068 - Agua Caliente (Palm Springs) and Same of 9-17-1936*, 1936, p. 6)

As Palm Springs' notoriety as a resort town grew, the 1959 Agua Caliente Equalization Act transformed tribal land by approving long-term leases.⁴⁶ Arguing in support of equalization, the Under Secretary of the Interior stated that:

⁴⁶ Passed on September 21, 1959 the Agua Caliente Equalization Act was designed to equalize the value of allotments made to tribal members through reallocation, sale of surplus tribal land, and increase in lease lengths. Prior to the Equalization Act, Agua Caliente land could only be leased for five years. The change in law significantly increased the value of Agua Caliente land. In 1938, 100x100 foot residential lots rented for \$25 a month and commercial lots for \$55 a month (Bowers, 1965). In 1960, longer tribal land

The tribal lands that are left are not lands which the Indians use or intend to use themselves. Palm Springs is a winter resort area, and the tribal lands are regarded only as an investment asset, not as an area for Indian use and occupancy. The most businesslike method for handling the lands as an investment asset is to put them in the hands of business organization. (*Comments of Bureau of Indian Affairs*, 1957, p. 131).

For those invested in the growth of Palm Springs, long-term leases on the reservation offered new developable land. Realtor Culver Nichols discusses tribal land's growth potential in a 1965 article on the Agua Caliente:

We are just beginning to realize that the delay in opening up these Indian lands is probably a good thing that will hasten the wonderful development that is already underway. As a result of the unique pattern of land ownership that caused the city to develop largely on the alternate sections that were Southern Pacific land, all of the large parcels of Indian land have not been subdivided or broken up into small lots to meet the smaller needs of earlier years, as is true in most cities. These big parcels of land are made to order for large scale, beautiful and well planned construction. (Bowers, 1965, p. 23)

By the mid-twentieth century, federal laws pushing private property had teed up Agua Caliente tribal land to accommodate the rapidly expanding tourist industry.

Tourism-led growth expanded east from Palm Springs, creating an urban core throughout the southwestern Coachella Valley. In 1946, the Los Angeles Times reported that local businessmen had announced plans to build a 1,480-acre tract into the city of Palm Desert, the

leases of 70 and 99-years for country clubs and resorts garnered minimum annual rents between \$36,000 and \$139,000 (Bowers, 1965).

geographic center of the Coachella Valley (Crider, 2018). The 1950s gave the Valley the nickname, playground of presidents, as various administrations visited to enjoy the region's golf courses. Its first course was built in 1951 at the Thunderbird Country Club in Western Coachella Valley's Rancho Mirage. By 1968, the Valley had more than three dozen golf courses, called "Emeralds on the Desert" by CVCWD (Coachella Valley Water District, 1968, p. 22). In 1953, a columnist for the Desert Sun predicted the growth, writing, "I'd like to go on record with this: The area lying about ten miles east of Palm Springs, namely Thunderbird, Tamarisk, Del Sol and Rancho Mirage, is in for the biggest boom our desert has ever known" (Jaynes, 1949).

Indeed, rapid growth began in the 1960s. The introduction of air conditioning made living in the valley more comfortable year-round (Crider, 2018). The completion of Highway 10 reduced driving times from Los Angeles and Orange County from four or five hours to two and a half (Crider, 2018). Both improvements expanded Coachella Valley's attractiveness to tourists and buyers of second homes (Crider, 2018). Where new country clubs and resorts provided accommodations for tourists, new subdivisions and trailer parks delivered seasonal second homes for part-time residents. In 1959, over 6,000 people lived in mobile homes in the Palm Springs area ("Trailer Life Found Ideal in Desert," 1959). An article in the Desert Sun described the trailer parks as seasonal residences perfect for "the needs of an ever growing retired, or semi-retired class" ("Trailer Life Found Ideal in Desert," 1959). They conformed with the city's original concept that "has always been synonymous 'with recreation, play, rest, relaxation, and the realization of a cultured, genteel way of life'" ("Trailer Life Found Ideal in Desert," 1959).

CVCWD responded to this growth by entering the domestic water business. Private water companies could not keep up with the increased demand for domestic water (Crider, 2018). CVCWD formally entered the domestic water service in 1961 "under the pressure of the need for

a unified agency eventually combining all the various small often inadequate water service companies and agencies within its boundaries” (Coachella Valley Water District, 1968, p. 22). Having studied and considered the market for several years as a member of the Riverside County Water Association, CVCWD acquired three domestic water systems that year, a combination of subdivisions and country clubs serving 1,100 metered-customers (Coachella Valley Water District, 1968; Crider, 2018). Between 1961 and 1973, CVCWD domestic water service connections increased to 10,741, 87% of which were residential (Crider, 2018).

CVCWD used acquisition, condemnation, and annexation to consolidate these small water systems into its domestic water service. Some water users lobbied the district for consolidation. In other cases, the CVCWD strategically annexed a system. The district concentrated on new domestic services in the Western Coachella Valley, following both the population and tourist industry boom.

For water users, CVCWD solved system issues, such as high water rates, unreliable water service, and poor water quality. In Sky Valley and Sun Valley property owners petitioned the district to provide domestic water service (“Injunction Urged on Water Plan Indio Hearing Delay Sought,” 1962). In Valley View, Riverside County’s Local Agency Formation Commission (LAFCO) looked to CVCWD to resolve a water crisis for nineteen families furnished by a single well “so feeble they can never be sure whether a shower bath can be finished before the supply runs out” (“Valley View Water Aid Action Begins,” 1966). In La Quinta, the city of La Quinta and its residents requested CVCWD to implement a public takeover of their water system; owned by the Southern California Water Company and serving 2,000 customers (Hussar, 1985). Their requests responded to high rates (\$18 a month compared to CVCWD’s average charges of \$12) and poor infrastructure conditions, including inadequate flow for fire safety and pipes with

frequent breaks (Hussar, 1985). East of Desert Hot Springs, CVCWD began to supply domestic water to a “booming mobile home section” where fluoride contaminated the area’s wells and Riverside County Health Officials condemned them (Crider, 2018). In addition, the district acquired and annexed Country Clubs, Salton Sea resort developments, and mobile home parks (Crider, 2018; “Water District Annexation Blueprinted,” 1961).

CVCWD used its new purview to fund and incentivize regional growth and development. The board of directors adopted a policy to reimburse developers for building subdivisions within and adjacent to the district boundaries (“Water District Plan Subdivisions Spurred,” 1962). This policy publicly funded new domestic water infrastructure. However, it offered differentiated reimbursements to developers building within and outside district boundaries. Payments incentivized growth within district boundaries as CVCWD offered subdivisions outside of the jurisdiction only half of the gross of water tolls (“Water District Plan Subdivisions Spurred,” 1962).

When CVCWD’s sphere of influence conflicted with competing water districts, developers favored CVCWD’s domestic service. They felt that CVCWD’s infrastructure supplied new subdivisions with a better water flow, could protect new developments against fire, and could better maintain the system’s infrastructure (Rooney, 1981). In addition, CVCWD was convenient. It provided both water and sewer service and had manpower, experienced staff, and budget for taking on major development projects (Rooney, 1981). Growth fueled growth. As its domestic water service grew, so did its ability to serve developers fueling the region’s growth. CVCWD’s infrastructure growth outpaced smaller private and public water systems allowing the district to protect its expansive territory.

CVCWD also used bond measures and its annual budgets to publicly fund new resorts and residential developments. A \$14.75 million bond measure was approved in 1964 to provide updated domestic water infrastructure to the Sky and Fun Valley communities east of Desert Hot Springs (“August Start Seen on New Valley Domestic Water System Near DHS,” 1965). Earlier in the decade, two families living on former homesteads (the only eligible voters in the area) voted to approve the sale of \$200,000 in bonds that would annex them to CVCWD by creating the half-square mile Improvement District No. 8 (“Farm and Home Boom Near Palm Desert Seen,” 1962). Residents voted on behalf of the many owners (including Bob Hope) who lived outside of the area, foreseeing “a booming future for their half of the section once the water system [wa]s installed” (“Water Decision Before Rancho Mirage Voters,” 1962). Auditors predicted that the new water service would boost the value of the lands to \$2,000 an acre, benefitting from “announced plans for a major recreation and residential development by several prominent screen and television stars in the mile section lying immediately to the west (“Farm and Home Boom Near Palm Desert Seen,” 1962).

During that same time, bonds from the water district helped to expand resort and recreational activities to the Eastern Coachella Valley’s Salton Sea recreational area (Crider, 2018). For example, the North Shore Beach, a 1,000-acre planned marine community, promised buyers:

1. Ideal year ‘round weather.
2. The Salton Sea’s excellent boating and water skiing conditions because of its extra salinity and less than sea-level altitude.
3. North Shore Beach Yacht Club’s magnificent facilities” and access to CVCWD’s proposed new 500,000 gallon fresh water tank. (“High Seas Area Sales Announced,” 1962)

Due to CVCWD's aggressive funding and acquisition of domestic water infrastructure and expansion of its jurisdictional boundaries, district customers increased to almost 54,000 by 1977 (Aleshire, 1978).

Introducing a new pattern of spatial inequality

When CVCWD entered domestic water service it expanded its water infrastructure by acquiring and updating old subdivision water systems and funding pipelines for new developments. It also expanded its water sources. CVCWD added groundwater and Feather River water through the State Water Project. It raised its revenue streams through water use charges and property taxes collected from domestic water users. However, adding domestic water service to its purview developed a new pattern of spatial inequality in water access in the Coachella Valley. By first expanding service first to already existing subdivisions, CVCWD concentrated domestic water provision in the Western Coachella Valley's central urban areas. As a result, Eastern Coachella Valley's peripheral rural areas continued to rely on private well service for potable water.

Residents in the Eastern Coachella Valley communities were left out of domestic water infrastructure when CVCWD entered the market. Exceptions were made to new developments designed for recreation and seasonal residencies, like the North Shore community. Residential areas in the Eastern Coachella Valley serving those employed in agriculture garnered less attention from CVCWD. For example, the town of Mecca's water system was not consolidated into the CVCWD domestic water infrastructure system until 1980 ("Mecca to Get More Water, 'plugs' for Fire Protection," 1981). The town relied on a single well until CVCWD used HUD grants to buy and improve the system ("Mecca to Get More Water, 'plugs' for Fire Protection," 1981).

The absence of CVCWD domestic water infrastructure was exacerbated by the lack of short-term housing for low-income, seasonal farmworkers. Rapid growth in tourist industry development was not accompanied by low-income housing construction that could serve low-paying service and agricultural industry jobs (Oddo, 1989). In 1989, the Coachella Valley Association of Governments estimated that 95% of Riverside County's 30,000 agricultural workers were "critically underhoused" ("Immigrants Find They Have Few Other Places to Live," 1989). In an illusory example of housing for seasonal workers, the Desert Sun reported that farmworkers in the Eastern Coachella Valley, like Rosalio Laderos, lived in sub-standard housing where:

There is no electricity and the water Laderos and his roommates use for cooking comes from the irrigation water pump in a nearby grape field. Signs on some of pipes warn that pesticides are in the water, but it is the only source available. ("Immigrants Find They Have Few Other Places to Live," 1989)

Lacking housing and domestic water service in the area, farmworkers were forced to use irrigation infrastructure to serve their household needs.

Valuing industrial growth, CVCWD selectively expanded domestic water infrastructure. This deepened spatial inequality in water access and altered its pattern. It also deepened the poverty and isolation for Cahuilla living on Coachella's reservations. CVCWD incentivized growth by expanding domestic water service for developments serving seasonal residents and tourists in Western Coachella Valley's urban core. Residents living in the Eastern Coachella Valley's rural periphery, where agriculture remained the dominant industry, were left out of CVCWD's domestic water infrastructure. Dispossessing Cahuilla and low-income farmworkers of water by exclusion, CVCWD constructed a center/periphery, west/east pattern of spatial

inequality in water access that mimicked the spatial pattern between tourist and agriculture industries and furthering the socioeconomic disparities between agro-industrialists, resort owners and visitors, and Indigenous and low-income farmworkers.

Conclusion

Planning scholars often argue that regional government is the scale at which inequity is best addressed. However, this government scale becomes ineffective when institutional values promote spatial inequity. The case of CVCWD formation and expansion highlights the role that values or priorities play in producing uneven development. The chapter demonstrates that policymakers institutionalize and seek uneven growth to manage capitalism and advance racial hierarchy, inevitably constructing spatial inequality in water access. When these values are in place, there is little the regional scale can do to address spatial inequality.

Designed to prioritize the maintenance and growth of the agricultural industry, CVCWD selectively constructed pipeline infrastructure to distribute Colorado River water. CVCWD created uneven development between land that had access to Colorado River water for irrigation and land that did not. It deepened the existing racialized checkerboard pattern of spatial inequality in water access by dispossessing 1) the Agua Caliente of Whitewater River water in the Western Coachella Valley through water rights and allocation and 2) the Desert Cahuilla tribes in the Eastern Coachella Valley by excluding them from irrigation infrastructure and Colorado River water access; thus also excluding them from the agricultural industry and the profits that come from inclusion.

When expanding its services into the domestic water market, CVCWD continued to prioritize industrial growth, using its domestic water policies and funding mechanisms to incentivize tourist sector growth. CVCWD concentrated domestic water service infrastructure in

the growing urban core of the Western Coachella Valley. It withheld domestic water infrastructure from the rural periphery. This created a pattern between west/east and center/periphery that redefined the region's spatial inequality in water access. The center/periphery pattern of spatial inequality that deepened under CVCWD's policies meant public infrastructure for domestic water could be accessed in the urban center but not in the periphery; and public infrastructure for agriculture could be accessed in the periphery but not in the urban core of the Valley.

The Coachella Valley's historic investment in an industrial model of agriculture suggests that when centralized scales of government, like CVCWD's regional government, are designed to pursue growth and development embedded in racial capitalism and settler colonialism, they become unable to alleviate spatial inequalities. Instead, when regional government takes on a profit-motivated and colonial value system, it will always produce spatial inequalities, creating new patterns of spatial inequality rather than erasing them.

Further, these patterns of spatial inequality exacerbate existing socio-economic disparities. In the Eastern Coachella Valley, continued exclusion from water access left the Torres-Martinez Reservation in "squalor bred of poverty," as one journalist wrote (Morris, 1948). This poverty was not isolated to the Torres-Martinez Reservation but was present on all reservations in the Coachella Valley as a result of deepening spatial inequality. However, in the Eastern Coachella Valley, white farmers surrounding Indian land continued to grow wealth from their agricultural production. And in the Western Coachella Valley, growing tourism put in place an additional dimension of socioeconomic difference and access to amenities with the onslaught of retirees and visitors. In the end, not only did spatial inequality in water access deepen, but so did the disparity between white wealth and Indigenous poverty.

Chapter 7 How Retreat Urbanism Exacerbates Spatial Inequality

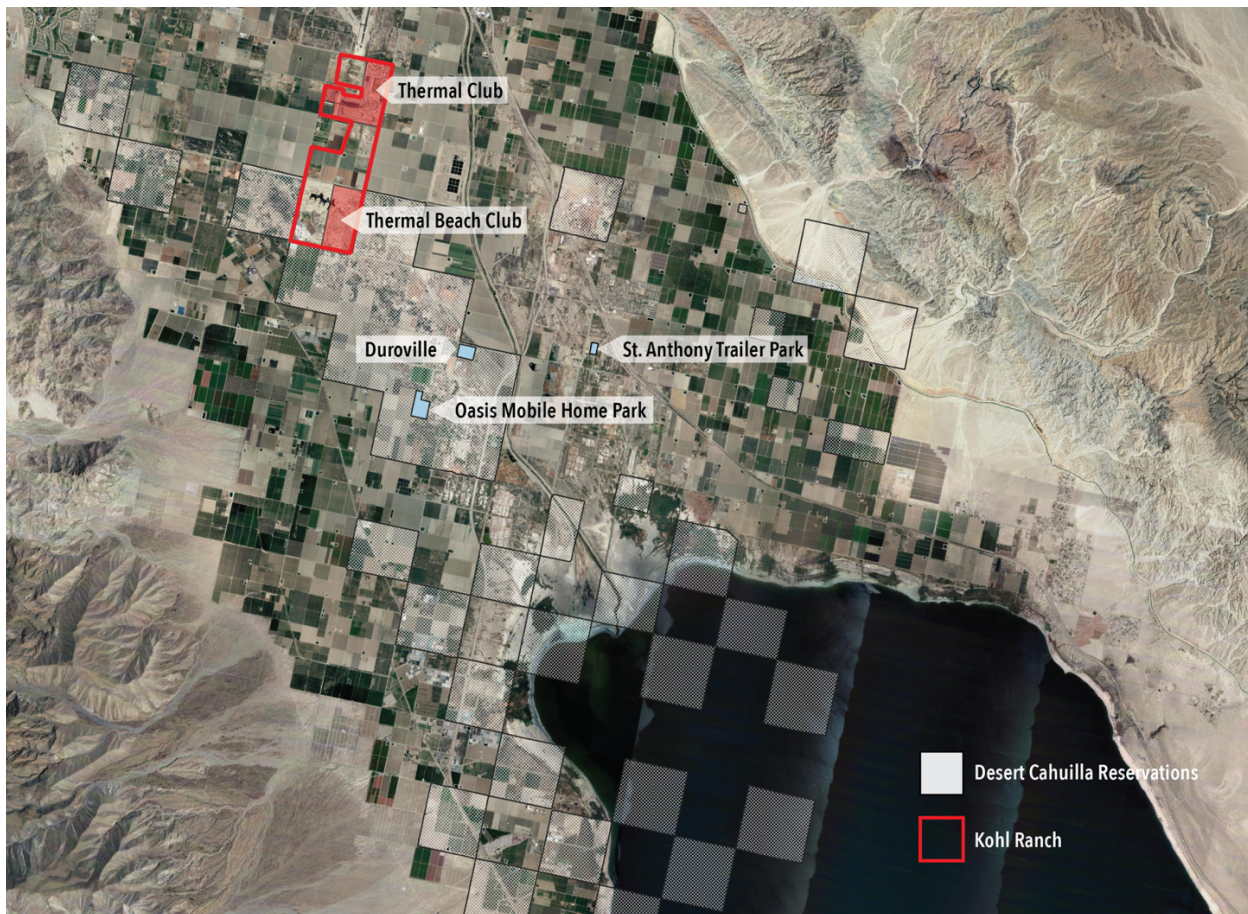
Introduction

Developer demand to expand tourism and play for the ultra-wealthy is changing the Eastern Coachella Valley. Long dominated by agriculture, these new economic development pressures exacerbate existing disparities in water access. The community of Thermal has become the epicenter of this peri-urban change. In 2020, the Riverside County Board of Supervisors approved the Thermal Beach Club. This new, exclusive development for short-term residence is the second high-end development approved by the county in Thermal. The first, the Thermal Club, a racetrack with adjacent vacation homes, opened in 2014. Both developments are part of the Kohl Ranch Specific Plan adopted in 1999. However, neither development adheres to the original plan's attention to permanent residential housing. Instead, they focus on building high-income, second homes. These developments represent the emerging pressure on the Eastern Coachella Valley from luxury tourism-led development that are supported by Riverside County's pro-growth model of urban planning.

These new development approvals are expanding peri-urbanization and socio-economic wealth disparity in the low-income, agricultural areas of the Eastern Coachella Valley. Luxury developments are sited near existing mobile home parks that have long served as affordable housing for farmworkers (see figure 7-1). Often, these parks lack consolidation with the Coachella Valley Water District's (CVWD) piped water infrastructure. Instead, they rely on private well water systems contaminated with arsenic at levels beyond the healthy, legal thresholds set by federal guidelines. Yet, their new ultra-wealthy neighbors enjoy in-house piped, clean water provided by CVWD.

Figure 7-1

Kohl Ranch and Notorious Mobile Home Parks



Water use at these new gated developments goes beyond domestic purposes. Water supports their leisure-centered lifestyles, including washing race cars, filling individual pools, and surfing artificial lagoons. Water fulfills the tourist industry’s promise of “finding your oasis in the desert.”⁴⁷

Thermal residents have spent over two decades fighting for improved water access. They refuse easy county approval of these developments. Instead, they leverage public hearings to

⁴⁷ “Find your oasis” is the slogan of Visit Greater Palm Springs, the official tourism marketing agency for the Coachella Valley (*Greater Palm Springs Hotels, Restaurants, Things to Do & Events*, n.d.)

ensure their voices and dissent are part of the public record. They contest new luxury development water use, challenging their legitimacy as legal and ethical land uses. In doing so, they lay bare the environmental injustice they witness and experience daily by lacking clean potable water and public water infrastructure. And they expose how uneven application of land and water regulations exacerbate existing patterns of spatial inequality in water access.

The Thermal Beach Club development process provides a point of entry for examining these regulations. And it is representative of the wider processes shaping peri-urban spatial inequality today. Riverside County and the CVWD's pro-growth land-use and water regulations ensure that increasing disparities in water access are inevitable. To government officials, these disparities are not only inevitable, but acceptable outcomes of regional economic development. The developments they approve increase proximity between those with and without water access. Ultimately, the disparities they create through their "growth for growth" policy regime exacerbate existing spatial inequalities in water access.

Luxury vacation developments, like the Thermal Beach, are driving peri-urbanization in the Coachella Valley through a process I call retreat urbanism. Retreat urbanism is centered around the approval and construction of luxury, vacation developments designed for high-income households to retreat from the reality of the city into manufactured oases in peripheral, seemingly "empty" places. It is bolstered by government's retreat from responsibility; towards evaluating and managing land use intensification against actual water supply and funding; and, in infrastructure investment. Government retreat is codified in policies that rely on growth (of private development) for growth (of infrastructure). These policies normalize socio-economic and water poverty of the periphery's existing low-income residents (in the case of the Coachella Valley, farmworkers). Retreat urbanism exacerbates inequality and increases socio-economic

disparities through expected and accepted uneven development that uses exclusive development for aggregate regional economic development.

Chapter Seven analyzes the Thermal Beach Club development process to understand how disparities in spatial inequality in water access grow and exacerbate under the regional government's policy regimes and retreat urbanism's peri-urbanization process. Following the introduction, the chapter describes growing socio-economic and water-based disparities in the Eastern Coachella Valley. The subsequent section explains Riverside County's land use policies, planning processes, and public participation that shape Coachella Valley's peri-urbanization. The final section examines the major debates around water and urban growth that surfaced during the Thermal Beach Club's planning process. It identifies retreat urbanism as a peri-urban process that shapes spatial inequality in the Coachella Valley. It demonstrates that Riverside County and CVWD growth-for-growth policies pursue uneven development through retreat urbanism and exacerbate spatial inequalities in water access.

Eastern Coachella Valley's Growing Disparity in Water Access

On the morning of Tuesday, November 19th, 2019, in Riverside, California – 80 miles from Thermal – the Riverside County Board of Supervisors conducted their monthly Board meeting. The day's agenda included approval for a new luxury development called the Thermal Beach Club. Numerous residents and advocates from the area had gathered in person and by phone to publicly comment on the project. Standing at a small podium between two large desks occupied by city staff and below a raised platform seating county supervisors, a young woman from the Eastern Coachella Valley leaned into the microphone formally registering her opposition, “drinking water should be your main priority, not water for rich people to play with” (*Board of Supervisors Regular Meeting*, 2019).

Because of the highly contentious meeting, the Board of Supervisors postponed the project's approval to provide time for more consultation between the developers, supervisors, planners, and community members. A year later, the Thermal Beach Club was unanimously approved by Riverside County's Board of Supervisors despite the significant community opposition.

Thermal, Oasis, and Disadvantaged Communities

Thermal is a small unincorporated community of approximately 2,600 people (U.S. Census Bureau, 2020a). It is bordered by the incorporated cities of Indio and Coachella to the west and northwest and the unincorporated communities of Vista Santa Rosa to the south and Oasis to the east. The area is also the Torres-Martinez Band of Cahuilla Indians' traditional homeland. Members of the tribe continue to live on, own, and manage their traditional land individually and collectively. Their reservation spans over 24,000 acres, half submerged under the Salton Sea. It spreads across Thermal and Oasis in the Valley's ubiquitous checkerboard pattern.

Since early United States settlement, the area was used for agricultural production. Today, date farms and fields of lettuce, melons, and peppers continue to fill checkerboard squares. These crops are tended to by a largely Mexican immigrant labor population.⁴⁸ In Oasis, Thermal, and Vista Santa Rosa, 58% of the population works in agriculture (U.S. Census Bureau, 2019c).⁴⁹ Thirty-eight percent of the population lives below the poverty line (U.S.

⁴⁸ Forty-one percent are foreign-born, 98% of whom are non-citizens and 95% of whom are from Mexico (U.S. Census Bureau, 2019e, 2019d).

⁴⁹ United States American Community Survey divides Industry by Occupation for the Civilian Employed Population 16 Years and Over into multiple categories. The category for agriculture includes agriculture, forestry, fishing and hunting, and mining.

Census Bureau, 2019g). Thermal and Oasis land and landowners have disproportionately provided affordable housing for the region’s farmworkers, Coachella Valley’s poorest residents.

Agriculture housing regulations in the early 1990s drastically changed housing accessibility in the Eastern Coachella Valley by ending requirements for on-site labor housing. Tribal and non-tribal landowners in Thermal and Oasis found their vacant land suddenly desirable and profitable, able to fill this new hole in the local housing supply. Large, hundred-family trailer parks and smaller “Polanco Parks”⁵⁰ (trailer parks with less than 12 trailers) popped up throughout the area in the 1980s and 1990s to provide low-cost, affordable housing and land ownership opportunities in the absence of industry-provided housing. Over 400 unpermitted mobile home parks provided new housing options for farmworkers (Brown, 2011). During this period, permanent residents in unincorporated Eastern Coachella Valley increased from 17,022 in 1990 to 26,764 in 2000, as previously mobile farm laborers settled in the area (U.S. Census Bureau, 1990d, 2000g).

The proliferation of trailer parks was met with Riverside County’s racially discriminatory code enforcement practices. In 1999, the California Rural Legal Assistance (CRLA) filed a fair housing discrimination complaint with the United States Department of Housing and Urban Development (HUD) against the county. In their complaint, filed on behalf of 24 families, they

⁵⁰ Polanco Parks is the colloquial name for trailer parks protected by State law authored by Senator Polanco. The 1992 law, AB 3526 (Polanco Bill), was written as an emergency measure to protect agricultural employee housing under the Employee Housing Act. The bill allows for employee housing of 12 or fewer employees to occupy land zoned for agriculture (deeming it an agricultural land use) without the need to apply for a conditional use permit, zoning variance, or other zoning clearance from a city or county. In addition, the bill exempted the housing from local jurisdiction authority and fees. The bill changed the term ‘labor camp’ to ‘employee housing’ and expanded the definition of housing to include manufactured homes, recreational vehicles, and travel trailers (Assembly Committee on Housing and Community Development, 1992).

claimed that Riverside County was unfairly discriminating against Hispanic-owned and occupied mobile home parks (*HUD Archives*, n.d.). An investigation by HUD found many of the allegations valid. It concluded that county practices violated Title VI and Title VIII of the Civil Rights Act of 1964. Working with HUD, Riverside County agreed to a settlement that set aside \$21 million for community housing projects and changed code enforcement policy and procedure (*HUD Archives*, n.d.).

Riverside County's discriminatory crackdown also resulted in thousands of residents, mainly indigenous and undocumented Mexican immigrants, moving from unincorporated county to tribal land to evade code and immigration enforcement (Associated Press & Flaccus, 2010; Brown, 2011). In 2000, over 125 unpermitted mobile home parks continued to house residents in the Eastern Coachella Valley (Brown, 2011). Today, many of these parks make up the over one hundred housing communities that lack connections to CVWD domestic water infrastructure (Lopezcalva et al., 2018). Instead, they rely on individual, community, and privately owned wells.

In the Eastern Coachella Valley, water access is precarious for residents served by these private wells. Well-water reliability depends on well-functioning and constant access to electricity, quality groundwater, and efficient filtration systems. Unfortunately, groundwater in the Eastern Coachella Valley contains naturally occurring arsenic. Arsenic is found in wells throughout the area at higher levels than what is considered healthy by United States Environmental Protection Agency (EPA) standards (see Chapter Four). State and federal guidelines require that arsenic levels in drinking water contain no more than ten parts per billion (ppb). However, wells in Eastern Coachella Valley's Mecca, North Shore, Oasis and Thermal communities have arsenic levels between "0ppb and 100ppb" (Department of Environmental

Health, 2020). Residents who rely on private wells in the Eastern Coachella Valley could be accessing drinking water with arsenic at levels more than ten times higher than the state and federal limits.

Water quality monitoring for domestic wells is complicated by a constellation of local, state, and federal agency responsibilities. The state classifies water systems as either small water systems – systems serving less than 24 individuals or between five and fourteen connections – or community water systems, which serve more than 24 individuals. Water quality for community water systems is monitored at the state level. Riverside County’s Department of Environmental Health is responsible for permitting small water systems. Neither the county nor the state takes responsibility for monitoring water quality for small water systems. Instead, monitoring falls to system owners. The county sets requirements for how owners manage and monitor their wells. It suggests that owners test their wells every three months to annually. It puts the onus on residents to contact their providers if they desire access to well-monitoring reports. Further, all water systems on tribal land are subject to tribal regulations and federal oversight, and the EPA is responsible for monitoring water quality.

Arsenic is not the only water quality issue that residents in the Eastern Coachella Valley face. Residents there are susceptible to chemicals entering their groundwater from agricultural runoff. These chemicals include pesticides and nitrates and are found periodically throughout the region (California State Water Resources Control Board, 2022). More recently, changing standards in acceptable levels of contamination for the chemical chromium are adding yet another layer of concern to water quality issues. Taking water quality, water access, and water reliability issues together, residents in the Eastern Coachella Valley, at large, and Thermal, specifically, are most affected by the region’s spatial inequality in water access (see Chapter

Four). An example of this predicament is the residential water plight at the Oasis Mobile Home Park.

In 2021, shortly after the Thermal Beach Club received Riverside County Planning approval, the non-profit advocacy organization, Leadership Counsel for Justice and Accountability (LCJA) filed a complaint against the owner of the Oasis Mobile Home Park on behalf of the over one thousand residents. The Oasis Mobile Home Park sits less than five miles from the Thermal Beach Club on Torres-Martinez tribal member Scott Lawson's allotted land. In the complaint, LCJA charged that Lawson had created unhealthy and unsafe living conditions for the hundreds of families renting spaces for their trailers on his land. These conditions included failing to provide clean potable water. The lawsuit described an overall lack of investment and maintenance that created a situation where drinking water was contaminated with arsenic at levels nearly ten times the EPA standard;⁵¹ water shutoffs were common; and retaliatory threats were used when residents tried to assert their rights to potable drinking water (*Juntos por un Mejor Oasis v. Scott Lawson*, 2021).

This 2021 complaint was only the latest attempt in the pursuit of clean water for Oasis Mobile Home Park residents. Two years earlier, the EPA issued an emergency administrative order to Lawson for failing to notify residents of the high arsenic levels found on four separate occasions that year. As a result, EPA required Lawson to provide alternative drinking water to residents, provide notice of arsenic, hire a certified water system operator, and work towards bringing the water system into compliance (*Juntos por un Mejor Oasis v. Scott Lawson*, 2021).

⁵¹ The well system at the Oasis Mobile Home Park includes an arsenic treatment facility. However, facility water quality tests showed that arsenic was found in concentrations of up to 97 parts per billion. The LCJA complaint contends that the lack of maintenance of the system is the cause for the high levels of arsenic (*Juntos por un Mejor Oasis v. Scott Lawson*, 2021).

In December of that year, the EPA found that the park owner had instead raised the rent from \$475 to \$575, provided misleading information on water quality, and implemented policies and regulations that prevented residents from accessing the bottled water provided as the alternative drinking water source (*Juntos por un Mejor Oasis v. Scott Lawson*, 2021). In its September 11, 2020 administrative order, the EPA concluded that the continuing high arsenic levels found at the tap in residents' homes were a result of:

arsenic-containing precipitate [that] is likely collecting in the System's piping and storage of the distribution system as well as the plumbing infrastructure of Oasis residential homes and is being released at concentrated levels. EPA believes this to be occurring because arsenic remaining in the water precipitates and concentrates due to iron or other chemicals that can precipitate arsenic present in the water or in galvanized piping. (*Juntos por un Mejor Oasis v. Scott Lawson*, 2021)

As a result of their state-level advocacy, residents won a \$30 million state budget allocation for their resettlement in 2021 (Perez, 2021). While residents wait for relocation, they continue to have issues in accessing drinking water.

In March 2022, the EPA filed emergency orders under the Safe Drinking Water Act for an additional four water systems at mobile home parks on Torres-Martinez reservation land (U.S. Environmental Protection Agency, 2022). On county land, over one hundred residential communities may face the same water access issues found at the Oasis Mobile Home Park and on the Torres-Martinez Reservation. As developers locate high-end developments, like the Thermal Beach Club, adjacent to these trailer parks they put new strains on regional water infrastructure and sources. They exacerbate existing water access, quality, and scarcity issues.

They increase water access disparities. And they shift the pattern of spatial inequality to one of increased proximity between those with and without water access.

A Surf Lagoon in the Desert

Renderings depicting desert sands, blue skies, white stucco bungalows, and purple mountains in the background populate the Thermal Beach Club's website. The site offers visitors the opportunity to buy into an "adventure-living retreat, wrapped in luxury and powered by adrenaline" in unincorporated Thermal. It promises to transform 370 acres into "a piece of paradise." Amidst unprecedented drought conditions in the Colorado River Basin, the \$750 million development's main attraction is a 22-acre lagoon designed for surfing eight-foot waves in Coachella's arid desert (Daniels, n.d.; *Founders' Introduction*, n.d.).

Surfing technology at the Thermal Beach Club churns water into six waves per second over 160 miles from the nearest ocean (*Founders' Introduction*, n.d.; Leach, P.E., 2019). A private clubhouse, fashioned in the image of Spanish Colonial haciendas, provides respite at its spa, pool, deck, restaurant, and bar. Surrounding both lagoon and club, 326 single-family, duplex, and fourplex dwelling units create a beach atmosphere. These "Beach Estates," "Newport Estates," "Bungalows," and "Villas" are advertised to future members promising the ability to "reign over the water" where "your personal desert retreat is a haven that will smooth the edges of everyday life" (*Founders' Introduction*, n.d.).

The Thermal Beach Club offers a vastly different residential experience from what currently exists in the community. Memberships to the club are sold at two levels: "Residence Club" starting at \$175,000 and "Full Ownership" starting at \$1 million.⁵² These new luxury

⁵² The neighboring Thermal Club (also located within the Kohl Ranch Specific Plan) indicates that these initial membership prices will most likely increase as construction begins. Oriented for car lovers around

housing options are inaccessible to residents in Thermal, where 48% of households live in mobile homes and 38% of the population lives below the poverty line (Manson, Steven et al., 2020; U.S. Census Bureau, 2019a, 2019b). New developments, like the Thermal Beach Club, drive retreat urbanism, creating socio-economic and water access disparities not previously present in the Eastern Coachella Valley.

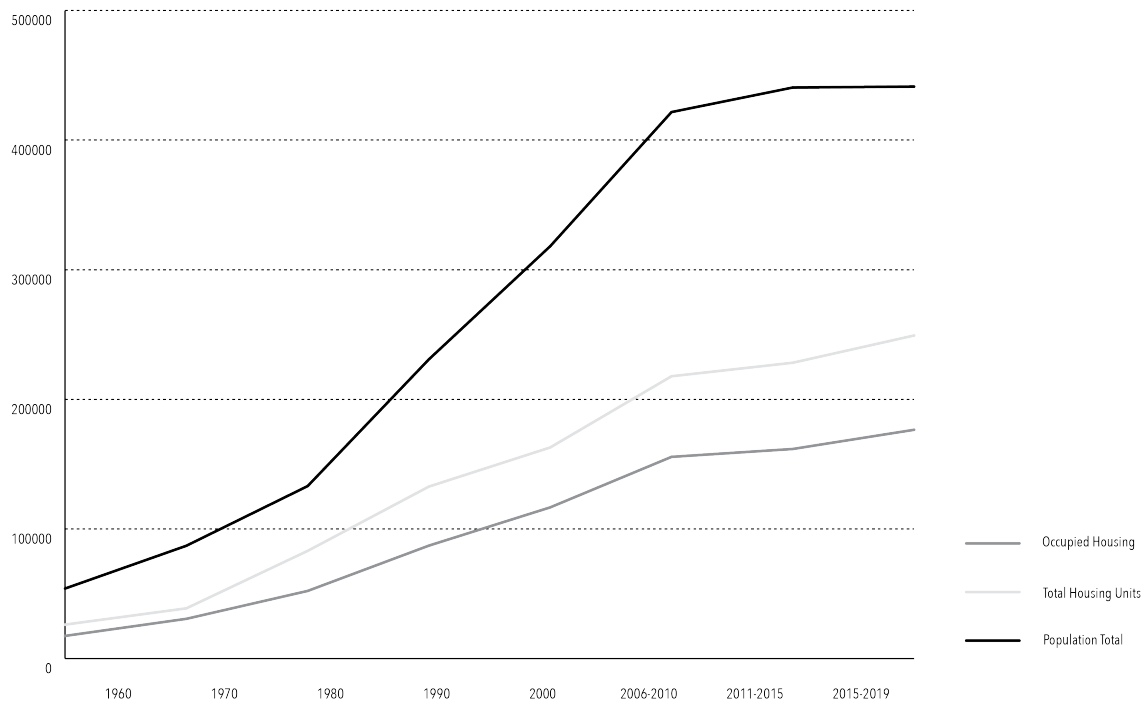
The Thermal Beach Club is the second luxury development approved in the last decade for part-time, seasonal residents at Thermal's Kohl Ranch. The Kohl Ranch Specific Plan, approved in 1999 for several mixed-use community typologies on over 2,100 acres, is three miles long and 1.5 miles wide. The Thermal Beach Club and the Thermal Club are the only developments that developers have moved through the county's permit approval process since the Specific Plan's approval over twenty years ago.

However, the two clubs join a growing number of developments throughout the Coachella Valley designed explicitly as retreats for part-time, seasonal residents. In 2021, there were 69,446 non-primary, single-family and condo residences in the Coachella Valley, an increase of approximately 3,000 units since 2017 (Coachella Valley Economic Partnership, 2021; Greater Palm Springs Convention and Visitors Bureau, 2017). Over the last fifty years, the region has experienced significant population growth and growth in non-primary residences (see figure 7-2). Today, these non-primary residences account for 28% of all housing units throughout the Valley (U.S. Census Bureau, 2019i).

a high-speed racetrack, the Thermal Club offers 276 housing lots for development. When the club opened to investment, lots cost \$400,000 (Carpenter, 2021). Today, lots are sold at a 275% increase in price at \$1.5 million per lot (Carpenter, 2021). Only five of the sixty completed houses have homeowners who are year-round residents, despite covenant restrictions on permanent residency (Carpenter, 2021).

Figure 7-2

Housing Growth in the Coachella Valley 1960-2019 (Manson, Steven et al., 2020; U. S. Census Bureau 1960-2019)⁵³



Whereas earlier seasonal residence development was built for lower to middle class “snowbirds” retiring from cooler northern climates, the Thermal Beach Club and the Thermal Club residents’ demographics differ. These new luxury developments specifically target high-income owners who will buy these new dwelling units as their second, third, or fourth homes (Carpenter, 2021). In the case of both the Thermal Beach Club and the Thermal Club,

⁵³ The U.S. Census Bureau defines occupied housing units as: “A housing unit is occupied if a person or group of persons is living in it at the time of the interview or if the occupants are only temporarily absent, as for example, on vacation. The persons living in the unit must consider it their usual place of residence or have no usual place of residence elsewhere. The count of occupied housing units is the same as the count of households.” (U.S. Census Bureau, 2021)

development covenants restrict permanent residency. County permitting stipulates that residents stay for no longer than 45 days at a time (Albert A. Webb Associates, 2018). In a community facing significant housing deficiencies, the newest developments do not address regional affordable housing issues. Instead, they are designed and regulated to attract new part-time residents looking for respite and play in the desert.

Planning, Contesting, and Approving Urban Growth

The lack of water access at the Oasis Mobile Home Park and the abundant water access at the Thermal Beach Club represent a growing and institutionalized disparity. This increasing socio-economic disparity is far from coincidental. It is made inevitable by Riverside County and CVWD's land use development and water infrastructure policies.

Planning Land Use and Disparity

Two county-wide documents guide land use development in unincorporated Eastern Coachella Valley: Riverside County's Zoning Ordinance and Riverside County's General Plan. The County's Zoning Ordinance provides county-wide standards for building development processes, designs, uses, and densities. Its General Plan⁵⁴ includes a broad vision for the county's future as well as area-specific blueprints that are meant to reflect the existing community's context and goals. The county's General Plan divides the Coachella Valley into Western and Eastern regions each with distinct area plans. The Eastern Coachella Valley Area Plan covers over 455,000 acres of unincorporated land east of the cities of Coachella, Indio, and La Quinta

⁵⁴ Adoption of general plans in the State of California is required for all cities and counties in the State under Gov. Code 65300 to guide land use plans for the jurisdiction. County and city general plan documents must include nine main elements (land use, circulation, housing, conservation, open space, noise, safety, environmental justice, and air quality) adapted to their local context and can include additional elements of identified by their communities.

(County of Riverside, 2021).⁵⁵ The majority of this land is designated as “open space” (345,191 acres) and “agriculture” (42,056 acres). The “community development” category designates land for housing, amounting to a little more than 28,000 acres. Today, approximately 24,000 people live in the unincorporated area of the Eastern Coachella Valley (U.S. Census Bureau, 2020b). If fully developed, the Eastern Coachella Valley Area Plan zoning accommodates over 550,000 people (County of Riverside, 2021).

Planning for water scarcity or availability is rarely discussed in the General or Area Plans. First drafted over 20 years ago, the General Plan states that “most of Riverside County’s sources of water are currently at capacity”(County of Riverside, 2015, OS-7).⁵⁶ Even with this acknowledgment, population and industry growth throughout the county, and in the Eastern Coachella Valley specifically, remains a central part of each plan. This planned growth far exceeds the region’s projected future water capacity (Water Systems Consulting, Inc., 2021).

The Eastern Coachella Valley Area Plan is designed “to maintain the predominantly rural, agricultural, and open space character of the Eastern Coachella Valley” (County of Riverside, 2021, p. 11). Yet, zoning in the community of Thermal diverges from this predominant landscape. Instead, it was redesignated to accommodate both light and heavy industrial uses (including warehousing, manufacturing, retail and other industries that generate “excessive noise, dust, and other nuisances” as well as higher density residential developments

⁵⁵ However, the City of Coachella is included within the boundaries of the Eastern Coachella Valley Area Plan.

⁵⁶ Riverside County’s General Plan was drafted in the late 1990s and adopted in 2003. Today it includes various updates and amendments from 2003 through 2021.

(County of Riverside, 2021, p. 20). Many of these designation changes come from three specific plans, including the Kohl Ranch Specific Plan.

Riverside County uses specific plans to address development concerns and details that conventional zoning is unable to.⁵⁷ The development approval process for the Thermal Beach Club required an amendment to the Kohl Ranch Specific Plan and its corresponding zoning ordinance. Twenty years after its adoption on November 16, 1999, only one-third of the site's total acreage (the Thermal Club and Thermal Beach Club) was approved for development (Albert A. Webb Associates, 2018). The two developments provide 492 of the specific plan's targeted 7,162 dwelling units, or 6.8% of the total planned units. Approved units include 166 units for the Thermal Club and 326 units at the Thermal Beach Club. Neither development includes dwelling units approved for permanent residency. Instead, they stipulate covenants that limit occupancy duration to 45 days.

Thermal Beach Club approval required planning staff review and recommendation for approval to the Planning Commission and then to the Board of Supervisors. Planning staff chose to recommend project approval having found that it met the intent and purpose of the adopted Kohl Ranch Specific Plan. With the project recommended for approval, the development application underwent a public approval process with the Planning Commission followed by one with the Riverside County Board of Supervisors. Both approvals required transparent processes conducted at public meetings and included public comments submitted prior to and during the hearings.

⁵⁷ The contents of specific plans are also guided by the State of California's planning and land use Government Code 65451.

The Public's Role in New Development Approvals

Public hearings are central to new development approval processes in California. Under the intent and requirements of the Ralph M. Brown Act (Ralph M. Brown Act, 1953) of California's government code, the actions and deliberations by state public commissions, boards, councils, and other public agencies must be taken and conducted openly. This includes any collective decision, collective commitment or promise, collective denial, or vote on a motion, proposal, resolution, or ordinance made by the majority of a legislative body. For planning projects requiring approval beyond the planning staff level, decision-making must be open to the public.⁵⁸

Local agency regulations for public meetings overlay onto these state regulations. Riverside County defines how public attendance and public comment occur during public meetings. These requirements include the amount of time a member of the public may speak (up to three minutes per agenda item), the amount of time the applicant or applicant's representative may speak (up to ten minutes for an opening presentation and up to twenty minutes for a rebuttal presentation), how to give your speaking time to another member of the public (one speaker may be given time from no more than four members of the public), and when a member of the public may request to speak (at least 24 hours prior to the meeting to participate remotely) (*Public Hearings*, 2022). Whether a development proposal requires a public meeting for approval

⁵⁸ As technology has increased, public hearings are becoming available through in-person and teleconference attendance. In 2020, to address the health concerns of gathering in public during the COVID-19 pandemic, Executive Order N-25-20 was signed by Governor Newsom. The Executive Order waived requirements of the Brown Act that previously required the physical presence of members of a quorum for public meetings. The Order allowed for public meetings by local and state legislative bodies to be held and accessible telephonically or electronically for members of the public to attend while state and local officials imposed social distancing measures.

depends on the intensity of the new development. Riverside County divides development projects into two categories: 1) Minor Planning cases and 2) Entitlement Processes or Major Cases. Only entitlement processes or major cases require a public hearing. These include specific plans and their amendments, change of zoning, major plot plans, and subdivision tract maps.

The Thermal Beach Club's development application included a plot plan, a tentative tract map, zoning change, and an addendum to an EIR, all of which required public hearings with the Planning Commission and the Board of Supervisors. Public hearing processes required that the Board of Supervisors give final project approval during a public hearing. As a result, Riverside County held six public hearings for the Thermal Beach Club project.⁵⁹ At each public hearing, supporters and opponents could voice their opinions and concerns regarding the Thermal Beach Club.

Public debate over the Thermal Beach Club approval centered on project benefits to the surrounding community and future disparities in water access between new vacationers and existing residents. Public hearings revealed the tension government agencies faced between revenue scarcity and water infrastructure security. They also demonstrated how county and CVWD growth for growth land use and infrastructure policies exacerbate existing spatial inequalities in water access affecting residents in the Eastern Coachella Valley.

⁵⁹ After receiving the Planning Staff recommendation for approval, the Planning Commission scheduled and held a public hearing for the project on September 25, 2019 in Palm Desert (Western Coachella Valley). Following their vote of 3-0,⁵⁹ the Commission recommended approval to the Board of Supervisors. The Board of Supervisors held its first public hearing for the project almost two months later, on November 19, 2019. After over an hour of planned public comment, the project was continued to the Board of Supervisors' regularly scheduled meeting on December 10, 2019. On December 10, 2019, and February 11, 2020, the Planning Staff recommended and the Board of Supervisors approved the continuance of the item to later meeting dates. On April 21, 2020 the Board of Supervisors again heard public testimony and the decision to approve or reject the project was once again continued. At a public hearing on October 27, 2020, the Board of Supervisors finally approved the project.

Minutes from the Planning Commission meeting, held at 9:30am on September 25th, 2019, in Palm Desert, recorded four public comments. Two people, including the project applicant, spoke in favor of and two spoke in opposition to the project. Opposition was “regarding the entire Kohl Ranch Specific Plan and how it addresses the subject of affordable housing” (County of Riverside Planning Department, 2020). The planning staff recorded no “controversial issues” and no written comment was received before the hearing. The project moved, seemingly easily, through the Planning Commission and onto the Board of Supervisors’ approval.

However, residents and advocacy organizations voiced greater opposition at the project’s public hearing with the Board of Supervisors. Community opposition fueled the supervisors’ caution in making a quick decision to approve the project. After the first public hearing’s hour-long public comment period, Supervisor Manuel Perez, representative of the Eastern Coachella Valley district, recommended to the rest of the board approval delay and transparent dialogue between developer and community members.⁶⁰

Contestation between project opponents and proponents took center stage at the Supervisors’ meetings. Depending on the level of support, the project was at once insulting and exclusive, necessary for economic development, dispossessing water, colonizing Thermal, and a savior of public infrastructure. The difference in who supported and who opposed the project

⁶⁰ According to the applicant’s documents submitted for the Board of Supervisors’ meeting on October 27, 2020, the developer’s representative held meetings with members of the Coachella Valley Unified School District board, the Torres-Martinez Band of Cahuilla Indians, Cabazon Band of Mission Indians, affordable housing developers, small business owners in the vicinity of the project, and the Vice Chairman of the Coachella Valley Water District, who represents the Eastern Coachella Valley on the Board. The developer’s representative also called several local advocacy organizations in the Eastern Coachella Valley. The developer’s representative recorded the date and names of the outreach.

mirrors the disparity between the Thermal Beach Club’s future users and Thermal’s existing residents. As a result, the ways in which they describe the project and its effects on Thermal, the Eastern Coachella Valley, and the Coachella Valley at-large were shaped by their socio-economic power and positioning. Their conflicting views illuminate how water infrastructure provision is tied to and relies heavily on growth into under-, un-developed and peri-urban land.

Exacerbating Spatial Inequality in Water Access with Growth for Growth

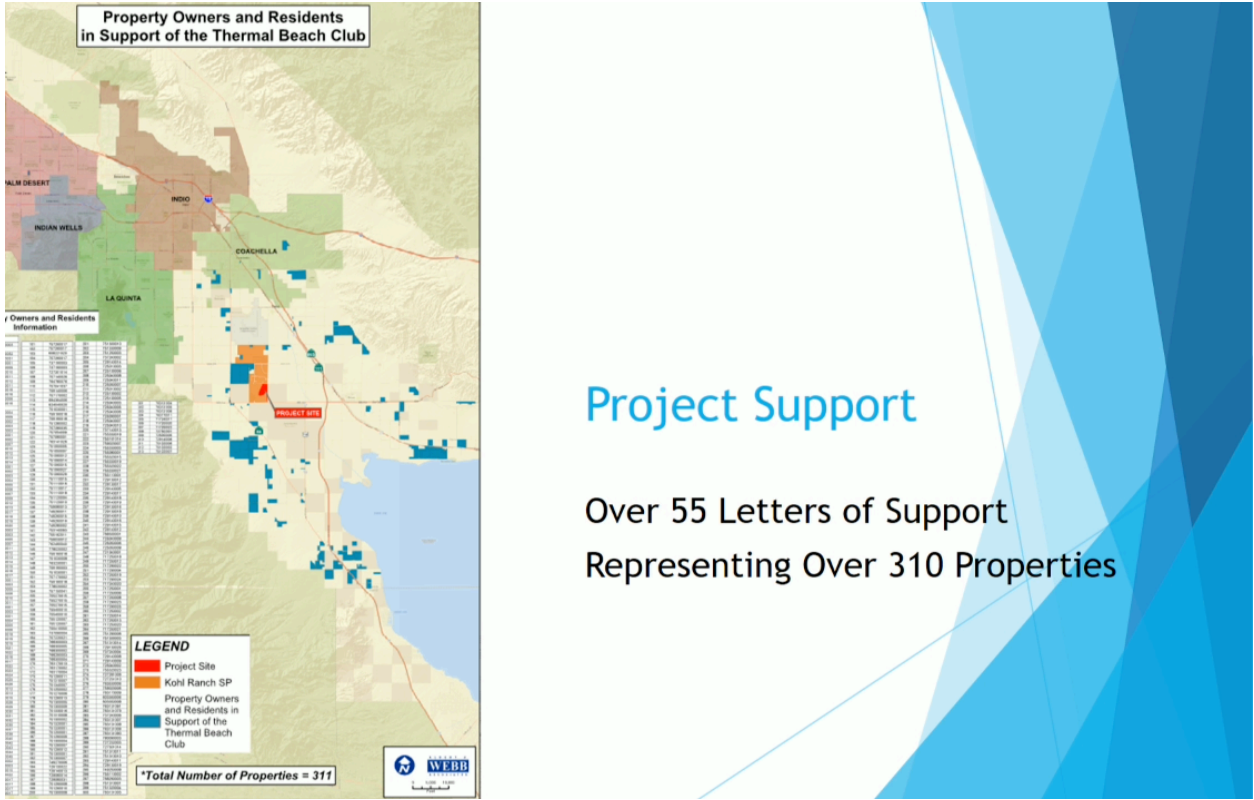
After the Supervisors’ request for dialogue, the Thermal Beach Club developers worked to increase support for their project. They conducted nine meetings and fourteen community outreach calls. In their submitted summary the developer noted receiving verbal support for the project at three meetings (County of Riverside Planning Department, 2020). The three meetings were with representatives in positions of power within Thermal institutions including: a board member of the Coachella Valley Unified School District, the Chairman of the Torres-Martinez Reservation, and the Gaming Commissioner of the Torres-Martinez-owned casino. In addition, the developer had also secured 55 letters of support from Eastern Coachella Valley property owners and residents representing 310 properties. However, few letters of support came from areas surrounding the project site (see figure 7-3). When they did, properties were located within the Kohl Ranch Specific Plan or were from representatives of large landholdings.

Few project proponents at the public hearings lived or worked in the vicinity of the project. Rather, when providing public comment, proponents located themselves in the “Coachella Valley.” Calling in from the Western Coachella Valley cities of Rancho Mirage, La Quinta, and Palm Springs, they signified their view of the project as a regional issue. When proponents were from Thermal or the Eastern Coachella Valley, they were powerholders. They

were property owners, farmers, Thermal Neighborhood Council members, and Torres-Martinez Tribal Council members.

Figure 7-3

Documented Project Support from Developer



Note. The author took this screenshot from the video recording of the public hearing on October 27, 2020. The map on the left shows the location of support letters from stakeholders with interest in 310 Eastern Coachella Valley properties, shown in blue. The Kohl Ranch Specific Plan is shown in orange and the Thermal Beach Club project site is shown in red. (*Board of Supervisors Regular Meeting, 2020*)

Proponents articulated that developing the Thermal Beach Club would bring regional benefits. They claimed the project would spur needed growth to both the Eastern Coachella Valley *and* the Coachella Valley. They argued that the project’s infrastructure would help future developments by providing easier infrastructure access. They believed that the Thermal Beach

Club would provide jobs to adjacent residents. Finally, they proposed that its waves would attract recreation-seekers to the area, incentivizing additional, like-minded developments.

Developer calls to advocacy organizations failed to produce support for the project. Residents and advocacy organizations continued their opposition throughout the public hearings. Over 300 residents signed a petition against the project's approval. Their concerns included gentrification, displacement, a growing wealth gap, the misuse of local and natural resources, discrimination, and growing racism (*Board of Supervisors Regular Meeting, 2020*). Local advocacy organizations joined residents in opposition, including ECV No Se Vende, LCJA, Coachella Valley Waterkeeper, Alianza, California Institute for Rural Studies, and Chica. The multi-generational opposition included teachers and students from the Coachella Valley Unified School District, residents of Thermal and Oasis, Torres-Martinez tribal members, and displaced Eastern Coachella Valley residents. Together opponents used legal and moral reasoning to argue for project denial.

In contrast to supporters, opponents of the project argued that the growth of the community should not be found in luxury developments. Instead, it needed to be rooted in the needs and priorities of current residents. In her comment at the October 2020 public hearing, a member of ECV No Se Vende stated:

To be clear, we are not against development or the growth of our community. But we are against luxury projects that exclude our community. Especially when community concerns have yet to be addressed. It's alarming when some of our representatives do not echo community concerns in public meetings... We keep hearing that funds for our community are scarce. But our community deserves a process that caters not only to our needs but to our priorities as well.

A second member of ECV No Se Vende warned of the negative consequences in the Eastern Coachella Valley from the Thermal Beach Club and projected future increases in luxury development. They noted that replicating these luxury developments would increase the houselessness and displacement already experienced in the community. This, they argued, was not just a local issue, but one that could be seen across California. Addressing the supervisors, they asked, “where across the state do you see the extremely poor and the extremely wealthy coexisting habitably without there being an increase in displacement and increase of the disparities of people who already suffer from a lack of quality living?” (*Board of Supervisors Regular Meeting, 2019*).

The concerns of Thermal and Oasis residents were so clear that Supervisor Perez, in opening the final approval meeting in October 2020, addressed them in full. He commenced the meeting by acknowledging that the project:

concerns [were] around what, truly, at the end of the day, what is the benefit to the community when we talk about this project and what does it look like. And so, what we have before us, at least for us as supervisors, we need to carefully consider and evaluate this project. And quite frankly, as I mention all those points, to the developers, [whether they] have met those requirements (*Board of Supervisors Regular Meeting, 2020*).

In their comments, opponents of the project did not see how the project could be evaluated under the terms laid out by the Supervisors. Instead, they described a future that excluded them from both the Thermal Beach Club and the Eastern Coachella Valley. A lifelong resident of the area stated this clearly in her public comment when she declared, this “project is no benefit to us.” Another opponent, noting that the Thermal Beach Club would not be the last luxury project in the Eastern Coachella Valley looking for approval, suggested that conditions needed to be put in

place so that projects would benefit the existing community instead of the new residents the projects propose bringing into the region.

In their arguments, opponents identified a future Eastern Coachella Valley where the intersection of exclusion, displacement, and inequality in water access would define resident life. One statement, from a young man who read a public comment on behalf of his uncle, described the ramifications of regional development on their community:

I would like to read something by my uncle Cali Ramos: Thermal Beach Club. We can add another place where people can't afford to enter. Our people work in hospitals where they can't afford to be treated, work in restaurants where they can't afford to eat, work in hotels where they can't afford to stay, and we're being convinced of better jobs and higher pay. And we know that time and time again these promises and these possibilities never come to fruition. (*Board of Supervisors Regular Meeting, 2020*)

Another resident shared her friends' experience with displacement after the racetrack and housing construction at the Thermal Club (*Board of Supervisors Regular Meeting, 2019*). Yet another resident discussed her own displacement due to the lack of high-income jobs in the Eastern Coachella Valley. As a recent college graduate, she was unable to move back to the Eastern Coachella Valley, where she grew up, because she couldn't find a job that matched her skillset. She implored the board that a foundation for "our students to come back and live" was needed. And in reference to the future occupants of the Thermal Beach Club, she said that "we are more than just servants for these people, we live there," that "our community is more than a source of labor. We are more than a workforce" (*Board of Supervisors Regular Meeting, 2020*).

To residents, the promised growth and opportunity by the developer, supervisors, and project proponents did not include them. Unlike the perceived benefits touted by proponents,

resident opposition was not a hypothesis of future consequences. It was born from their past experience with disenfranchisement, disinvestment, and displacement. At risk for residents was exacerbating an already increasing disparity in socio-economic and water inequality.

Exacerbating Water Quality and Scarcity

Water was principal to project opposition. In its public comment letter on behalf of ECV No Se Vende, LCJA wrote that the project “allocate[s] even more of Coachella Valley's limited surface and ground water supplies to Kohl Ranch's vacationers, while doing nothing to address the prevalent lack of safe drinking water” (Leach, P.E., 2020, p. 4). Residents and community organizers questioned the project’s water use. They wanted to know about project water sources. They inquired into the legality of CVWD’s water assessment. They challenged government determinations finding sufficient water capacity for the project. They asked how the county could ethically approve a project designed for the rich to use water for play when existing Thermal residents lacked potable water access. Finally, opponents disputed the project’s appropriateness when the region lacked naturally sufficient water sources for existing residents and industry.

Advocacy organizations opposing the project, claimed legal missteps in the county’s water use assessments. Primary to opponents’ legal arguments was the county’s lack of conformity with the California Environmental Quality Act (CEQA), California’s key legal procedure assessing the environmental impact of new developments during planning processes. Opponents argued that modifying the original design from a passive lake to a surf lagoon should be considered a substantial change to the project. This change, they contended was not considered in the application’s Environmental Impact Report (EIR) addendum, nor in the water

assessment required by CVWD. Further, they found CVWD's water assessments did not adequately reflect recreational surf and vacation residences' domestic water use.

Opponents of the Thermal Beach Club found the project's EIR addendum misleading. They argued that the Thermal Beach Club represented a substantial change to the Kohl Ranch Specific Plan in two ways (Leach, P.E., 2020). First, they felt that the Thermal Beach Club's water use for a surf lagoon with seven-foot waves should be considered a substantial change from the originally proposed still lake. Second, they noted substantial contextual changes to the region, including droughts impacting Coachella Valley's water sources and changes to the legal frameworks regulating groundwater management and the Colorado River Compact. Opponents questioned how and why an EIR from 1999 could continue to be relevant when after its approval the Coachella Valley experienced three droughts and the state acknowledged that these droughts would be perpetual and extended (*Board of Supervisors Regular Meeting, 2019*).

To fight project approval, opponents challenged the legality of using an EIR addendum. They contended county staff should refuse approval of the EIR addendum because of the aforementioned substantial changes in water use and climate context (Leach, P.E., 2020). Planning staff did not agree with advocacy organizations' assessments of substantial change. They responded to public comment letters point by point, concluding either that there was a minimal increase in water use or that no new environmental issues were raised.

In the opponents' opinion, the surf lagoon substantially changed the Kohl Ranch Specific Plan by increasing water use. Advocacy organizations hired a consulting company to provide an independent assessment of water use. Using 2019 CVWD calculations for a Palm Desert surf lagoon, they found that the Thermal Beach Club's 22-acre surf lagoon would use 292 Acre-Feet per Year (AFY), or 116 AFY more than the originally proposed lake (Leach, P.E., 2020).

However, project planners' calculations differed. They estimated an increased water demand between a still lake and surf lagoon of approximately half a percent, or fourteen acre feet per year (AFY). Project opponents rejected these calculations and argued that increased and intensified project water use required a new water assessment.

The Thermal Beach Club application relied on a 2011 water assessment, approved for the Kohl Ranch Specific Plan, that determined CVWD had sufficient water supply for the project. Project planners cited Senate Bill 610 to identify that no new assessment was needed. They contended that the 2011 water assessment "was prepared in accordance with SB610 and sufficient water supply was determined to be available for the Kohl Ranch" (Leach, P.E., 2020, p. 40). In addition, they noted that "CVWD determined there to be definite physical evidence that construction on the Kohl Ranch had begun prior to the end of the 5 year review deadline" which would have otherwise required a new assessment (Leach, P.E., 2020, p. 40). As part of a specific plan, the Thermal Beach Club's water and land uses were evaluated against the Kohl Ranch's housing, landscaping, and water totals. The Thermal Beach Club provided a portion of those totals, according to planners, and therefore did not meet overuse or change criteria.

Planners and developers argued that the project's dual water system, separating domestic and landscaping water, mitigated any increase in water use. Describing the project's dual system, the developer argued that the landscaping and lake would use Coachella Canal water provided by CVWD, not potable domestic water. The developer's representative claimed that through the dual system, the project was "lessening the demand on CVWD supplies. And with this project we will eliminate groundwater pumping. So as an overall, we are actually helping with the water availability in the area" (*Board of Supervisors Regular Meeting, 2019*).

The Thermal Beach Club developer claimed the project created water availability through water use. Their assertions are based on infrastructure consolidation with CVWD's potable and non-potable water distribution systems. The alternative, they imply, is constructing their own wells for drinking, landscape irrigation, and surfing, which would stress existing groundwater reserves. However, while the project eliminates self-produced groundwater pumping, it does not eliminate groundwater pumping, as claimed by the developer. Instead, the Thermal Beach Club receives potable groundwater from CVWD, which pumps over 100,000 AFY from over a hundred wells (Water Systems Consulting, Inc., 2021). Whether privately or publicly provided, all domestic water in the Coachella Valley comes from groundwater pumping.

For opponents, the project's additional water use strained the region's already scarce water sources. In their letter to the planning department, LCJA argued that the project's EIR addendum was misleading when it stated that "development of the Project will not negatively impact sustainable groundwater management of the Basin as groundwater is so abundant that additional groundwater replenishment is prohibited" (Leach, P.E., 2020, p. 6).⁶¹ Instead, LCJA argued, the Basin is only able to avoid overdraft due to CVWD recharge efforts using imported water from the Colorado River. In her public statement, the Associate Director for Coachella Valley Waterkeeper argued that because Colorado River water is used for aquifer recharge, any

⁶¹ The full text from the EIR addendum discussing groundwater conditions reads: "The original intent of the drainage within SP303 (Kohl Ranch) was to infiltrate or reuse stormwater; although reuse is still a design intent, infiltration is no longer a viable option. Groundwater replenishment in this area over the last 10 years has resulted in a rise of groundwater throughout the east Coachella Valley. Much or most of Kohl Ranch now has groundwater within 10-15 of the surface which prohibits the use of infiltration basins as these need 10 feet of soil between bottom of basin and groundwater. (FEI-B, p. 1-3). However, development of the Project will not negatively impact sustainable groundwater management of the basin as groundwater is so abundant that additional groundwater replenishment is prohibited" (County of Riverside Planning Department, 2019, p. 58).

use of canal water is a reduction in groundwater and, thus, drinking water (*Board of Supervisors Regular Meeting*, 2019).

Citing CVWD’s Sustainable Groundwater Management Alternative Plan and the Coachella Valley Water Master Plan from 2010, LCJA contended that CVWD did not have a sufficient water supply for the project. Instead, it required additional water sources to meet future demand. Indeed, CVWD relies heavily on the Colorado River, the State Water Project, and other imported water to support the Valley’s water supply and growth. Additionally, the 2020 Coachella Valley Regional Urban Water Management Plan does not assess climate change’s impact on Coachella Valley water resources (Water Systems Consulting, Inc., 2021, p. 4-17).

However, planners responded to environmental concerns by arguing repeatedly that “no new environmental issues are raised by this comment.” Instead, they cited CVWD’s water rights to the Colorado River as providing sufficient supply for the project. In doing so, planners were implicitly stating that they knew of regional water scarcity and regional drought at the time of the original EIR and the 2011 water assessment approval. And, within that environmental context they believed that the type of water use the project prioritized was acceptable including using over two-thirds of the specific plan’s estimated 5,439 AFY of water for landscaping (Leach, P.E., 2020).

To support their position, the Thermal Beach Club developers brought the former General Manager of CVWD, Tom Levy, to speak on their behalf regarding water concerns. Citing his role as lead negotiator for the Quantification Settlement Agreement and the Monterey Agreement that restructured State Water Project contracts, he reassured the Board of Supervisors that there was sufficient water for the Thermal Beach Club. In his statement, he contended “we’ve got water for growth” (*Board of Supervisors Regular Meeting*, 2019). CVWD’s ability to

meet projected growth includes an unbuilt expansion of recycled and imported water sources (Water Systems Consulting, Inc., 2021, p. 4-27).

Levy went on to describe water quality issues in his testimony on behalf of the Thermal Beach Club's developer. He stated:

When people talk about the poor water quality in the area they are talking about private systems, systems not of the Coachella Valley Water District, but of a trailer park, of private homes, this sort of stuff. And I understand it's a major issue. We spent a lot of time trying to get money from different grants and different programs to be able to improve the water system in the lower Coachella Valley, but money is always hard to get. I always laugh, we won a large sewer construction grant back in the late 70s, and where did it go, it went to the rich side of Palm Desert even though we submitted applications for different areas that were a lot more in need of it and not having the financial wherewithal. So that is the water equality side (*Board of Supervisors Regular Meeting*, 2019).

In his statement, Levy evaded CVWD's responsibility for water quality. Instead, he blamed water quality and infrastructure equality on private well systems and state funding. He described how the owners and operators of private systems were responsible for water quality issues because they accessed arsenic-contaminated groundwater through their private wells. He believed that the state's funding prioritization mechanisms, which in his experience selected projects in wealthier areas of the region, restricted CVWD's ability to extend infrastructure into the Eastern Coachella Valley. In his account, CVWD bore little responsibility for water quality or infrastructure issues in the Eastern Coachella Valley.

Nonetheless, CVWD's operations negatively impact the region's groundwater quality and availability. CVWD relies on the Colorado River water to recharge the aquifer. Groundwater pumping by CVWD, individuals, and corporations extracts more water than can naturally be recharged through rainfall. This aquifer overdraft has been ongoing since early settler water use.

Coachella Valley groundwater was once considered superior quality. However, bringing Colorado River water into the Valley has for decades caused issues of salinity and reduction in water quality regionally (*Agua Caliente Band of Cahuilla Indians v. Coachella Valley Water District: Complaint for Declaratory and Injunctive Relief*, 2013; Chenoweth, 1959). In a 1959 hearing in the Coachella Valley, CVWD's general manager Lowell Weeks complained of the Colorado River's salinity, which contained "one ton of salt per acre foot" of water (Chenoweth, 1959, p. 12). He provided testimony stating, "[i]f agriculture is to remain in a healthy condition in this Valley, the water should be salt free or additional water is required for leaching as the salinity of irrigation water increases" (Chenoweth, 1959, p. 14).

More recently, the Agua Caliente Tribe filed a lawsuit against CVWD and the Desert Water Agency over groundwater rights. In its complaint, the tribe described how importing water from the Colorado River was causing further contamination of the Basin's aquifer. It charged that, "the Colorado River water has a higher level of total dissolved solids (TDS) than local groundwater. This has resulted in further degradation of groundwater quality and increasing salinity levels within the Coachella Valley Groundwater Basin aquifer" (*Agua Caliente Band of Cahuilla Indians v. Coachella Valley Water District: Complaint for Declaratory and Injunctive Relief*, 2013, p. 13).

CVWD began using Colorado River water in 1973 for aquifer recharge to counterbalance user overdraft. While aquifer recharge prevents complete overdraft, it contributes to groundwater

contamination. It adds larger salinity and TDS quantities to groundwater. As the Coachella Valley increasingly relies on aquifer recharge from the Colorado River groundwater quality decreases.

There is not enough natural capacity in the aquifer for any new development. Developments depend on CVWD's artificial groundwater recharge to fulfill their water demands. Thus, new developments exacerbate existing water scarcity and quality issues for residents in the Eastern Coachella Valley who rely on private wells that lack proper filtration systems. New developments increase regional groundwater use and pumping, contribute to further aquifer overdraft and the need for more water from the Colorado River, and, as a result, decrease the quality in groundwater from recharge. Moreover, new luxury developments reserve CVWD's scarce water supply for recreational use.

Growth for Growth Policies

While Riverside County land use development approval processes lack concern for regional water security, project benefits were assessed at the regional level. Thermal Beach Club proponents argued that the region should be considered when evaluating project benefits. One proponent compared the Thermal Beach Club to Western Coachella Valley's polo fields and tennis courts, contending that it would bring notoriety to the region and attract visitors from around the world (*Board of Supervisors Regular Meeting, 2020*). Likewise, a Western Coachella Valley resident argued that because the project is in an unincorporated area and approved by a Board of Supervisors, who represent the entire County, it is a regional concern.

For proponents, regional benefits came from growing luxury tourism. They believed the projected \$8 million in tax revenue (which far exceeded the existing \$13,000 Riverside County received from Thermal) would help combat environmental justice issues pertaining to the Salton

Sea (*Board of Supervisors Regular Meeting, 2020*). Others believed this tax revenue should be shared by all residents in the Coachella Valley, instead of just the Eastern Coachella Valley (*Board of Supervisors Regular Meeting, 2020*). They contended that the surf lagoon’s recreational assets would bring more like-minded developments. A farmer from the Valley argued that the region “needs places like this for families to come and enjoy the water” (*Board of Supervisors Regular Meeting, 2020*). Supervisor Jeff Hewitt⁶² reiterated project proponents’ arguments, associating recreational opportunities with attracting new development:

I think it helps it make it a destination for things like recreation, whether it be fishing or other water sports on the Salton Sea. I think it has the potential to be a magnet to bring more developers there and one of the side effects, like I see one of my fellow supervisors just said, all these things cost money, and we can’t magically shake a tree and get money. I believe that a lot of those health issues too for a lot of people who have lived there now, who have lived there for generations, it’s going to be a lot better for them overall, especially bringing this kind of prosperity to the area as a whole. (*Board of Supervisors Regular Meeting, 2020*)

Countering these arguments, a resident asked the board, “how are you going to show the growth of the community with vacation homes?” (*Board of Supervisors Regular Meeting, 2019*).

However, proponents viewed the development’s exclusivity as essential to successful growth in the Eastern Coachella Valley.

They argued that a key component of community benefits was the project’s infrastructure expansion. The developer and supporters described project infrastructure as necessary for

⁶² Representative of the fifth district; the western adjacent district to the Coachella Valley.

addressing water access issues. One resident from the Middletown Road community in Thermal, contended that the project was “instrumental to help with infrastructure and give opportunities to community to grow and develop” (*Board of Supervisors Regular Meeting, 2020*). He continued, noting “we need to start growing and competing with surrounding communities and surrounding cities” (*Board of Supervisors Regular Meeting, 2020*).

Proponents cited past infrastructure investments, required for Kohl Ranch Specific Plan approval, to demonstrate projected project benefits. Jeff Dankin, Kohl Ranch’s representative since 1989, insisted that the Kohl Ranch Specific Plan and its owners were the single most important part of the Thermal community. “No one has done more in this community to promote growth and promote benefits in the community than the Kohl family,” he stated (*Board of Supervisors Regular Meeting, 2019*). He cited their efforts to bring or fund elementary, middle, and high school sewer and water infrastructure and roads to Thermal. He reminded those present that roads were unpaved and “septic [was] in this entire area” before the arrival of the Kohl family. Discussing these infrastructure improvements, he asserted that:

We’ve poured millions of dollars into infrastructure in this area...When it was determined that the water did not meet the federal standards for arsenic the Kohl ranch contributed money to build a new arsenic treatment plant that services this area. (*Board of Supervisors Regular Meeting, 2019*)

The developer’s representative echoed these comments. Responding to opponents’ concerns that bristled at luxury development approval over affordable housing, he stated:

The initial infrastructure that was built by Kohl Ranch, that infrastructure has been expanded, in some cases by the County and in some cases by CVWD. But because of that initial infrastructure there’s a number of affordable housing projects that have now come

up around that infrastructure because they need that infrastructure in order to make it viable for affordable housing (*Board of Supervisors Regular Meeting, 2020*).

In their comments Kohl Ranch and Thermal Beach Club representatives insinuated to Thermal residents and project opponents that without Kohl Ranch they could not live affordably in Thermal.

Bolstering project developer's comments, the Planning Department attested to the need for infrastructure investments through private development. The Transportation and Land Management Agency Director, Juan Perez, declared infrastructure as the most meaningful benefit to the community:

I think it is important then to point out certainly that it's not up to us as a County to dictate what is proposed on property. Our role is to evaluate the proposals that come before us and determine if they are mitigating their impacts, if they are good on balance for the community. And, given those things, this is not a project that the County is directly investing in, this is a project that is investing in the communities and helping to provide infrastructure to the communities around them. And I do want to stress that point, one of the most really impactful challenges to affordable housing is infrastructure. That is often the problem, it's not zoning, or it's not designating land, it's the cost of providing water, sewer, and roads to connect to that. So every bit that happens and helps grow the network out there helps increase opportunities for affordability for other projects around it (*Board of Supervisors Regular Meeting, 2019*).

To county officials, their capacity to provide more affordable housing necessitated luxury development growth.

The director of multifamily housing at the Coachella Valley Housing Coalition, provided support to this notion (*Board of Supervisors Regular Meeting, 2020*). She declared that the lift station from the Thermal Beach Club would help their affordable housing project, currently in development near the site. Another “life-long resident of Thermal,” breaking through crowd jeers calling him a “sell out,” also supported the project because of its perceived benefits towards affordable housing (*Board of Supervisors Regular Meeting, 2019*). Like the agency director, he believed the community lacked affordable housing because it lacked infrastructure. He contended that developments like the Thermal Beach Club could help change the community’s situation. By receiving the new infrastructure, the community could begin to advocate for affordable housing (*Board of Supervisors Regular Meeting, 2019*).

County supervisors recognized infrastructure disparities in under-resourced, disadvantaged communities as a regional issue. Many of the supervisors were facing the same challenge in their own districts. Supervisor Kevin Jeffries from Riverside County’s first district asked, “How do we help the disadvantaged communities get the infrastructure and the services that they need? And that burden rests entirely on our shoulders. It doesn’t rest on the private sector, it doesn’t rest with others, it’s our problem” (*Board of Supervisors Regular Meeting, 2020*). He went on further, describing Riverside County as a “poor county overall,” stating that the county did not have the revenue to fix any of the problems facing disadvantaged communities throughout the region. Supervisor Hewitt affirmed the lack of revenue when discussing the infrastructure needs of communities in Riverside County, saying “these things cost money, and we can’t magically shake a tree and get money.” Supervisor Jeffries reiterated this need saying, “our unincorporated areas just don’t have the revenue streams we need to put the infrastructure in, so we don’t have that choice. We have to partner with private sector

developments to get more infrastructure.” According to the Supervisors, the county could do little to improve the infrastructure needs of their unincorporated communities. New infrastructure required new private development. The Thermal Beach Club, they argued, would bring future development to the Eastern Coachella Valley, creating a trickle-down effect for infrastructure.

However, this promised growth has not come to fruition from the past Kohl Ranch infrastructure. The Kohl family’s representative conceded that past infrastructure improvements have done little to attract new housing. Discussing 800 lots they had graded for workforce housing, he stated that, “we want to see development happen, we want to see further infrastructure happen.” These lots, according to Dankin, have yet to see any housing construction (*Board of Supervisors Regular Meeting, 2019*).

Past and future Kohl Ranch infrastructure fails to address water infrastructure issues for existing homes. The project’s new water infrastructure, as one opponent noted, would require surrounding housing to fund the connections to water lines themselves. This was money they might not have, and the connections would cost more than they currently pay for water. The Thermal Beach Club does not propose building water infrastructure off-site. Existing CVWD water main lines remain the closest water infrastructure to the project’s surrounding residences.

CVWD’s Eastern Coachella Valley consolidation needs survey⁶³ also shows that Thermal Beach Club’s infrastructure does little to help residents connect to public water infrastructure. Proposed water infrastructure for the Thermal Beach Club includes piped water to new dwelling units for domestic water, a 22-acre surf lagoon, spa and pool, landscape maintenance, and a reservoir (County of Riverside Planning Department, 2019). A three-acre reservoir will hold

⁶³ The survey does not include any housing developments located on Torres-Martinez Reservation land.

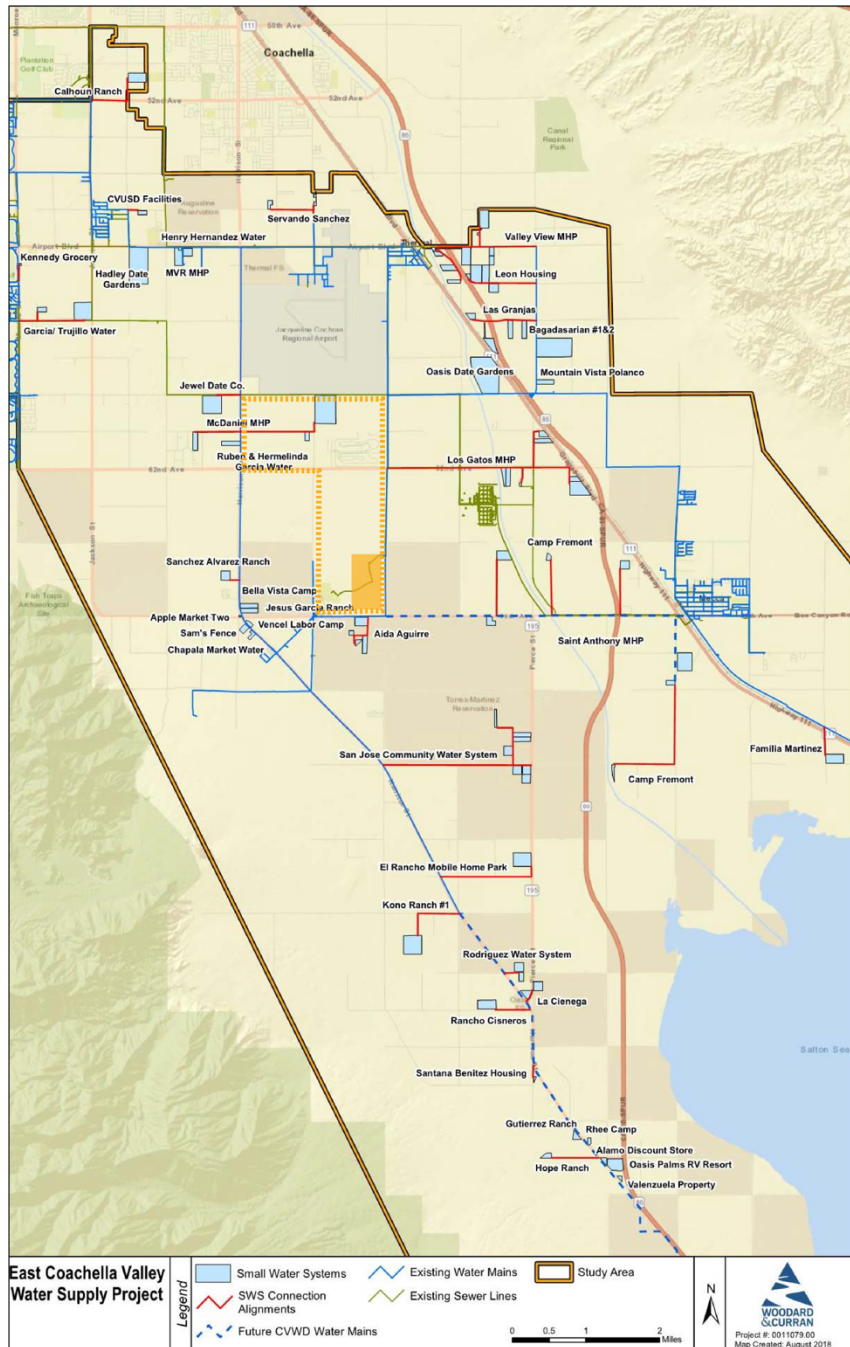
Colorado River water provided through the Coachella Canal for the lagoon and landscape irrigation (County of Riverside Planning Department, 2019). A new $\frac{3}{4}$ mile water line will connect new residences to existing CVWD potable water infrastructure (*Board of Supervisors Regular Meeting*, 2019). Located within the Kohl Ranch site, the $\frac{3}{4}$ mile water line does not make it possible for surrounding communities to connect to public water infrastructure (figure 7-4).

Despite the infrastructure touted by the Kohl Ranch developers, hundreds of households in the Thermal and Oasis areas continue to lack access to public water infrastructure. No communities identified by CVWD for consolidation are located where they can take advantage of the project's infrastructure improvements (see figure 7-4). This includes a site within the Kohl Ranch Specific Plan where approximately twenty people access water from a well contaminated by Chromium (Lopezcalva et al., 2018). Thermal Beach Club's proposed water infrastructure does not decrease the distance between existing CVWD water mains and communities needing consolidation.

In sharp contrast to proponents' arguments, opponents disputed County dependency on private development to build new infrastructure to the water infrastructure-poor Eastern Coachella Valley. Instead, they viewed it as an evasion of government responsibility. A member of LCJA, who grew up in the Eastern Coachella Valley, pointed out that the County and its elected officials neglect the Eastern Coachella Valley despite resident advocacy for direct and specific resources that would address residents' expressed needs (*Board of Supervisors Regular Meeting*, 2019). Instead, she observed that the County relied on new development to bring resources to the under-resourced community. This "quid pro quo," a young Thermal resident argued, should not be used to achieve basic human rights.

Figure 7-4

CVWD Water and Sewage Mains and Consolidation Project Connections (Lopezcalva et al., 2018)



Note. This map shows CVWD water mains in blue lines, small water systems needing consolidation in light blue, and the connection alignments between CVWD infrastructure and

small water systems in red. The orange square shows the approximate location of the Thermal Beach Club and the orange dashed line the Kohl Ranch Specific Plan area added to the map by the author. As can be seen on the map, there are no small water systems near the project site, nor planned connections to project or Kohl Ranch infrastructure.

Thermal Beach Club opponents did not approve transferring responsibility for infrastructure provision and expansion from government to private entities. Pointedly outlining the responsibilities of the government versus private development, one speaker commented:

We do not want a wealthy development to come and solve our community's issues. We want the County, our elected officials, to take responsibility for these issues and to begin to address them in an equitable way that prioritizes our community and our residents' needs rather than use these issues as a way to justify a wealthy vacation development.

...It should not take private development for our County to address toxic arsenic water, sewage spills, a lack of sidewalks, a lack of paved roads, and a lack of affordable housing. Our residents and children deserve equitable solutions with no strings attached
(Board of Supervisors Regular Meeting, 2020).

A resident of Thermal and member of ECV No Se Vende echoed this comment, "we can't continue to depend on luxury projects to be our only option" *(Board of Supervisors Regular Meeting, 2020).*

Reliance on private development for infrastructure expansion is written into the regulations at the county and water district levels. Connecting to public water infrastructure in unincorporated Riverside County requires submitting building and site plans for approval by the Planning and Building and Safety Departments.⁶⁴ Applicants can either apply for a private well

⁶⁴ These processes do not apply for housing projects located on tribal land, but only those under the jurisdiction of unincorporated Riverside County. For housing projects developed on Tribal land, the

permit with Riverside County Environmental Health or submit development plans to CVWD to connect to public water infrastructure. Riverside County Planning Department provides no guidance on water use for development projects. Instead, it passes the responsibility to water districts.⁶⁵

CVWD provides water assessments for new projects using its projected water supply data. It checks whether there is sufficient water supply for new projects. CVWD's Urban Water Management Plan outlines a population ceiling for its current (and future) water supply. In its 2020 Regional Urban Water Management Plan, CVWD ensured sufficient water supply for the projected growth of the region until 2045.⁶⁶ Because the Thermal Beach Club's water use falls within total projected water reserves, CVWD found that it had sufficient water for the project.

CVWD projections include increased demands between 2020 and 2025 that reflect "planned expansion service areas to include areas not currently connected to CVWD System. The timing of this expansion will depend on the availability of grant funding" (Water Systems Consulting, Inc., 2021, p. 4-15). It has included the one hundred small water systems in need of consolidation into their projected water supply. But this consolidation is dependent on CVWD successfully finding grant funding for new infrastructure and water supply is not guaranteed. In

process for project approval and development goes through both local tribal council processes and federal processes.

⁶⁵ For example, the Thermal Beach Club's conditions of approval outline that the project would need to "provide documentation establishing water service from Coachella Valley Water District" before building permits are issued (Leach, P.E., 2019, p. 20).

⁶⁶ Projected population growth for the region includes estimates for permanent, seasonal, and RV park populations to establish more accurate per capita water use for the Valley. These numbers use projected population growth from the Southern California Association of Governments (SCAG) Regional Transportation Plan.

addition, as new projects are approved throughout the region on a first-come, first-serve basis, sufficient water supply for the unconnected water-poor is dwindling.

Approval based on CVWD water supply is only one consolidation hurdle. Physical connections to water main lines require capital. The piped water infrastructure costs are directly related to household proximity to water lines. The longer the distance from CVWD main lines, the more expensive it is to connect. For example, the cost to connect the St. Anthony Trailer Park to CVWD infrastructure is estimated at \$1,437,000 (Lopezcalva et al., 2018). New construction consolidation costs are solely borne by development owners, whether this is the farmworker and their family building a small Polanco Park or a multi-million dollar company developing a surf club. CVWD water infrastructure access is cost prohibitive in the Eastern Coachella Valley and other peripheral areas in Riverside County because of distance to main lines (see Chapter Six on CVWD's role in developing the center/periphery pattern of water infrastructure). Lacking the capital to pay for the design, approval, materials, and construction to connect to CVWD water infrastructure, most residents in the Thermal and Oasis communities elect to use private wells to supply domestic water.

CVWD explicitly regulates its dependence on private development to expand domestic water infrastructure using its water code. Section 3.05.130 Water system backup facilities charge (WSBFC) states that: *“Since 1978, with the passage of Proposition 13, capital construction costs for new domestic water service infrastructure have been borne by developers through the WSBFC”* (author's emphasis). Prior to 1978, CVWD funded potable water connections through its annual budget or government bonds. After voters passed Prop. 13, CVWD transferred funding responsibilities for domestic water infrastructure expansion from service provider to customer. In

addition, CVWD is restricted from using funds received from current customers to expand water infrastructure to households currently lacking consolidation to its system (CWEA, 2019).

CVWD's "growth for growth" policies fund infrastructure in two ways: first, through a series of development fees, and second, by putting the cost burden for water main line consolidation and construction on developers. In a November 2021 presentation to CVWD Board of Directors, staff described two types of developer fees that achieve the "goal of 'growth paying for growth'" (Coachella Valley Water District, 2021). The fees cover water infrastructure capital costs needed to maintain clean-potable groundwater supply for domestic water use including wells, reservoirs, transmission mains, groundwater recharge stations, arsenic treatment plants, and non-potable water system expansion projects (Engineering Department, 2021). In addition to these fees, owners and developers are required to fund and manage domestic water pipeline construction and connection from the housing unit to the nearest CVWD water main line.

Public debate during the Thermal Beach Club approval on regional-wide water scarcity, water use, and water infrastructure exposed how regional government policies guiding land use development exacerbate issues of water inequality. State policies guiding regional water management require water districts to assess present and future water security for a growing population. Riverside County's land use development approval process depends on these water district assessments. In the Coachella Valley, the county defers water assessments and allocations to CVWD on a per project basis. Estimates of development impacts on water and hydrology through CEQA enactment are piecemeal at best. In Riverside County, new developments and their water use are evaluated lacking concern for land use's regional water impact. By deferring water assessments and allocations to CVWD, Riverside County's Planning

Department avoids taking on the responsibility of evaluating and managing how land intensification affects water use. Instead, they extend California's first appropriation water rights by allocating water on a first-come, first-serve basis.

New projects in the Coachella Valley will continue to garner adequate water assessments from the CVWD until the region surpasses the district's established threshold for projected growth and water use. Instead, the county has zoned the Eastern Coachella Valley to exceed projected population growth that CVWD and the Valley's water resources can serve. In doing so, Riverside County and CVWD policies increase disparities in existing spatial inequality in water access by perpetuating a system where the approval process for rights to water distribution is inequitable and uneven.

Changing the Pattern of Spatial Inequality

In the end, the Thermal Beach Club's approval was contingent on the county's professed lack of capacity to extend infrastructure into its under-resourced communities. Like CVWD, the County relies on a growth for growth model. New development is needed to fund infrastructure in areas currently lacking it. For the Supervisors, the community protests around water access and exclusion could only be resolved by adding new luxury developments.

The approval of the project was not without internal and external attempts at balancing the benefits of the project with the needs of existing residents. Supervisor Jeffries acknowledged this struggle:

So how do we accomplish the needs of the community, which clearly Supervisor Perez is struggling with, and the partnership we need from the private sector to fund these services. It's just a dance. It's not pretty. And I understand how you're struggling with this. But I gotta tell you right now, for Mead Valley, Good Hope where I'm at 70%

Hispanic populations, no infrastructure, nothing in sight to fund that infrastructure, if this project doesn't happen out there you are welcome to come to Mead Valley or Good Hope and I'll take you in a heartbeat to help get some streets paved, some water lines in, some sewer lines in. 'Cause we don't have them in parts of the community. We don't have them at all and there's none in sight (*Board of Supervisors Regular Meeting, 2020*).

Supervisor Perez recognizing the issues facing residents of the Eastern Coachella Valley and the need to take their concerns into his decision-making process, reiterated the conundrum the board faced:

All of us here recognize the concerns of affordable housing. All of us here recognize the concerns of lack of infrastructure. The need for water. And we also know that our funds are very limited as a county. So, we have to establish partnerships and relationships to try to move that along. With that said, I believe that we are bringing a good faith approach to ensure that our communities in the east end also have the same amenities that others have on the west end, or other parts of the county of riverside. And I'm just talking about the basic stuff. Once again, paved roads, sidewalks, arsenic free water that's clean and not contaminated, ensuring that, ultimately, we are able to move people out of dilapidated mobile home parks (*Board of Supervisors Regular Meeting, 2020*).

Through project contestation, community members and planning staff extracted a community benefits agreement from the developers. The agreement sets aside and donates land within the Kohl Ranch Specific Plan for roughly 500-1,000 units of affordable housing.⁶⁷ It creates an area-specific fund for infrastructure and community improvements that is less than

⁶⁷ Or if no land could be found, fund the acquisition for the land needed for the units elsewhere.

one percent of the cost to build the development, or just under \$749,800 (*Riverside County Supervisors Unanimously Approve Thermal Beach Club with Unprecedented Community Benefits*, 2020).⁶⁸ Fund use will be directed by Eastern Coachella Valley residents and organizations to meet their needs.⁶⁹ However, continued project opposition did not substantially change the Thermal Beach Club's development proposal nor persuade the Board of Supervisors to address resident concerns at the heart of the opposition. For the Supervisors, the community benefits and new infrastructure was enough to support the project's approval, despite leaving issues of exclusion and increased disparities in water access unresolved.

The Thermal Beach Club requires water that the Coachella Valley's aquifer does not naturally have. As a result, it exacerbates existing water scarcity and water quality issues. Project water use requires that CVWD use Colorado River water to recharge the aquifer, contaminating groundwater quality. This is groundwater that over 4,000 people rely upon in the Eastern Coachella Valley, groundwater that is already contaminated with arsenic and other chemicals (Lopezcalva et al., 2018).

Riverside County and CVWD growth for growth policies create disparities in regional water access and exacerbate spatial inequality. Riverside County's dependency on luxury developments and growth uses large quantities of water for play that exacerbates the region's water scarcity and water quality. CVWD policies make water access dependent on household capital and spatial location. In doing so, it exacerbates the inequality between who has future

⁶⁸ The developer's initial community benefit offer only included \$1,000 per housing unit. In addition, these funds were not location-specific and there was no inclusion of future opportunities for affordable housing in the Kohl Ranch Specific Plan. The final agreement requires \$2,300 per project housing unit.

⁶⁹ Prior to this community benefit agreement, funds from new developments were distributed through normal budgetary processes to benefit any region within the County.

water access in a region facing extreme water scarcity. In addition, the Thermal Beach Club adds to resident experience in water access inequality. It locates new residents with water access next to existing residents without it. By making its amenities exclusive to members, it continues CVWD's mid-century tactic of water dispossession by exclusion. And it fails to extend infrastructure and economic benefits to existing communities.

Luxury developments leveraging growth for growth policies are changing the pattern of spatial inequality in the Eastern Coachella Valley. These policies increase the adjacencies between who has and who doesn't have water access. Previous spatial patterns of center/periphery and east/west are dissolving into a checkerboard of water wealth and poverty. Here, water dispossession by overdraft, exclusion, and contamination are all at play.

Conclusion

Spatial inequality in water access is longstanding in the Coachella Valley. The Eastern Coachella Valley, and in particular the Oasis, Thermal, and Torres-Martinez Reservation communities, has always experienced water scarcity due to a lack of reliable water quality and access. These domestic water access issues, present in the Valley's periphery and on tribal land, are absent in the region's urban core creating a center/periphery spatial pattern to water access. However, today, these spatial inequalities are exacerbated by retreat urbanism in the periphery.

Riverside County and CVWD growth for growth policies are centered around expanding the luxury tourist industry into the Eastern Coachella Valley. Historically, the Eastern Coachella Valley's Salton Sea was a key feature of tourism's mid-century growth. It provided water-based recreation to seekers of play from outside the Valley. CVWD issued bonds to fund water infrastructure for new subdivisions catering to these vacationers ("High Seas Area Sales Announced," 1962). In the Eastern Coachella Valley's community of North Shore, a beneficiary

of these bonds, little development came to fruition. Instead, growth in North Shore over the last couple of decades was fueled by low-income families in search of affordable homeownership.

Unlike earlier Salton Sea recreational activities, contemporary tourism in the Eastern Coachella Valley is focused on attracting high-income customers by promising exclusivity at luxury retreats. The success of retreat urbanism's new luxury developments relies on land, water, and cultural dispossession. Growth into the peri-urban requires appropriating the region's water for exclusive use by part-time residents. Land use policies guiding and approving these new developments actively invest in this exclusionary water access. County project covenants limit permanent residential use, instead requiring part-time residencies. County project approval processes perpetuate prior appropriation of water rights by approving water use and developments on a first-come, first-serve basis.

Riverside County and CVWD growth strategies depend on and fuel retreat urbanism's luxury developments. These new developments are defined by their water use for play. These retreats are constructed next to long-term residents who have faced issues with water access for decades. Here, uneven development at the hyper-local scale is viewed by government officials as necessary for the growth they desire. The county government depends on new water infrastructure accompanying these developments to expand public infrastructure. As such, their policies prioritize the land and water use for the luxury tourist industry and its customers, and aggregate regional economic development, over permanent low-income residents. However, Thermal Beach Club's water infrastructure is not being extended to their neighbors who lack public water infrastructure connections. Instead, peri-urbanization through retreat urbanism exacerbates and worsens their conditions by contributing to water scarcity, aquifer depletion, and water contamination.

Retreat urbanism's new luxury developments in peri-urban areas are also changing the pattern of spatial inequality in water access. Here, new luxury developments create exclusive oases of scattered water access. They offer customers the opportunity to escape their daily lives in busier, global cities and play in desert retreats. The spatial adjacencies of these new developments to existing communities that experience water insecurity are decreasing the gap between the water-poor and the water-rich. This increased disparity in water access intersects with an increase in socio-economic disparity. Both disparities are widening the gap between the poor and wealthy in an area that, until recently, primarily served the housing needs of farmworkers and their families. However, they increase physical proximity between those with and without water access.

Retreat urbanism's developments are designed around recreational water use. Water for play is central to their manufactured retreats. However, their water needs strain the Coachella Valley's scarce water supply. They ignore the local and southwestern region's droughts and climate change's effects on their water supply. Once approved, the developments are allocated water from the Valley's projected supply. Their water use contributes to aquifer overdraft and CVWD aquifer recharge. Artificially recharging the aquifer with Colorado River water is exacerbating groundwater contamination. For Eastern Coachella Valley residents who already face high arsenic levels in their wells, groundwater recharge further degrades their water quality. This exacerbating spatial inequality in water access is a result of land use and water infrastructure policies that court growth, reinstall seemingly neutral water allocation, and encourage new and ongoing forms of colonialism.

Chapter 8 Conclusion

Introduction

This dissertation attends to the inequitable conditions experienced by communities of color. Their voices often go unheard and unrecorded. Their plights remain forgotten or concealed. They appear in the official records through moments of contention and conflict. They show up in lawsuits, congressional records, documents from public meetings, and newspaper articles as their water insecurity reaches levels of impossibility.

The Thermal Beach Club, rather than an anomaly, was a harbinger of Valley-wide urban changes. By fall 2022, developers had proposed at least five surf parks in the region. In the Western Coachella Valley city, La Quinta, residents organized La Quinta Residents for Responsible Development, protesting against the “mind-boggling” water use of a proposed surf club (James, 2022a). Arguments in favor of the project followed the same lines of thinking as in Thermal. The surf park would attract new visitors, tax revenue, and economic growth to the city. Unlike residents in Thermal, La Quinta residents won a brief reprieve from the new development when their City Council voted unanimously to reject the zoning changes needed for the surf club.

Water continues to be viewed as abundant in the Coachella Valley. One La Quinta resident quoted in favor of the surf park said, “I know the rest of California is in a major drought. But we here have an abundance of water” (James, 2022b). Coachella Valley Water District’s (CVWD) water assessment for the development assured sufficient water for the project.

However, 2022 also brought recognition of unprecedented low water levels throughout the Colorado River Basin, a result of a two decade megadrought exacerbated by climate change (Fountain, 2022). The year before, the federal government had imposed cuts on water use for the Colorado River for the first time since the Colorado Compact (Fountain, 2021). The cuts reduce

water allocations for the Lower Basin states. However, by late 2022, California's water allocations remained relatively unscathed. As California (and other Western states) faces a dwindling water supply, public conversations are turning towards policies that address the conservation and prioritization of water use.

Developments fueling retreat urbanism, like the Thermal Beach Club and the new surf development in La Quinta, defend their water use by arguing that the Coachella Valley has water to grow. Their arguments are bolstered by regional government policies. CVWD's water management and policies contend that imported and recycled water can relieve any water overdraft. Riverside County Planning Department's land use policies ignore the need to consider water use and management. Instead, these policies and agency officials view growth as crucial for the greater good and necessary for extending infrastructure to under-resourced communities. The spatial inequalities these policies create are viewed as necessary and desired for growth to take place. But they simply worsen longstanding spatial inequalities in water access.

This dissertation set out to answer how Coachella Valley's spatial inequality in water access developed, deepened, and exacerbated? To do so, I first mapped the characteristics of water access over time to understand inequality in water access' spatial characteristics. Through the spatial analysis, I identified three conjunctural eras for detailed exploration. I examined early settler colonialism in California and the Coachella Valley in the first conjunctural era. In the second conjunctural era, I analyzed the formation of regional government and water management. The final conjunctural era dissects contemporary peri-urban development processes. I found that spatial inequality in water access is longstanding and getting worse in the Coachella Valley. I elaborate below.

Findings

The fourth chapter of the dissertation mapped the geography of spatial inequality in water access in the Coachella Valley. I analyzed and mapped contemporary water access using multiple characteristics. These characteristics included physical access and water reliability and use. I found that the peripheral unincorporated, Eastern Coachella Valley faces greater water access challenges than the rest of the Coachella Valley. Household water access issues are compounded. Their lack of physical access through plumbing or lack of consolidation with public water infrastructure is exacerbated by greater susceptibility to aquifer overdraft through industry water use and higher, unhealthy arsenic levels in their groundwater.

To understand the longevity of these water access issues, I analyzed census data from 1960 to 2019 on plumbing completeness as a proxy for water access. I found that spatial inequality exhibited two regional patterns: center/periphery and east/west. In the first pattern, households in peripheral Coachella Valley lack access to water, while those in the center core do not. In the second pattern, the Eastern Coachella Valley has a disproportionate number of households who lack access to water. A third-related pattern illustrated community concentration of water poverty. These patterns presented themselves throughout census years and are longstanding.

Chapter Five examined the longevity of spatial inequality in water access in the Coachella Valley, taking early settler colonialism in California as the launching point. I found that spatial inequality in water access in the Coachella Valley developed from intertwining settler colonial land use and water rights laws. While geographical and resource-based spatial inequality in water access existed prior to European colonialism in the Coachella Valley, the Cahuilla met this unevenness with adaptation, mobility, and innovation. During this period, when natural

water flows created spatial inequality and water scarcity, Cahuilla moved their villages to find new sources. They also used ingenuity to combat water scarcity including hand digging wells and building irrigation channels.

The onset of United States settler colonialism in the Coachella Valley in the late 1800s transformed the nature of unevenness in spatial inequality. Settler colonial land use and water rights policies were designed to expand United States territory, property rights, and industrial production into California. Settlers used these policies to dispossess land and water from the Cahuilla. Surveying and disposing land in the Coachella Valley, the federal government created a checkerboard of public and private land. The federal government then racialized this checkerboard into Indian and non-Indian land when it designated land for Indian reservations. Settler possession and productivity relied on water dispossession. As a result, settlers dispossessed Cahuilla of water using water rights, water allocations, and water overuse. Water dispossession created water scarcity for the Cahuilla. From this dispossession and scarcity, spatial inequality in water access developed into a racialized checkerboard pattern of Indian and non-Indian land. And, this spatial inequality was essential to developing socioeconomic inequality between the newly impoverished Cahuilla tribes and enriched white settlers.

Settler overuse created water insecurity for the Valley by depleting the aquifer within twenty years of commencing well drilling. To protect their newly acquired water sources and increasing agricultural profits, Coachella Valley farmers formed the Coachella Valley County Water District. When forming the new water district, Valley stakeholders ensured that the new regional government would prioritize water use for the agriculture industry.

Chapter Six shows that spatial inequality in water access deepened under the district's water management practices. I found that the Coachella Valley County Water District furthered

Indigenous water dispossession under its purview. The district used water rights in the Western Coachella Valley to dispossess Agua Caliente tribal water. And it implemented dispossession by exclusion in the Eastern Coachella Valley, refusing to extend irrigation water infrastructure to Desert Cahuilla reservations. Once again, dispossession created water scarcity for the Cahuilla and further degraded their living conditions and ability to enact mechanisms of self-sufficiency.

In addition, the Coachella Valley County Water District created a two-tier system of water management. It acquired rights to the Colorado River for agriculture irrigation use in the Eastern Coachella Valley. It entered the domestic water business by prioritizing developments and sub-divisions geared towards a burgeoning tourist industry in the Western Coachella Valley. By prioritizing agriculture and tourist industry water use, the district deepened the racialized checkerboard of spatial inequality. Dispossession by exclusion created a center/periphery and west/east pattern of spatial inequality. Within this pattern, non-Indian land in peripheral Coachella Valley had abundant access to Colorado River water for irrigation while the center core had domestic water access. This left Eastern Coachella Valley residents lacking domestic water, deepening their conditions of depravity and income disparities between farmworkers and Indigenous and farm owners, resort operators, and tourists.

Issues of water access in the Eastern Coachella Valley have exacerbated over the last few decades. Residents face issues of potability due to naturally occurring arsenic and lack of consolidation with public water infrastructure. Chapter Seven discusses the more recent peri-urban processes that are exacerbating and reshaping the patterns of spatial inequality in the Valley. New luxury tourist developments are increasing socio-economic disparities in the Eastern Coachella Valley while decreasing spatial proximities between who has and who does not have access to water.

Regional governments' growth for growth policies are encouraging these new luxury developments to take place in the impoverished Eastern Coachella Valley. Policymakers pursue urban growth to expand water infrastructure. They believe infrastructure expansion depends on private developments and that the accompanying unevenness is necessary to provide this greater good and can be addressed later. Coachella Valley governments chase a specific type of urban growth, retreat urbanism. Retreat urbanism creates urban growth through development of luxury part-time subdivisions intended to provide an escape for the ultra-rich. These developments depend on water amenities to attract their clientele.

In the Coachella Valley, luxury developments exacerbate water scarcity, water quality, and, ultimately, spatial inequality in water access. Region-wide aquifer overdraft compounded by multiple decade megadrought has created water scarcity throughout the Western Region. However, governments in the Coachella Valley continue to approve new development projects that exacerbate this water scarcity. Approval of new golf clubs, resorts with pools, and, more recently, subdivisions for part-time residencies with multi-acre surf lagoons and beaches strain water security and accessibility. Artificial aquifer recharge contaminates groundwater with Colorado River's salinity. For residents in the Eastern Coachella Valley, who rely on private wells for water, their water quality diminishes from the contamination during artificial aquifer recharge; their water security decreases as water pressures from high-end developments increase. These luxury developments are also changing the pattern of spatial inequality in water access. Located next to communities lacking water access, these luxury developments are creating a new checkerboard of water poverty and water abundance.

Theoretical Contributions

This dissertation provides theoretical contributions to the spatial inequality, water dispossession, and peri-urbanization literature. Using the Coachella Valley as the case study, I examine spatial inequality at the regional level, a scale that is understudied by scholars interested in spatial inequalities (Anderson, 2007; Ong & Gonzalez, 2019). By using the regional scale and drawing on racial capitalism as my framework, I demonstrate how structures and actors interact to construct local spatial inequality. Where spatial inequality literature is often capitalocentric and market-driven, this dissertation demonstrates how colonial power through settler colonialism interlocks with capitalism to construct spatial inequalities. Settler colonial policies racialized land as Indian and non-Indian, creating a different set of policies and land value for each. Settler colonial policies incentivized white settlers' pursuit of agricultural profits and water and devalued Indigenous agricultural practices and water uses. As the Coachella Valley grew, subsequent water management policies upheld these racial hierarchies, extending new water infrastructure into non-Indian land and refusing it for Indian land. Today, growth-for-growth policies enact neo-colonial dispossession of land, water, and culture in the Eastern Coachella Valley.

My focus on water access adds to the conventional emphasis of the spatial inequality literature, which primarily examines residential location. While scholars focusing on residential location and exclusionary local governments argue for regional decision-making, my research throws the conventional wisdom in sharp relief. Regional governance has played a significant role in constituting Coachella Valley's water access inequalities and is not a solution on its own.

Equally, I use a spatial lens to analyze issues of water access in the Coachella Valley and contribute to the water access literature, which often lacks rigorous spatial analyses (Deitz &

Meehan, 2019). Existing water access literature with spatial analyses uses aggregate data focusing on a singular characteristic of water access to illustrate racial and socio-economic characteristics of those who lack access during a certain period. In contrast, I apply a spatial lens to multiple characteristics of water access and longitudinally analyze aggregate data as a starting point to set the context of my inquiry into spatial inequality. I spatially map where inequality exists in the Coachella Valley, who it affects, and how it has changed overtime. I use spatio-temporal analyses to indicate conjunctural eras for tracing spatial inequality's development over time, and examining how spatial patterns deepen and contemporary policies are worsening and exacerbating these inequalities.

In doing so, I add to the literature on water dispossession. This literature focuses on traditional water dispossession typologies advancing either settler colonialism or capitalism, such as water rights, grabbing, allocation, diversion, or industry contamination. I show how successful white settlement in the Coachella Valley could only happen through Indigenous water dispossession. Settlers leveraged multiple mechanisms for water dispossession. I analyze how they varied between Western and Eastern Coachella to expand growth. Through this, I identify an understudied typology of water dispossession: overdraft. I demonstrate that water overdraft during settler colonialism contributed to indigenous water dispossession, regional water scarcity, and racialized spatial inequality in water access. I illustrate that water overdraft is not just a characteristic of settler colonialism but continues to the present day, exacerbating spatial inequality in water access. The dissertation describes how overdraft is managed by regional and federal water and land use policies. It illustrates how policies and actors view overdraft as an issue that can be resolved through other forms of water dispossession including diversion and exclusion.

In addition, these water policies drive Coachella Valley's peri-urbanization. They incentivize a particular form of elite growth. Retreat urbanism pursues urban growth through developments that prioritize luxury escapes for the world's ultra-rich. The region's new luxury developments are designed around water overuse in a landscape of water depravity. Chapter Seven adds to the peri-urbanization literature, meeting the call for spatio-temporal examinations on how peri-urban processes create unevenness (Bartels et al., 2020; Leitner et al., 2022). Coachella Valley's peri-urban processes exacerbate spatial inequalities and create new patterns by improving water access for the elite while worsening it for the under-resourced.

Water and land use policies driving peri-urbanization also reinforce racial hierarchy and enable capitalist production. They explicitly disinvest from poor and racialized communities and invest in expanding industrial and land development profits. Chapter Six demonstrates that these values deepen spatial inequalities. Where scholarship regards the regional scale of government as best suited to alleviate spatial inequalities, the case of the Coachella Valley demonstrates that scale is ineffectual when values uphold racial hierarchy and capitalism, and growth policies depend on uneven development. The spatial inequalities are inevitable and by design.

Future Research

The COVID-19 pandemic limited in-person and on the ground research possibilities. It restricted in-person interactions with residents and advocacy organizations. Using social media, government digital archives, and newspaper articles I was able to illuminate pieces of these stories. I show that communities facing spatial inequalities in water access always resist their water poverty. Future research could expand analyses of spatial inequality in water access in the Coachella Valley. On-the-ground research could focus on residential experiences with water access challenges, including gender and age-based differences. Research could examine how

individual households overcome water access challenges. In addition, in-person research could better illuminate community resistance against spatial inequalities in water access. Tribal and farmworker communities are currently engaged in litigation and community water management that respond to their water poverty. Examining their work, this dissertation's study could be extended by asking the question how does resistance contribute to or alleviate spatial inequality?

Policy Implications

The policy implications from this dissertation's findings are two-fold. First, findings demonstrate the ways in which land and water are intertwined, but their policies are not. Water is relatively unacknowledged in government land use planning practices. Instead, its management and oversight are siloed. Responsibility for water is passed onto water providers. In doing so, planning and planners imply that land use has little impact on water, water scarcity, and water access.

Land use policies must evaluate and plan for individual developments and urban growth's ramifications on water use and access. The changing climate does not allow for planners to ignore the relationship between land and its uses and water. Recent revelations of water poverty and precarity throughout the United States put into question the ethics of such a stance. As such, water use must be considered alongside land use.

Changing planning in this way, requires addressing the values and priorities that underlie policy. This starts by recognizing the embeddedness of planning policies in racial capitalism and settler colonialism. It then requires that planning policies are designed to counter and prevent the effects of both. This goes beyond neutrality. Rather, it requires an equity-driven approach to planning land and water use.

At the local level, zoning regulations need to plan for the intensity of water use. This goes beyond requiring that a development receives a water allocation from the responsible water district, as is the case in Riverside County. Instead, zoning regulations should consider and calculate industrial and residential water use, as they might for density and population accommodation. This also necessitates zoning for growth that is responsive to the area's water supply. In addition, legislation regarding local-level general plans and environmental assessments (like CEQA) should require water elements that accurately analyze water use and existing water equity. New environmental justice requirements in California general plans have started to advance this work.

Regional government also has a role to play in addressing spatial inequities. But to do so, values and priorities must be equity-driven and institutionalized. The regional government scale can distribute funding and infrastructure. It can assess equity across multiple jurisdictions and address negative externalities. It can harness community affinities to the region – such as those that were voiced by proponents of the Thermal Beach Club. However, it can only do this when it foregoes allegiance to structural oppressions that create spatial inequalities in the first place.

In the absence of funding overhauls such as tax law changes that could assist local infrastructure provision, state and federal-level funding should be equity-based. In fact, the Coachella Valley demonstrates how equity-driven policies address decades of disinvestment. Coachella Valley Water District mapped the disadvantaged communities in its service area and identified households in need of consolidation. In doing so, it has started to address water dispossession by exclusion for farmworkers and Indigenous communities in the Eastern Coachella Valley. However, this action was only taken as a result of California passing Proposition 1 in 2014, which tied regional water management planning efforts and state funding

to the mapping and involvement of disadvantaged communities, economically distressed areas, and underrepresented communities (California Department of Water Resources, 2022). To access state funding, Proposition 1, requires water agencies to consider disadvantaged communities in their service areas. As a result, this equity-based policy is helping to address issues of spatial inequality in water access in the Coachella Valley.

Equity-driven policies may take the approach of class and race-based analysis of communities for funding, like Proposition 1. But they can also go further by refusing to allow industry practices that create and exacerbate socio-economic and spatial inequalities. In the Coachella Valley, this might look like curbing development approvals for second homes until existing residents have safe, affordable housing and curbing approval for new water uses until existing residents' water challenges are addressed. Equity-driven policies could take the form of government's refusal to incentivize growth for growth's sake.

Equity-driven policies also require redress. To address settler colonialism's damage, regional governments could give land and water back to the Cahuilla, as California state and local agencies have started to do over the last few years (Chamings, 2020; City of Alameda, 2022; City of Oakland, 2022). The land back movement asks settlers and settler colonial governments to consider decolonization beyond the metaphor and legally give land back to Indigenous caretakers (Tuck & Yang, 2012). The Agua Caliente litigation is currently fighting for the tribe's water back from the two largest water districts in the Coachella Valley. The Agua Caliente argue for recognition that they have jurisdiction over groundwater and do so to protect it from contamination and overuse. However, the Agua Caliente litigation demonstrates that recognized (and unrecognized) Indigenous communities are still considered wards of the government. They are still unable to make decisions on their own without federal oversight. And

they are treated by regional and local jurisdictions as private entities and not as sovereign governments. Equity-driven redress of settler colonial damage also requires recognition and responsiveness to Indigenous sovereignty and Indigenous governments.

Appendix A: Maps Addendum

Demographic Changes Over Time

Figure A-1

Percent of Population Working in Agriculture (Manson, Steven et al., 2020; U.S. Census Bureau, 1960-2019)

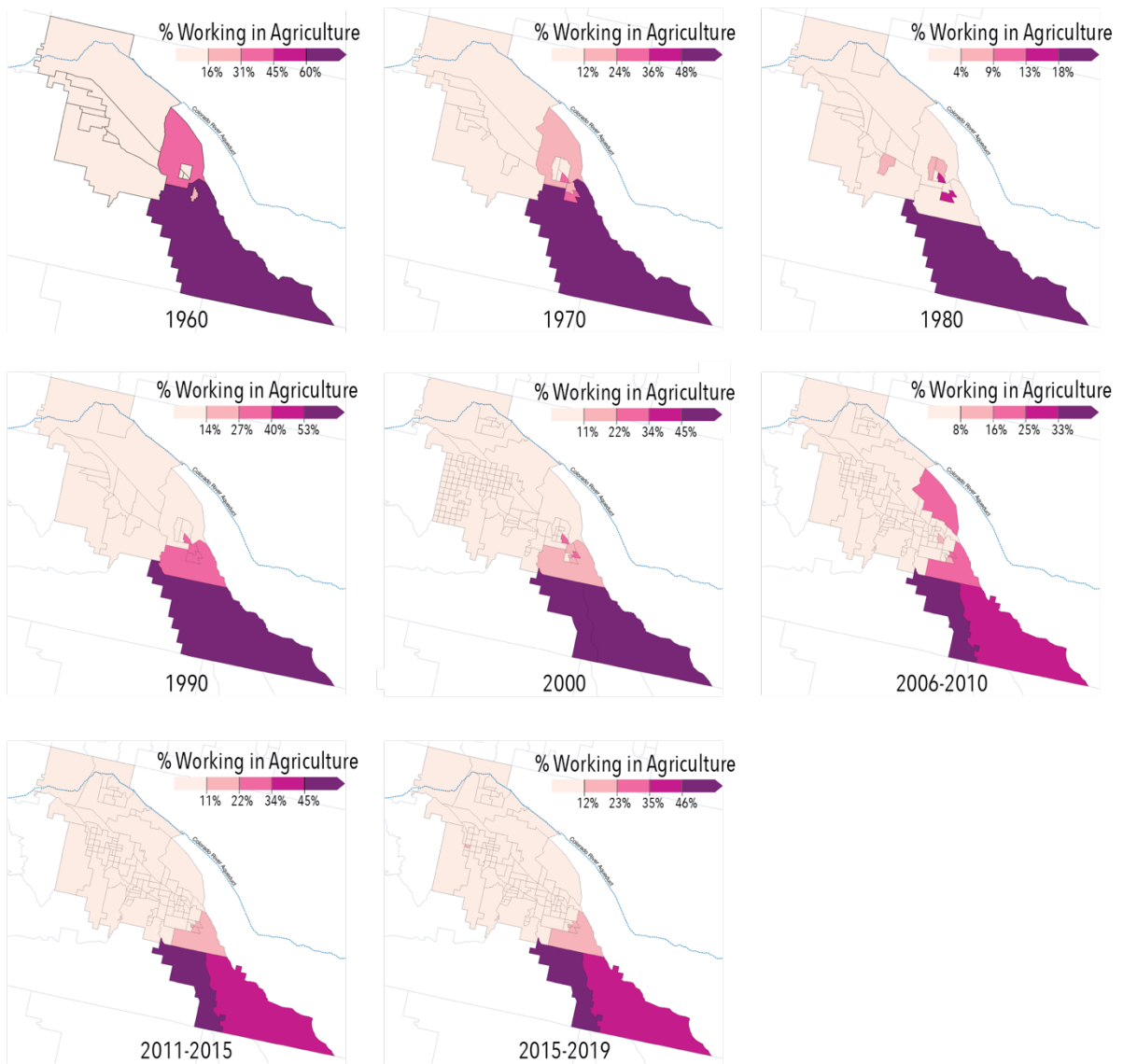


Figure A-2

Percent of Population that Identifies as Hispanic (Manson, Steven et al., 2020; U.S. Census Bureau, 1960-2019)

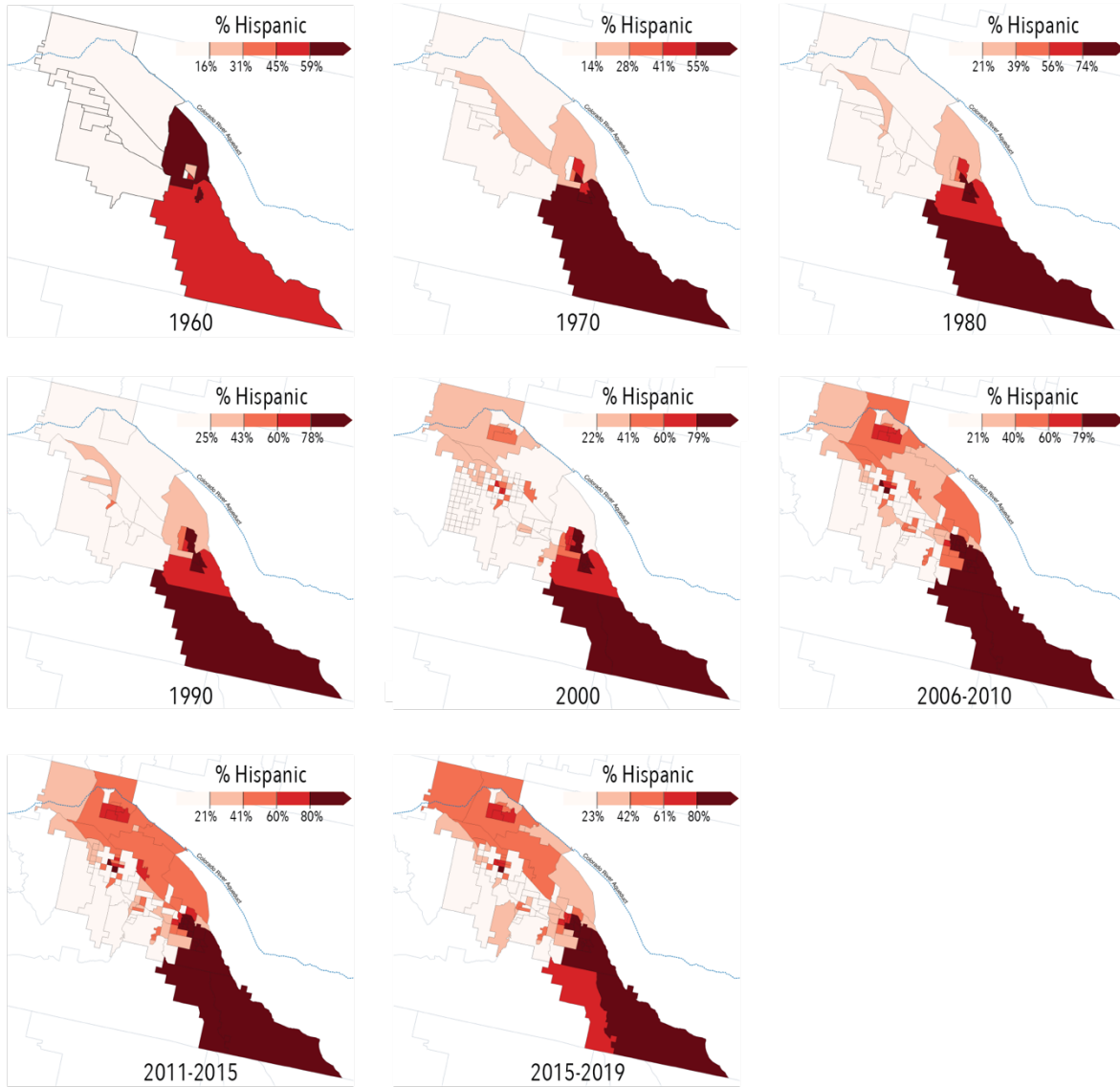


Figure A-3

Percent of Population that was Foreign-Born (Manson, Steven et al., 2020; U.S. Census Bureau, 1960-2019)

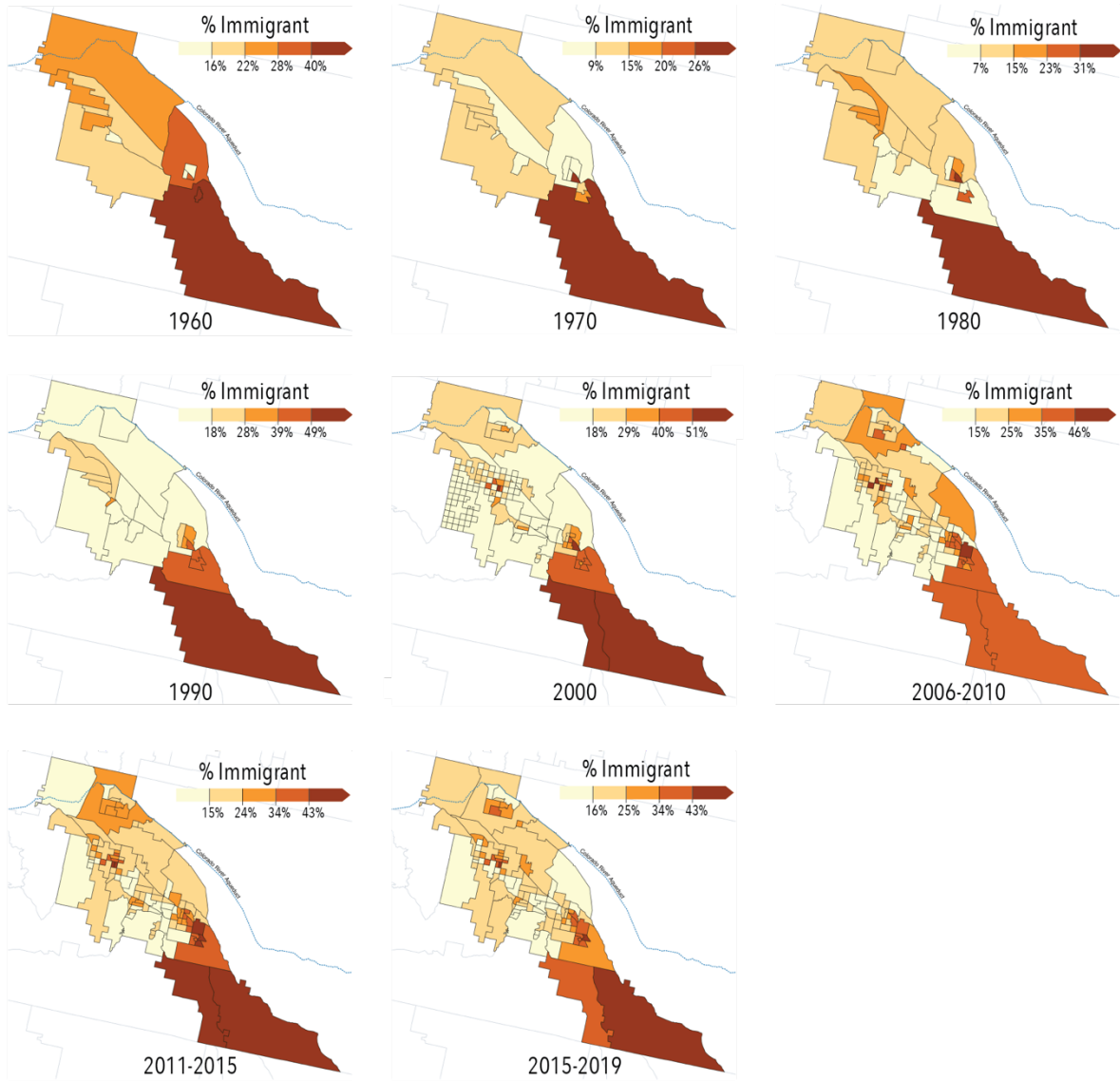


Figure A-4

Percent of Population Living Below Poverty (Manson, Steven et al., 2020; U.S. Census Bureau, 1970-2019)

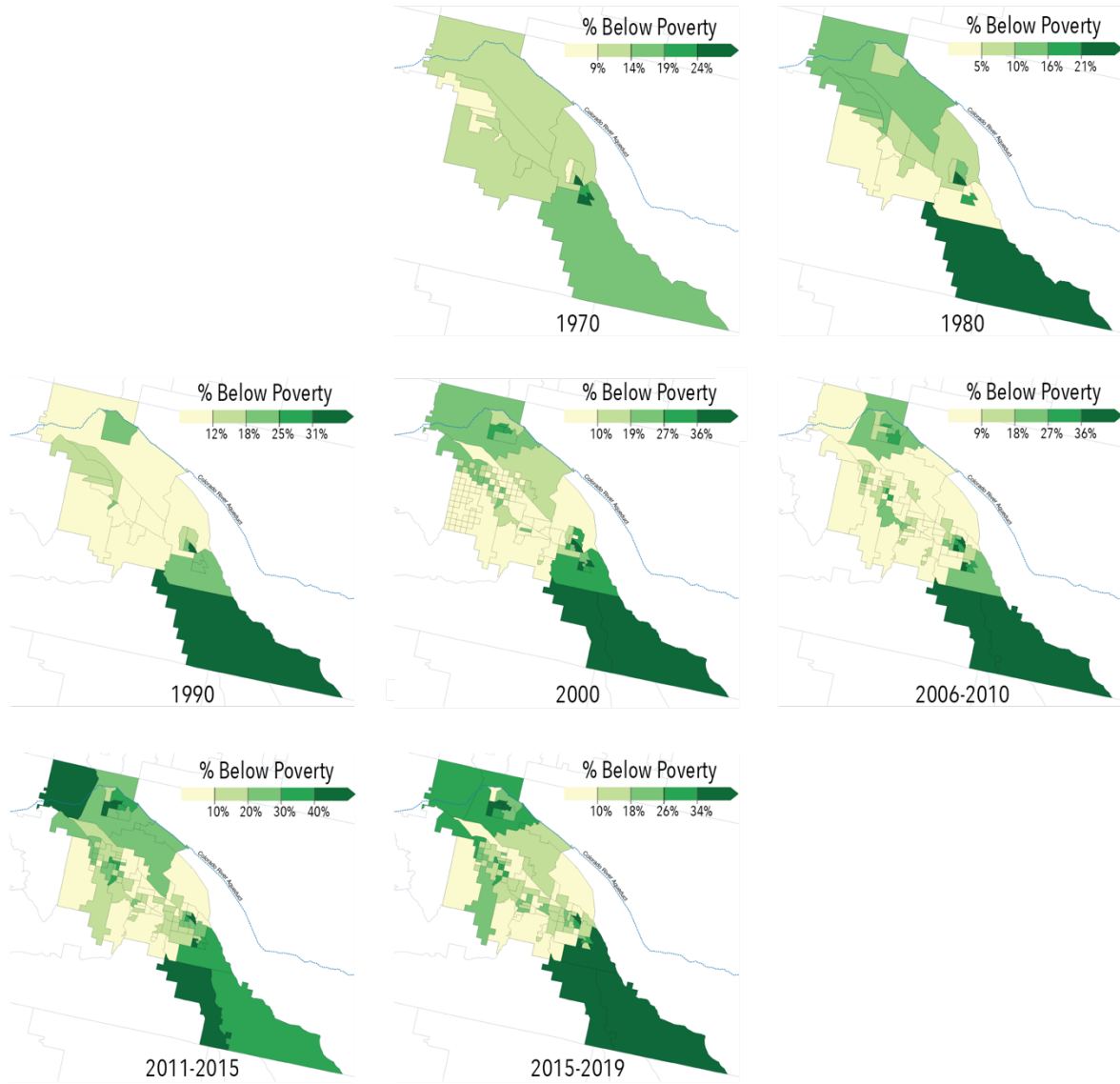


Figure A-5

Percent of Households Living in Mobile Homes (Manson, Steven et al., 2020; U.S. Census Bureau, 1960-2019)

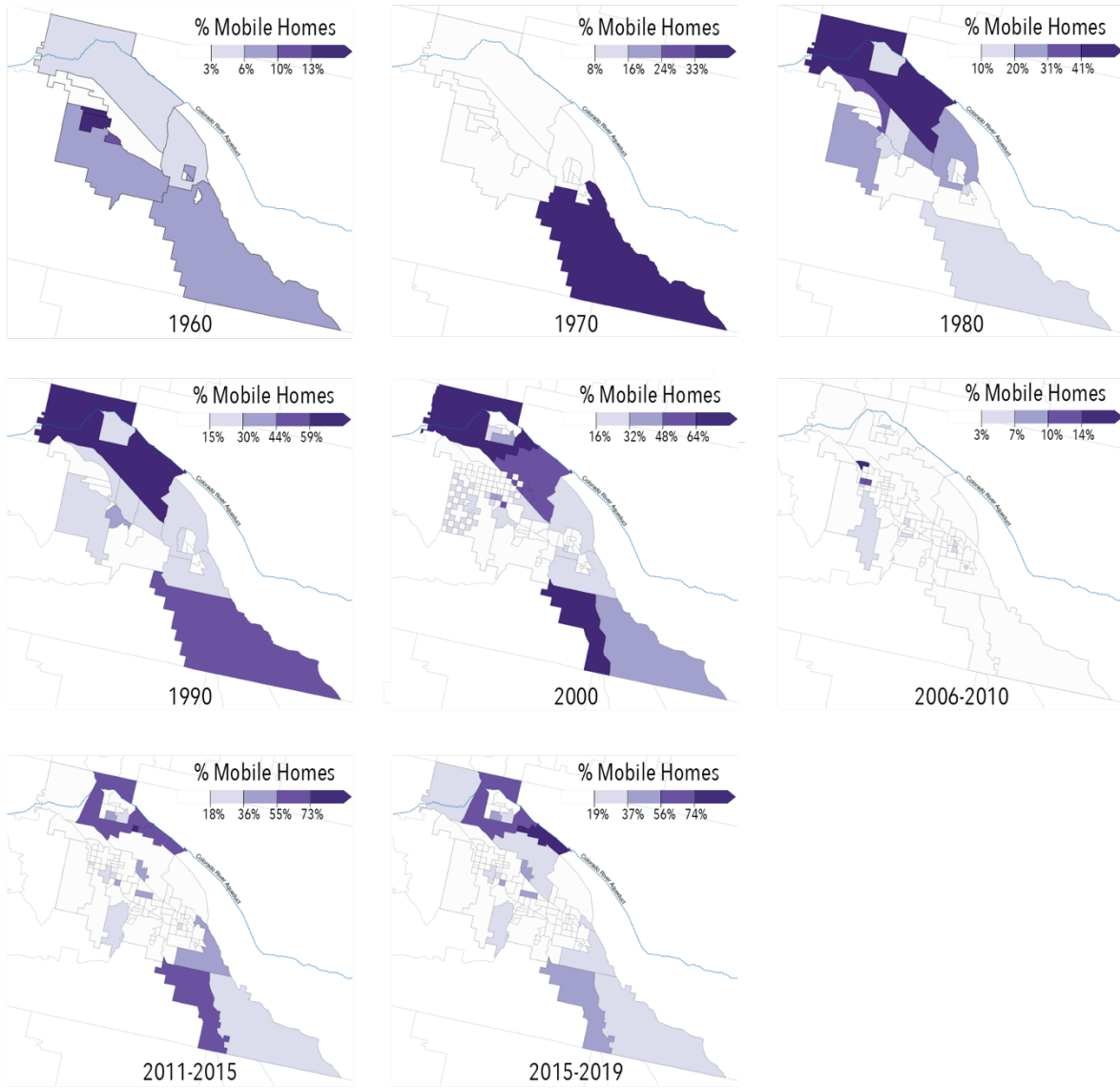
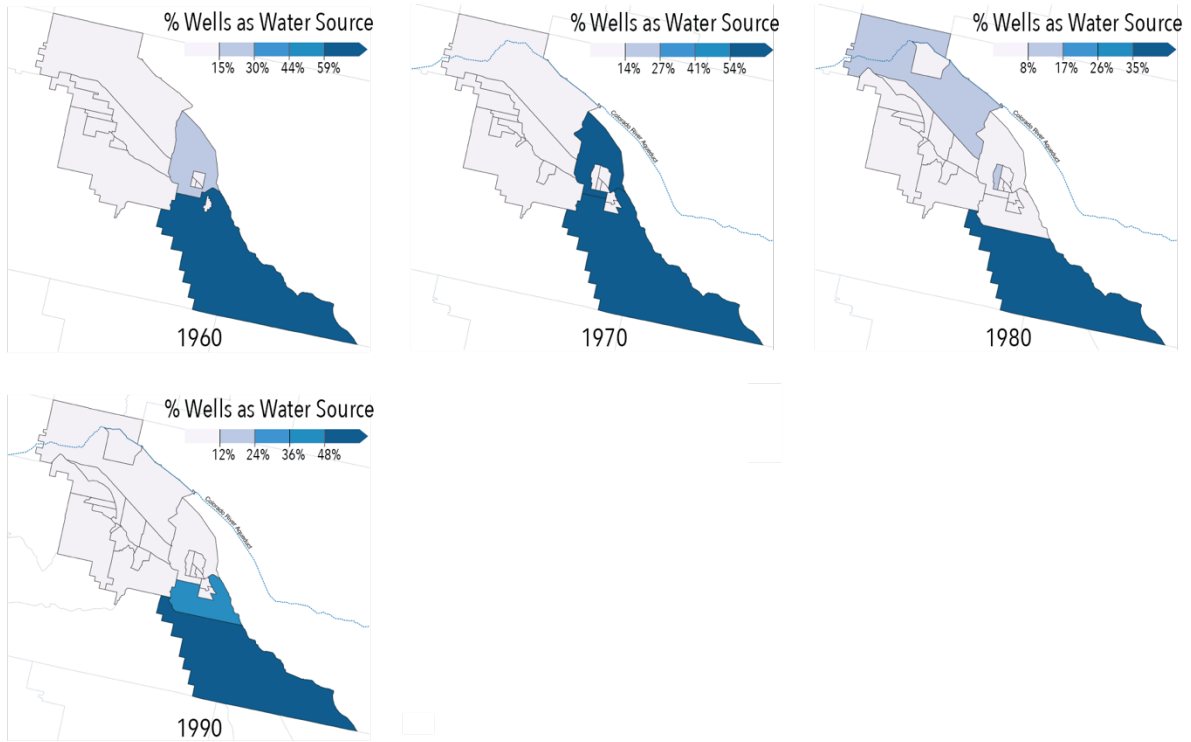


Figure A-6

Percent of Households with Individual Wells as Water Source (Manson, Steven et al., 2020; U.S. Census Bureau, 1960-1990)



Water Quality Contaminants

Figure A-7

Wells with Perchlorate Detected above MCL 6 UG/L (State Water Resources Control Board, 2022b)

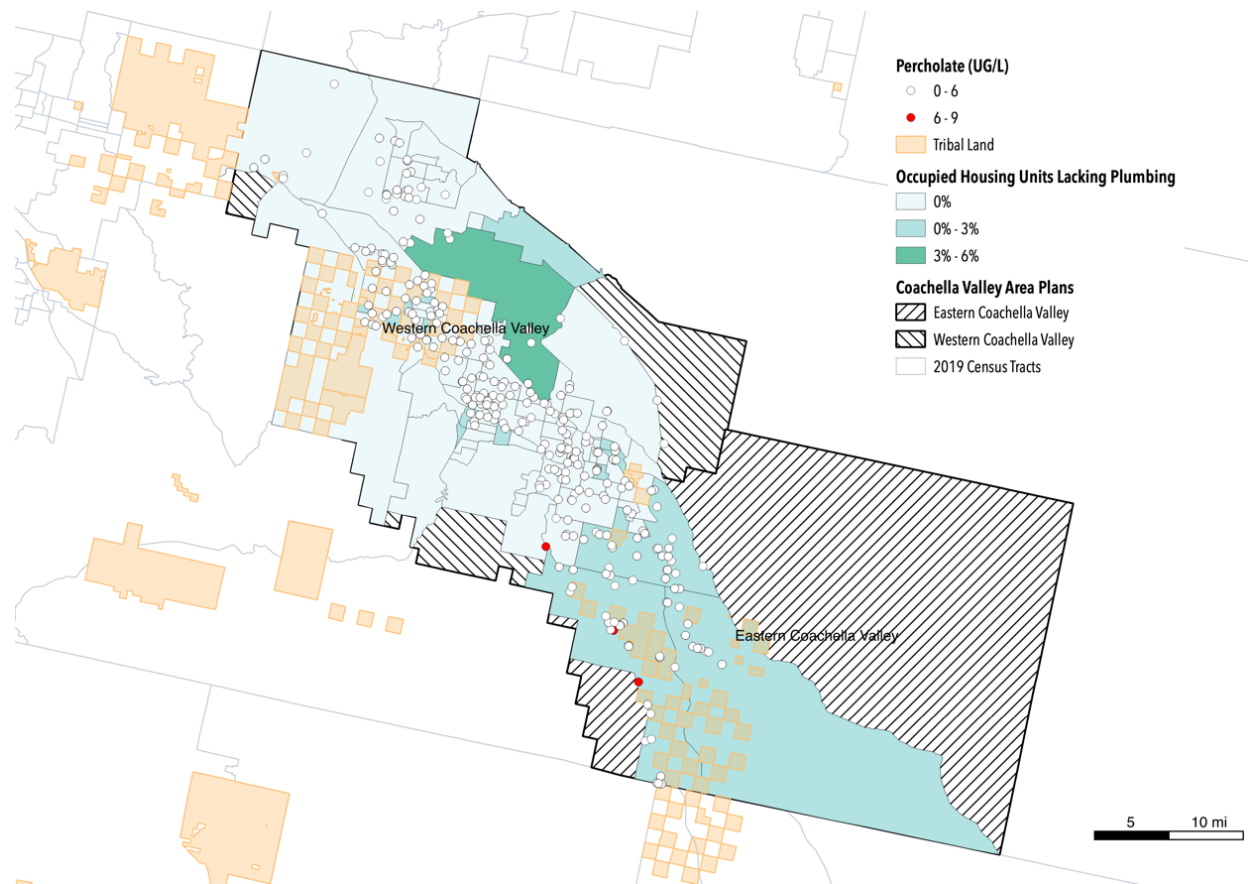


Figure A-8

Wells with Uranium detected above MCL 20 pCi/L (State Water Resources Control Board, 2022b)

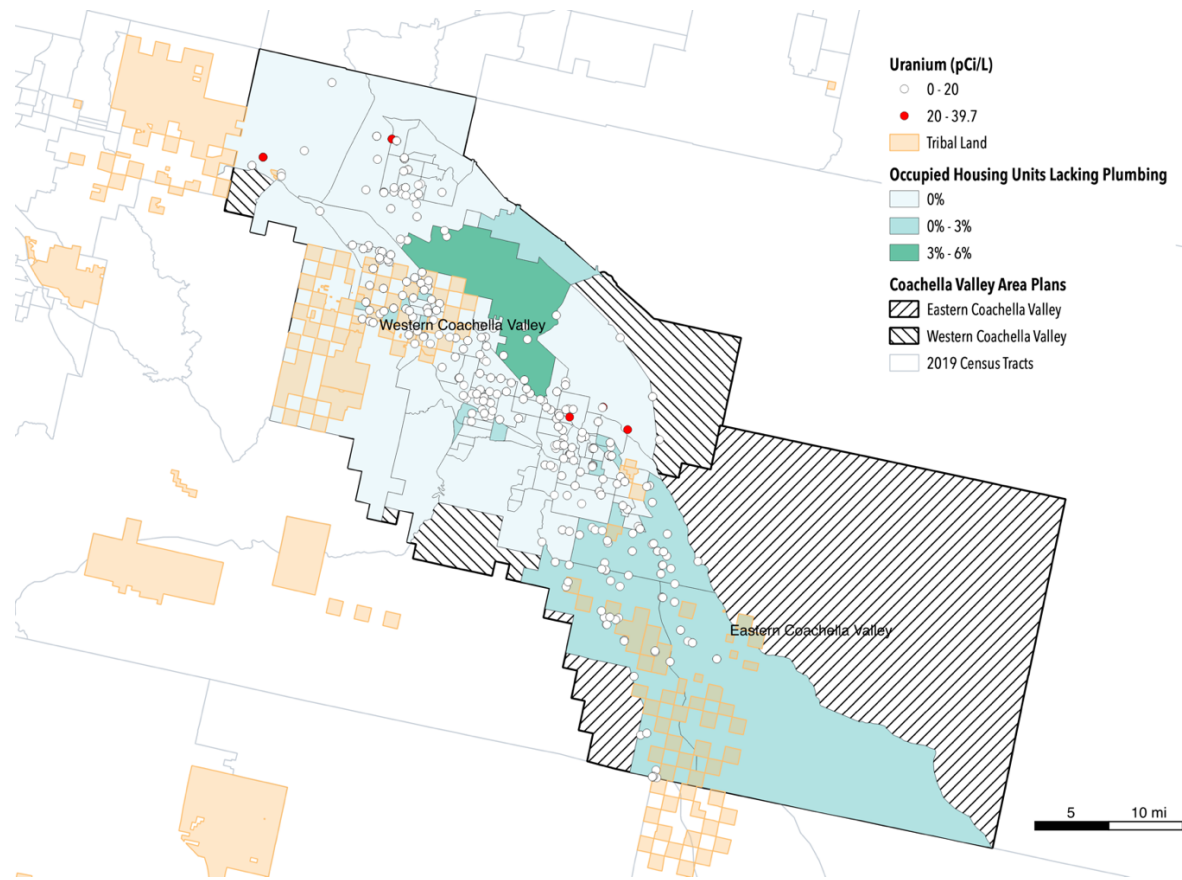


Figure A-9

Wells with Nitrate Detected above MCL 10 MG/L (State Water Resources Control Board, 2022b)

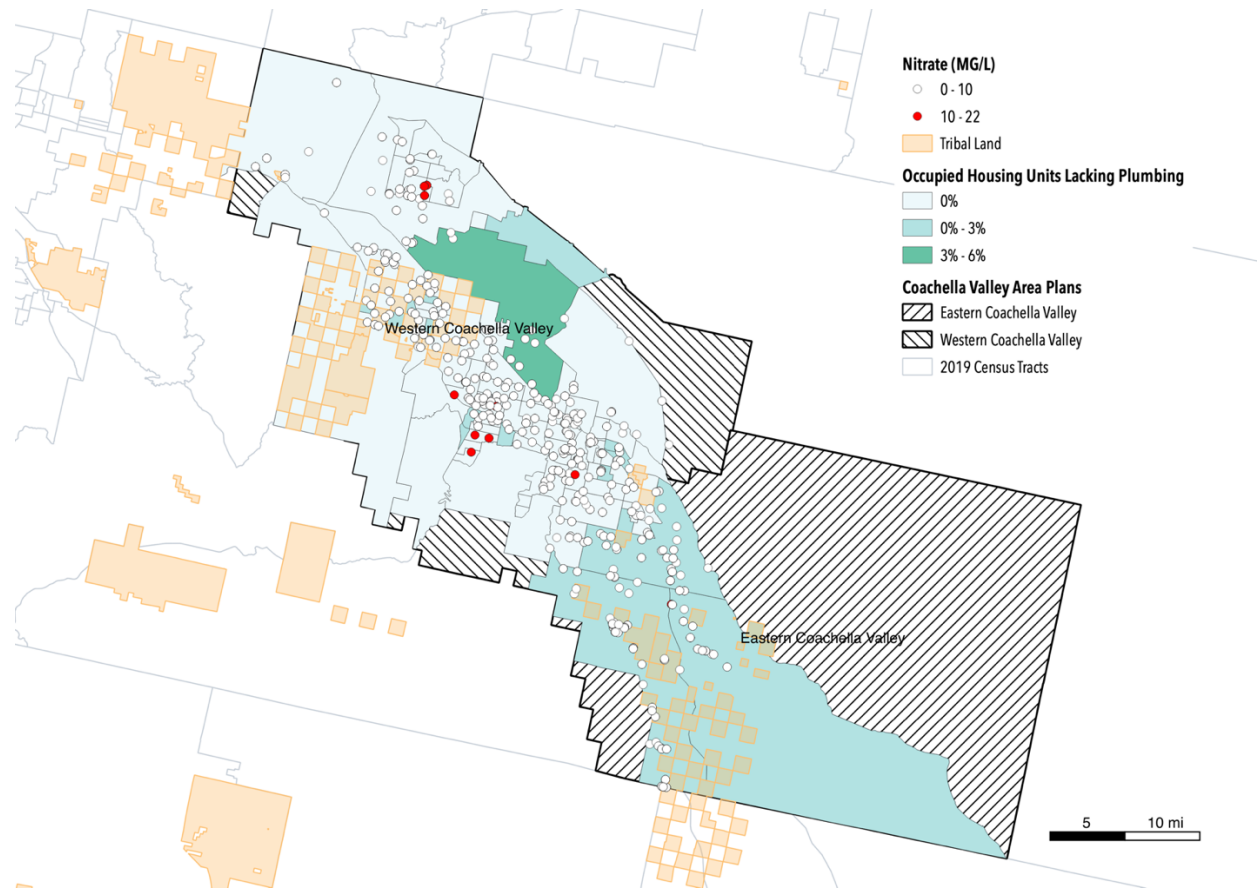


Figure A-10

Wells with Chromium, Hexavalent Detected above HBCL 20 MG/L (State Water Resources Control Board, 2022b)

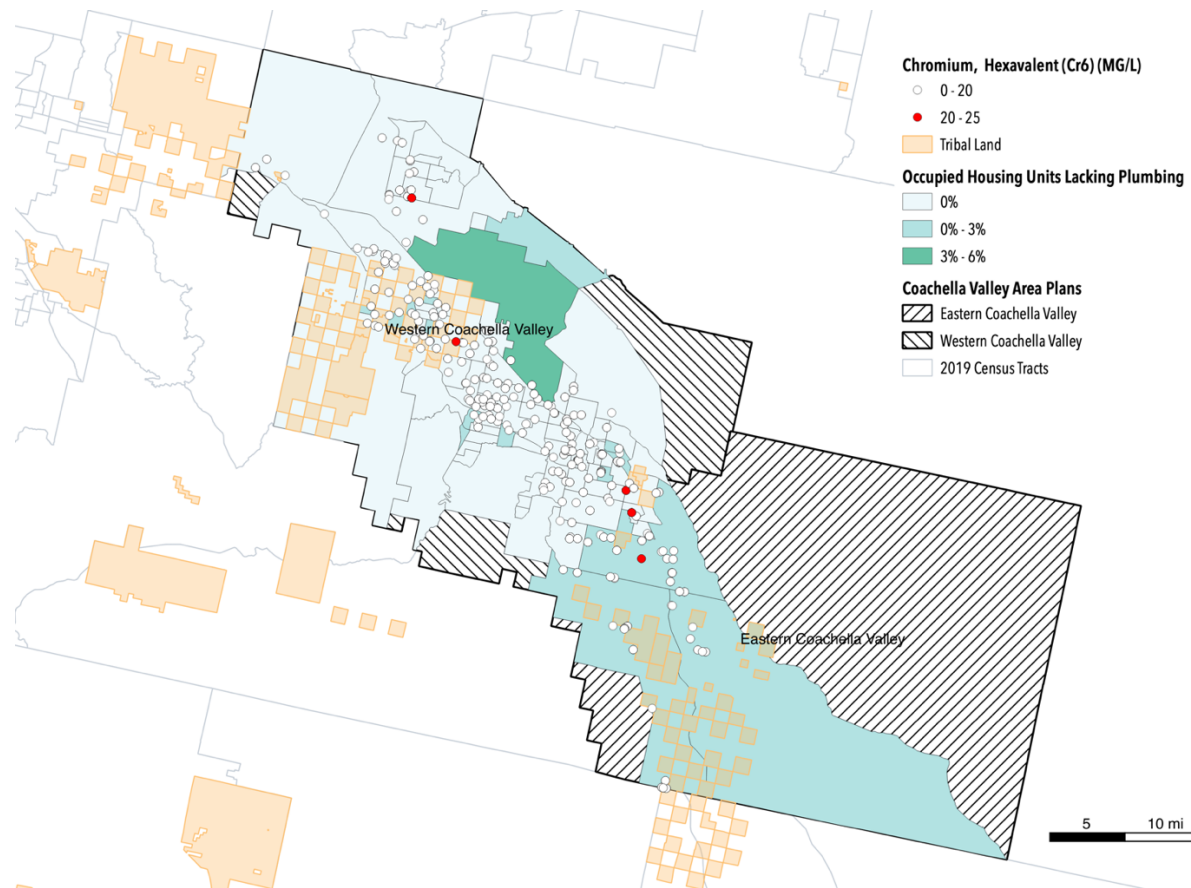
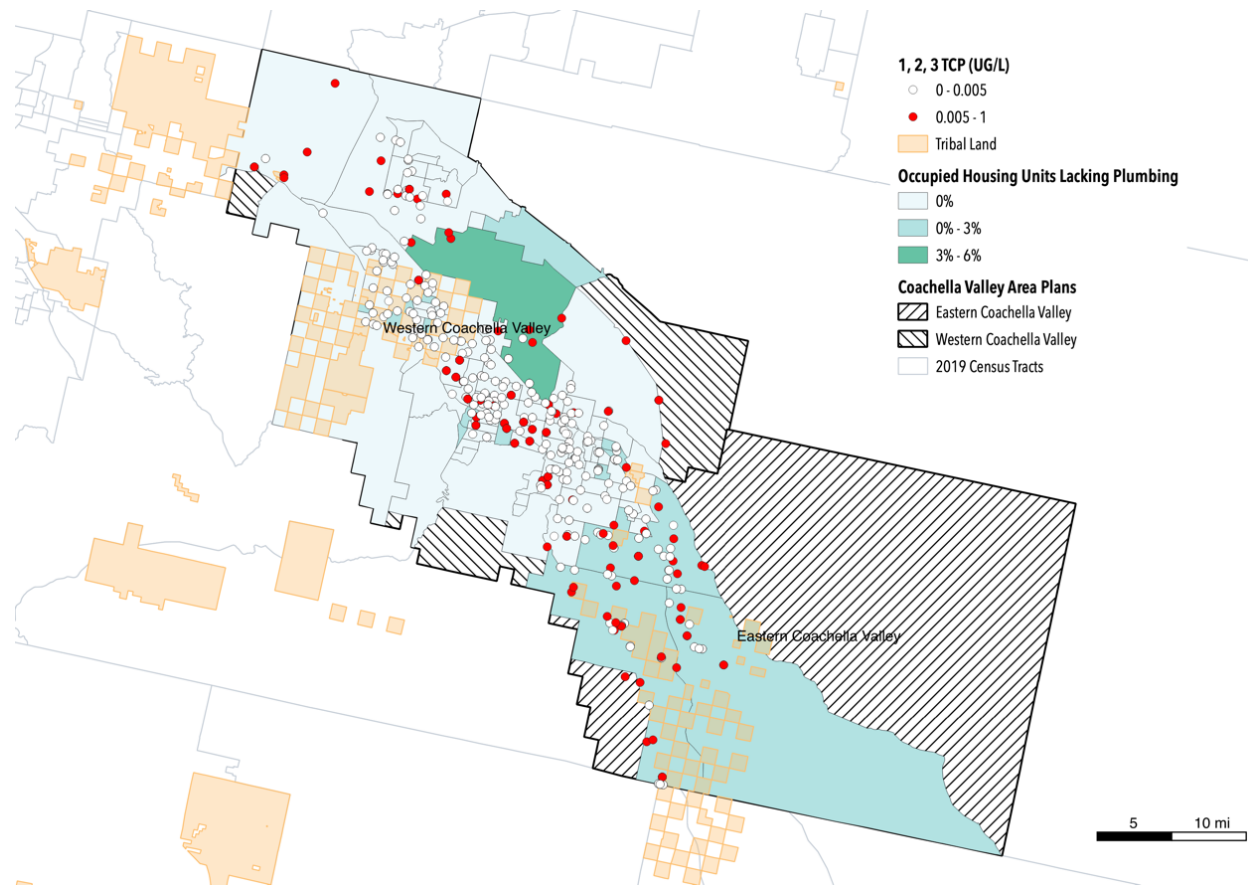


Figure A-11

Wells with 1,2,3 TCP Detected above MCL 0.005 UG/L (State Water Resources Control Board, 2022b)



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