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From Access to Excess: Agribusiness, Federal Water Programs, and the Historical Roots of the California Water Crisis

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FROM ACCESS TO EXCESS: AGRIBUSINESS, FEDERAL WATER PROGRAMS, AND
THE HISTORICAL ROOTS OF THE CALIFORNIA WATER CRISIS.

By

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Abstract

The purpose of this paper is to show the link between water use, land consolidation, agribusinesses, and the water crisis that California now faces. In order to better understand the relationship between the growth of agribusiness in the state and the evolution of water policy, this paper explores the historical context of land policy, the growth of farming in the San Joaquin Valley, and the development of federally funded water projects in the Central Valley. Years of expanding farmland, use of surface and underground water with limited regulation have played an important role in exacerbating California's water problems. The impact of corporate farming and the conversion of row crops and grazing land to crops that required abundant water year round, such as fruit and nut trees, were profound. Predictions made by early champions of the 160 acre limitation for access to publicly funded water programs came to fruition as environmental and social issues plagued the Central Valley. Efforts to divert any real change to water policy by corporate farmers and power brokers in the state were largely a success in the late twentieth and early twenty-first centuries. However, farmers themselves began to feel the consequences caused by years of unregulated pumping from aquifers as soil salinity levels increased each year, causing salt to build up in the soil and reducing crop yields or led to collapse of aquifer systems altogether. Although the focus of this paper is on the San Joaquin Valley, attention was given to the Sacramento Valley in order to show what impact water diversion and relocation has had on the entire state. Change in water policy is necessary to stave off environmental and economic crisis that will eventually come if water continues to be used in the manner it has.

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Chapter One

Introduction

Aridity in the American West has served as a unifying descriptor for large swaths of the United States located west of the Hundredth Meridian. People living in arid regions have had to deal with water scarcity, in addition to other issues, as they established laws, built communities and infrastructure, and planned for future growth. Different ways in which state and local leaders have addressed the issue of water scarcity and use in their respective states have, to some degree, led to a variety of consequences for and differences in the social, political, and economic structure of their societies. One thing remained constant, however, and that was when water became so limited as to threaten metropolitan areas or agricultural economies, residents became increasingly concerned with how water was being used in their state. That is not to say people were unconcerned until a crisis occurred, but most residents did not pay enough attention to policy when water was plentiful to elicit long-term change. No better example of this phenomenon exists than California, which had some of the most impressive water holding and redistribution networks in the nation and yet suffered from periodic episodes of drought and the uncertainty over whether or not water resources would be readily available in the future. Much of what helped shape land and water policy in California were the ways in which the state was settled, the people that came first and established rules, and the growth of economic systems rooted in a modern capitalist society.

Carey McWilliams was able to write about the history of California in a way that captured the essence of what made California unique even in the early twenty-first century. Written during the postwar boom in 1949, McWilliams's historiography, *California: The Great Exception*, provides insight into the reasons why California developed in the manner it had. McWilliams made a point of explaining the differences between land settlements in California

versus that of other states, pointing to the Gold Rush as the primary reason for the differences. Land grabs that occurred in the early years of settlement were a consequence of Forty-niners making their own rules to ensure some type of structure for the process of mining and setting up mining camps. This was important as an immediate concentration in ownership of lands that were agriculturally suitable impacted the social and economic development of the state in ways that resonated well into the 2010's. Inspired by the Gold Rush, fortune hunters of every ilk were drawn to California which helped to create a unique social mix in which average citizens, men of adventure, and immigrants were able to make substantial profits from mining, either directly or indirectly. This also meant that individuals without a keen understanding of how important it was to be a steward of land and resources often found themselves in positions of power in California. Lucky individuals who were able to get the lion's share of the land before other settlers arrived made a fortune but had little desire to see others in a position to compete for economic and political power. Such individuals often worked around laws that guaranteed free land to others in order to ensure their prominence.

Consequences of land grabs and efforts to secure economic dominance left considerably less arable land open to settlement by Homesteaders than was open in other states west of the Appalachians. McWilliams cites biographical information on land baron Henri Miller as a prime example of the growth of agricultural estates in California with much of the statistics and analysis given by Paul S. Taylor, noted agricultural economist and author of several articles pertaining to land development and water use in California, for support. As conception and construction of public water programs began, the issue of land consolidation became an important factor in determining who should and would receive water. McWilliams made it clear

that neither the spirit of the Homestead Act nor the letter of the law was adhered to in California, making water issues all the more complicated as private parties made money from public works.

Popular imagery of what a farm looked like did not match the reality of corporatization of farming that occurred in California. To support these claims, McWilliams referenced Walter Goldschmidt's report, "As You Sow," which compared the impact agribusiness had on dependent communities versus communities whose economy and social structure revolved around small farms. Unfortunately, many states have experienced changes in farming that often resembled more and more the agribusinesses found in California, such as agricultural giants Dole, Grimmway Farms, and Foster Farms. Agribusiness nationwide had been on the decline in the 1930s; price supports during WWII led to a short burst of growth, but the decline continued into the 1970s for most of the nation. This was not true for California, despite its feeling the pressures of periodic economic stagnation, as new farms sprang up to support the increased labor force of the 1940s. For this reason, perhaps, McWilliams presents California as a being in a constant state of development.

When McWilliams published *The Great Exception*, he noted that if the Sacramento and San Joaquin Valleys utilized their combined water resources, there would still not be enough water to irrigate the total land available for farming in the Central Valley. That was in 1949; since then the population increased from just over ten million residents to almost forty million in 2015, and although it is true that the total number of acres of farmland dropped from 37 million to 27 during that same period, the percentage of water used by the agricultural segment did not. In fact, the number of irrigated acres in California saw a steady increase from 6.4 million acres in 1950 to 9 million by the year 2000. Claims made by McWilliams in 1949, like those of so many other historians and agricultural economists, were just as true in 2016 as they were then.

As early as 1878, McWilliams notes, California's first State Engineer, William Hammond Hall, plainly stated that riparian rights would need to be addressed before any publicly funded water projects were to be considered. Because of the way riparian rights were recognized in California business interests and private parties who owned thousands of acres of land, like the Southern Pacific Company, Henry Miller, Charles Lux and Ben Haggin, were able to lay claim to water rights throughout much of the San Joaquin Valley, giving them a virtual monopoly on a resource without which the land was almost worthless. This is an important point, and one that McWilliams made repeatedly; because of the way land was distributed, purchased, or otherwise acquired, access to prime farmland and water was limited. Individuals that had access to water did not want to see changes made to land and water policy if it did not benefit them directly. It seems apparent to McWilliams that the Central Valley Project was built in a state already primed for misuse of water resources.

Although some may argue with McWilliams's evaluation of California economy and development as being in a constant state of boom, California has suffered its fair share of recessions and was especially hard hit in the 1990s, his analysis has been accurate over the long haul as the state has fluctuated in ranking amongst the top ten economies in the world from at least 2005-2015. The newest edition of his work would benefit from further analysis on contemporary economic and social issues related to the development of agricultural industry and water shortages, specifically agrarian labor and the increased poverty among some groups in the state. Addressing changes in these areas would link the history McWilliams presents with contemporary issues faced by many California residents.

Much like McWilliams, Donald Worster points to the manner in which California developed as markedly influencing land and water policy in the state. As it grew, consequences

of such policy began to have a negative impact on social, economic, and political structures within the state. In *Rivers of Empire*, Worster makes the claim that the arid West followed a similar pattern of development as that described by Karl Wittfogel, German-born scholar of Chinese civilization, in his most noted work *Oriental Despotism*. California, according to Worster, is an example of Wittfogel's "hydraulic society," in which an agrarian culture is dependent upon government bureaucracies or elites with the means to build and maintain irrigation networks and flood controls. According to this theory, dependency upon large-scale water projects leads to monopolistic control of water, and thus to the agricultural economy by those in power while also establishing social stratification which maintains the balance of power toward the top. Although it is true that state and federal bureaucracies controlled access to water stored in reservoirs throughout California and social stratification within agricultural communities did occur, I would argue this had less to do with California being a hydraulic society and more to do with the capitalist system that Americans embraced. For this reason, California's water crisis is more aligned with arguments Worster puts forth in *Dust Bowl*.

An "absence of environmental realism" coupled with a desire for profit, which Worster says helped create the Dust Bowl that spread across the Great Plains, is also recognizable in California agriculture. Much like the expansion of wheat production during WWI, farmers in California turned fields of row crops into almond and pistachio orchards because of the market demand and potential for increased earnings. Even in the driest part of the San Joaquin Valley, farmers planted trees and grape vines using water from irrigation projects and aquifers with little concern for the impact this had on the environment, often until a crisis occurred. Moreover, like the farmers of the Southern Plain who saw the error of their ways in the 1930s only to do even more damage leading to the Filthy Fifties, California farmers had experienced droughts in the

past and yet endeavored to dominate their environment only to be dumbfounded when nature acted in accordance with natural laws. Both narratives indicate either a lack of understanding of how nature works or general disregard of the consequences.

Worster determined that a lack of connection to the land, “the modern feeling of absolute free will and human autonomy,” and the general greed of people were the principle causes of the Dust Bowl. These same elements were apparent in modern California agriculture and were evidenced by the conflict over water resources and new laws regulating underground pumping. Even when problems were acknowledged and reforms were instituted to help conserve water for long-term use, both agribusinesses and small farmers often planted additional acres or turned to those which required water year round. Where Worster points out that constant growth meant that there would never be enough land to meet demands by Plains farmers, a parallel can be drawn between water usage and growth in the San Joaquin Valley.

In addition, the economic and environmental damage that occurred during the Dust Bowl was, according to Worster, caused by the capitalist nature of American culture. Thus, “It (the Dust Bowl) came about because the culture was operating in precisely the way it was supposed to. Americans blazed their way across a richly endowed continent with a ruthless, devastating efficiency unmatched by any people anywhere.” Growth, progress, and a desire to dominate the environment and generate personal wealth had terrible consequences on the Southern Plains on more than one occasion, and similar problems occurred in California as well, albeit at a much slower rate and with less dire consequences for most residents. Without addressing the cultural and economic underpinnings that helped create the Dust Bowl, Worster maintains that another such disaster is inevitable. Given the current state of water resources in California, his warning should be taken seriously.

Chapter Two

The Crisis at Hand: Pumping the Well Dry



Figure 2.1 Dust Bowl. This is a sign along Interstate 5. In the distance grow rows of pistachio trees, while in the foreground the earth is dry and barren. Aside from the trees, the landscape is bleak as one would expect to see in a naturally arid region, and yet the sign would indicate that the dry earth was the fault of the government.

“Things are tough all over, cupcake, an' it rains on the just an' the unjust alike...except in California.”

-Alan Moore, *Watchmen*

Beginning in 2011, and continuing through 2016, California faced the worst drought on record since it became a state in 1850. Exceptionally scant rainfall and mountain snowpack were only part of the problem Californians faced. Naturally occurring aquifers that many residents and farmers had relied upon during normal periods of aridity were no longer useable. In fact, some parts of the state experienced such severe water shortages that residents literally had no running water in their homes. The agricultural development of vast amounts of newly arable land and substantial population growth in California, especially along the coast and in the Central Valley, were also contributing factors to the water crisis. However, neither the expansion of farming, nor growth of urban areas could have occurred without access to a considerable amount of water in the first place. Thus, large-scale water projects allowed California to become both the most populated state in the Union and an agricultural powerhouse, but there were warnings early on

that mismanagement of water and unrestricted growth could lead to the very plight California began to suffer in 2011.¹

Although California had a vast system of aquifers providing significant water for farming and municipal use, this system was not enough to allow for the degree of expansion that had occurred in the southern half of the San Joaquin Valley.² Urban growth placed a greater demand on water resources, as did the increasing numbers of family-owned farms.³ However, the vast majority of acres planted in the San Joaquin Valley, and thus the greatest burden to water resources in the driest part of the Valley, were owned by corporate farmers. In California, water acquisition by such farms had occurred without regard to the impact on smaller, less competitive farmers and rural residents. Instead, these farms expanded to the brink of sustainability and did so with publicly-funded water programs such as the Central Valley Project (CVP), the State Water Project (SWP), and by the overdraft of underground water sources. As California continued to face this historic drought, the entire state felt the pressures of water scarcity.

¹ Norris Hundly Jr., *The Great Thirst: California and Water-A History* (Rev. ed. Berkeley: University of California Press, 2001). This extensive work traces the development of water resources from Native American irrigation networks through construction of modern, large-scale water projects of the twentieth century. Hundly describes the rapid pace at which water projects were constructed and the tremendous growth of urban centers and agricultural development that occurred as a result. *The Great Thirst* serves as a warning to the residents of California, connecting early concerns over monopolization with problems regarding water quality and other environmental issues. More importantly, Hundly draws a connection to environmental problems, social inequality, and outdated laws in the state that allow for the mismanagement of water. He makes the case that reform in both urban development and agricultural use must be made to avoid a major crisis.

² An aquifer is an underground layer of water-permeable rock, gravel, sand, or silt from which water can be drawn or pumped out to the surface. California has a large network of these that fill up from melting snowpack in the Sierra Nevada Mountains and from rainfall. For the past several decades aquifers have been pumped so frequently that they have become compacted. This means that they no longer function as an aquifer and reduce the amount of water available for use throughout the year.

³ Cities and towns have had to increase the amount of water used as populations have grown; however the *percentage* of water allocated for urban use has not increase. In fact, urban areas have often been the first places to reduce water consumption, and do so effectively, especially in California where recent water restrictions have even been exceeded by some urban populations.

Increased demands from both urban development and large-scale farms, beginning even prior to the 1950s, had placed an incredible strain on this already scarce resource.

Even though this particular episode of drought is an extreme example, it should come as no surprise that water, or lack thereof it, has always been one of the most important topics when discussing the arid West.⁴ Control of water resources and who should have access to them has been debated since California entered the Union in 1850. Scholars have written extensively on water rights and how water has been relocated and distributed. Many historians have examined the Central Valley Project specifically and the impact this public work has had on development in the Central Valley.⁵ Although these historians have differing opinions as to who should have

⁴ Water is essential for survival in the West. This is as true today as it was over one hundred years ago, only there are much higher financial stakes at risk. California has the eighth largest economy in the world, and without access to water for residents, a labor force, and business centers, none of this would be possible. (Agriculture currently makes up only about 2% of California's GDP; however, about 60% of the state's water goes to farming.)

⁵ Paul S. Taylor, "Central Valley Project: Water and Land" *The Western Political Quarterly* 2, no. 2 (1949): 228-53. "The 160-Acre Limitation and the Water Resources Commission" *The Western Political Quarterly* 3, no. 3 (1950): 435-50. Taylor examined problems associated with land monopolies and social inequality noted in the early development of the state and how these issues persisted into the middle of the twentieth century. In essence, Taylor claims that the Central Valley Project benefited those who already had much and increased an already uneven distribution of wealth and power in the state. Robert de Roos, *The Thirsty Land: The Story of the Central Valley Project* (New York: Greenwood Press, 1968). This work details issues surrounding funding and construction of the Central Valley Project. He explains the social, political, and economic concerns regarding construction of the Project and use of resources. William Kahrl, *Water and Power: The Conflict Over Los Angeles* (Berkeley: University of California Press, 1982). An examination of the struggle over water use between urban and rural residents, Kahrl provides a national and regional context that lends meaning to the broader topic of the arid West. Donald J. Pisani, *From the Family Farm to Agribusiness: The Irrigation Crusade in California and The West 1950-1981* (Berkeley: University of California Press, 1984). Pisani explains water and land policy in California including legal and political arguments regarding these policies. He claims that many believed irrigation would advance democracy in the West by affording an opportunity for small farmers only to see monopolies and speculation dominate the process. Donald Worster, *Rivers of Empire: Water, Aridity, and the Growth of the American West* (New York: Oxford University Press, 1985). This work examines the growth of government controlled resources in the West, the relationship between man and his environment, and the social stratification in irrigation societies. Worster utilizes Karl Wittfogel's theory of hydraulic society to describe the social, political, and bureaucratic structures in civilizations in which government bodies rather than local communities are in charge of irrigation networks. *Dust Bowl: The Southern Plains in the 1930s* (New York: Oxford University Press, 1979). Worster makes a similar argument in this work about the disconnect between man and his environment and what role capitalism plays in this process. Mark Reisner, *Cadillac Desert: The American West and Its Disappearing Water*

access to water and how much water they should receive, as well as who was to blame for the mismanaging of water resources, all agree that large landholders benefited the most from such projects. Growers in the Southern San Joaquin Valley benefited considerably from water reclamation and redistribution in the Central Valley, via the CVP and the SWP, which allowed farms to expand in size and into areas that would have been impossible otherwise. In this case, water reclamation projects have had unintended consequences as they helped set the stage for water crises California has repeatedly experienced. The crisis Californians faced beginning in 2011 highlights the significance of water needs in urban and rural development and the struggle to acquire and maintain access to dependable sources of water. This situation also underscored the impact water has on California's economy, especially in the most arid regions and within specific communities. The economic impact can be linked directly to socioeconomic issues including concerns over quality healthcare, education, affordable housing, and the lack of political voice experienced by many California residents.

(New York: Penguin Books, 1993). Much like Pisani's claim that irrigation was supposed to revitalize the family farm but was instead usurped by big agriculture, Reisner points to the ineptitude of bureaucracies charged with managing water projects, claiming they aggravated economic, political, and environmental issues surrounding water development and use. Norris Hundly Jr., *The Great Thirst: California and Water-A History* (Rev. ed. Berkeley: University of California Press, 2001). This extensive work traces the development of water resources from Native American irrigation networks through construction of modern, large-scale water projects of the Twentieth Century. Hundly explains that even though California has the most heavily engineered water networks in the world; managers of those networks did not address modern needs of the state nor made any real reform to areas that were already considered problematic. David P. Billington, Donald Conrad Jackson, and Martin V. Melosi, *The History of Large Federal Dams: Planning, Design, and Construction in the Era of Big Dams* (Denver: U.S. Department of the Interior, 2005). This work tells the story of federal contributions to dam planning, design, and construction of specific dam sites in the United States. The authors also describe some of the negative social and environmental consequences of dam building. Ellen Hanak, Jay Lund, Ariel Dinar, Brian Gray, Richard Howitt, Jeffrey Mount, Peter Moyle, Barton Thompson, "Ch. 1 Floods, Droughts, and Lawsuits: A Brief History of California Water Policy" *Managing California's Water From Conflict to Reconciliation*. (San Francisco: Public Policy Institute of California, 2011). This work divides water management into different eras, describing each in relation to social, economic, and political arguments surrounding water projects and management.

The purpose of this paper is to explore the historical context of California's most recent water crisis in order to understand better the relationship between the growth of agribusiness in the state and the evolution of water policy. Terry L. Anderson, author of *Water Crisis: Ending the Policy Drought*, defined an economic crisis as existing "when the quantity demanded is greater than the quantity available and when there is little time to adjust either of them."⁶ This same formula can be applied to almost any nonrenewable resource and, in this case, can be applied to water. In 1983, Anderson equated the "future" water crisis with the energy crisis of the 1970's. For California, that future began in 2011. Farmers, specifically those in the most arid regions of California's Central Valley, began to see a considerable increase in the amount of water available for irrigation due to reclamation and diversion projects during the late 1930's. Access to more irrigation waters meant an increase in agricultural production and potential profits from cultivation or land speculation, making the notion of planting more acres very enticing to those who were able to do so, especially in the midst of such challenging economic conditions. Unfortunately, many family farms in California were lost during the Depression as the state reached an unemployment rate of 28 percent by 1932, higher than the national average of 25 percent, with nearly one-fifth of the state's residents receiving public relief by 1934. This meant limited funds for purchasing foodstuffs for average citizens making it difficult for farmers to pay their mortgages and other debts. Individuals that were able to hold on to their farmland were poised to make a fortune once New Deal programs were implemented, in most cases this

⁶ Terry L. Anderson, *Water Crisis: Ending the Policy Drought*. (Baltimore: Johns Hopkins University Press, 1983) p. 4. In this book, Anderson blames resource economists and the inefficiency of bureaucrats for water issues in California and the arid West in general. He claims that private investors had much more success in developing water diversion and containment systems and in distribution. His work minimizes the cost of larger, long-term structures that serve larger populations, funded by taxpayer dollars.

meant individuals with enough money to survive the economic collapse and who had already accumulated thousands of acres of grazing and farmland by the turn of the twentieth century. Thus, when irrigation water was made available in large quantities, such individuals saw increased productivity and profits from their lands.

The augmented water supply was achieved through reclamation projects funded by public monies, namely the Central Valley Project and the State Water Project. Shifts in crop production and expansion into more arid parts of the Valley were primarily driven by the desire for increased profits by both large and small-scale farming operations. Agribusinesses and large-scale farms in particular continued to cultivate as many acres as possible and to plant crops that required more water than those that had traditionally been planted in this part of the Valley, consolidating land and making huge profits. This process was made possible because of access to federally subsidized water. However, due to the rate of growth and type of crops planted, many agribusinesses demanded that more and more water be made available even with the knowledge that episodes of drought are common in the Southern San Joaquin Valley. In addition, it is typical that those who owned and operated industrial farms had more money and political pull than those who ran traditional family farms, which has often allowed agribusinesses to influence water policy in order to get water they “needed,” intensifying episodes of water shortages and environmental problems. The impact of this type of usage has periodically been felt in local communities, specific geographic regions and, at times, across the entire state.

There are several components to this argument, but all are linked to land being cultivated at a rate, in a manner, and in locations not suited for long-term agricultural sustainability. California has a long history of land consolidation and the consolidation of other resources at the hands of very few, very influential people, which has had long lasting ramifications concerning

land and water policy. First, those who own large tracts of land often had access to more water than those who had smaller farms. This water was usually acquired at a low-cost, except during the most extreme circumstances, as it was federally subsidized. Landowners with large tracts of land were usually in a better position to compete in local, state, national, and international markets. Access to inexpensive water gave them an even greater economic advantage than their smaller neighbors. Second, large landowners tended to be opposed to government regulation of resources, pesticide usage, wages, taxes, and environmental concerns. They also used their power and influence to keep water policy reforms off the table when possible; yet, they made millions of dollars each year via resources from publicly funded water programs. Third, agribusinesses were typically owned by investors for the sole purpose of making profits. Industrial farms have generally not been concerned with the types of crops they planted, pesticides they used, environmental impact they have had, or what impact their farming and labor practices have had on surrounding communities, as long as they did not suffer losses in revenue. This has usually been different for a family-owned and operated farm because the family lived in or near the community surrounding their land, thus, they could see and feel the impact their farming practices had. And, although it is the goal of both large and small-scale farms to make profits, customarily, family run farms also operated with the objective of keeping the land intact and fit for future generations to utilize for agricultural purposes.

Throughout this thesis terms like, “corporate farms,” “agribusinesses,” “industrial farms”, and “large landholders” appear. I use these terms, as does the U.S. Census Bureau and Hoy Carmen, contributor to the Giannini Foundation, in order to identify a specific type and size of land holding and to clarify differences between those landholdings and smaller, typically family-

owned and operated farms.⁷ The terms corporate farms and agribusinesses are interchangeable and refer to farms with an average of over 780 acres, with annual sales of more than \$2,000,000, and with a market value of land and buildings of over \$6,300,000. Family farms refer to land holdings which were on average 200 acres and had annual sales of around \$162,000. Market value of the typical small or family farm, including land and structures, was estimated to be at about \$1,292,000.⁸ These are twenty-first century figures, but will work for understanding the main arguments of the paper, especially when contemporary topics are introduced. To be clear, family-owned farms can be thousands of acres in size and incorporated, and small farms might also be agribusinesses, however, for the purposes of this paper, family farm will be synonymous with small farm, under 500 acres, and also managed and worked by the family that owned the property. Regardless of size, farms in the San Joaquin Valley, if not located on or near a river, are likely to utilize water from manmade water networks such as the Central Valley Project or the State Water Project.

The Central Valley Project--a series of dams, reservoirs, aqueducts, canals, and pumping stations--was proposed in 1933 as part of state and federal reclamation programs. The purpose of the CVP was to supply water-poor areas in the southern half of California's Central Valley with irrigation and municipal water and to be a means of flood control throughout.⁹ By controlling surface water, the CVP also led to less reliance on ground water and allowed wells and aquifers

⁷ "Farms and Farmland - The 2012 Statistical Abstract - U.S. Census Bureau." Accessed October 13, 2014. <https://www.census.gov/>. Hoy Carman, "California Corporate farms: Myth and Reality," *Giannini Foundation of Agricultural Economics*: University of California, <http://giannini.ucop.edu/>

⁸ Hoy Carman pp. 9-11. These figures are from 2007 and are not adjusted for inflation or for market shifts.

⁹ Elizabeth Eiselen "The Central Valley Project: 1947," *Economic Geography*, Vol. 23, no.1 (Jan. 1947) p.22-27. The northern half of the valley often suffered flooding when riverbanks overflowed into towns and croplands. In order to make both halves of the valley more productive in both wet and dry years, engineers determined that waters from the Sacramento River could be diverted into the San Joaquin River, and the waters of the San Joaquin could be pumped back toward areas with less rainfall and sources of irrigation.

to recharge after dry periods.¹⁰ Thus, the CVP has largely been a success in regard to its intended purpose. Water has been stored and rerouted to areas with low precipitation, power stations have been constructed at several dam sites, and floodplains have been controlled and are used for crop production. Even though the project has come under fire in the past several decades due to negative environmental impact studies indicating damage along tributaries and in the Sacramento-San Joaquin River Delta, in recent years precautions have been taken to improve wildlife habitats and to ensure that natural environments are not altered further. Environmental concerns, which lead to periodic disputes over access to water especially during drought years, withstanding, the Central Valley Project is viewed, overall, as a positive endeavor.¹¹ Yet, it is the very success of the CVP and the State Water Project which led to unsustainable agricultural growth in the arid southern half of the San Joaquin Valley and helped to create a water crisis in the state.

The construction of the CVP allowed for easy access to irrigation water, which, in turn, helped increase the productivity of farms encouraging farmers to plant additional acres. With adequate water supplies, farming was seen as a good investment, especially in the fertile San Joaquin Valley, which, although it had long growing seasons, was previously limited as to the number of acres that could be brought under cultivation by the amount of water furnished by the

¹⁰ Recharging refers to the replenishment of underground water sources via snowpack and rainwater runoff that refill the permeable layer of clay, sand, or sediment that makes up a particular aquifer. In order for an aquifer to remain viable, there must be some level of water refilling it on a relatively consistent basis, or it will collapse and no longer be able to hold water. This also leads to land subsistence, which will be explained later in this paper.

¹¹ "San Joaquin River Restoration Program," *California Department of Water Resources*. Last modified August 4, 2009. <http://www.water.ca.gov/rivers/sanjoaquin/program/> This is one example of the many programs to improve ecosystems dependent upon rivers in California. There are several other articles pertaining to such programs under the Environment tab on the Department of Water Resources website. In addition, it has become clear to urban and rural residents alike that it is in their best interest to keep the environment as healthy as possible. Ramifications of changing water quality and the fluctuation in the number of certain animal populations and plant species have been observed all along the Sacramento and San Joaquin rivers, out to the Delta.

Kern and Kings Rivers. On average, annual runoff for the Kings river has been 1,745,000 acre-feet per year and the Kern typically carries 700,000 acre-feet per year, during dry seasons there is not, nor has there ever been, enough water to irrigate the more than two million acres of farmland in Kern County alone.¹² The burden of supplying water to expanding farmland, along with increased populations in rural and urban areas, led to an expansion of the CVP well into the 1970's, including construction of new dams, canals, and power stations. Expansion of the SWP also occurred for the same reasons. Even in 2016, much of the water from these public works went directly to large-scale farms in the driest part of the Valley.¹³ In order to facilitate the redirection of water to the southern half of California, part of the Sacramento River was diverted so that it flowed into the San Joaquin River. This allowed waters from the San Joaquin to be rerouted back upstream through a series of canals in order to irrigate Kings, Tulare, and Kern counties. These counties were in the top five producers of agricultural goods in California between 2005 and 2016, which would have been nearly impossible without water from publicly funded water programs. This would have been especially true during the years of drought.

¹² R.H. Dale, James J. French, and G.V. Gordon, "Ground-Water Geology and Hydrology of the Kern River Alluvial-Fan Area, California." *California Department of Water Resources* (Menlo Park, California: 1966) <http://pubs.usgs.gov/of/1966/0021/report.pdf>. Acre-feet refers to the volume of water necessary to cover one acre of land with one foot of water.

¹³ Lawrence B. Lee, "California Water Politics: Opposition to the CVP, 1944-1980." *Agricultural History* 54, no. 3 (July 1, 1980): 411-417. Lee examines the shifts in agriculture and water use caused by military production during WWII. He also explains opposition to increased building on the CVP by various groups and the reasons for that opposition.

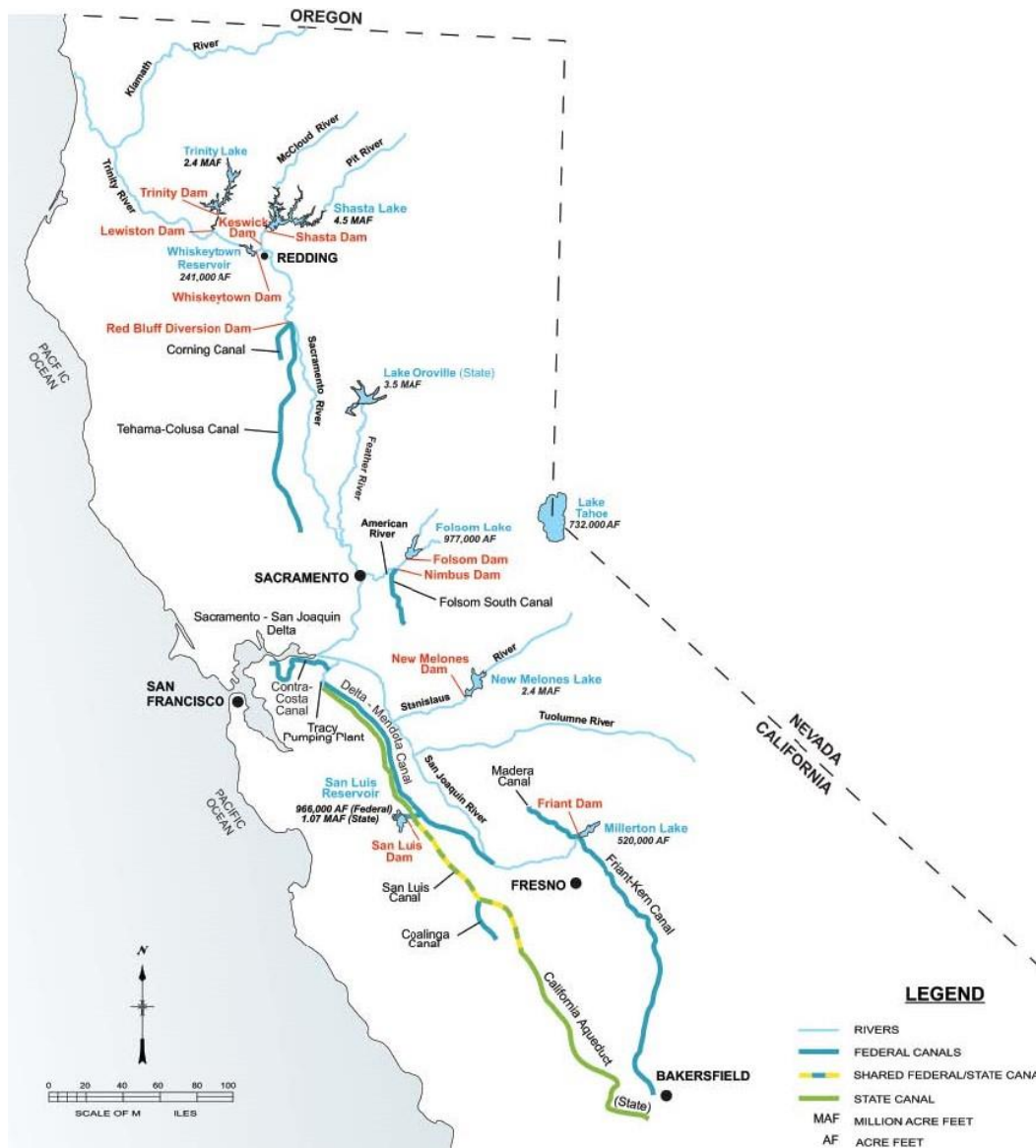


Figure 2.2 CVP. Aqueducts constructed for the CVP usually run parallel to the rivers. This map shows many of the water systems which have allowed for expansion of both farming and urban development.

California has seen a fair number of droughts in the past century which lasted longer than the 2011 drought. However, this situation was different from previous episodes due to the unprecedented lack of rainfall occurring across the state. Also, specific regions in the Central Valley receive varying amounts of precipitation even under normal conditions, making some parts of the Valley more suitable for farming than others. The Central Valley can be divided into three segments with differing amounts of precipitation and average temperatures. The upper third

consists of the Sacramento River and surrounding areas. Different parts of this third can receive anywhere from 17 to 40 inches of rainfall each year, with Sacramento reaching an average of 58 days of rainfall annually.¹⁴ This part of the Valley also has more rivers and runoff from mountain snowpack in the warmer months than the other two thirds. The San Joaquin River runs through the northern part of the San Joaquin Valley and receives about seventeen inches of rainfall annually with growing seasons all through the year for different crops.¹⁵ The southern half of the San Joaquin Valley is the most arid, receiving between three and 5.7 inches of rain per year and has the fewest natural waterways in the entire Valley.¹⁶ However, even in the driest counties, such as Kern, the soil was excellent for farming and it was only lack of precipitation and ability to utilize ephemeral water supplies that limited agricultural development here.

Beginning in 2011, California experienced a reduction in annual rainfall statewide. Sacramento received 31 percent of its annual average, Fresno 36 percent, and in 2015 alone, Bakersfield saw a 40 percent reduction in annual precipitation, from the average of 4.3 to 2.75 inches of rainfall.¹⁷ This lack of surface water impacted the amount of water available for storage in reservoirs and pumping stations across the state. Coupled with less snowpack in the Sierra Nevadas, this meant less runoff during the dry seasons and less groundwater recharge for wells and aquifers. Unfortunately, less surface water also meant more reliance on groundwater,

¹⁴ “Ground Water Atlas of the United States, Central Valley Aquifers” United States Geological Survey, last modified February 9, 2009. <http://pubs.usgs.gov/ha/ha730>. This digital resource provides detailed information on how the Central Valley basin works. Descriptions of underground and above-ground water flow, mountain runoff and valley drainage are also presented. Pre and post groundwater flow systems are analyzed and ground subsidence issues are explained.

¹⁵ Paul Vossen. “California Climate Zones for Growing Temperate Tree Fruits and Nuts,” Growing Temperate Fruit and Nut Trees in the Home Garden. UC Davis, 2014. <http://homeorchard.ucdavis.edu>

¹⁶ Devin Galloway and Francis S. Riley “San Joaquin Valley, California: Largest Human Alteration of the Earth’s Surface.” *U.S. Geological Survey*. Menlo Park, CA. pubs.usgs.gov

¹⁷ *California Department of Water Resources*. Last modified August 4, 2009. <http://www.water.ca.gov/rivers/sanjoaquin/program/>

which had not been able to recharge properly since the drought began. As a consequence, groundwater levels began dropping consistently with each drought cycle California experienced. Not including the 2011 episode; California has experienced six periods of drought since 1959: 1959-1962, 1976-1977, 1987-1992, 2000-2002, and 2007-2009. Water restrictions have been imposed on various regions throughout the state whenever scarcity occurred; however, no significant change in policy had been established to limit the impact insufficient water supplies had on the state as of 2016. Nor were long-term solutions suggested for continued use of underground water systems, although new legislation did pass in 2015 to regulate subterranean pumping, which were depleted during every dry season and major drought.

Prior to the construction of the CVP, farmers and residents of cities and towns in the southern San Joaquin Valley relied on groundwater as a dependable source; many continued to do so.¹⁸ Despite construction of the CVP beginning in the late 1930's, irrigation in the Southern San Joaquin Valley was almost entirely furnished by ground water before 1968. According to the U.S. Geological Survey, by 1955 the San Joaquin Valley accounted for one-fourth of the groundwater used for irrigation in the entire country.¹⁹ However, groundwater alone was not sufficient to support the more than 26 million acres of farmland in production in California in 2014; controlled surface water was necessary for this. The precipitation and agriculture maps shown below illustrate just how much agricultural development occurred in the southern half of

¹⁸ Senator Sheridan Downey, *They Would Rule the Valley* (San Francisco, Kessinger Publishing, LLC, 1947). p.32-35. Senator Downey was vehemently opposed to construction on the CVP. He was especially opposed to the 160-acre limitation, citing that large farmers would not need access to CVP water so the limit was unnecessary and arbitrary. He claimed that these farmers typically used aquifers for irrigation and public monies should not be used to continue construction that would primarily benefit a few private individuals. The long-term consequences of reliance on aquifers on agriculture and economies in the region seem not to have factored into his argument.

¹⁹ Galloway, p.28-29.

the San Joaquin Valley. Interestingly, there appears to be an inverse relationship between precipitation and agriculture in the state.

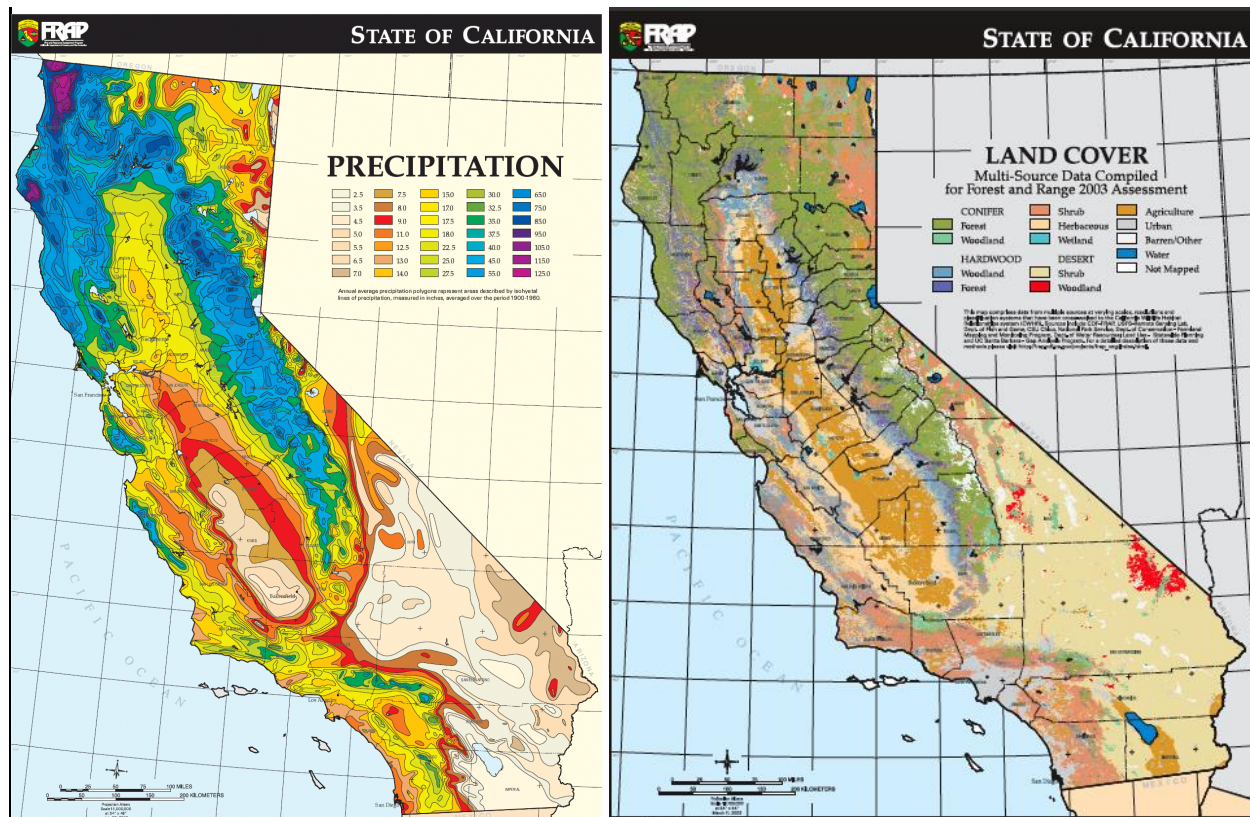


Figure 2.3 Precipitation and Agriculture. Precipitation in the southern half of the Central Valley is inversely related to farm production.²⁰ These images indicate that in the driest part of the Valley the most acres are used for agriculture. The red, light pink and white are used to show very low amounts of precipitation in the map on the left. In the image to the right, the brown color is used to show agriculture, much of which corresponds to the dry area on the left.

As of 2016, the CVP provided irrigation water to 3 million acres of farmland and the SWP supported 600,000 which should have helped to alleviate ground water dependence, but farmers in the Valley also used the supplemental water supplies to irrigate additional acres as soon as they were able to do so. In the 1970's farm expansion was encouraged by the Secretary of Agriculture Earl Butz in an effort to meet growing demand for agricultural products

²⁰ Management Landscapes FRAP Maps. *Department of Forestry and Fire Protection, State of California*, 2014. <http://frap.fire.ca.gov/>

worldwide and to expand America's presence in the global marketplace.²¹ This boom in the agricultural sector was, like so many other booms in American history, a precursor to over production and eventual bust. Industrial farms, which Butz supported due to perceived efficiencies and sheer quantity of production, eagerly embraced expansion and use of the newly "freed up" water supply. In this case the solution for aiding in the recharge of depleted aquifers actually made the problem worse as it was not used for the intended purpose but rather to put more land into production and make more money for agribusinesses. Thus, the issue of depleted aquifers remained a problem for California even after reservoirs, canals, and other water redistribution networks were put into use.

Even after construction of public water systems was completed, farmers relied on water from aquifers during episodes of drought. Rural residents all over the state often depended upon wells to meet their daily water needs, tapping aquifers for municipal use even though water from the CVP and SWP provided resources to nearly 22 million residents in 2015. As more and more water was diverted into the CVP and SWP, less water made it back into aquifers to recharge and allow water tables to rise. As a result, wells had to be dug even deeper in the Valley. On average, wells had a yield of 1,000 gallons per minute, about 800 gallons per minute in Sacramento and an average of 1,100 in the San Joaquin Valley. Historically, well depths in the Sacramento Valley have been less than 500 feet; many measured less than 300 feet.²² Some wells could be found with depths that did not even reach 40 feet in depth. However, by 2015, at least five wells used for irrigation in the San Joaquin Valley were at a depth of 3,500 feet.²³ Wells deeper than 500 feet were expensive and difficult to drill, making some small farmers and rural inhabitants

²¹ Tom Philpot, "A Reflection on the Lasting Legacy of 1970s USDA Secretary Earl Butz," *The Grist*, February 8, 2000. <http://grist.org/article/the-but-z-stops-here/>

²² William Kahrl, *Water and the Power: The Conflict over Los Angeles*. (Berkeley: University of California Press, 1982), p.6.

²³ Ibid.

reluctant or unable to drill newer or deeper wells. In some cases, the value of water for irrigation or private use was insufficient to offset the cost of drilling and putting in a new pump.

Even for municipal use well depths began to be problematic. For example, in Davis, California, located in the northern part of the valley, well levels dropped steadily since the 2011 drought began and eventually surpassed the lowest levels reached in the 1977 drought, dropping 21 feet in 2013 alone.²⁴ Well levels dropped even more dramatically in the San Joaquin Valley. Due to dependence on groundwater through the 1960s, wells in this part of the state were depleted by roughly 200 feet. Groundwater did have time to recharge once surface water was available for irrigation, but droughts from 1976-77 and again from 1987-1991 led to a loss of 150 feet during each episode.²⁵ Less than average rainfall and mountain runoff left aquifers even lower and there was not adequate recharge in the early 2000s to bring the water table up to normal levels. (Traditionally, aquifers were recharged from annual runoff from the Sierra Nevada Mountains, maintaining good quality and dependable water.) Unfortunately, in 2013, CVP officials stated that they would not be releasing water to farmers; the following year the SWP came to the same decision, leading once more to dependence on underground sources statewide and exacerbation of the problem.²⁶

²⁴ Elizabeth Case, “Well Levels Drop Around the County As Drought Presses On,” *Davis Enterprise* (Davis, California), September 12, 2014.

²⁵ Galloway, p31.

²⁶ Lisa M. Krieger, “California Drought: San Joaquin Valley Sinking As Farmers Race To Tap Aquifer,” *San Jose Mercury News* (San Jose, California), March 29, 2014.

Rush to drill

Because surface water is scarce, an increasing number of wells have been drilled in the San Joaquin Valley to provide reliable water supplies. California law gives landowners the right to the water under their property. But because groundwater is a limited resource, the state is growing concerned about this proliferation of wells.

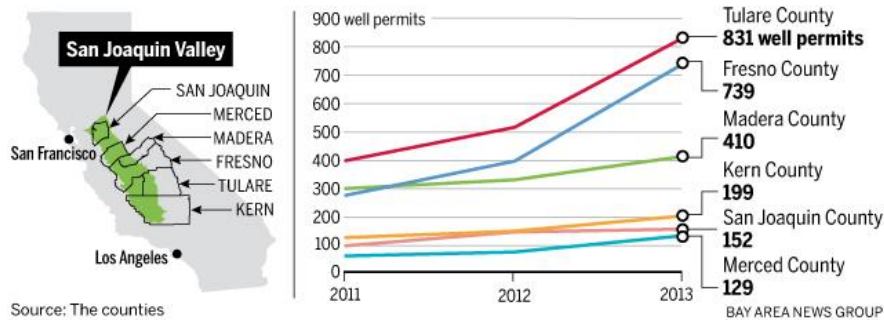


Figure 2.4 Rush to drill. This graph, from an article by Elizabeth Case, writer for the *Davis Enterprise*, shows the sudden increase in both depth and number of wells drilled in the San Joaquin Valley. The number of wells being dug deeper or in new areas continued to increase through 2016, as water tables dropped statewide, not just in the San Joaquin Valley.

Not surprisingly, in 2013, the number of permits for new wells increased in almost every county in the San Joaquin Valley. In Madera, the number of well permits increased from 300 to 410. Fresno saw the number of new permit requests rise from just fewer than 300 in 2011 to 739, and Tulare County saw the largest increase with permit requests growing from 400 in 2011 to 831.²⁷ As water levels dropped dramatically in the southern half of the Valley, very deep wells were drilled, which cost farmers anywhere from \$200,000-\$600,000.²⁸ The number of new well permits for residential use was higher than usual in 2014, with 124 in Fresno and 182 in Tulare counties. At least five new wells in Kern County reaching 2,500 feet in depth were drilled by 2016.²⁹ There were so many demands for new or deeper wells that many drilling companies found they could not meet the demands and gave out wait times to all new requests. Pump repair

²⁷ Ibid.

²⁸ Ibid.

²⁹ Vance Kennedy, Retired U.S. Geological Survey hydrologist; his perspective on water use in the Central Valley can also be found on The Valley Citizen <http://thevalleycitizen.com/>

companies faced the same dilemma, and often had to tell pump owners that it is not the pump that needed to be repaired or replaced, but that the well needed to be deeper.³⁰

Aquifers in different parts of the Central Valley are linked, so as more water is withdrawn for agricultural use, residential water goes with it. It is like having too many straws in a glass, with a few sucking out the water much faster and more frequently than everyone else. Vance Kennedy, retired U.S. Geological Survey hydrologist, summed it up this way: “People don’t know, or don’t care, that they are also pulling water from thousands of feet around them.”³¹ Consequently, the largest number of new well requests was for private rural residences as old pumps could no longer reach depleted water levels. An increase in the number of water storage tanks purchased by private residents in rural areas also occurred as some wells dried up altogether or became too deep and expensive to manage.³² Nick Beard, owner and operator of Wallace M. Beard Pump Co., Inc., says that wells in Yolo County began to dry up in May of 2014. Beard noticed an increase in calls to repair pumps for domestic and agricultural use as early as 2008, only to find it was the well depth that needed to be altered not a malfunctioning pump that was the culprit.

Another issue for farmers regarding well depth occurred as borane salt levels increased in irrigation wells, and even deeper wells were needed to get better quality water for certain crops like olive trees. On average, stated Beard, domestic wells in Yolo County have increased to a depth of 320 feet, whereas the well on his property was drilled to a depth of 200 feet in 1977, which was during a drought, so even that level is not indicative of normal levels.³³ As with other

³⁰ Nick Beard, Wallace M. Beard Pump Co., Inc., Woodland, California. Interviewed by Tracy Neblina on September 12, 2014. Beard has been a family owned business operating out of Woodland, CA, for over twenty years.

³¹ Ibid.

³² Galloway, and Nick Beard interview.

³³ Nick Beard.

pumping companies, Beard had had more requests than he could accommodate in a timely manner during the drought, so he began referring clients to competitors when necessary. Mr. Beard found himself working seven days a week, sometimes ten to fifteen hours a day due to the number of residents and farmers scrambling to get potable water out of their ever deepening wells. It was not the first time that drought had occurred in Yolo County, however, the degree of the 2011 episode was shocking to many residents as the county is located in the northern half of the Central Valley where rainfall is usually plentiful as are surface and groundwater supplies. Residents that rely on the Sacramento River and its tributaries are finding it difficult to rationalize sending water to a desert in the south to sustain farms when they are now struggling to keep water in their own homes.

Most everyone involved with water use on a large-scale knew that deeper wells and continuous reliance on groundwater were not long-term solutions. In fact, overuse of aquifers often led to soil subsidence, aquifer-system compaction, increased soil salinity, and lower quality surface water. All of these problems had a profoundly negative impact on the very farms that used water from the wells in the first place. Some experts believed underground water stores would be used up in the next few decades.³⁴ Director of the University of California, Irvine, Center for Hydrologic Modeling, Jay Famiglietti estimated that underground reserves in the Central Valley “are shrinking by 800 billion gallons a year...” Depleted underground water sources directly impacted farmers but were caused, in part, by the farmers themselves. The cycle of overuse and continued planting during dry seasons and drought years was driven by the desire for increased profits; this was especially troubling in the arid half of San Joaquin Valley where agribusinesses controlled a great deal of land. Family-run farms often followed suit to remain

³⁴ Jay Famiglietti, “How Much Water Does California Have Left?” *Los Angeles Times*, July 8, 2014. Famiglietti is a professor at UC Irvine. He is the founder and director of UC Center for Hydrologic Modeling. His outlook on water availability for California is bleak, but he is not alone in this assessment.

competitive in the national and global markets, and of course make their own profits. Such practices placed a strain on the entire state and did not address the underlying cause of water shortage or misuse and sometimes led to the collapse aquifers and land subsidence in the Central Valley. The photograph below shows what happens when aquifers are depleted and indicates the level of compaction that had already occurred in the Central Valley prior to 1977. An illustration on the following page shows what happens below the surface when compaction occurs such as that shown in the image of Dr. Poland. Clearly this issue was not new to California, yet it was still a problem when another drought began in 2011.

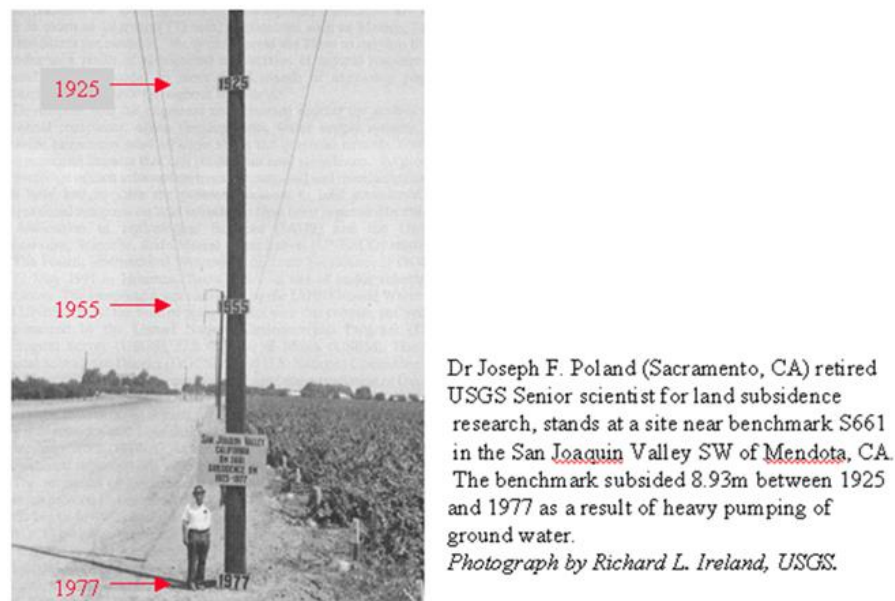


Figure 2.5 Subsistence. This image shows how far land collapsed in one part of the San Joaquin Valley between 1925 and 1977. To the right grow grapevines, a crop that requires water year round and cannot be fallowed without losing the vines.³⁵ This image indicates an awareness of situation as early as 1955. The drop in levels is due to compacted or collapsed aquifer which means water which used to flow under these rows of grapevines no longer exists. Farmers in this area would have needed to dig deeper wells and/or get more waters from public water networks. Given that these areas continued to see land subsistence between 1977 and 2015, it can be inferred that even more aquifers have collapsed, reducing underground water sources still further. The fact that this issue was ongoing from 1925 to 2016 should give California residents pause because the availability of water from the CVP, SWP, and local water diversion projects had not ended the overdraft of subterranean water supplies and aquifer depletion.

³⁵ D. Galloway, "San Joaquin Valley, California: Largest Human Alteration of the Earth's Surface" *United States Geological Survey*, <http://pubs.usgs.gov/circ/circ1182/pdf/06SanJoaquinValley.pdf>.

Sinking ground

The floor of California's great San Joaquin Valley is filled with deep layers of clay, sand and gravel, left by ancient lakes and streams. These layers hold fresh water, called aquifers. The largest layer is called Corcoran Clay, and it separates the valley's shallow aquifer from its deep aquifer.

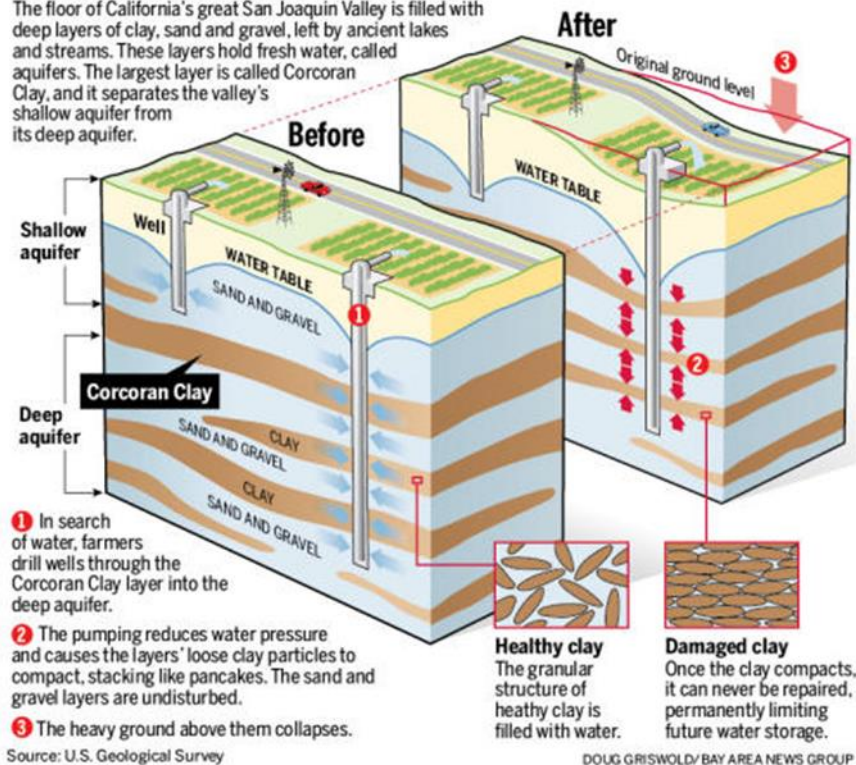


Figure 2.6 Sinking Ground. Used in an article about land subsidence, this image shows what happens when aquifers are depleted without chance for normal recharge. It helps to explain what has occurred in the previous photo of Dr. Poland standing next to the pole with subsidence markers dating back to 1925. The impact is profound and long-term as once the clay or other permeable level is compacted and collapsed it can never hold water again.

Although lack of water resources was nothing new for California, due to the increased number of residents depending upon depleted water sources for both agricultural production and domestic needs, calls for water regulation reached a fever pitch. It appeared that California residents were reticent to the fact that solutions addressing these issues would not be simple, nor would they please all involved in the process, but the task could be made clearer by looking at the historical link between land and water. Indeed, the water crisis in California was tied directly to the history of land and water management in the state and the desire for increased wealth by agribusinesses and small farmers alike. Patterns of land acquisition that occurred prior to California entering the Union persisted into the twenty-first century, and had a profound impact

on water usage for both farming and urban development. Thus, in order to understand the dilemma concerning water California has faced periodically throughout its history, it is also important to understand the early patterns of land acquisition and development. It is equally important to understand that water rights, storage, and flood control were an integral part in the development of large and small-scale farms across the state

Chapter Three

Land Monopolies and Family Farms: Setting the Stage for Crisis

*“The great estates of that region are doomed to disintegration. The great wheat ranch cannot compete with the small diversified farm. In agriculture the big fish are furnishing food for the little ones.”*³⁶

-Dr. Charles B. Spahr

The history of water reclamation and the influence of money, land, and power in Central California began long before construction of large public water works, such as the Central Valley Project, were even conceived. As mining began to decrease in the late 1860's, the number of farms began to increase. At roughly the same time, the Southern Pacific Company began construction on a railroad through the San Joaquin Valley.³⁷ This rail line supplanted transportation of crops by river to markets and ports, and created new connections where rivers did not exist, allowing towns and farming communities to grow in places where there were railroad stations. By 1874, the Southern Pacific (SP) stopped in Modesto, Tulare, Delano, Fresno and Bakersfield, to name but a few. The newly constructed railroad also opened up opportunities

³⁶ Richard Theodore Ely. *Monopolies and Trusts*. (New York: The Macmillan Company, 1906), p. 193. In this book, Ely examines the meaning of monopoly, the economic and social implications, and issues with trusts that create monopolies. A simple evaluation of his assessment is that if issues with natural monopolies are eliminated, such as consolidation of wealth, social privileges, etc., there would be no problems with trusts. I use the quote by Dr. Charles B. Spahr, chairman of the Anti-Imperialist League of New York from 1900-1904, because it shows how large farms from Minnesota to South Dakota were seen as a temporary phenomenon. This runs contrary to the way farming occurred in California.

³⁷ Donald J. Pisani. *From the Family Farm to Agribusiness: The Irrigation Crusade in California and the West, 1850-1931*. (Berkeley: University of California Press, 1984), p. 102-103. Pisani is a professor of Western American History at the University of Oklahoma and has written several books on the topics of water, land, and law in California. Born and raised in Sacramento, Pisani has firsthand experience with the effects of land and water policy in California. In this work, Pisani explains how “irrigation contributed to the evolution of California agriculture from the pastoral and wheat boom era,” to the large agribusinesses that control the most farm acres in the state. He also argues that water was not just about farming and making a living but a means to control social and economic development in California. The mismanagement of resources at the local, state, and federal levels and how this contributed to land and water issues are also important elements of his argument. Similarly, his 2002 book, *Water and the American Government*, highlights the way in which water reclamation projects fall prey to local interest groups and the inability of the federal government effectively to manage resources.

for business endeavors in the new towns and for farmers across the Valley, even into areas not supported by readily available water. Due to both the productivity of the land and proximity to the railroad, real estate values around Fresno and Porterville, located in the center of the San Joaquin Valley between the San Joaquin River and Kings River, increased to a steep 150 dollars an acre.³⁸ This made land purchases for small farmers difficult to say the least, and many of those looking to make money by farming in the fertile Valley found themselves limited to purchases of land further down into Kern County, an area with far less readily available water.

Agricultural development did not occur in isolation, in fact there was a great deal of urban development in California, with nearly one quarter of the population living in San Francisco, and several other cities, like Sacramento, Oakland, San Jose, and Los Angeles each had populations of 10,000 residents.³⁹ Growing metropolitan areas created a greater demand for crops and livestock, and with the railroad now established, this meant farming in the state could be highly profitable, inspiring the migration of many would-be farmers. Facilitated by construction of the railroad, the rapid growth of towns and cities, and the value of land for agricultural development or speculation, it was possible for ordinary men to build great wealth in many parts of the West. In 1888, Englishman James Bryce wrote *The American Commonwealth*, in which he noted just such a trend, particularly in California, where a number of men who had come from relatively little, had amassed great fortunes.⁴⁰ This, he noted was most apparent in

³⁸ Eugene Moehring, *Urbanism and Empire in the Far West, 1840-1890*. (Las Vegas: University of Nevada Press, 2004) p. 32-33.

³⁹ David Alan Johnson, *Founding the Far West: California, Oregon, and Nevada, 1840-1890* (Berkeley: University of California Press, 1992), p.238.

⁴⁰ James Bryce, *The American Commonwealth*, (Indianapolis: Liberty Fund Inc., 1995), p.1066-1069. Bryce, a famed academic, historian, and Liberal Parliament member, traveled extensively throughout the United States. During his time in California, Bryce noted that there were definite class distinctions in California based economic lines, which seemed deeply problematic as members of each class were really the same sort of men. He observed that those who had newly acquired money and power were more prone to exert their will onto others and those in the lower echelons were resentful.

urban centers but had far reaching consequences for rural areas where farms of “enormous size” were leased to numerous farmers by land speculators or owned by land barons who hired seasonal labor.⁴¹ California was unique in this way as most states had farms of more modest size and families lived and worked on the land themselves. Most importantly, because there was not typically a direct connection to the land on the part of the land owners and because the fundamental goal was to make money, there was no sense of stewardship. Individuals felt that they were entitled to do what they liked with their property regardless of what happened to others, especially if their own interests were at stake. This was seen by many as part and parcel of expansion, progress, and full entry of the state into the market economy. Unfortunately, this model persisted, with few exceptions, as did the consequences well into the twenty-first century.

Initially, this model of expansion was bolstered by large transportation projects that linked towns to markets near and far, especially rail lines. By the time the Southern Pacific Railroad had completed lines through the San Joaquin Valley, much of the land had already been accumulated by a few wealthy individuals who often fit the description presented by James Bryce. For example, Henry Miller & Charles Lux, who owned hundreds of thousands of acres crossing three states, even granted a right of way through land near Gilroy to the SP in exchange for an extension line to their Bloomfield Farm for which they secured very low shipping rates for transporting cattle to market.⁴² This arrangement helped Miller & Lux become the controlling interest in the beef industry for San Francisco and surrounding areas. In his 1975 article, “Public Land Disposal in California,” Paul W. Gates, historian and authority on federal land

⁴¹ Ibid., 234-235.

⁴² David Igler, *Industrial Cowboys: Miller and Lux and the Transformation of the Far West*. (Berkeley: University of California Press, 2001) p. 53. Igler argues that land and resource acquisition in California was an industrial and capitalistic endeavor. He uses Henry Miller and Charles Lux as prime examples of the process of consolidation of land and power in the state, with a uniquely “Western” flair. Igler also asserts that the methods used for this process have continued to plague residents of California.

policy, points out that several large rancheros were purchased in similar fashion by Anglos like Thomas O. Larkin, John Bidwell, and Abel Stearns.⁴³ Construction of railroad lines near their farms not only gave owners a leg up on competition and reduced transportation costs for getting crops and livestock to markets, but it also helped build long-term connections with investors and transportation moguls that other farmers were not able to establish. Railroad lines cut across the state directly through the Central Valley, as indicated in the map below from the 1870s, which

⁴³The effects of monopolies in California and other parts of the nation have been examined by economists, historians, and those in other fields of study for more than a hundred years. Henry George, *Our Land and Land Policy* (San Francisco: White and Bauer, 1871). George, a progressive political economist, viewed land policy in California as a major cause of inequality and poverty. Kenneth C. Wenzer Ed., Henry George, *Our Land and Land Policy: Speeches, Lectures, and Miscellaneous Writings*. (East Lansing: Michigan University Press, 1999). This text includes works selected by Henry George Jr. and compiled by Wenzer, to provide a more complete sense of the views held by George. Richard Theodore Ely, *Monopolies and Trusts* (The Macmillan Company: 1906). Different types of monopolies are defined and classified Ely in this work. The ills of monopolies are addressed with one solution being public ownership with public stewardship of scarce resources. Paul S. Talyor, "Excess Land Law on the Kern: A Study of Law and Administration of Public Principle vs. Private Interest" *California Law Review*, 46, no. 2 (1958): 153-84. Taylor explains the importance of the 160-acre limitation and points to land consolidation and use of water resources by large landholders as the cause of social and economic issues and political unrest. Paul W. Gates, "Public Land Disposal in California" *Agricultural History* 49, no. 1 (1975): 158-78. Paul Gates presents his research on federal land laws and policies that have influenced the course of the development of California specifically and the nation in general. He has written numerous books, pamphlets, and articles, in which he describes the creation and manipulation of land policy and what effect of these policies, have had on the society and the economy. Donald J. Pisani, "Land Monopoly in Nineteenth-Century California" *Agricultural History* 65, no. 4 (1991): 15-37. Pisani argues that water scarcity and the development of irrigation society helped to promote agricultural monopolies in California at the detriment of family farms and egalitarian society. David Alan Johnson, *Founding the Far West: California, Oregon, and Nevada, 1840-1890* (Berkeley: University of California Press, 1992). Focused on how local political customs, habits, and institutions, developed in three states, Johnson argues that these early developments greatly impacted socioeconomic development of the region, including land and water policy. Jon Lauck, "American Agriculture and the Problem of Monopoly" *Agricultural History* 70, no. 2 (1996): 196-215. Lauck examines the impact corporate farms have in agricultural markets and independent family farms. He also addresses the potential success of farmers if they organize in order to counter the market power of large-scale agribusiness. Carey McWilliams, *California: The Great Exception* (Berkeley: University of California Press, 1999). The exceptional nature of California, its origins and development are examined by McWilliams including what role land grabs, agricultural production, field labor, and perpetual growth have had on the state. David Igler, *Industrial Cowboys: Miller and Lux and the Transformation of the Far West*. (Berkeley: University of California Press, 2001). Igler examines the importance of Henry Miller and Charles Lux in the development of the West, presenting these men as self-made captains of agricultural industry that utilized sentiment about private property and entrepreneurship to create an agricultural empire and transform the West.

allowed landowners in the fertile valley to transport goods to market more easily, further increasing the value of the land.



Figure 3.1 Railroad Map. This map shows the major lines of the Southern Pacific Rail Road in California and surrounding area to accompany printed agreement of S. O. Houghton as to the rights of the Southern Pacific R.R. Co. of Cal. to government lands under Acts of Congress passed July 27, 1866 and March 3, 1871 made before the committee of the judiciary of the Senate and Ho. of Reps. in May 1876. If compared to other maps showing the landholdings of several land barons, it is clear that the lines go directly or very near their estates.

Eventually, this elite group of California landholders was joined by men who had recently made their fortunes in banking, shipping, mining, cattle ranching, and railroads, like Miller & Lux.⁴⁴ Most of these men had ties to land offices and banking interests in San Francisco which facilitated acquisition of Mexican land via the appropriate “legal” channels.⁴⁵ John Parrott, land broker, mining investor, and money lender operating out of San Francisco, assisted in many of the land deals via his Parrott and Company Banking Exchange and Agency founded in 1855. Because of this, land granted by the Mexican government moved more quickly into the hands of American landowners in California than it did in Texas and other parts of the southwest, and impacted the way in which the economy and state land policy developed.

Poorly drawn state and federal land laws also helped create and perpetuate land monopolies in California. In fact, members of the Kern County Land Company had a heavy hand in the 1877 Desert Land Act and were able to purchase thousands of acres due to the wording they helped craft. Land ownership was the means to establishing control over resources in the state, for extraction or transportation to markets, which required a lot of capital, thus, such endeavors tended to be carried out by men with large-scale operations. Furthermore, the sale of public lands in other states was limited to areas that had already been surveyed, although the Pre-emption Act of 1841 technically provided a solution for dealing with those who settled on land

⁴⁴ Paul W. Gates, “Public Land Disposal in California,” *Agricultural History* Vol. 49, No. 1 Agriculture in the Development in the Far West: A Symposium (January 1975) p. 159. Gates is considered an authority on federal land policy in the United States. In this article Gates explains how differences in early California land policy impacted who had access to farm land, who was able to maintain control of that land, and how those differences allowed for the accumulation of land by very few wealthy men. This is essential to the argument that wealth and power played a tremendous role in who had access to water in the early 20th century. His explanation is also important to show how this trend has not really changed over time. Although he acknowledges that there are many more family farms in California than in other states, he also points out that the vast majority of farming acres are still controlled by very few people or corporations. Census data supports this assessment even in 2015.

⁴⁵ David Igler, *Industrial Cowboys: Miller and Lux and the Transformation of the Far West*. (Berkeley: University of California Press, 2001) p. 46.

not yet open for sale. Prospective buyers in such states could file a claim with the Land Office requesting purchase of between 40 and 640 acres. In contrast, no such office was established in California until 1858.⁴⁶ In addition, the cost of surveying land was placed on the buyer even though this land was also seventy-five cents more expensive than that of surveyed land in other states. Individuals that wished to purchase more than the maximum number of acres were simply required to fill out forms stating that the purchase would serve as a permanent residence.⁴⁷ However, residency rules were seldom enforced which allowed for wealthy bankers to remain in cities like San Francisco as absentee owners. All of these conditions served to undermine settlement by small farmers establishing agricultural communities, but instead propagated the growth of agricultural empires.

To make matters worse, President James Buchanan also attempted to remedy fiscal issues faced by the Nation after a depression in 1857 by putting 11,000,000 acres of California land on the market. Gates explains that some of the land was very desirable, but, due to the recent depression, few had enough money to purchase land and so the price dropped to \$1.25 an acre, the national averages ranged from \$5-\$18 an acre. Those who had money and connections were allowed to purchase unlimited amounts of this land with cash, devalued military bounty warrants or other forms of scrip.⁴⁸ Unfortunately, this land was off limits to homesteaders and pre-

⁴⁶ Donald J. Pisani, "Land Monopoly in Nineteenth-Century California." *Agricultural History*, Vol. 65, No. 4 (Autumn, 1991), p. 19. Although Pisani agrees with most of the arguments put forth by Gates, he asserts that water scarcity and increased irrigation contributed more to land monopolies than did poorly constructed land policy. Pisani's argument highlights the circular logic that follows irrigation, agriculture, water policy, land monopolies, and scarcity that are part of California's history of drought.

⁴⁷ Paul W. Gates, "Public Land Disposal in California," *Agricultural History*, Vol. 49, No. 1, *Agriculture in the Development in the Far West: A Symposium* (January, 1975), p. 161.

⁴⁸ Donald J. Pisani, "Land Monopoly" p. 20. Scrip refers to payments made by special forms of currency or lines of credit good only for particular purchases. In this case there were several types of scrip used to purchase specific types of land, including scrip for swampland, or land used to support agricultural colleges. Scrip seemed to be in endless supply for men like Miller & Lux who purchased a great many acres using such currency.

emptioners alike, even after passage of the Homestead Act of 1862. This meant that most yeomen farmers or prospective land owners of modest means found it almost impossible to afford land even at the lower prices. Again, men with ties to bankers in San Francisco were able to purchase land using scrip in what appeared to be limitless quantities. When land did become available for purchase or homestead, settlers found the best land had already been claimed.⁴⁹ In short, control of good quality farmland, and a lot of it, fell into the hands of a few individuals which further established agricultural monopolies in California.

Of equal importance was the fact that laws put in place to safeguard small farmers were generally disregarded, allowing for landholdings to become even more concentrated in California. For instance, in 1841 President John Tyler had signed into law the Log Cabin Bill. The intent of this legislation was to protect the rights of “preemptors” or squatters who had gone onto federal lands prior to public release and made improvements to that land just as any homesteader was required to do.⁵⁰ In other states preemptors could file a claim and make payment on the land they had improved and gain title to a certain number of acres. In California, petitions by preemptors were seldom upheld, and they usually lost all investment they had made in improving the land while waiting for homestead measures to pass. However, those with means were represented with great success when making claims against preemptors and families that had been granted land rights by the Mexican government. In some cases, families had settled on land not yet open to the public and made improvements in hopes that when the Log Cabin Bill took effect they would be able to buy it. Unfortunately, the improvements were used when

⁴⁹ Carey McWilliams, *California: The Great Exception* (Berkeley: University California Press, 1999), p. 96.

⁵⁰ Squatters, or individuals that moved onto land prior to that land being open to purchase, were not a new phenomenon. The Northwest Territory, Far West, and Midwest all had a fair share of squatters. This usually occurred because land offices were understaffed and overburdened and could not meet the demand of land purchases and land claims. By the time land offices got around to surveying land for sale, there were typically already preemptors living on some part of it.

evaluating the property value and the family that had worked the land was seldom able to afford it at auction; instead land barons added these improved farmlands to their already sizable holdings.⁵¹ A report by the California State Board of Agriculture in 1872, showed just how extensive land consolidation was in the state. According to the report one hundred people held titles to roughly 5,460,000 acres and in the San Joaquin Valley alone, three individuals each claimed an average in excess of 235,000 acres.⁵²

Still another issue that allowed for land and agriculture monopolies was that the law was on the side of wealthy landowners in practice, if not in fact. Squatters could seldom afford court costs or hire lawyers with the same skill as could men like Henry Miller and Charles Lux, who acquired 300,000 acres just from the sale of rancheros. In contrast, Gates gives the example of a would-be homesteader that was displaced on two separate occasions. Robert Fulton Jr. had settled on land that was part of the Mexican claims after the Mexican American War. Because of this, he was forced to leave land he had already begun improvements on. He relocated, and this time he filed a claim before he began improvements on the land. However, it was not until after he had started the improvements that he was told there was a state warrant filed on what he thought was his property.⁵³ Episodes like this demonstrated just how little the law applied to men with influence and how hopeless small farmers and homesteaders must have felt given that almost twenty-five percent of the land in the San Joaquin Valley was owned by less than one percent of the landholders, most of whom lived outside of the Valley.⁵⁴ Much of that twenty-five percent was also prime farmland near rivers and with relatively easy access to rail lines running vertically across the state. Henry Miller, for example, owned much of the land along the San

⁵¹ Carey McWilliams

⁵² California State Board of Agriculture, *Biennial Report of the State Board of Agriculture for the years 1870 and 1871*. pp. 15-16.

⁵³ Paul W. Gates, "Public Land Disposal in California." p. 162-163.

⁵⁴ David Igler, p. 64.

Joaquin, Kern, and San Benito Rivers in California, a bit more near Walker Lake in Nevada and further north in Winnemucca and surrounding area, and even some up along the Silvies River in Oregon. Red areas on the map below indicate just how much land Miller owned across three states, most located adjacent to sources of water, and he is but one of a handful of men who owned so much prime land in California.

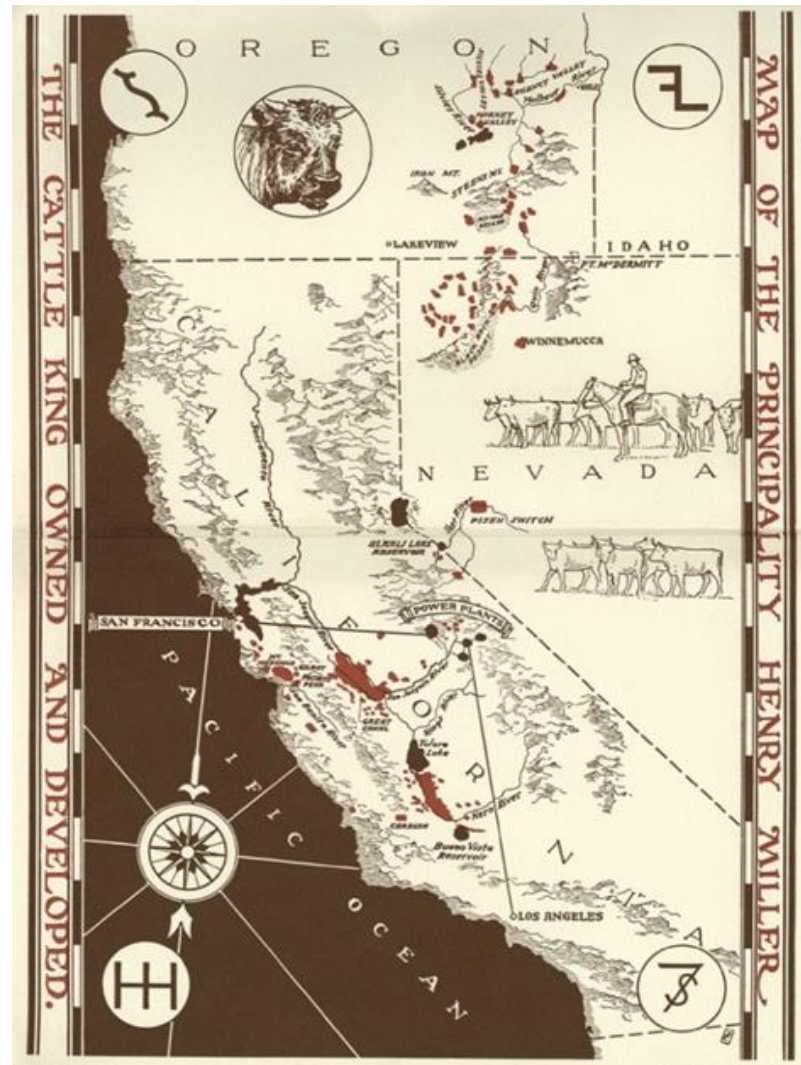


Figure 3.2 Miller Land Holdings: Map of Henry Miller Land Holdings from Edward F. Treadwell, *The Cattle King, A Dramatized Biography* (New York: Macmillan Co., 1931) Miller, known as the “Cattle King”, was an immigrant butcher who eventually became one of the largest cattle suppliers in the state, owned land across three states. Land used for farming and cattle ranching is denoted in red. Miller helped to develop much of the southern San Joaquin Valley, and he and Charles Lux established one of the largest agricultural empires in California, eventually dabbling in irrigation projects as well. Courtesy of the Library of Congress, public domain.

Several other schemes allowed for those with money and connections to obtain land not available to the average citizen. Policy regarding swampland purchase helped perpetuate monopolies in California that remained intact where other states saw such monopolies broken up.⁵⁵ Holders of swampland warrants were allowed to purchase more land at a lower price as it was understood that swampland was less valuable or would require more investment than dry land in order to be made useable. For this reason, swampland tended to be unappealing for most yeoman farmers with little extra capital to invest in land reclamation on their own. What most homesteaders were not initially aware of however was that the land purchasers themselves were able to determine what parts of the unsurveyed lands were considered swampy and which were dry.⁵⁶ An additional perk of this system was that speculators who purchased land with a swampland warrant were able to avoid payment for years due to lax enforcement within the state.⁵⁷ As such, large tracts were purchased by a few individuals privy to this information, leading to increased monopolistic landholdings.

The consequences of unethical land dealings did not go unnoticed, but little was done to curtail the activity. U.S. Surveyor General for California, Sherman Day, warned that the system in use allowed too much land to be procured by too few people without the proper protection for actual homesteaders.⁵⁸ Despite this warning, Will S. Green, a large landowner in the Sacramento Valley and recently elected member of the California State Legislature, sponsored a bill that eliminated any restrictions that still applied to swampland purchases. The bill, which allowed land holders to pay only the 10 percent interest on land they owned or wished to purchase,

⁵⁵ Gates p. 164.

⁵⁶ Ibid p. 163-164.

⁵⁷ Pisani, "Land Monopoly in Nineteenth-Century California." p. 22.

⁵⁸ Gates, p. 164.

passed unanimously.⁵⁹ Once the machinations of such land purchases became known, it was not lost on the public that the passage of this bill worked to the benefit of those who already owned considerable amounts of land and had connections to urban investors, bankers, and politicians at the state and local level. Legends about manipulation of this bill were rampant. One story describes Henry Miller as sitting in a row boat atop a horse drawn wagon riding across a valley of grassland. By doing so, he was able to claim that he had covered a vast swath of land in a boat; therefore it could be labeled as swampland.⁶⁰ Miller was not alone in his efforts to add acres of “swampland” to his already considerable holdings. What men like Miller, Lux, and William S. Chapman, a San Francisco real estate agent, realized early on was that certain areas in the San Joaquin Valley were covered by water during the wet season, which was a brief period, the rest of the year the land was dry and often ideal for planting.⁶¹ Most of these types of land purchases were made far in advance of homesteading rights, leaving even less public land available when the laws did go into effect.

In addition, when land was finally made available to homesteaders and for public purchase, land barons simply employed different tactics to procure even more acres for their estates. One strategy used to obtain tracts of land was to establish dummy purchasers and later, false homesteads. Individuals put in claims to purchase the maximum number of acres and then turned them over to employers or individuals who paid them a fee. This was true for many enterprises including the California Redwood Company, who would take immigrants right off the docks to the homestead office, have them get their documents in order, and then pay them a

⁵⁹ Ibid p. 165

⁶⁰ David Igler, p. 60.

⁶¹ McWilliams

50-dollar fee to sign over the paperwork.⁶² It was unlikely that very many knew what was happening except some very helpful men took them ashore and gave them a large sum of money for their troubles. Men who already owned thousands of acres were signed over thousands more through these homestead patents. In addition, bankers, speculators, and investors, used dummy companies and continued to acquire land through homestead claims. James Haggin, who made his vast fortune in multiple gold rushes that occurred in the West and eventually owned more than a million acres in California, used these methods to obtain 183,000 acres. Lloyd Tevis, a banker and associate of Haggin, and William B. Carr, Republican Party boss, and the so called “King of Kern County” received smaller land holdings in this same manner.⁶³ It was difficult for real homesteaders to compete with men like this for what little land had been made available.

Even land set aside for internal improvements and schools was not safe from efforts to acquire property. The Morrill Act of 1862 required that land be set aside to sell with the intent of the proceeds being used for the funding schools and agricultural colleges. School scrip was used by many of the same individuals that filed dummy claims for homesteading to purchase this land. Scrip, a substitute for legal tender that can only be used for specified purposes, allowed for the purchase of no less than 40 acres in sections set aside for providing funding for education within divisions of surveyed land. Property in this area was very valuable because of the location within surveyed divisions and the potential for commercial, if not agricultural, development. Of the 96 individuals who used scrip to purchase school land, cattle magnates Miller and Lux received 19,078 acres, and Gerald Nash had 91,000 acres signed over to him.⁶⁴ These men used Agricultural College scrip to purchase even more acres from the University of California. Land

⁶² Robert V. Hine and John Mack Faragher, *Frontiers: A Short History of the American West*. (New Haven: Yale University Press, 2007), p. 135.

⁶³ William F. Donnelly, *American Economic Growth: The Historic Challenge*.

⁶⁴ Gates, p. 166-168.

purchased with scrip through the Morrill Land Act had to be recorded in land patent books at increments of 160 acres. In one set of patent books the first forty-seven pages alone were filled with purchases made by William Chapman, Isaac Freeland, and Miller & Lux.⁶⁵ In brief, such land purchases increased the sizeable holdings these men already controlled, expanding land monopolies throughout the Valley.

Only six years after the Homestead Act was passed in 1862 to encourage the growth of small farms across the country, there were 4,753 farms in California which were, on average, more than 3,500 acres in size and that acreage continued to increase well into the 1870's.⁶⁶ As acres were planted to crops instead of being used primarily for cattle ranching, water scarcity became more of a concern for farmers. Those with large estates wanted to ensure they were able to control access to the valuable resource, determining who could and could not use water. Many of these same individuals purchased land along rivers or with claims to riparian rights making it difficult for farmers without direct access to river water or riparian rights of their own to make the fertile land bloom. For example, Miller & Lux purchased land and water rights along the Pajaro River, San Benito River, Pacheco Creek and Carnadero Creek, all land that was desirable to small farmers because of its proximity to water.⁶⁷ Henry Miller acquired one such estate from Francisco Soberanes, who had been granted the land in 1862 by the General Land Office honoring his 1851 Mexican land grant, shown in Figure 3.4. This land purchase, illustrated on the following page, was Miller's favorite property. In the drawing, Miller's land is shown on both sides of the San Joaquin River and has housing, vineyards, and irrigation networks neatly planned out, making success on such a property highly likely, and this being only one of his properties. In contrast, small farmers seldom had the opportunity to make land purchases with

⁶⁵ Igler, p. 66.

⁶⁶ Gates, p. 166-168. Igler, p. 102.

⁶⁷ Igler, p. 51.

easy access to irrigation waters, often times making it difficult for them to compete with the vast holdings of men who had consolidated land as a consequence of their wealth and power.

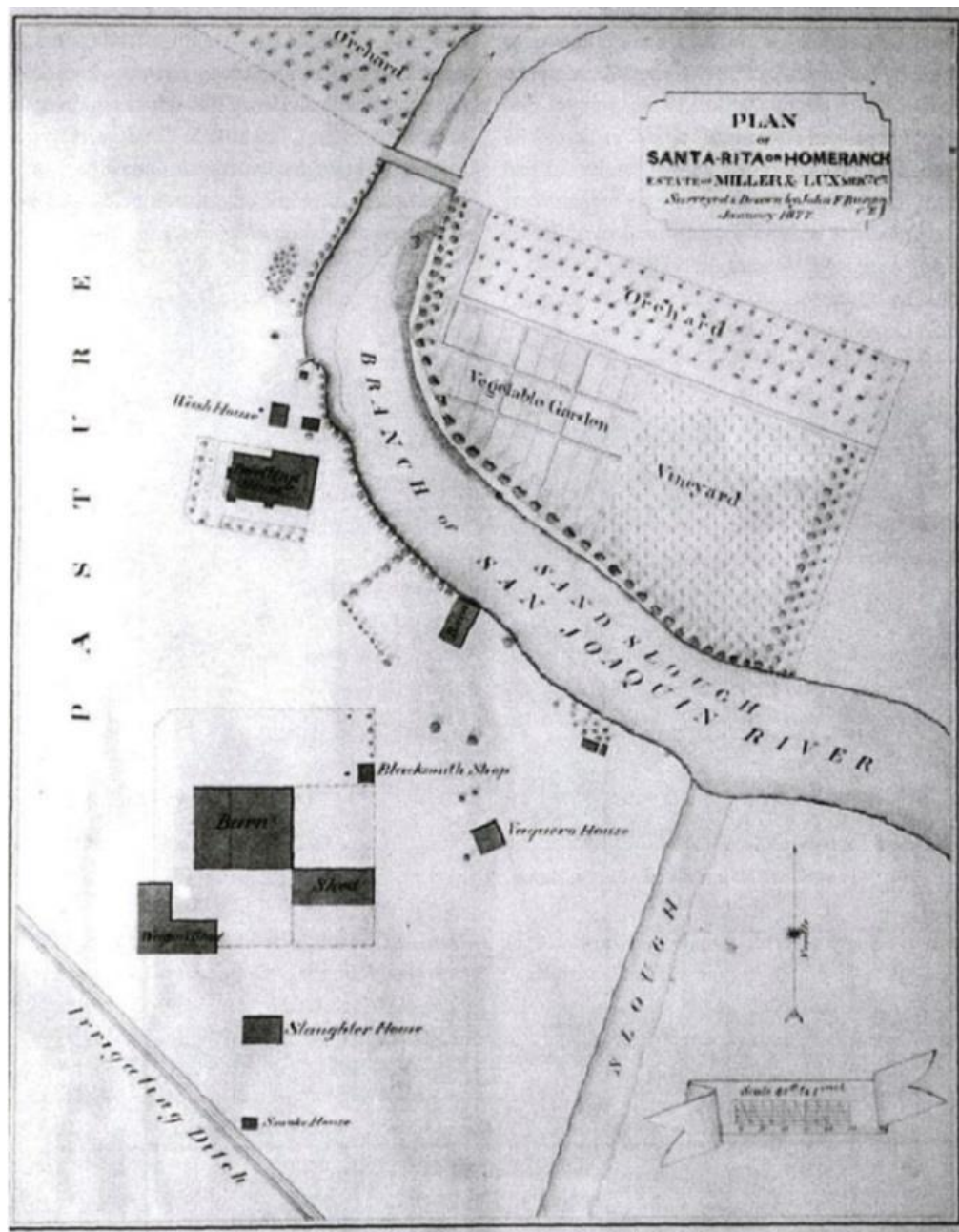


Figure 3.3 Plan for the Santa-Rita Ranch 1877. Milliken Museum Public Domain entry=153 Favorite home of Henry Miller, located on a branch of the San Joaquin River. The neatly drawn dwellings, garden, and vineyard are all nestled between irrigation canals, sloughs, and the San Joaquin River. This is but a glimpse of the land and water supplies that Miller controlled, and is telling of his expansive holdings across three states.

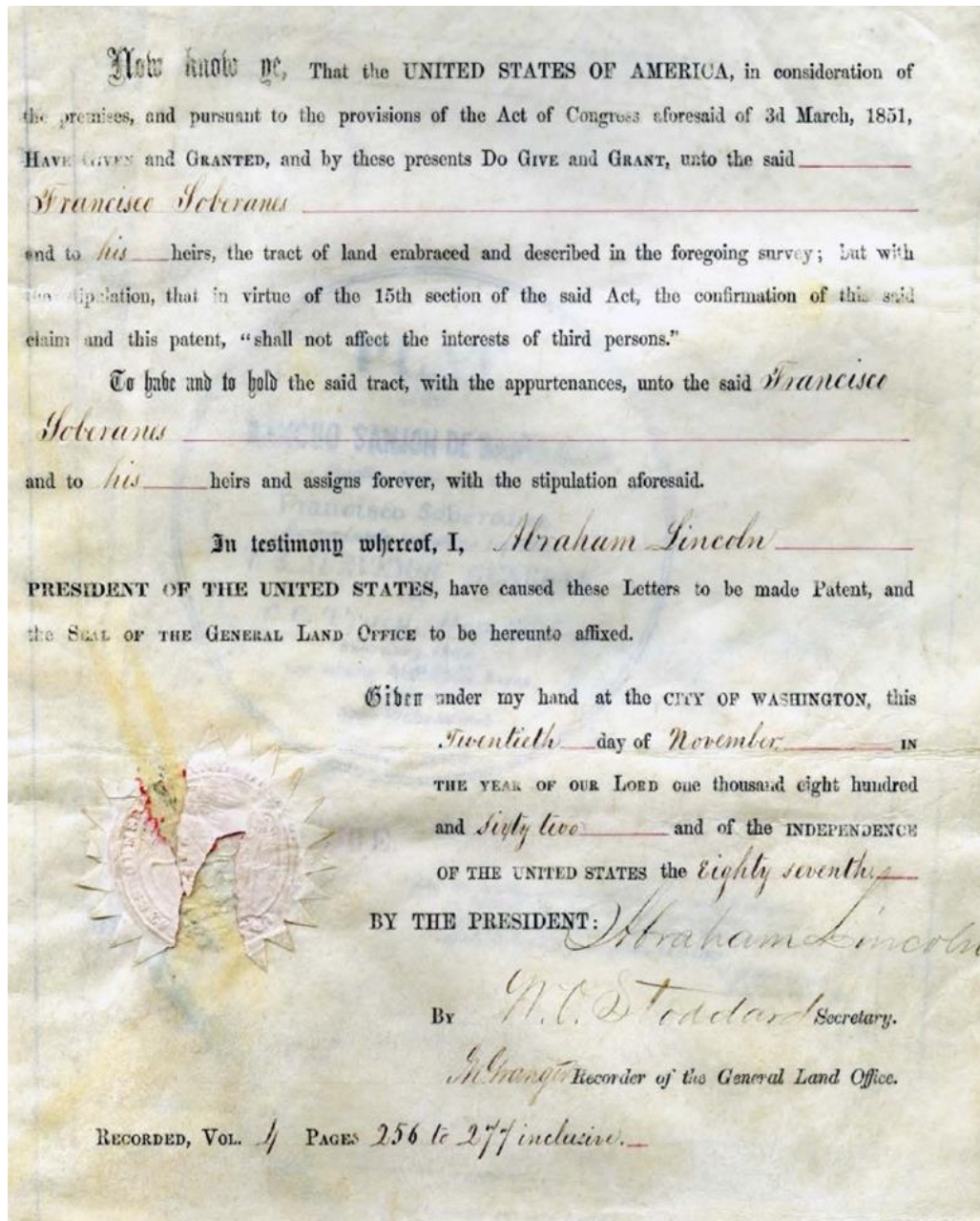


Figure 3.4 Grant Document. Land grant document for Santa-Rita Ranch, signed by Abraham Lincoln. This document signified land ownership that was eventually transferred to Miller for the Santa-Rita Ranch. Numerous other land titles were signed over to Miller, Lux, Haggin, and many other estate holders in California.

Generally speaking, small farmers already found it difficult to compete in the marketplace as their overhead was greater than agribusinesses, they did not always have the luxury of hiring cheap seasonal labor, and adding the difficulty and cost of attaining water for irrigation all ate

into their profits, making the success of their farming efforts less likely than their affluent neighbors. Moreover, those who controlled riparian rights sometimes limited how much water other farmers received. Manipulation of water resources were seen by some as an opportunity to acquire land that had already been improved but whose owners were no longer able to afford to pay for irrigation water or found themselves unable to make a profit. Many small farmers in such a position were forced to put their land up for sale or, worse still, had farms foreclosed on by the banks who seemed unwilling to extend credit to yeoman farmers. An unintended consequence of this process was the increase in urban populations as families who had migrated to California found good land too expensive, the cost of irrigation improvements too costly, or farming simply too difficult, frequently saw moving to cities and finding work as their only option. This has a level of irony as many small farmers looked toward urban centers as the source of their difficulties. After all, major cities housed bankers, land developers, and railroad magnates, all enemies of the common man in the Populist narrative. In any case, because so many families sold or were forced off their land, ownership became even more concentrated in the state.

As a result of legal maneuvering and manipulation of both financial and environmental resources, land monopoly was more widespread and lasted longer in California than any other state.⁶⁸ This fact shaped California land holdings and agricultural development as corporate farms are common even when property is held under a family name, or multiple farmers lease from a land holding company which is still a corporate entity. Residents who were not privy to the logistics of farming may not have understood this, equating the term farmer with the yeoman tradition of yore. But, as water availability periodically became an issue for Californians, where the water went and what it was used for became hotly debated topics. Unfortunately, once water

⁶⁸ Gates, p. 158-160.

supplies became ample concerns over who was using water subsidized and land consolidation became little more than an afterthought for most, save some small farmers.

However, there was public outcry over land monopoly occurring in real time including several newspaper editors that championed the cause of small farmers. Henry George, classical economist and editor of the *San Francisco Daily Post*, tried to make Californians aware of both the monopolistic practices and their long-term consequences to smaller farms, communities, and the state. Other newspapers, including the *Sacramento Bee* and *Sacramento Union*, decried the monopolistic activities, too.⁶⁹ It had become clear to many that public lands had not been distributed in accordance with the Homestead Act and that some individuals had circumvented the law in almost every way possible, allowing them to build agricultural empires. In light of this information, incidents of violence occurred when preemptors were evicted from their homes, and many Californians became convinced that political, economic, and social systems were not working in accordance with democratic ideals.

Agrarian populism was on the rise in the United States in the 1870s, in reaction to what many saw as the struggle of the people against wealthy, powerful, and greedy industrialists. The National Farmers Alliance and The National Grange saw the growth of land and farming monopolies as undemocratic and the large number of such landholdings in California helped bolster their belief that money and power were used as tools to subjugate the common man.⁷⁰ It was within the framework of this national discourse that the California State Grange held meetings to inform the public, petitioned state and federal officials, and attempted to get progressive members into state and federal positions in order to limit new land grabs and to

⁶⁹ Kenneth C. Wenzer Ed., Henry George, *Our Land and Land Policy: Speeches, Lectures, and Miscellaneous Writings*. (East Lansing: Michigan University Press, 1999.) p. 17-23.

⁷⁰ Richard Hofstadter, *The Age of Reform: From Bryan to F.D.R.* (New York: Vintage, 1955), p. 53-59.

break up monopolies that already existed. The Grange and Farmers Alliance made every effort to assert the will of the people and produce a cooperative and local alternative to what they saw as increasingly centralizing tendencies of industrial capitalism.⁷¹ These efforts were strong, but the power of large landholders proved stronger as they appeared to be integral to the inevitability of economic progress.

Populists had not been wrong in their assessment of the importance of power and wealth in the process of centralization and industrialization of farming. Unfortunately, what members of the Grange feared regarding land grabs had already come to pass by the time their movement had momentum at the state or national level. For instance, by 1871, when 6,000,000 acres of land had been removed by either homestead or purchase, homestead entries made up just over 809,000 acres.⁷² Land scrip made up about 1,618,000 acres and more than 3,300,000 were removed via purchase.⁷³ A limit on the number of acres available for land purchase was established by the late 1870s, but it was already too late. Noted agricultural economist Paul S. Taylor described “a pattern of extraordinary concentration of landownership had already become established in California, especially in the southern and western San Joaquin Valley. It survives to this day.”⁷⁴ Taylor made this observation in 1947, at which time thirty-four individual and corporate owners each held 5,000 acres or more.

By 2012, even though California was able to boast the greatest number of small farms when compared to other states, 65 percent of farmers had fewer than 50 acres in 2012 compared to a national average of 39 percent, the greatest number of acres and market shares were still held

⁷¹ Lawrence Goodwyn, *Democratic Promise: The Populist Moment in America* (New York: Oxford University, 1976), chapters 1-5.

⁷² Gates p. 172.

⁷³ Donald J. Pasini, *Land Monopoly in Nineteenth-Century California*, p.22

⁷⁴ Paul S. Taylor. “Excess Land Law on the Kern: A Study of Law and Administration of Public Principle vs. Private Interest.” *California Law Review*, Vol 46, No. 2 (May, 1958), p. 160.

by a few individuals or by corporations.⁷⁵ Much of the farmland in the San Joaquin Valley was held by investment companies and corporate farms, sometimes leasing land out to individual farmers. This concentration of land was a holdover from the methods used in land acquisition during the early years of statehood. Much of the original land was obtained by developers, bankers, and oil companies. Still more acres were held in partnerships, by corporate farms, or other companies such as railroads, often with the heads of one company having ties to others, all of whom relied on water from the San Joaquin River to increase the value of their assets. As water was essential in keeping the land productive and values high, and due to the uncertainty of precipitation and river flow, water policy began to be written in favor of such individuals to ensure their success. Consequently, water began to be allocated according to size of land holdings instead of to the greatest number of small-scale, individual farmers as was originally intended.⁷⁶

Competing in the marketplace with those whose dominion stretched across thousands of acres of land was certainly a concern for small farmers, but there was also a negative impact on state revenue due to lax land and tax policy. Prior to the turn of the century, the greater the amount of land owned, the lower the percentage of taxes the owners paid, increasing the imbalance between those with resources and those without. Owners who had made improvements to their farmland tended to pay a tax rate eight to ten times higher than those who had not improved their lands, and improvements were most often made by small farmers, with the number of acres taxed in this category at approximately 5,000,000 acres. Roughly 21,000,000 acres of unimproved land, taxed at a lower rate, were typically owned by cattle ranchers or

⁷⁵ Emma C. Knoesen and Rachael E. Goodhue. "How California Farms Measure Up in the 2012 Census of Agriculture: Smaller in Size with Higher Value of Production ." *ARE Update* 17(5)(2014):5-8. University of California Giannini Foundation of Agricultural Economics.
<http://giannini.ucop.edu/publications/are-update/issues/2014/17/5/how-california-farms-meas/>

⁷⁶ Taylor, p. 161.

investors.⁷⁷ This meant that 75 percent of the total taxes collected on agricultural real estate in California were paid by small farmers who had only 20 percent of land, the other 80 percent of was owned by wealthy individuals or corporations paying only 25 percent of the state's agricultural taxes. By the twenty-first century, revenue that could have been generated by taxing this faction of land owners could be assessed in the billions. This money could have been used to improve roads and other forms of transportation, build schools, and fund social programs in California, what a difference this may have made for all residents in the state.

The same individuals that could afford to buy millions of acres also had enough money and power to influence which laws regarding land were passed or enforced, often to the detriment of their neighbors. Not surprisingly, this same pattern of circumvention and blatant disregard was evident in the fight to remove the acreage limitation for access to federally funded water. Water was an essential component in maintaining the value of land for both agricultural use and residential/business development. Accordingly, in order to ensure prospects of future development, many land barons began to focus on water rights and private water storage and diversion projects. Initially, the cost for such projects limited their size and therefore their ability to redirect water to all acres held by landowners, which was later used to make the case for having government agencies take the lead in future water storage projects. In the meantime, irrigation networks remained relatively local and even some small farmers established irrigation communities to build and maintain small-scale canals and reservoirs.

Although it took some time to become evident, the remarkable amount of land consolidated by a few individuals in California had a significant impact on the water crisis faced

⁷⁷ Pisani, "Land Monopoly", p. 22.

by residents of the state. It is true that there were always periods of drought and then ample rainfall in the Central Valley as this was inherent of the climate in the region. However, the staggering number of acres eventually planted to crops in such an environment led to an increasingly greater need to control water resources in the area. Furthermore, new farmers found little land available for purchase or homestead with access to enough water for their farms to become prosperous. Just as land was consolidated, so too was access to the resource that would make that land flourish, seemingly without much thought to the long-term consequences of continued growth in agriculture or urban development. Thus, those who had control over land and the resources found on it were better suited to exert power over individuals and communities that relied upon those resources. This held true in the twenty-first century as landowners with deep pockets were able to access deep aquifers to ensure the success of their crops while those with more modest means struggled to make it through long periods of drought. In addition, those with power and influence were also increasingly keen on crafting water policy within the state, ensuring that they would have access to water for their crops during dry spells. Circular in nature, this process also allowed agribusinesses to purchase land from individuals who found it necessary to cut their losses and sell off some or all of their farmland when times became too difficult. Thus, it was understandable that after much of the land had been homesteaded, purchased, or misappropriated; those that owned the most turned their attention to the resource that made it valuable, water.

Chapter Four

Canal Kings: Riparian Rights and the Promise of Fortune

"The marketplace is an institution that teaches self-advancement, private acquisition, and the domination of nature. Its way of thinking is incompatible with the round river. Ecological harmony is a nonmarket value that takes a collective will to achieve."

-Donald Worster

"When the well is dry, we learn the worth of water"

-Benjamin Franklin

In 1873, California suffered a drought that hit the southern half of the state the hardest. Many farmers could not afford to replant, cattle and sheep men drove their herds into nearby states for grazing, and many abandoned their homesteads altogether.⁷⁸ This sparked interest in reclamation projects, specifically private investment in water relocation and development. Although there had been previous efforts to build canals and redirect water in the 1850's and 1860's, the first large-scale endeavor was undertaken by John Bensley, a businessman from San Francisco.⁷⁹ Due to the drought and because construction of the railroad through the Valley was underway, speculators were very interested in Bensley's ideas for construction of canals in the San Joaquin Valley.⁸⁰ Initially his enterprise faced periods of near economic ruin, but Bensley was eventually able to get enough investors, including financial support from William C. Ralston, president of The Bank of California, to organize the San Joaquin and Kings River Canal Company (SKRCC).⁸¹

⁷⁸ Pisani, *From the Family Farm to Agribusiness*. p. 104-105.

⁷⁹ John Bensley had traveled to Chile where he saw acres of land irrigated by water redirected by canals. This inspired him to seek investors for such an endeavor in the San Joaquin Valley. He was sure that money was to be made by improving the land via irrigation and selling water to farmers in the valley.

⁸⁰ David P. Billington, Donald Conrad Jackson, and Martin V. Melosi. *The History of Federal Dams: Planning, Design, and Construction in the Era of Big Dams*. (Denver Colorado: US Department of the Interior, 2005) p. 306-308.

⁸¹ Pisani p. 106-107.

Like many proponents of land development in California, the list of investors for Bensley's company read like a who's who of California powerbrokers. The list included prominent financial experts such as Nicholas Luning and A.J. Pope, directors of the Bank of California, and Lloyd Tevis, President of the Wells Fargo Company. Several landowners were also listed; especially those with large tracts of land in the southern half of the San Joaquin Valley. There were men like Isaac Friedlander, who controlled a wheat monopoly in California, and Henry Miller and Charles Lux, who owned so much land in the southern half of the San Joaquin Valley that no usable canal could be constructed without passing through some part of it.⁸² Men with such vast land holdings stood to make huge profits from water storage and redirection, either by using water on their own land or by selling access to small farmers and farming communities. More importantly for Miller & Lux the first portion of the canal would go through their property, diverting water onto drought stricken grazing land.⁸³ This project would give them a leg up on their competitors in two ways, watering their grazing land to ensure their cattle were fattened for market during years of drought and give them control over whom else had access to water during these dry periods. Canal projects appeared to be a win-win situation for those fortunate enough to invest.

Bensley and the SKRCC board found it much easier to deal with agribusinesses and large-scale landowners than small farmers. Issues of riparian rights and the cost of leasing land for construction and maintenance of canals were easier to negotiate when dealing with fewer people, so proprietors of large estates were sought out over large groups of small farmers. In the case of the SKRCC, Miller and Lux had also promised to purchase water for irrigation once

⁸² Ibid p. 108.

⁸³ Igler, p. 74.

canals and aqueducts had been completed in exchange for stock in the company.⁸⁴ Of course, guaranteed revenue from large-scale landowners was more appealing to investors than the possibility of revenues from small farmers so this arrangement worked well for all parties. This, according to Gates, was the beginning of the monopolization of water resources by those who controlled access to those sources. Land ownership had provided the means for the development of mining, railroad construction, and agricultural industries to expand in California, now land ownership eased these same western industries into a position of control over water resources. However, once aqueducts and canals were constructed by private enterprises, farmers downriver or without appropriate funds could find themselves without water and less able to compete in the marketplace or make payments to banks during years of poor harvests. Those who controlled the water, therefore, could also effectively manipulate farmers into selling their land and increasing their own holdings, consolidating land in the Central Valley even further.

The question of who would benefit from water relocation provided by the SKRCC was a concern for some board members and engineers of the project. It was evident that, because most of the construction would be on large tracts of land owned by one person or company, large-scale landowners would profit the most. Land adjacent to the canals and farms and grazing land which had already been improved would also become more valuable and thus more expensive making it even more difficult for small farmers to afford. It is interesting to note that issues of land and water use were present at the earliest discussions in establishing water reclamation and distribution systems, even when owned by private enterprises. Clearly those who invested in or worked on the project realized there would be long-term consequences for homesteaders and rural communities alike. To be sure, there were some investors that hoped to spark immigration into the Central Valley to ensure the growth of towns and farms. However, unlike factory owners

⁸⁴ Ibid.

that found paying urban workers a living wage afforded them the choice of buying goods made in the factory, agricultural products were often shipped to distant markets or at least major cities with populations that require a constant food supply. Consequently, as long as the agricultural goods made it to market, it made little difference who was growing the crops or getting them there. Several investors, specifically Miller & Lux, understood this and so construction of the canal continued without much more debate.

Eventually construction costs for the small scale irrigation projects proved more expensive than anticipated. More investors were sought out, but with little success. Robert Maitland Brereton, chief engineer for the SKRCC, began to lobby Congress for a federal land grant in the San Joaquin Valley. Once again, ties to those with power and wealth made it easier to accomplish the goals of the SKRCC. Connections between William C. Ralston and Nevada Senator William Morris Stewart proved invaluable, and by February of 1873, the bill proposed by the SKRCC had passed both the House and the Senate. Passage of the bill gave right of way to the SKRCC through Kern, Tulare, Fresno, Modesto, Stanislaus, San Joaquin, Contra Costa, and Alameda counties. In addition, the company pursued a grant of 256,000 acres of land to cover construction costs and “a promise of virtual monopoly over the waters of Buena Vista and Tulare lakes and of the Kern and San Joaquin rivers.”⁸⁵ That is to say, the canals and reservoirs would be built and control of both land and water resources would stay in the hands of those with immense wealth with the obvious potential of appropriating even more.

In reaction to what was seen by the people of California as yet another example of wealth and power used to suppress the masses, local Grange associations protested the construction and funding for private water projects putting their complaints into print in both the *Sacramento Daily Bee* and the *Sacramento Union*. Members of the Grange saw water monopolies and land

⁸⁵ Pisani, *From Family Farm to Agribusiness*. p. 111-113.

subsidies to fund construction of canals as antithetical to democracy and akin to serfdom.⁸⁶ To appease angry citizens, Senator Stewart recommended that a federal government survey of irrigation for the Central Valley be conducted by a commission before any further work was completed. The survey of was approved by President Grant and the Board of Commissioners was established headed by General B.S. Alexander of the Army Corps of Engineers. Brereton was also offered a position, which he refused and instead served as an outside consultant.⁸⁷

Once completed, the Alexander Commission filed a report of their survey to present to President Grant in which it was determined that a long-term and large-scale water reclamation project would serve the interest of the citizens of California and the rest of the nation. At this point, it appeared that funding the construction of the project was the only major obstacle. In particular, and just as the SKRCC had surmised, construction would be expensive, but it was theorized that the eventual increased value of land and tax revenues would likely cover the costs. However, getting the State and the citizens to support such an expensive project was problematic; farmers would not be able to afford the costs, and private companies found the investment risky without guarantees from state and federal agencies. A compromise was proposed in which the state and federal governments would help with construction costs via land grants and tax revenue, but construction would be completed by private companies who would build according to strict guidelines set forth by state officials.⁸⁸ Public funding would be used to build the project, and sale of public lands would be used to recoup the costs.

⁸⁶ Igler, pp.82-83.

⁸⁷ Billington, p. 308.

⁸⁸ Pisani, *From the Family Farm to Agribusiness*, p. 116-117. Paul S. Taylor, *Central Valley Water Project*, p. 239. Agricultural economist and professor of economics at U.C. Berkeley from 1922-1962, Taylor was at the forefront of the water use issue in California. A humanist, he saw the connections of water, power, and wealth in the West and how these things impacted the economy and society in their present time and what impact such connections would have in the future. In recent years his predictions turned out to be true for California.

Of course, water projects designed to reclaim desert lands and irrigate farms that were already squeezing out homesteaders was not convincing enough of an argument for the public to acquiesce to foot the bill for construction.⁸⁹ Therefore, in an effort to appeal to average citizens, Congress concentrated more on what impact that water would have on the land owned by small farmers and focused their arguments on historic land policy in the United States, which allowed the state to decide who would get water and how much, determined by acreage and crop type. Given that many who invested in the SKRCC were also heavily connected to state and local politicians, even getting men elected to posts like county tax assessors to avoid paying real taxes, it was unlikely that they disagreed with this stipulation as they understood that they would have friends in the right places ensuring they would have access to water no matter the state requirement. As a result, there seemed to be more reasons to begin the reclamation project than to prolong construction.

Another important factor in gaining support for the project was that the Alexander Commission also recommended that land and water rights be sold in conjunction so that monopolies would not be created by companies building the canals.⁹⁰ This was necessary, according to Pisani, because the public was wary of monopolies of any sort at this time; the Populist movement was gaining strength amongst both urban workers and agrarian communities, both of which made up much of the population in California. The California State Grange was openly concerned about further consolidation of land and these concerns had to be addressed in order for the project to move forward with public support. Unfortunately, this cautious approach did not prevent a great deal of water from making its way onto the fields of agribusinesses as these industries had years of practice getting around laws that did not suit them. One result of

⁸⁹ Billington, p. 309.

⁹⁰ Paul S. Taylor, *Central Valley Water Project*, p. 239.

recommendations made by the committee, however, was the rejection of the proposed land grants which would have been given to the San Joaquin and Kings River Canal Company.⁹¹ Nonetheless, this recommendation did not stop the consolidation of land nor did it limit in any real way control of access to water by men like Miller, Lux, Haggin, or Freeland.

The goals of Ralston and Bensley, to reclaim the Central Valley through private enterprise, were never achieved. Faced with the results of the Alexander Commission's recommendations and confronted by attacks from Californians over poor construction on parts of canals they had already built, the SKRCC was not able to continue to attract enough investment to complete construction according to their original design. In addition, the U.S. was in the midst of a deep economic recession and a populist, anti-monopoly sentiment had swept the nation, particularly against railroad companies due to increased shipping fees and anger over the amount of land granted to railroad companies which served to reimburse companies for construction costs. The same arguments began to be applied to water and land highlighting resentment over consolidation, especially in California, to the detriment of the Company. The common man had spoken and he wanted government intervention to provide some balance of power between the wealthy industrialist and the working class.

The voice of the populism was strong in California during this period as members of the State Grange also railed against fees that would be imposed by the SKRCC whether members used irrigation water from the company or not.⁹² The Grange petitioned Congress to ensure that no land and water grants would be made in the future to private enterprises as they saw such

⁹¹ David P. Billington, Donald Conrad Jackson, and Marin V. Melosi, *The History of Large Federal Dams: Planning, Design, and Construction in the Era of Big Dams*. (Denver: U.S. Department of the Interior, Bureau of Reclamation, 2005.) pp. 305-309. This work explores the role of the federal government in dam planning and construction in the United States. The authors point out that canal and dam building in California's Central Valley did not begin as a federal undertaking, but it certainly fit the New Deal programs proposed by Franklin Delano Roosevelt in the 1930s.

⁹² Taylor, p. 134.

grants as collusion between Eastern and urban elites and government officials at the expense of small farmers. Failure of the San Joaquin and Kings River Construction Company did not mean an end to reclamation nor to the power struggle between private enterprise and access to public water. In fact, Miller & Lux became the beneficiaries of what was built of the canal on their property and related holdings for improved irrigation despite changes to water policy in California.⁹³ What it did mean was that future water projects and water rights would be determined through state or federal entities still influenced by wealthy individuals in positions of power.

A similar scenario played out with the Kern County Land and Water Company (KCLWC). Some of the same men who had seen potential in the SKRCC, including Lloyd Tevis, invested in the KCLWC. Tevis, James Ben-Ali Haggin, and William Carr had purchased tens of thousands of acres of the most readily irrigable land in the Central Valley.⁹⁴ In anticipation of the settlers that would purchase available public land in Kern County, the driest part of the Valley, Tevis and his fellow investors attempted to buy up new and existing water rights throughout the county. The men also oversaw the construction of several ditches, making sure that they had majority control over several canals branching off from the Kern River. Farm settlements which could be irrigated by these canals were marketed as irrigation communities, and farmers who purchased this land paid for the privilege of water use. Thus, Tevis, Haggin and Carr were guaranteed a tidy return on their investment. In light of this, by 1875, Tevis, Haggin, and Carr also made claims of prior appropriation on the waters of the Kern River itself, which amounted to more water than the Kern ever actually carried.⁹⁵ It was at this point that they

⁹³ David P. Billington, p. 310.

⁹⁴ Taylor, p. 197, Pisani "Land Monopoly," p. 27-29.

⁹⁵ Pisani, "Land Monopoly", p. 28. *From Family Farm to Agribusiness*, p. 197.

formed the KCLWC and began building more ditches and canals to divert water from the Kern River.

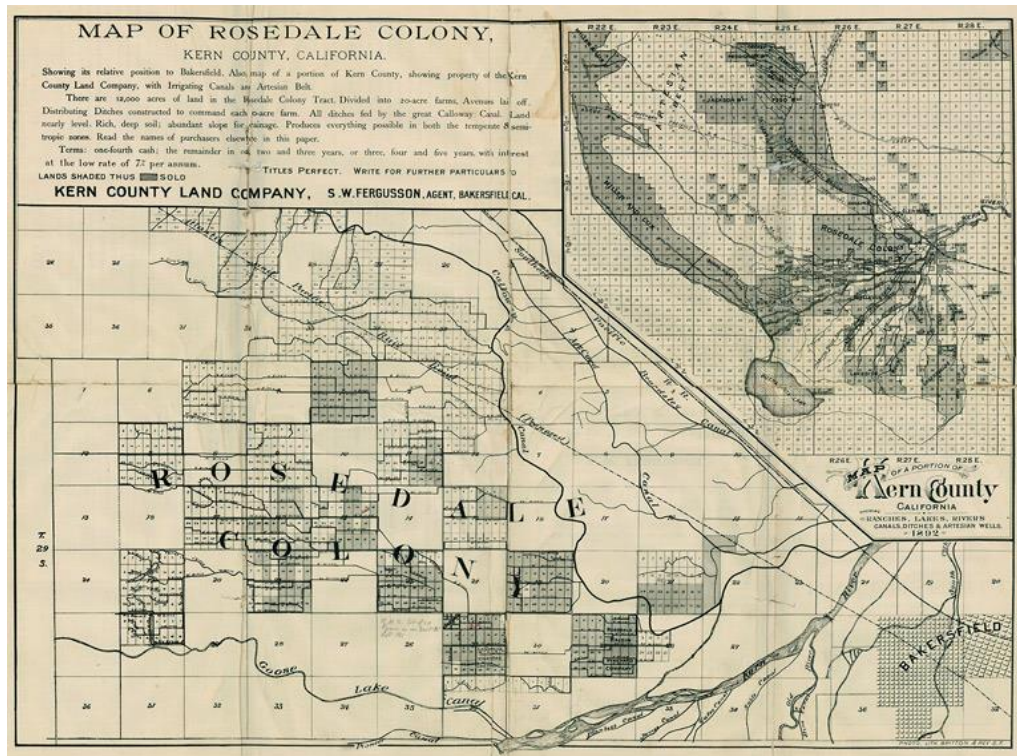


Figure 4.1 Rosedale Colony. This map of surveyed and parceled land is a part of a land and irrigation development by the Kern County Land and Water Company owned and operated by Lloyd Tevis, James Haggin, and William Carr.⁹⁶ The Rosedale Colony was a small farming community that paid for the privilege of utilizing small-scale canals and reservoirs on the land they purchased from the Kern County Land and Water Company. The residents often maintained the facilities at their own expense, and eventually found that it was too costly to continue to farm as two years of drought made it impossible for them to pay their bills, let alone make a profit.

Once again, the Grange stood up for small farmers in California with some success. Members of the Bakersfield Grange argued that the KCLWC forced farmers to purchase water from them and that the KCLWC cut off the water supplies to some farms and challenged the water rights of others in order to secure total control of water sources and drive out competitors.⁹⁷ This, the Grange contested, amounted to ruin for small farmers in such a dry local as Kern County, especially near Bakersfield. The Grange could point to the Rosedale Colony,

⁹⁶ "The Rosedale Colony" Bakersfield Magazine, August 11, 2015. <http://bakersfieldmagazine.net>

⁹⁷ Pisani, *From Family Farm to Agribusiness*, p.116-117.

illustrated on the previous page, as a prime example. Farmers in this community found that water supplies from the canals were not sufficient to irrigate crops over the course of a two year drought, and most had been forced to sell their land. Of course, it was the KCLWC that purchased the land from Rosedale farmers, recouping the money they had invested in irrigation and getting improved farmland to boot. Not surprisingly, investors in the KCLWC were well connected and well off and used these facts to manipulate and pressure local officials to bend to their will for several more years. In reality, it was not until the drought of 1877 and with the increased number of court cases filed against them that the Kern County Land and Water Company began to follow, at least for appearance sake, what few laws there were regarding water rights in California.⁹⁸

At this point it was quite clear that water control had led to a shift in the way farming communities functioned in California. Such communities had once controlled and maintained the water they needed for food production and individual consumption, which helped to limit social stratification within such communities. However, once land and water resources were consolidated to any real degree, well-organized growers with capital and influence were able to manipulate water supplies and the laws that governed water, land, and taxes, seldom paying their fair share. In fact, environmental historian Donald Worster claimed that individuals with power, connections, and means seldom wanted to pay for improvements to water systems that they ultimately benefit from, and usually succeeded in having others foot a large part of the bill for such undertakings.⁹⁹ This is one of the main arguments put forth by Worster in *Rivers of Empire* and is supported by both Gates and Pisani in their evaluation of land and water development and power structure in California. Relevance of this argument did not lessened over time; in fact it

⁹⁸ Pisani, "Land Monopoly," p. 29.

⁹⁹ Donald Worster, *Rivers of Empire: Water, Aridity, and the Growth of the American West* (New York: Oxford University Press, 1992) p. 51.

became even more vital to issues surrounding water usage as agribusinesses complained loudly when not given their “fair share” of water during prolonged periods of drought.

Giving credence to Worster’s argument, land barons paid others to do both construction and farming work, establishing a social stratification consisting of those who controlled the water and means of production and those who worked for wages. Worster went further, specifically making the claim that once the Bureau of Reclamation became involved and “corporations and quasi-corporate entities succeeded at last in farming rivers for substantial profits” it helped to create a “sharply divided rural class structure.”¹⁰⁰ Although it is possible that stratification may have occurred with or without the Bureau of Reclamation getting involved, this social hierarchy was still apparent in farming communities in which agribusinesses were the dominant farming type long after water projects were completed and put into use. In communities with a strong economic link to agribusiness productivity, there also tended to be a feeling of the old “company towns” that could be found near mining industries or railroad construction, some towns even sport the names of old families such as McFarland and Spreckles. In communities reliant upon corporate farming, wage workers were dependent upon jobs provided by the agribusiness, small businesses relied on monies earned from wage workers, and both were tied to yield and market value of crops produced by the farm industry. As McWilliams put it “The farm population is oriented toward the market and both farm and small town reflect the ‘hierarchy of elites’ to be found in urban centers.”¹⁰¹ Agribusinesses and small-scale farmers alike understood that without water for farming or residential consumption, none of this, good or bad, would be possible.

At the time concerns over who controlled water supplies were seen as temporary, it was believed by many Californians that the availability of water, or lack thereof, and the amount of

¹⁰⁰ Ibid p. 64.

¹⁰¹ Carey McWilliams, p. 102.

property tax owed by those with thousands of acres would eventually lead to the end of water and land monopolies in their state. Unfortunately, that proved to be untrue. Prior to construction of government funded water systems, many farmers relied on underground water supplies for irrigation and personal use. As populations grew in hamlets and urban centers and the number of acres under cultivation expanded, so too did dependency on subterranean water supplies. The increased drain on aquifers led to a drop in the water table making extraction difficult for some. In light of these circumstances, it should have been evident to anyone using this method that there would be even more problems with extraction as farming expanded and urban areas spread across the state.

There were immediate consequences felt by some part of the population as water levels dropped and farmers faced the costly task of drilling deeper wells. In many cases, small farmers abandoned their land altogether or sold it to more affluent neighbors. For example, in 1930, Jimmie Palmer, an orange grower in Tulare County, was able to afford \$1000, an enormous sum of money at the time, for a 507 foot well when his neighbors could not. He was then able to purchase more land as his neighbors' faced both drought and the Depression and could no longer pay their debts.¹⁰² Joseph DiGiorgio, an Italian immigrant and successful East Coast grower and merchant who came West in 1915, was also able to buy up large tracts of his neighbors land as their farms began to fail due to drought.¹⁰³ DiGiorgio was able to purchase thousands of adjoining acres of land, drill deeper wells to access lower water levels, and out produce his neighbors leading to more failing farms and more land purchased by him. DiGiorgio was a perfect example to illustrate the fact that more land and higher taxes coupled with limited water supplies did not mean large farms would be broken up. In fact, the larger the farm the greater the

¹⁰² Pisani, *From Family Farm to Agribusiness*, p. 235.

¹⁰³ Worster, p. 235.

advantage growers appeared to have had. And yet, this idea that large-scale farms in California could not continue to thrive persisted well into the twenty-first century and was debated ad nauseam despite most evidence indicating that it was not only possible that they would become the norm, but inescapable.

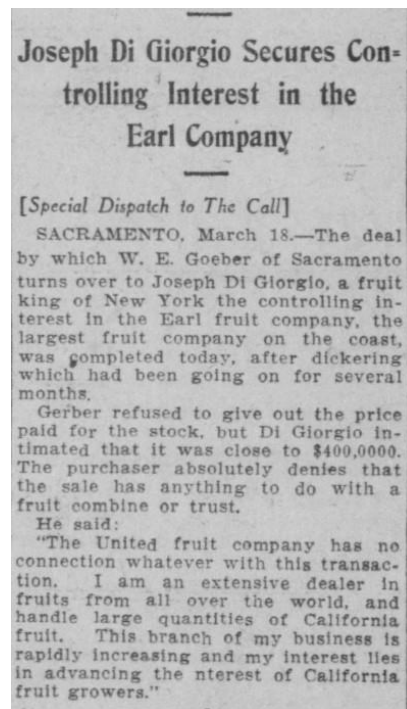


Figure 4.2 Di Giorgio. Although this article from *the San Francisco Call* is from 1911, it illustrates the wealth and power that Di Giorgio already had prior to acquiring thousands more acres during the Depression. It also indicates the level of influence he held within agricultural communities.¹⁰⁴ DiGiorgio was one of the few immigrants who were lucky and shrewd enough to come to the U.S, make a tidy profit in the East and then move west with the ambition of increasing their newly acquired wealth.

In light of the advantage held by land barons, many land speculators and farmers purchased as much available land in the San Joaquin Valley as they were able to. They understood that there were aqueducts that ran throughout the Central Valley which could be accessed and utilized without regulation. However, it soon became clear that the water was not without limits, and the need for deeper and deeper wells proved too costly for some to entertain.

¹⁰⁴ "Di Giorgio Secures Controlling Interest in the Earl Company" *San Francisco Call*, Vol. 109, Num. 109, 19 March 1911. <http://cdnc.ucr.edu/>

Even men like DiGiorgio realized that digging ever deeper wells was not a long-term solution to alleviate periodic water shortages. It was suggested that if an aboveground water redistribution systems were not put in place, many farmers would go under, causing banks to lose money, and lead to a negative economic impact statewide, even reaching external markets that sold crops grown in the San Joaquin Valley.¹⁰⁵ In the midst of the Great Depression, this did not seem like a good option to many leaders at either the state or national level looking for ways to stabilize the economy.

In agricultural communities, stabilizing the economy meant price supports, crop reduction subsidies, and storage for surplus agricultural products. It also meant providing access to low cost sources of water for those struggling to irrigate their fields. Addressing the irrigation needs of California fell under the purview of the Bureau of Reclamation, which established policy that would aid the citizens of the state by using federal funds to help construct water conduits from rivers and other aboveground sources. In theory this would help farmers and rural residents throughout the state and provide water for increased urban development. Reclamation was also intended to help with hydroelectric power and improve the economies of agricultural regions in the Central Valley, which would, in turn, allow farmers to hire workers, pay bank loans, increase monetary circulation, and create revenues to offset the cost of construction. Under the Agricultural Adjustment Act, as part of the New Deal, farmers were also paid to keep a percentage of their land unplanted to encourage the stabilization of farm prices and allow recovery of the land itself. However, the Central Valley Project was not simply saving the estimated 200,000 acres already planted and in need of water but would irrigate an additional 3,000,000 acres already in the hands of private investors.¹⁰⁶ This meant that while farmers in

¹⁰⁵ Pisani, *From Family Farm to Agribusiness*, p. 239.

¹⁰⁶ Ibid Pisani, *From Family Farm to Agribusiness*, p. 241.

almost every other state were required to limit how much they grew, farmers in California were allowed to bring more land under cultivation, specifically corporate farms. Eventually, those who paid close attention to the power struggle between the Bureau of Reclamation and large growers saw that the CVP was not going to focus on aiding small farmers but rather to save “big, multi-billion-dollar private agricultural investment.”¹⁰⁷ Little changed over the next several decades, except that some small farmers joined cooperatives or established partnerships with corporate farms in order to have a similar advantage. Unfortunately, this only served to exacerbate the problem of water shortage and aquifer collapse.

Tackling water shortage in the arid but fertile areas of California was a large part of what the Bureau of Reclamation aimed to do. However, in the late nineteenth and early twentieth centuries, large landowners were, for the most part, opposed to state or federal water programs. There were several reasons for this opposition. First, most of these landowners controlled land near, or had rights to, above-ground water sources. Second, there was no regulation on groundwater pumping, and there was plenty of groundwater in aquifers throughout the San Joaquin Valley and on their property; thus, they did not feel the need for water diversion on a large-scale. Third, water storage and relocation would allow for increased access for smaller farmers and reduce the dominance of large farmers and land owners in the area. Fourth, water was seen as a commercial instrument that could be used to alter markets for land, agriculture, and urban development. It was not until a drought occurred in the 1920's that large landowners began to be concerned with large-scale water storage and relocation projects. Farmers, especially those with large estates, were forced to rely more heavily on groundwater during this period. Aquifers were not able to replenish naturally because of the drought causing groundwater levels in the San

¹⁰⁷ Worster, p.240.

Joaquin Valley to fall roughly 39 feet by 1939.¹⁰⁸ New Deal programs targeted at the agricultural sector seemed to provide a way out of this cycle of overdraft. The possibility of increased water availability prompted growers throughout the Central Valley, regardless of the size of their land holdings, to begin seeking state and federal aid in the development of water resource management systems.

In order to develop reservoirs and canals that would help with urban development and provide relief for California farmers, the Bureau of Reclamation needed to establish a set of water management guidelines. Part of policy they established included supplying water from publicly funded water works only to farms of a particular size. Limiting how much land can and should be cultivated by individual farmers was not a new idea, and was a foundational part of the Agricultural Adjustment Act which did help stabilize farm prices. In fact, part of the logic when drawing up the plans for the Central Valley Project and presenting it to Congress revolved around the possibility of supplying water to a large number of farmers in California but not to farms that were large in size. The Bureau of Reclamation, under whose authority the CVP was constructed, settled upon the 160-acre limit to determine who would have access to water from the project. The goal of this limitation was for family-owned homesteads of 160 acres, 320 if owners were married, to have access to inexpensive and dependable water so that they could be productive and competitive. Moreover, the ideal of an agrarian democracy was not lost on Americans living during the Depression, and 160 acres seemed a reasonable amount to most.

Irrigation was not the only component of Reclamation policy. Indeed, flood control, energy production, water storage and distribution were all elements of the public works project designed to bring dependable, low-cost water to the greatest number of people all over

¹⁰⁸ Ibid p. 235.

California.¹⁰⁹ These topics were open for discussion and concerns regarding all of them were addressed to varying degrees of satisfaction. Of course discussions about these issues continued, and all the components of public water programs were debated prior to, during, and after the CVP was funded, built, and put in to use. For the most part, these same issues continued to plague the state in light of environmental impact studies conducted as early as the 1960s, which led to increased energy costs and, most obviously, drought.

In spite of disagreements over certain aspects of Reclamation policy, the acreage limitation was adopted prior to construction. The acreage limitation written into the CVP's charter was based on homestead language used by the federal government. Part of the reason it was adopted was due to the fact that many congressmen and farmers alike were concerned that private landholders, those with thousands of acres, stood make a hefty profit from a publicly funded water program. For example, land without water in Kern or Tulare counties was not worth very much, but once the Central Valley Project was commissioned, this land became extremely valuable. Speculators had already bought up huge tracts of land and sold it to farmers for a hefty profit, this was sure to become an even greater problem if there was an assurance of future irrigation projects in the Central Valley. For instance, according to a report submitted to the Secretary of the Interior by the Committee of Special Advisers on Reclamation during the 68th Congress, "...the settler, full of hope, frequently agreed to pay a high price for the land, in addition to the construction cost included in his water-right contract."¹¹⁰ Farming was very labor intensive and subject to the whims of both the market and nature, making it difficult for smaller

¹⁰⁹ Paul S. Taylor, "The 160-Acre Limitation and the Water Resources Commission," *The Western Political Quarterly*, Vol. 3, no. 3 (Sept., 1950): 435-450. Here Taylor explains how the arguments against the 160-acre limitation were circumvented by those with large landholdings. Again, these historic issues are relevant today, as they were never really resolved and have helped to perpetuate the current water crisis in California.

¹¹⁰ Ibid, p 436.

farms to become profitable in the early years, especially when trying to pay off the costs of water-right contracts.

In an effort to remedy the issue of land speculation and increased costs passed along to farmers for improved irrigation systems, Congress added a provision in the Omnibus Adjustment Act of 1926, prior to acceptance of the proposed CVP. Specifically established to limit speculation, the Act required that land in areas zoned to receive water could not be sold until half of the construction charges were repaid.¹¹¹ It was the hope of those who supported it that this would help lift the burden of water-rights costs from small farmers and encourage more family farms in the Central Valley. On the surface, this seemed to have been effective as by 2014 the average farm size in California was 312 acres and many were fewer than 50, as illustrated in Table 1. However, such averages can be misleading as some farms were tens of thousands of acres, accounting for the bulk of land under cultivation. Figure 4.3 shows that, even though they made up only a fraction of the farms in 2007 and 2012, larger farms still held ninety percent of the agricultural market. These larger farms also continued to receive federally subsidized water.

Table 1 Average Farm Size in California. California had a higher percentage of small farms than the national average, but this figure does not show exactly how large some farms in the state were. Size does matter in this case. In fact, if it was reported that only two farms were over 2,000 acres, this information would not really say anything as those farms could be one million acres apiece. Capping the acreage at 2,000 is misleading and other measures need to be presented to get have an accurate assessment. *ARE Update* 17(5) (2014):5-8. University of California Giannini Foundation of Agricultural Economics.

	California		United States	
Acres	Number of Farms	Percentage of Farms	Number of Farms	Percentage of Farms
1 to 9 acres	24,637	32	223,634	11
10 to 49 acres	25,811	33	589,549	28
50 to 179 acres	13,056	17	634,047	30
180 to 499 acres	6,649	9	346,038	16
500 to 999 acres	3,230	4	142,555	7
1,000 to 1,999 acres	2,040	3	91,273	4
2,000 acres or more	2,434	3	82,207	4
Average Acreage/Farm	328		434	
Source: 2012 Census of Agriculture				

¹¹¹ Ibid, p 437.

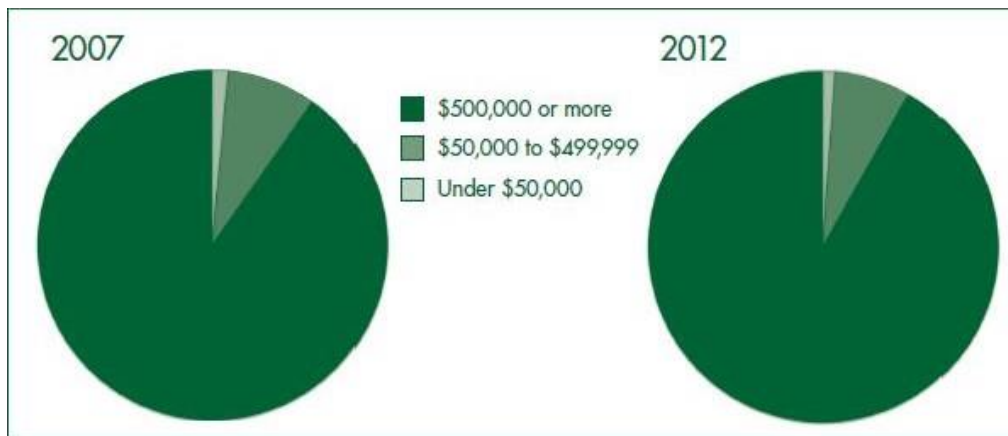


Figure 4.3 Market Shares in Agriculture. This pie chart shows that, even though they made up only about eight percent of the farms in California, larger (often corporate farms) had over 90 percent of the market shares in agriculture for the state. They had more market shares, made higher profits, and did so with water subsidized with taxpayer money. *ARE Update* 17(5) (2014):5-8. University of California Giannini Foundation of Agricultural Economics.

Although it had accepted as part of the requirements to get funding for the Central Valley Project, controversy over the 160-acre limitation began even before construction was underway. Even though large landowners now encouraged dam construction, water diversion, and flood control, they were unified in opposition to the limitation. Notably, by the 1940s, arguments over the limitation were heating up as it became clear just how much land could be cultivated by using federally funded water programs. Almost no argument against the limitation went untried. In fact, one of the most convoluted arguments against the acreage limitation was put forth by Senator Sheridan Downey. He claimed that large landholders like the Kern County Land Company, (KCLC), with 350,000 acres in Kern County alone, did not need or want the water from the CVP.¹¹² In addition, Downey asserted that the KCLC was perfectly happy using water they were pumping from wells and that purchasing water from public works would be cost prohibitive. This was true for most corporate farms in the Valley, he concluded, making the land

¹¹² Senator Sheridan Downey, *They Would Rule the Valley* (San Francisco, Kessinger Publishing, LLC, 1947), p.10.

limitation arbitrary and unnecessary.¹¹³ The most practical thing, he argued, would be to get rid of the limitation altogether so that moderately sized farms in excess of the acreage limitation would be allowed access to CVP water. Of course, this appealed to families with acreage exceeding the limit as it would allow them to compete with agribusinesses, at least in theory. What was not lost on smaller farmers at the time was that once the limitation was gone even corporate farms would openly have access to CVP or SWP water, making the perceived benefit to moderately sized farms short-lived.

Likewise, many supporters of the limitation agreed that the number used to denote who had access to public water was arbitrary and that perhaps the amount of land one could own and still get the resource should be increased. Experts conceded that they did not have a plan to deal with the amount of water that could or should be pumped from underground sources in California, an issue that continued to present a challenge for the state by 2011. However, most acknowledged that keeping the limitation where it stood until a new number could be agreed upon was better than no limitation at all. Much like earlier politicians that had helped Miller, Lux, Haggin, and others circumvent limits on land purchase, Downey could not, or would not, see the logic in this answer. He accused those in favor of keeping the limit as “doing nothing” instead of making a decision.¹¹⁴ Downey also berated the education and professional experience of many Bureau of Reclamation officials in his book, *They Would Rule the Valley*, a tactic not lost on modern politicians or pundits.¹¹⁵

¹¹³ Ibid, pp10-21.

¹¹⁴ Ibid, pp 13, 18-19.

¹¹⁵ In May of 2009, Sean Hannity, a Fox News reporter conducted a series of investigative reports on the man-made drought occurring in the Central Valley. In his “investigation” he explained how efforts to protect the Delta Smelt were having a negative impact on farmers in the valley. The drought, he and others claimed, was caused by environmentalists and government officials intent on preserving this minnow over the livelihood of local farmers. His over simplistic perspective on water issues in the Central Valley is indicative of arguments used by water use advocates in the past and present. His goal,



Figure 4.4 Senator Downey. Senator Sheridan Downey in his office, 1940. Although a liberal in his early political career, Downey secured support from California agribusiness and the oil industry once in office as a senator, to the delight of big business across the state.

In light of all these issues, it seemed a dilemma for politicians and the public alike to assess what problems arose and what problems were solved by having an acreage limit in order to access publicly funded water supplies. Although it was understood that the idea of a limit was meant to be a way to help the many instead of the few, it was also true that much of the land in the San Joaquin Valley had been owned by private investors for a very long time. In 1947, there were an estimated 9,500 farms that exceeded the acreage limit. This meant that there were only two-million acres of farmland that met a newly established limit of 180 acres, and almost eleven million acres that exceeded the maximum.¹¹⁶ Not all large farms were owned or operated by

although lost on many, was to create distrust of politicians friendly to environmental protection policy or opposed to an agenda aligned with his political ideology. Hannity is correct in his assessment that water issues are man-made, precipitation in the Central Valley is not the issue, getting access to water in the middle of the desert is. Hannity's reports can be viewed online at The Great American Blog.

¹¹⁶ Elizabeth Eiselen, "The Central Valley Project: 1947," *Economic Geography*, Vol. 23, no.1 (Jan. 1947) p.30.

corporations; some were simply large family-owned spreads, which seemed to further complicate the issue. For some, like Senator Downey and Edward Hyatt, California's State Engineer, the answer was simple; water should be distributed according to the amount of property held, not limited by it.¹¹⁷ The simple logic of this argument follows a capitalistic and Social Darwinist philosophy. Simply put, farms that are the most fit or can respond to the "free market" are more likely to succeed. Those that do not will fail. On its face this seems reasonable, even appealing. However, anyone familiar with John Rawls' *A Theory of Justice* will see that the playing field was not level in this instance.¹¹⁸ Those who began with more money and land had an exponentially greater chance to become more successful and squeeze out their smaller, less powerful competitors. The role of government should, therefore, not be to facilitate the growth of large businesses and the expense of smaller businesses, but rather to ensure access to resources to facilitate possible growth at all levels. The former is in direct opposition with the principles of democracy and equality. Although many did not see the wisdom of imposing limitations, enough did to ensure that limits would stay in place, at least for a while.

Unfortunately for Downey and Hyatt, many in the Bureau of Reclamation, Congress, and experts in agriculture and economics, like Paul S. Taylor, agreed that the spirit of the reclamation law was to use public funds to provide the greatest good for the greatest number of people.

Taylor, a humanist as well as an economist, saw several issues with allowing those with large

¹¹⁷ Edward Hyatt, "The Central Valley Project of California," *American Water Works Association*, Vol. 30, no. 3, (March, 1939), pp. 389-401. Senator Sheridan Downey, *They Would Rule the Valley*, pp. 5-8.

¹¹⁸ John Rawls was an American moral and political philosopher. A proponent of the rules governing the social contract, Rawls developed his own theories regarding implementation of it. Rawls' theories are founded on the position of justice as fairness, in which the outcome of social, political, or economic events would be satisfactory to any member of society. That is to say, if an individual were at the top of the social hierarchy they would be satisfied with the outcome and if they were at the lower end of the social hierarchy they would also be satisfied, because the laws, etc. are fair. For further reading on his theory of original position and the veil of ignorance please see his books *A Theory of Justice* (1971), and *Political Liberalism* (1993).

amounts of land access to water from publicly funded projects.¹¹⁹ Many of the issues Taylor was concerned with were social, but they revolved around the consequences of creating agricultural monopolies. He, and many others, felt that access to low-cost water would further skew the advantage of large farms, making it even more difficult for smaller, family-run farms to compete and remain viable. If smaller farms were not able to compete with agribusinesses and land developers, they would be more likely to sell their land. Thus, large farms would be able to purchase land already under development by these small farmers and increase their hold on agricultural monopolies. In Taylor's estimation, this was neither democratic nor a good use of public funds, and he was not alone in his thinking. Many Americans had learned a great deal about resource depletion and monopolies during the Gilded Age, the Progressive Era, and the Great Depression. Like Taylor, such individuals did not see agricultural industry any differently than manufacturing, mining, or transportation monopolies, but convincing still more individuals that they were similar proved difficult.

In an effort to silence critics of the acreage limitation, the Bureau of Reclamation hoped to show what impact corporate farming had on agricultural communities in California versus the impact of family-owned farms.¹²⁰ The Bureau had a theory that family-sized farms produced communities in which residents had a better quality of life than did large corporate farms. To test this theory, a study was conducted in 1944 by Walter R. Goldschmidt, an anthropologist and graduate student at the University of California. Goldschmidt concluded that communities whose

¹¹⁹ Ibid p. 436, "The Central Valley Project: Water and Land", *The Western Political Quarterly*, Vol. 2, no. 2 (June, 1949), pp. 228-253. "Excess Land Law on the Kern?: A Study of Law and Administration of Public Principles vs. Private Interests," *California Law Review*, Vol. 46, no. 2 (May, 1958), pp. 153-184. Taylor has several articles relating to private profit, public water, and acreage limitation. He also supported studies by economists, agriculturists, anthropologists and social historians who investigated the relationships between agribusinesses, small farmers, and the impact they had on local economies and society. (See Walter R. Goldschmidt's study on Arvin and Kern Counties.)

¹²⁰ Richard S. Kirkendall, "Social Science in the Central Valley of California: An Episode" *California Historical Society Quarterly*, Vol. 43, no. 3, (Sept. 1946), pp. 195-218.

economies revolved around family farms had a better quality of life than did those communities whose economies revolved around industrialized farming.¹²¹ Two towns in the San Joaquin Valley served as test subjects for the study: Arvin in Kern County, which had mainly large farms, and Dinuba in Tulare County, which had smaller, family-sized farms. Goldschmidt used questions designed to measure income, job opportunity, education, and allocation of local funds. On average, wages were found to be higher in Dinuba, people had more say in what happened within their community and, as a consequence, more funds were used for the good of the town. Streets were paved, Dinuba had sidewalks, there were modest single-family homes, more professionals lived in town, and more businesses were present even though the farms themselves made less money annually than did those in Arvin. In contrast, Arvin farms made \$14,700 more than did Dinuba farmers each year, but the town had few paved streets and fewer professionals and businesses, the bulk of the population being labor wage earners.¹²²

Findings in Goldschmidt's report supported convictions held by Taylor and several members of the Bureau of Reclamation, but were subsequently discredited by state water officials and politicians opposed to limitation, who claimed the study was propaganda. This was unfortunate because, as McWilliams pointed out in 1949, the residents of California were still trying to deal with social instability rooted in the relationship between people and the land.¹²³ Social issues persisted in the state that can be tied directly to social and economic structures that existed in farming towns in which seasonal and or immigrant labor was utilized on a regular basis. In many such communities, an underclass of immigrant workers, sometimes undocumented, found themselves marginalized and taken advantage of by growers, often with no

¹²¹ Walter Rochs Goldschmidt, *As You Sow: Three Studies in the Social Consequences of Agribusiness*, (Montclair, New Jersey, Allanheld, Osmun, 1947).

¹²² Ibid

¹²³ McWilliams, p. 101.

means of improving their situation. Just as with other industries, this system often served the owners in two ways. First, lower wages were paid to immigrant or minority laborers, which allowed for more profits to go into the pocket of farmers and or investors. Second, growers were able to deflect the cause of low wages as a consequence of immigrants coming into the United States; it was simply not the farmers' fault wages were low. Indeed, this tactic was not new to industrialists and was utilized in both the economic and political arena to keep laborers pitted against one another making organization all but impossible. Unfortunately, the impact of such tactics was experienced by laborers as evidenced by their economic conditions and social interactions. For instance, the Economist ran an article as late as 2010 compared living conditions in the Central Valley with that of Appalachia. Although not a flattering comparison, it underscored the fact that social and economic structures established in California farming communities did not improve much in the years after construction of the CVP began and, in some cases, were even worse.

Although most opposition to the Central Valley Project did revolve around the 160-acre limitation, there were other areas of contention. State officials, including the California Division of Water Resources, the Pacific Gas and Electric Company (PG&E), the state Chamber of Commerce, and agribusinesses, predominantly from the San Joaquin Valley, all worked to end the acreage limitation.¹²⁴ State officials felt the federal government had too much control over state water resources. This was, in part, why the State Water Project was proposed and constructed. The SWP distributed and enforced repayment differently than the CVP and gave more leverage to state officials who had historically opposed limiting water based on acreage.

¹²⁴ Lawrence B. Lee, "California Water Politics: Opposition to the CVP, 1944-1980", *Agricultural History*, Vol. 54, no. 3 (July, 1980) p.403-404.

Some critics also claimed that, although the CVP was presented primarily as an irrigation project, its real goal was to create a federally run power system. The Assistant Director of the Public Utilities Department of the California Farm Bureau, Edson Abel, went so far as to say the irrigation project was just a means of getting public support for taking over private businesses, namely power.¹²⁵ PG&E began to support the CVP when it became clear that no funding for the construction of electrical lines for power delivery would be forthcoming. As PG&E already had electrical lines built, they were the natural choice for delivery of power from the hydroelectric stations located at dams along the CVP to businesses and private homes throughout the valley.¹²⁶ Energy delivery and sales continued to be an issue in the state, but PG&E was no longer pushing for the Bureau to relinquish control of the CVP, at least for the present. There may have been one less group opposing the CVP, but this deal did nothing for their image as the public viewed them as increasingly in cahoots with big business, and the battle over limitations no longer unified supporters.

As the struggle over acreage limit continued weakly, the Bureau of Reclamation began to lose influence. Former supporters saw the shift in energy to PG&E as selling out to big business. A report on the study by Goldschmidt was never officially published by the Bureau of Agriculture, (BEA) and was therefore not used to support claims made by the Bureau of Reclamation that family-farms were better for local economies and community development. In fact, the BEA tried to suppress the work as men like Senator Downey and Congressman Alfred J Elliot lambasted the piece as propaganda intended to limit the opportunity of all farmers in

¹²⁵ Edson Abel, "The Central Valley Project and the Farmers", *California Law Review*, Vol. 38, no. 4 (Oct., 1950), 656-657.

¹²⁶ Ibid, Leland O. Graham, "The Central Valley Project: Resource Development of a Natural Basin," *California Law Review*, Vol. 38, no. 4 (Oct., 1950), p. 619-627.

California.¹²⁷ The Bureau found its authority over the CVP being challenged from the common man because of their relationship with PG&E in addition to challenges from industrial farmers from the south and state policy makers regarding the acreage limitation. By the second half of the twentieth century the Bureau of Reclamation was operating almost in survival mode, navigating a very fine line between defender of the common good and a puppet entity for big agriculture.

¹²⁷ Richard S. Kirkendall pp. 201-209.

Chapter Five

Agribusinesses Take Notice: Maneuvering for Access to Federally Funded Water Projects

“In the East and South, farming may be a way of life, but in California it is a business and it is run like a business.”

-California farmer

As the 1940s was an era of growth and shifting attitudes in the U.S. it was not surprising then that it was during this period that large landowners in California’s Central Valley really began to exert control over the publicly funded waters of the CVP. Although many industrial farmers had initially been opposed to construction of the Central Valley Project because of restrictions on water use, some began to see the potential of such a grand undertaking and turned their attention to finding an easier way to get around the acreage limitation. Ultimately, agribusinesses did gain access to water from the CVP and SWP due, in part, to the amount of money and influence they had, making the intent of the acreage limitation largely meaningless.¹²⁸

The state of California had passed the Central Valley Project Act in 1933, but did not have the funds to begin work until they turned to the federal government for aid. Construction of the CVP began in the late 1930’s, when the nation was well into the Depression, and in the 1940s the United States found itself embroiled in WWII. Many saw this as a time for Americans to pull together, heal, and work toward defeating enemies abroad, which meant making the most of the

¹²⁸ Christina P. Flores, “They Rule the Valley: The Story of How Large Central Valley Landholders Became the Primary Beneficiaries of the Central Valley Project.” University of California Berkeley, 2011. The title used by Flores is a play on the title of the book written by Senator Sheridan Downey, *They Would Rule the Valley*. In her paper, Flores argues that, despite the CVP being a public works project, large-scale landholders became the primary beneficiaries of the CVP. They made and continue to make huge profits because of their access to CVP water. This works well with my paper as I argue that access to CVP water has allowed large-scale farms to expand exponentially and in places that are unsuitable for sustained agricultural production. Low cost and dependable water via the CVP has allowed the expansion of farmland to go virtually unchecked and, when there are episodes of drought, cause panic in the agricultural sector which ripples across the state.

resources at home, including water for agriculture. Images of yeomen farmers doing their part to grow food for American soldiers and allied nations were powerful indeed and would have been difficult to counter, even if Americans were familiar with corporate farming. Consequently, talk of limiting the amount of water that a “farmer” could have access to must have seemed absurd to many Americans at the time. It was unlikely that many citizens understood agricultural economics or the difference between a family farm and an industrial farm, growing food in an efficient manner would have been the primary interest for most Americans.¹²⁹

In conjunction with the war efforts, large-scale growers also appeared to be arguing for more opportunities for small farmers via removal of the acreage limitation. In *The Thirsty Land: the Story of the Central Valley Project*, Robert De Roos revisits arguments presented by Senator Downey, and explains how owners with large estates made claims to the effect that limiting the amount of water a farmer could get from the CVP was unfair to small farmers as it would stifle their ability to expand and prosper. This was, after all, the goal of all businesses was it not? Why should small farms face punitive restrictions for trying to achieve the American Dream? By arguing in this way, corporate farmers appeared to be looking out for the “little guy” all the while perusing their own agenda. Agribusinesses were able make such claims because those who were unfamiliar with reclamation policy, which was most people, mistook the acreage limitation for a limit on the number of acres one could own instead of whether or not they could have access to CVP water for those acres.¹³⁰ The acreage limitation was purposely presented in this way to the

¹²⁹ I put farmer in quotations here because when most people envision a farm, it is often the stereotype of a small, family-run operation. Most people have no idea how many acres an average farm is, nor do they think of farms as industrialized, but corporate farms are an industry.

¹³⁰ Robert De Roos, *The Thirsty Land; the Story of the Central Valley Project*. New York: Greenwood Press, 1968. pp. 92-94. This work by De Roos is an important contribution to the ongoing water debate in the American Southwest. De Roos, like Flores, references arguments made by Dr. Paul S. Taylor especially when referring to the acreage limitation and cost of water consumption. Confusing limits on water use with the amount of land an individual could own was something that the uninformed

general public in order to confuse and mislead them. Such tactics worked, slowly causing support for the limitation to waver across the state.

Although some farmers and most other citizens may have genuinely misunderstood the acreage limitation to be about limits on land ownership but, De Roos says, politicians knew better as they had helped hammer out the language when seeking funding for the CVP.¹³¹ By conflating the number of acres that made a farm eligible to use CVP water with that of limiting land ownership, agribusiness and politicians were eventually able to manipulate public opinion and put an end to the restrictions altogether, although this would take some time. However, once public opinion softened on this issue, agribusinesses must have realized that they would be able to expand with few limitations, and many did. Of course, this expansion was not a cause for concern for most California residents until drought struck, but by then the genie was already out of the bottle.

At the same time that the limitation was beginning to soften, farms that supported urban centers were also being pushed east, deeper into the arid Central Valley, making them even more dependent upon both public water and underground supplies. Part of the reason that farms were pushed eastward was that during WWII the population on the West Coast had increased substantially. Many of the nation's war production facilities were located in California, and as such, large numbers of working class Americans moved into cities and towns to find work. As suburbs pushed up against the Coastal Mountains, many farms in the area were also pushed out

may have done, De Roos states, but politicians and corporate farmers knew better as the distinction was clearly made during negotiations to get federal funding for the water projects. In addition, many of the points made about farming as an industry and not a way of life correspond to those made by Donald Worster in *Rivers of Empire: Water, Aridity, and the Growth of the American West*, and Mark Reisner in *Cadillac Desert: The American West and Its Disappearing Water*. De Roos infers and Worster plainly states that largescale irrigation projects cause a shift in farming from a local endeavor to part of a global market in which profit is the main purpose. Reisner, Worster, and De Roos all point to this shift in economic importance as problematic to both small farmers and to water use in general.

¹³¹ Ibid pp. 82-90.

into the dryer, southern half of the Central Valley. Even as farms moved inland, the demand for agricultural products was high, not only because of the war effort, but also because of the large numbers of people moving into the state.¹³² Consequently, the acreage limitation was less important for those establishing or relocating their farms than was ensuring access to dependable irrigation in the dry climate. Again, the focus was on increasing productivity, feeding the troops, and expanding American industries, not limiting them which the acreage limitation appeared to do.

If productivity and efficiency were the order of the day, then agribusiness fit the bill. As a general rule, larger farms tended to be more efficient and cost effective, not to mention lucrative, often producing more crops per acre than smaller farms. As the nation experienced considerable industrial expansion to meet war production quotas and domestic needs, it made sense that farms would also expand to produce food for the growing population within the state and to meet demands in foreign markets opened by war. Entrepreneurs of every ilk saw this as an opportunity to aid the nation and increase personal profits. It is not surprising then that the acreage limitation was seen as a hindrance by a great many people living in California. De Roos used the words of one farmer to make the point: “In the East and South, farming may be a way of life, but in California it is a business and it is run like a business.”¹³³ Coupling these conditions with an

¹³² “Whither California Agriculture: Up, Down or Out? Some Thoughts about the Future.” III. The Changing Structure of California Agriculture, Statistics, and Financial Indicators: 1950–2000. *The Giannini Foundation of Agricultural Economics, University of California*. <http://giannini.ucop.edu/pdfs/giannini04-1c.pdf>. This report shows the shift in production from the coastal areas of California to the interior from 1949 to 2000. Regions that were once the main supplier of citrus in the state began to see major shifts toward the Central Valley. Where Orange County had over 60,000 acres planted to oranges in 1950, by 2000 it had only 115 acres. In 2000, the San Joaquin Valley accounted for 82 percent of the entire state’s orange production. Shifts out into the Central Valley may have gained traction in the 1940s, but they clearly did not stop.

¹³³ De Roos, p.88. This quote is relevant today. It is difficult to reconcile the image of Jefferson’s beloved yeoman farmer with the corporate farming so prevalent in the West. Any disparaging remarks about water usage and farming are often taken as attacks on small or family-run outfits. Sometimes such arguments are redirected there by savvy politicians and corporate farmers themselves in an effort to vilify

increased sense of patriotism and all-out support of the war effort, limiting the amount of water a large farm could access was the antithesis of American sentiment.

Seeing an opportunity to end the acreage limitation, the House passed a rivers and harbors bill in March of 1944. Presented by Representative Alfred J. Elliot, from California's 10th District in Stanislaus and San Joaquin counties, this bill, had it passed in the Senate, would have exempted land irrigated by the Central Valley Project from the acreage limitation. Senator Downey attempted to push through a similar bill in 1947, but his was also rejected.¹³⁴ Clearly, there was still opposition to ending the limitation altogether, but it was wavering. At this point, the Bureau of Reclamation was under a great deal of pressure from the general public, politicians, and large-scale farmers and finally began to soften its stance on limitation, if only unofficially. For instance, from 1945-1953, Michael Straus served as commissioner of the Bureau of Reclamation and during his term the "technical compliance" formula was introduced. This formula gave the appearance to the public that the limitation was still in place, for those that cared, and that family farms were protected. At the same time industrial farmers were made aware that the Bureau would not be enforcing the limitation to any real extent.¹³⁵ From a distance, technical compliance seemed a simple solution, making most everyone involved in the water usage debate happy. However, this was neither a long-term solution, nor a sound one.

Not everyone bought into this new strategy either, including the state Grange and Farmers Alliance. Early on in the water debate, both groups wrote articles in local newspapers

those making such arguments against granting water to larger farms. This has been a highly successful method of deflecting blame; unfortunately it has also limited the potential for discussion leading to real solutions to water usage issues.

¹³⁴ Richard S. Kirkendall, p. 201, 209.

¹³⁵ Lawrence B. Lee, p. 404, 410. Technical compliance simply means that as long as it appeared to the public and/or the Bureau, that land owners met with the 320-acre maximum, they could purchase low-cost water from the CVP. To "meet" the requirement, landowners could lease land to other people, in name only, or divide acreage by crops planted and apply for water for the different plantings; these were only the most obvious ways around the limitation.

and held town meetings in support of the acreage limitation and in an effort to communicate the importance of how water usage by large farming entities impacted small farms in California. By the late 1950's, the state Grange had teamed up with the Federation of Labor to block the passage of laws that would allow state land and water projects to be exempt from the acreage limitation.¹³⁶ The National Farm Union, the National Catholic Rural Life Conference, and the AFL-CIO backed senators Paul Douglas, Wayne Morse, and Hubert Humphrey as they debated an anti-family farm provision on the Senate floor in 1960.¹³⁷ It was argued by their opponents that getting rid of the limitation would actually lead to an increase in the number of family farms across the state. This prediction was untrue, of course, and is evident in Figure 5.1 which illustrates a steep reduction in the number of farms between 1950 and 1960, and again between 1960 and 1970. This chart does not show the number of acres cultivated during this same time, which increased from 6.4 million in 1950 to 7.9 million by 1959, and again to 8.5 million by 1978.¹³⁸ In other words, there were fewer farms after the acreage limitation was eased but they were of greater size. This meant that more farmland had been consolidated by large landholders, exactly as supporters of the limitation had surmised. Ignoring or repealing the water limitation evidently did not boost the number of family farms in California; on the contrary it appeared to be killing them. Regardless of this evidence, it took almost a decade for supporters of the limitation to bring enough attention to the “technical compliance” policy to elicit change.

¹³⁶ Lee p. 418-420. Lee takes a much harsher view of the Bureau of Reclamation than some of his contemporaries. He sees the Bureau as an agent of corporate farms, state business interests, and politicians.

¹³⁷ Ibid p. 418-419.

¹³⁸ “Wither California Agriculture: Up, Down, or Out?” p. 1.

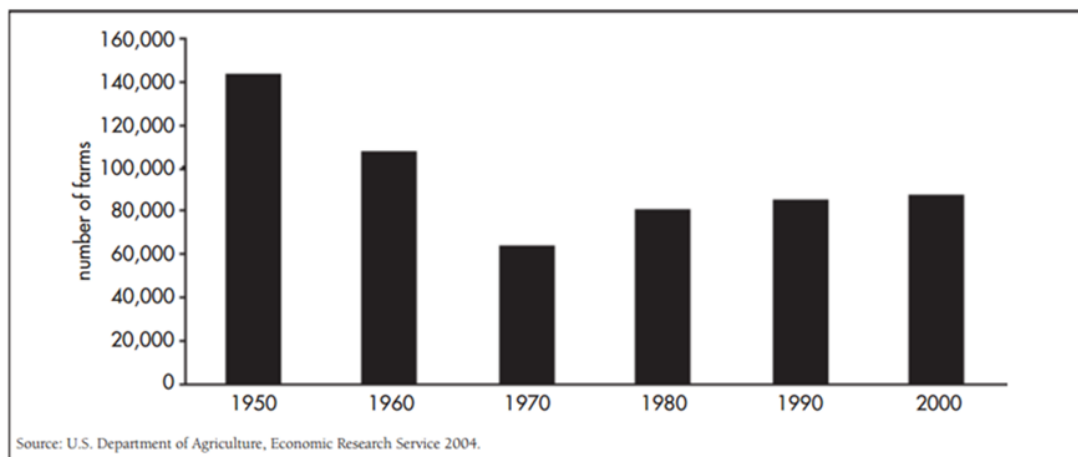


Figure 5.1 Number of Farms. Number of California Farms for Selected Years, 1950-2000.¹³⁹ This chart shows a decrease in the number of farms in the state with significant drops in 1960 and 1970. These were the hallmark years of the technical compliance formula, showing that easing the restriction did not allow for the growth of small farms in the state.

It was not until the late 1960's that the excess-land law was again enforced to any real degree. Data simply did not support those who had argued that allowing the limitation to slide would give all farms, including family farms, greater opportunity to expand and thrive. For more than a decade no real growth in the number of family farms occurred in California. In the meantime, agribusinesses worked around the acreage limitation and procured water to bring new acres of land into production even though state engineer, Edward Hyatt, had clearly stated that the purpose of the CVP was to "...save one-half million irrigated acres from returning to desert. It is not a new land project, but a rescue project or relief enterprise for large areas now settled

¹³⁹ Ibid p. 15. This graph shows the reduction in the number of farms in California between the years 1950 and 1970. The number of acres planted also peaked in the 1950's with a steady decline for the state overall, except in the San Joaquin Valley, which saw an increase in acres planted as farming shifted toward the center of the Valley and away from urban areas on the coast, in the south, and in the north. The most recent drought has caused many farmers to limit replanting or forced them to remove some acres from being used altogether. This graph, coupled with the information about the number of acres planted, would indicate that farmland often became consolidated. If the number of acres planted stayed the same or decreased in some areas, but the number of farms also decreased at a much faster rate, then the acres of farmland would have to be owned by a fewer number of land owners.

and developed...”¹⁴⁰ In light of this, Senators Gaylord Nelson and Floyd Haskell held hearings in 1975 and 1976 in Washington D.C. to determine if agribusinesses had colluded with CVP officials to avoid enforcement of the acreage limitation.¹⁴¹

During the hearings a multitude of evidence was presented which was damning to both CVP officials and corporate farmers. In 1976, Congress required the Bureau of Reclamation to enforce both the land limitation and the 1902 residency requirement that had originally been written into the Reclamation Act. However, the number of acres planted in the Central Valley actually increased between 1975 and 2000 just as it had between 1950 and 1978, even though the number of farms increased only nominally. This evidence seems to indicate that de facto enforcement was not as important as it appeared to be during the hearings.¹⁴² Unfortunately, after the unsettling hearings of the mid-1970s, the Bureau’s reputation did not recover, and by the end of the decade they found themselves under attack again, this time by those with environmental concerns. In the meantime, increases in both population and agricultural production had occurred well into the 1970s and the CVP had allowed that to happen.

Approved in 1933, most of the Central Valley Project was not completed until the early 1970’s. Not all of the components of the Project were actually constructed; some were cancelled, and others were contingent on approval. By the time most of the CVP was built, urban centers, small towns, and farmers in the Central Valley were utilizing water storage facilities and reaping

¹⁴⁰ De Roos, *The Thirsty Land* p. 44 This quote was part of the argument state engineer Edward Hyatt presented to California’s State Legislature and the federal government in his efforts to get federal funds for public water projects for the state of California. This was, in part, how he gained support for the project from citizens in urban centers like San Francisco and Sacramento. De Roos points this out because more land was brought under development via the CVP, much of which was owned by agribusinesses.

¹⁴¹ Lee. 420.

¹⁴² “Whither California Agriculture: Up, Down, or Out?” p.7. Given that the number of acres increased statewide from 900,000 in 1975 to 1.5 million in 2000, many of which are owned by large-scale farming entities, those holding the hearings may have had good intentions, but the “enforcement” appeared to be for show.

the benefits. One of the main issues the CVP addressed for the northern half of the Central Valley, or Sacramento River Basin, was flood control along the Sacramento and feeder rivers.¹⁴³ This issue was resolved by storing water in the Trinity Reservoir, about 45 miles northwest of Redding, California. Trinity Reservoir stemmed the flow of water to the Sacramento River and the dam was used to generate hydroelectric power. Trinity had only half the capacity of the Shasta Reservoir, which is located on the Sacramento River 12 miles north of Redding. Shasta was the largest storage facility and producer of hydroelectric power within the CPV. The Tehama-Colusa Canal was constructed to run parallel to and divert water from the Sacramento River to Colusa County. Folsom Reservoir was built on the American River, east of Sacramento, and water from this storage facility was used in the Folsom South Canal and also produced hydroelectric power. More dams, canals, and pumping stations were constructed along the Sacramento River system, all of which helped to regulate floodwaters in the north and to regulate the amount of water that made its way into the Sacramento-San Joaquin River Delta. This helped maintain water levels for Delta farmers and kept the salinity levels in check.

In the southern half of the Central Valley, the San Joaquin Valley, aridity was the prime issue, not flood control. The Delta Canal System diverted water from the Sacramento River and forced it southward, back toward the source of the San Joaquin River via canals and pumping stations. Dams along the San Joaquin River were used to divert water to storage facilities at

¹⁴³Ellen Hanak, Jay Lund, Ariel Dinar, Brian Gray, Richard Howitt, Jeffrey Mount, Peter Moyle, Barton Thompson, "Ch.1 Floods, Droughts, and Lawsuits: A Brief History of California Water Policy." *Managing California's Water From Conflict to Reconciliation*. San Francisco: Public Policy Institute of California, 2011. http://www.ppic.org/content/pubs/report/R_211EHR.pdf . This information can be found in a variety of places, and descriptions of the CVP will be in varying degrees of completion depending upon the year the material was published. The United States Geological Survey, in print and online, has similar information, as does Nikola P. Prokopovich's article "Engineering Geology and the Central Valley Project," *American Water Works Association*; 65, no. 3 (1973) : pp. 186-194.

Millerton Reservoir, above the Friant Dam and to the Madera Canal which ran north and the Friant-Kern Canal which ran south to Bakersfield.¹⁴⁴ These manmade networks allowed for agriculture to flourish in a fertile yet extremely arid region of the nation. Once initiated, the potential for growth was realized and, eventually, limits on irrigation water were no longer seen as necessary nor useful tools in a modern and global market economy. While many touted this transformation as a great success, the reasoning was problematic, especially when dealing with natural resources which were necessary for survival but were treated as if they were inexhaustible. Although water was a renewable resource, there were fluctuations in availability, even in areas that typically experienced heavy precipitation. The successful construction of dams, reservoirs, and hydroelectric stations may have given most Californians the sense that they had dominated their environment, but circumstances that arose in 2011 served as a stark reminder that this notion was little more than fantasy.

Regardless of future consequences, in 1982, after years of struggle to keep the 160-acre limitation in place, the Bureau of Reclamation increased the limit to 960 acres. This occurred as part of the deregulation and privatization movement under President Ronald Reagan and a conservative tide that swept the nation. Realistically, the Bureau had other issues to deal with, such as the impact that water use and relocation were having on the environment, specifically indigenous plant and animal life. At this point, sticking to and enforcing the Homestead limitation did not seem to be a fight they could continue to win. In addition, many saw the new limit as a benefit as it meant more farms could have access to CVP water and would need to rely less on underground sources, especially in the San Joaquin Valley. For some farmers the increase came as a great relief after facing a serious drought from 1976-77. Shifts in policy seemed to

¹⁴⁴ Ibid. The State Water Project, a separate system, uses the California Aqueduct and branches to pump water roughly 700 miles from a pumping station near Tracy, California, to Silverwood Lake, in San Bernardino County. It runs parallel to both the San Joaquin River and the Friant-Kern Canal.

validate what critics had been saying all along: give water according to the amount of acres planted and meet the needs of the farmers. However, issues of land and water use did not simply fade away with the altered limitation. Given that data regarding well depth and acres of new cultivation in the southern San Joaquin at late as 2015, it appeared the water problem was exacerbated by the limit change. Because the acreage limitation did work to limit the size of farms, even if poorly, it also helped limit the impact drought had on crop prices, water quality, and increased soil salinity. When the limitation was altered and large-scale farmers found new and better ways around enforcement, growth in the San Joaquin Valley occurred and changed in ways that led to a litany of concerns for everyone impacted by California water use, not just farmers.



Figure 5.2 Incomes. Net Farm Income in California, 1960-2000. (Billions)¹⁴⁵ There were a variety of reasons that incomes rose steadily between 1970 and 2000, including inflation, higher yield crops, market demand, better fertilizer, and shifts in crop production. A correlation can also be drawn between consolidation of farmland and increased incomes during these years.

¹⁴⁵ “Whither California Agriculture: Up, Down, or Out?” p. 17. In this graph and the next, it is clear that the amount of money farmers have made in California has increased exponentially as has the value of their land. There is also a correlation between the lack of enforcement and the increase to the number of acres one could own in order to get water from the CVP. Given the fact that most of the farmland in Southern California has been turned into urban and suburban developments and that the San Joaquin Valley has surpassed all other region in fruit and nut production, it is safe to say that farmers in this area have reaped the benefits of publicly funded water, without paying the full cost of construction.

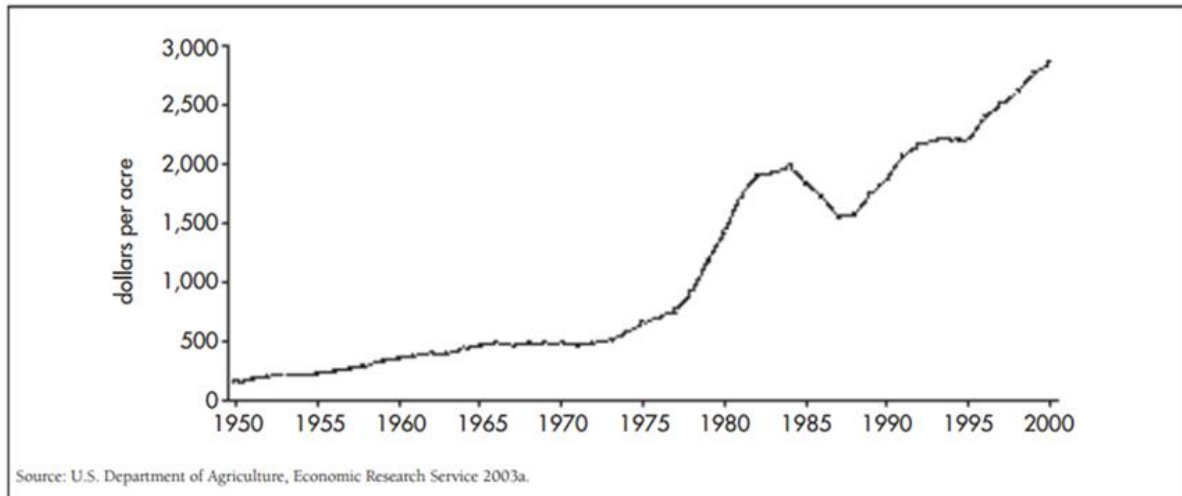


Figure 5.3 Land Values. Average Values of Land and Buildings in Farms in California, 1950-2000.¹⁴⁶ The same reasons for increased incomes for farms can be used to explain increased land values, but improvements to the land and structures on the farms would also have been taken into account during assessment.

It is important to see the patterns of landownership and the machinations employed by large landholders in order to gain access to water resources, but equally important is what role access to low-cost, publicly funded water has had in creating a self-perpetuating cycle of expansion and water shortage in the Central Valley. As agribusinesses gained access to low-cost water via the CPV, the more attractive expansion of their farmland became. As farmers experienced a steady increase in income and land value over the next fifty years, as indicated by Figures 5.2 and 5.3, expansion must have seemed even more alluring. It was dependable supplies of surface water which made expansion possible in the San Joaquin Valley and more acres were planted despite the characteristic aridity of the region. However, during regular periods of drought, when surface water was not available, farmers relied on groundwater as they had in the past. Eventually, the increased number of acres under cultivation created an unsustainable demand on those groundwater sources, causing water tables to fall and, in some cases, rendered aquifers useless as they collapsed completely. Farmers with smaller spreads were often unable to

¹⁴⁶ Ibid. p. 19.

compete with industrial farms as they did not have the economic resources to reach depleted groundwater. On many occasions desperate farmers sold their land to agribusinesses, as they had in the past, and the cycle repeated. The very fact that water was available to irrigate more farmland led to an overextension by owners of large-scale farms. This in turn wreaked havoc on the environment and small farmers and ultimately allowed for further consolidation of farmland to occur once yeoman farmers realize the difficulty of surviving, let alone thriving in, prolonged periods of water scarcity.

Despite the glaring problems that occurred with increased access to water, the Central Valley Project, as previously noted, was viewed largely as a success. Effective flood controls were put in place, irrigation water turned the southern half of the Valley green for most of the year, and California was able to boast some of the most profitable crops in agricultural markets. However, a catch-22 developed in the state wherein the very success of the CVP led to increased vulnerability when droughts occurred with more frequency or lasted longer than was typical. Although small farmers did benefit from water provided by the CVP, large-scale operations benefited appreciably more. In addition, during periods of insufficient water supply industrial farmers were able to access water in deeper aquifers than were small farmers, allowing them to make profits even when there was less rainfall or water available from the CVP. Corporate farms also increased their shares in fruit and nut tree cultivation. As land planted to fruit and nut trees could not be fallowed water use was constant in orchards, even during drought, which led to even lower water tables in the Valley. This fact should have troubled the farming community, but there seemed to be little concern until the drought that began in 2011 hit its third straight year.

Use of water to make farmers and investors wealthy was bothersome to many residents of California not engaged in agricultural production of some sort. This issue was especially problematic for environmental historians Mark Reisner and Donald Worster, who argued that profits made by corporate farms, which also allowed for expansion of those farms, were done so at the taxpayers' expense.¹⁴⁷ De Roos came to this same conclusion in *The Thirsty Land* using calculations by Paul S. Taylor to support the argument that profits made by corporate farms far exceeded their share of construction and maintenance costs.¹⁴⁸ Undoubtedly, residents benefited from public water facilities as these resources allowed them to meet their daily needs, and so it was right that they should pay their fair share to ensure continued access to this resource. However, residents did not make a profit from turning on their sink or watering their lawn and so made no monetary gain from using this resource while farmers did. Further, agribusinesses could not have afforded to build the large-scale water relocation systems on which they depended, but they certainly were willing to use water from them to increase profits.¹⁴⁹ This was but one problem with agricultural production in an increasingly profit driven society.

¹⁴⁷ Mark Reisner, *Cadillac Desert: The American West and Its Disappearing Water*. (New York: Oxford University Press, 1985). Donald Worster, *Rivers of Empire: Water, Aridity, and the Growth of the American West*. (Viking Penguin Inc.: 1986) Both also see corporate farms in California as entirely profit driven, making those running them less likely to worry about the environmental impact of pesticides, over-pumping of groundwater, or the economic and social conditions of the workers and communities that depend upon wages from working on such farms. Worster points to the capitalist system as being the main problem in the mismanagement of land and resources using the Dust Bowl as a prime example of just how much impact the drive to conquer nature and make money have on the land and everything connected to it. In the case of the Dust Bowl, capitalism led to a disconnect between people and the environment in which they lived leading to disastrous consequences, there is little difference in the role capitalism has played in California's water crisis, it is only the details that vary.

¹⁴⁸ De Roos pp. 86-89.

¹⁴⁹ "Central Valley Project," *Water Education Foundation*. 2014. Accessed October 15, 2015. According to this not-for-profit, foundation, farmers in the Central Valley have until 2030 to pay for dams constructed in the 1960s which total \$497 million dollars. As of 2008, farmers had only paid back 15 percent of the total cost. Profits made by farmers using water from the CVP are far in excess of this number. Agribusinesses continue to make huge profits, switching fields to the most profitable crop type regardless of water consumption or impact on the environment.

Additionally, an immediate need by investors to make money overrode the long-term impact of any methods used to achieve that end, even in agriculture. A good description of this process and the possible consequences were presented in Worster's *Dust Bowl*, which chronicled the natural and manmade disaster that struck the middle of the United States in the 1930's and again in the 1950's. Worster argued that it was both the changes that occurred in a society as it became more capitalistic and the notion that man can dominate nature which led to the duration and intensity of the Dust Bowl. In this case, small farmers and agribusinesses alike competed for more shares of the agricultural market only to deplete the land of vital nutrients, plants that prevent soil erosion, and to cultivate acres beyond a farmer's ability to be productive in times of drought. Even when farmers realized they needed to change their practices and the ways they viewed the land in general, as soon as the crisis was over and the sense of urgency passed, they slipped back into complacency regarding farming practices, confident that they would be able to dominate their surroundings once again. This confidence led farmers in the Midwest to behave in the same ways they had prior to the decade of drought and sandstorms, leading to similar results in the 1950's. In much the same way the CVP and SWP gave many California residents a false sense of triumph over nature, causing the same problems regarding water to surface again and again.

In essence, the long history of land consolidation, investment agriculture, and political structures that supported the almost despotic control of resources by a wealthy few in the name of capitalism and the free market were left unchecked for far too long. What remained unclear was if anyone that subscribed to a capitalist society could ever address water use issues in a way that would evoke the necessary changes to elude a crisis. What was clear however, were the consequences that occurred because law makers had neglected to deal in any real way with land

and water issues in California. Simply put, problems such as aquifer collapse, water shortages, soil salinity, and intermittent water restrictions had compounded over time and the people of the state found themselves in a real dilemma, one that pitted residents of urban and rural communities, small farmers and large farmers, environmentalists and pro-business leaders against one another. This division did nothing to solve the problems that persisted and may even have perpetuated the systems of power that contributed to the problems in the first place.

Chapter Six

Legacies of Power: Consequences of Expanding Farmland in the Central Valley

“Water, water, water.... There is no shortage of water in the desert but exactly the right amount, a perfect ratio of water to rock, water to sand, insuring that wide, free, open, generous spacing among plants and animals, homes and towns and cities, which makes the arid West so different from any other part of the nation. There is no lack of water here unless you try to establish a city where no city should be.”

-Edward Abbey, *Desert Solitaire: A Season in the Wilderness*¹⁵⁰

Anyone who has driven through the San Joaquin Valley on I-5 or CA 99 between May and September has seen rolling hills covered in dry grass. From Merced to Kern County, long stretches of road were paralleled by hills that looked as if they had been covered in golden velvet, unbroken by other vegetation save an occasional oak. It should be surprising then to suddenly be driving alongside orchards of almond and fruit trees where no trees grew of their own accord. Fields of grapes, roses, and carrots flanked the interstate, and everywhere were signs indicating that “food grows where water flows.” This statement is fascinating as the southern half of the San Joaquin Valley receives only between five and sixteen inches of rainfall annually, which was not enough precipitation to support such grand agricultural efforts, even when groundwater sources were taken into account.¹⁵¹ The southern half of the San Joaquin is a desert, albeit a desert with very fertile soil. And yet, this region led the nation in nut and fruit production, among other agricultural products in the late twentieth and early twenty-first

¹⁵⁰ I use this quote by environmental activist and author Edward Abbey, best known for his novel *The Monkey Wrench Gang*, even though he is referring to building a city “where it doesn’t belong.” Farms can also be located in places where they don’t belong, like the desert. This can and does lead to tension between groups vying for access to water in such an environment.

¹⁵¹ Devin Galloway and Francis S. Riley “San Joaquin Valley, California: Largest Human Alteration of the Earth’s Surface,” *U.S. Geological Survey*. Menlo Park, CA., pubs.usgs.gov. This report describes the natural and manmade water networks in the Central Valley. Galloway and Riley examine the consequences of pumping water from underground sources in the San Joaquin Valley, including land compaction, subsidence, and soil salinity. The charts, maps, and photographs in this report are very easy to understand and help clarify the written report.

centuries.¹⁵² The only reason this part of the state was able to become so productive was because of the CVP and the SWP. Without this dependable and inexpensive water source, such farming would have been impossible.



Figure 6.1 Dry Hills. As indicated by the road sign in the photo, this image was taken about 35 miles outside of Bakersfield. The vegetation is sparse and even the dirt on the side road is dry and appears almost grey. The closer the drive to Bakersfield, the greener the scenery becomes, not due to natural growth, but rather from intensive irrigation. Image is courtesy of Stefani Evans, University of Nevada, Las Vegas 2014.

The number of acres brought under cultivation in the Central Valley since the 1950's was exponential. By 1950 the number of acres being farmed had reached 6.4 million and by 1959 that number had jumped to 7.4 million. It is no coincidence that this was when the technical compliance formula was put in use. It is also interesting to note that there was no appreciable increase in the number of farms during this jump in acreage. Most of the increase in cultivated

¹⁵² "Agriculture: Farms and Farmland," *Giannini Foundation* p.3. This report by the Giannini Foundation contains data regarding agricultural production for the State of California from 1950 to 2000. In the report, crop production, ranching, dairy, farm size, and farm value are broken down by county. This information allows for a comparison of farming output, size, and value over the past fifty years, which shows a trend in increased farming and production in the San Joaquin Valley while other areas have seen a reduction in most types of farming.

acres was done by the expansion of corporate farms in the Valley, which according to data collected in 1997, experienced an increase of acres planted reaching 8.7 million.¹⁵³ In 2000, there were 28,000,000 acres of agricultural land, including grazing land, statewide. That number dropped in 2010 to 25,000,000 due to the growth of urban areas and in an effort to remedy environmental problems caused by water relocation.¹⁵⁴ And, although the number of acres and farms decreased across the state, parts of the southern half of the San Joaquin Valley continued to see growth, at least until the drought beginning in 2011. There were several reasons for growth in this particular part of the state. One reason was the water made available by public works used for agriculture. Another reason for the expansion of farming in this area was a population increase, especially around Los Angeles and the upper San Joaquin Valley, which led to the proliferation of urban and suburban development into old farming and ranching communities. In addition, the excellent soil and the longest growing season in the Central Valley allowed farmers to plant a greater variety of crops, making the Southern San Joaquin Valley an expedient option for farmers and investors.

Chiefly because of the long growing season, fertile soil, and availability of irrigation water, the San Joaquin Valley dominated almost every agricultural commodity the state produced. As noted in previous chapters, Los Angeles used to be the largest producer of citrus fruits in California, with 80 percent of the state's oranges coming from this region. That title was held by the San Joaquin Valley beginning in the late 1990s, as farmers in this area produced 82 percent of the oranges versus Southern California's 18 percent.¹⁵⁵ The Sacramento Valley produced 50 percent of the state's almonds in 1950; by 2000, the San Joaquin Valley was

¹⁵³ Ibid p. 1

¹⁵⁴ "Farms and Farmland, 2012 Statistical Abstract." *The United States Census Bureau* . pp. 533-558. www.census.gov Information from this source supports that found in the Giannini Foundation report and offers a comparison, not just statewide, but at the national level.

¹⁵⁵ "Agriculture: Farms and Farmland," *Giannini Foundation* p. 8.

producing 80 percent and the Sacramento Valley only 20 percent. Beginning in 1969, five counties in the San Joaquin Valley made the list of top ten agricultural producers in the state. Since 1992, those same counties, Fresno, Tulare, Monterey, Kern, and Merced, were in the top five for agricultural production.¹⁵⁶ Of those five, three counties, Fresno, Kern, and Tulare, receive less than fourteen inches of rain annually.

Given the level of success California agriculture has had, many would argue that it was a good thing that more food was being produced in the Central Valley. Some may even wonder why it mattered that the San Joaquin Valley produced so much of the agricultural commodities for California; they may correctly point out that more food production meant lower prices for consumers. In addition, the number of acres planted statewide also declined between 2005 and 2015, so increased agricultural development in the San Joaquin Valley seemed like a good thing. The problem was that many of the crops being farmed were very water-thirsty plants. Generally speaking, corporate farms were concerned with profits, not with consumer costs or the long-term consequences of their farming techniques, so they were more likely to plant crops that needed more water to produce a harvest. On the other hand, most family-run farms, even large ones, tended to be more concerned with the long-term impact of their farming practices because they intend for their land to remain in their family for generations. For clarity, corporate farms were not necessarily large nor are family farms necessarily small, but it was typical that agribusinesses had more acres than did family or cooperative farmers.¹⁵⁷ This meant that using water to produce

¹⁵⁶ Ibid p. 10.

¹⁵⁷ Hoy Carman, "California Corporate Farms: Myth and Reality," *Giannini Foundation of Agricultural Economics*: University of California, <http://giannini.ucop.edu/> pp. 9-11. Carman defines family farms and corporate farms and establishes the amount of profit and acreage needed to be considered a large-scale farming operation. This is a useful resource as it really does help to debunk myths that Americans hold about farming.

crops in order to make money was the primary goal of corporate farms, even if it meant planting water thirsty plants on thousands of acres of arid land.

With greater acres converted to plants that required more water than row crops, corporate farms led the way in increased water use. A great deal of what was produced in California was also exported to foreign markets. This meant that farmers used publicly subsidized water to irrigate crops that they then sold overseas.¹⁵⁸ Many residents in the northern half of the Central Valley, especially farmers, resented this practice, as water from their river system was diverted to support agriculture in the southern half where planters then made profits off of the water supply. Thus, farming practices in the southern half of the San Joaquin Valley impacted residents and farmers the Sacramento River Valley, such as Winters, Marysville, and Yuba City.



Figure 6.2 Trees. Nut trees growing along CA-99. (Courtesy Stefani Evans, 2014.) The importance of such images cannot be overstated. Here, nut trees have been dusted with some sort of pesticide. The trees appear to be healthy as they grow full and low to the ground. But, if one looks closely they can see the dry earth and dead plant matter that runs between the rows of trees. Rainfall is not keeping these trees alive; they are green and lush from waters supplied by canals and aquifers. In the distance dead grass suitable for grazing covers the rolling hills, but no other plant life is apparent, especially not trees.

Historically, farmers allowed fields lie fallow during dry seasons and let aquifers recharge during wet seasons. Row crops, like lettuce, broccoli, and sunflowers, were irrigated during or after wet seasons, harvested, and then the field would sit fallow until it was time to replant. This seemed both practical and responsible, especially in the arid southern part of the

¹⁵⁸ Ibid.

state. Unfortunately, this traditional method of farming seemed to have been dispensed with in order to make year-round profits. In fact, some farmers sowed even more land with plants that required not just more water, but more water all year long.¹⁵⁹ Fruit and nut trees, along with grapes, became the crops of choice for many farmers in the San Joaquin Valley. These crops had high yields and increased steadily in price per pound between 2000 and 2016. The Valley also saw an increase in the number of acres planted with almond trees during this same period. In fact, the Almond Board of California stated that the number of acres planted with almonds increased by 20,000 to 30,000 every year beginning in 1995 at the latest.¹⁶⁰ Although this translated to lower prices for almonds in grocery stores, it also meant year-round water supplies were needed for harvests placing an even greater demand on already sparse resource. As a result, water overdraft and shortages increased throughout the state as the drought intensified in severity and extent.

¹⁵⁹ Lisa M. Krieger, "California Drought: San Joaquin Valley Sinking as Farmers Race to Tap Aquifer" *San Jose Mercury News*. Posted 03/29/2014: p. 5-6 <http://www.mercurynews.com/drought> This online article also has video footage ranging from field irrigation to large-scale water pumping. The footage also shows drilling to reach deep aquifers; it is very impressive footage that shows the efforts some farmers put forth in order to have adequate water supplies for their crops.

¹⁶⁰ Ibid p. 6.

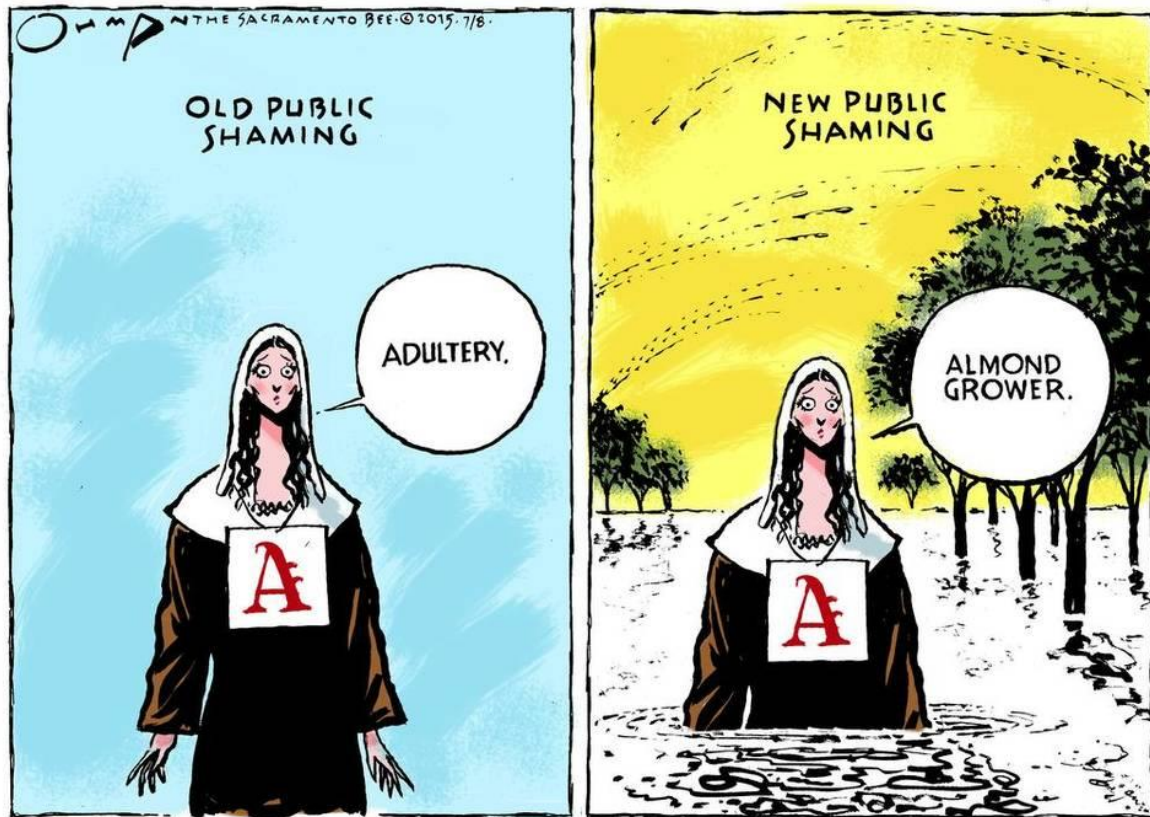


Figure 6.3 The Scarlet Letter. How almond growers feel they are being treated in California, by Jack Ohman. This is just one of many cartoons depicting farmers who felt as though they were scapegoats during the water crisis. This image seems to be giving credence to more than one view on the issue of water use. First, it is clearly a play on how almond growers viewed their treatment by society at large, but the cartoonist also shows the almond grower standing waist deep in water, seeming to indicate that there may be something to the perception that almond growers got more than their fair share of water during the drought.¹⁶¹

¹⁶¹ Jack Ohman, "The Scarlet Letter." 2016. *Sacbee*. Accessed October 20. <http://www.sacbee.com/opinion/editorial-cartoons/jack-ohman/article26715928.html>.

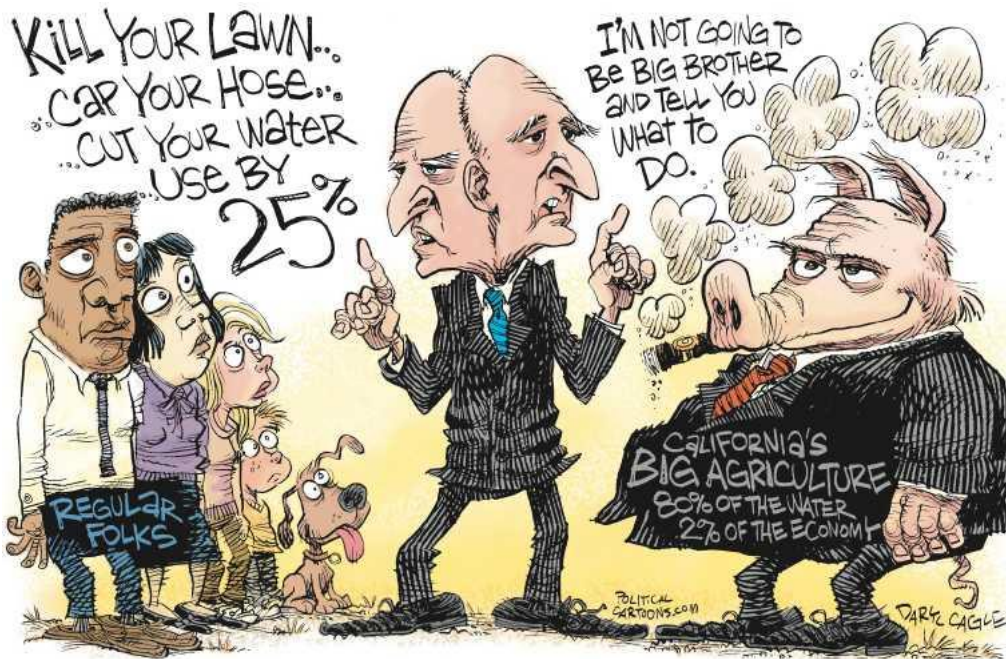


Figure 6.4 Residents v Big Agriculture. 'California imposes water restrictions' by Daryl Cagle. This, like so many other cartoons, shows two policies for water use, one for residents and another for "Big Agriculture."¹⁶² This image hits all the machinations that Californians felt were at work in their state regarding water policy. First, the governor set steep restrictions on residents and imposed fines and penalties as well. But, Governor Brown and other politicians placed very few restrictions on agribusinesses and claimed that the government had no right to tell farmers what to do on their land, especially if it had a negative economic impact on those farmers. Californians were confused if not angered by this double standard.

During the 2011 drought, almond farmers in California indicated that they felt they had been vilified in the press. Political cartoons were published between 2011 and 2016, like those above, which captured the perceived differences experienced by almond growers and residents in California. It is apparent from both cartoons that neither group felt their needs were being addressed adequately and that perceived inequalities were a major issue. Many almond growers rightly pointed out other types of crops required just as much water to produce a harvest as did almond trees. What they failed to acknowledge was that during episodes of drought, farmers

¹⁶² Daryl Cagle, 'California Imposes Water Restrictions' *Cagle Cartoons at the Comic News*. Accessed October 31, 2016. <http://thecomiconews.com/edtoons/2015/0408/california/04.php>.

could simply leave their fields unplanted, whereas trees required water all year, whether there was a drought or not. A walnut or pomegranate grower could not simply stop irrigating the orchard as the economic losses would have been profound. Tomato growers, on the other hand, would be able to leave fields fallow or grow less irrigation-intensive crops for a season or two and not suffer the same revenue loss as those with unirrigated orchards. This would be especially true in arid regions, like the San Joaquin Valley.

Worth noting is that most of the shifts toward planting fruit and nut trees began with corporate farms. In 2007, of the 5,750 corporate farms in California, 2,674 were fruit and nut tree farms, and through 2015 even more acres were converted from row crops to fruit and nuts in the San Joaquin Valley.¹⁶³ For example, in 2014 it was noted in an article in the *Western Farm Press* that “Paramount Farming [had] recently purchased 15,000 acres of row-crop land in Madera County from Newhall Land Co., which likely will be planted to almonds, pistachios, or pomegranates. Paramount farms about 30,000 acres of almonds, 25,000 acres of pistachios, and 6,000 acres of pomegranates in the southern San Joaquin Valley.”¹⁶⁴ Paramount was an agricultural empire owned by Lynda and Stewart Resnick located in Kern County. By 2014, Paramount also had thousands of acres planted to pomegranate trees and produced 20 percent of the state’s citrus. Those competing with Paramount in markets and for access to irrigation water claimed that control of so much of the pistachio market allowed Resnick to manipulate long standing organizations and regulation regarding water use. This had a familiar ring to it, as these were the same charges that Miller, Lux, and other land barons of the nineteenth and early twentieth century faced.

¹⁶³ Carman p. 9.

¹⁶⁴ Harry Cline, “Paramount Farming Kills California Pistachio Commission,” *Western Farm Press*, (March 1, 2007). <http://westernfarmpress.com/paramount-farming-kills-california-pistachio-commission> Los Angeles billionaire Stewart Resnick owns the Paramount Farming Company in Kern County. His company produced 30 percent of the pistachio crop in the state.

Moreover, it was not just row crops that were converted to orchards; land that was once used for cattle grazing was also planted with water-thirsty crops. In Stanislaus County, 6,500 acres of grazing land were converted to almonds in 2013 by Trinitas Partners, an investment firm in the Silicon Valley.¹⁶⁵ Even in the midst of the drought that began in 2011, newly planted fruit and nut trees lined the roadways for miles near Wasco, CA. The purposes of these types of “investment farms” were exactly what the name implies, to get a return on an investment. Family farms, especially small farmers, adapted to these methods or found they were unable to compete. This meant that more water was pumped from wells during dry seasons and even more so during years of drought. What should be of great concern to California law makers and residents alike, is that much of that water went to vast tracts of land consolidated during the early years of California’s statehood.

To emphasize, Paramount and Trinitas were not an anomaly; many of the farms in the Central Valley were tens of thousands of acres in size and belong, not to family farmers, but to agribusinesses. Farms of such size would have been impossible to irrigate in dry years without access to dependable water, leaving smaller more flexible farmers in the majority. Smaller farms were usually more flexible in the sense that they would be able to determine what to plant or change farming strategies without having to worry about pleasing investors. Granted, such farmers would still need to make a living, but would also be able to go a year without increased revenue as long as they were able to pay their debts or have access to credit. Unfortunately, that simply was not the case in the San Joaquin Valley. In 1997, agribusinesses accounted for sixteen percent of the farms in California, but they made up 91 percent of the sales for the state. Nationwide, these farms accounted for sixty-seven percent of agricultural production.¹⁶⁶ In other

¹⁶⁵ Krieger p. 6.

¹⁶⁶ *Giannini Foundation* p. 16.

words, there were a lot of family farms in the 1990's that were not making near the dollar amount that corporate farms were, placing them at a considerable disadvantage.

On the whole, large corporate farms were not practical without water to irrigate the land; this was especially true when they were located in arid regions. But, such large landholdings often meant there was a considerable amount of money and influence by which the owners/operators could acquire the water they needed to be successful and profitable. In order to garner access to the appropriate amount of irrigation water, industrial farm often employed the services of farm lobbies. Like lobbyists for any other industry, farming lobbies pushed for access to water in order to make more profits. Granted, not all farms represented by lobbyist were corporate farms, but many in California were, specifically those located in the southern San Joaquin Valley Westlands Water District which represented farms in excess of 25,000 acres. In 2013 the Westlands Water District, the largest water district in the United States representing farm interests between Firebaugh and Kettleman City, increased monies spent in Washington to ten times what it had in 2010.¹⁶⁷ One goal of Westlands was to get legislation that would reestablish contracts for another forty years and limit the ability of state and federal agencies to restrict water during drought. Just such a bill was passed by the House in 2015 and a similar bill, which was being considered in the Senate, did not. If it had passed, the Senate bill “would allow regulators to ‘provide the maximum quantity of water supplies possible’ to where it’s most

¹⁶⁷ Kitty Felde and Viveca Novak, “The Politics of Drought: California Water Interests Prime the Pump in Washington” *Open Secrets.org: Center for Responsive Politics*. April 10, 2014. <http://www.opensecrets.org/news/2014/04/the-politics-of-drought-california-water-interests-prime-the-pump-in-washington/>. This article highlights issues regarding the politics of water, showing the importance of “big money” and land be when determining water use or even evaluation of the process. Felde and Novak present an example typical of the early land consolidation efforts and ways in which individuals skirted laws regarding residency, taxes, and water rights. This is a Twenty-first Century reenactment of a Nineteenth Century drama.

needed and boost existing federal drought programs by \$200 million.”¹⁶⁸ The obviously vague wording was intended to allow specific farming entities to have access to more water during drought, even at the expense of other water districts, farms, residences, and over environmental concerns. Given that the words “most needed” would indicate greatest impact to revenue or jobs, it could easily have been assumed this water would have gone to corporate farms.

State and local agencies were also targeted by agricultural interest groups to ensure access to water during hard times. Donations of nearly five million dollars were made by Paramount Farming Company to federal and state politicians on both sides of the aisle as well as special action committees, presumably to influence their decisions regarding Paramount’s water rights in 2014.¹⁶⁹ Rebranded as the Wonderful Company in 2009, the Resnicks acquired public land via dealings with state water officials in 1994 under which aquifers with plentiful water supplies were located. The Kern Water Bank, as the aquifers were called, made it possible for Wonderful to use more water than any other farm in the region without purchasing it from the CVP or SWP if they were not inclined to do so.¹⁷⁰ However, aquifers used by the Paramount Farms were partially replenished by water pumped from the Sacramento River Delta, technically part of the public water system. As a result, the Resnicks and their subsidiary holdings were sued repeatedly for over pumping from aquifers and depleting water resources available to surrounding water districts and farmlands. In addition, Agribusinesses were also able to afford to dig a 2,500-foot well while a family-owned farm would be far less likely to, as was the case with Paramount Farms which sunk eighty-five wells into the Kern Water Bank as soon as it was

¹⁶⁸ Ibid.

¹⁶⁹ Ibid.

¹⁷⁰ Chloe Sorvino, “America’s Nuttiest Billionaire Couple: Amid Drought, Stewart and Lynda Resnick Are Richer Than Ever,” *Forbes*. November 23, 2015.
<http://www.forbes.com/sites/chloesorvino/2015/11/04/americas-nuttiest-billionaire-couple-amid-drought-stewart-and-lynda-resnick-are-richer-than-ever/3/#55c527125ef7>

signed over to the corporation. As of 2015, reminiscent of Charles Miller vs Henry Lux, the Resnicks were once again fighting charges that the Kern Water Bank had been over pumped to the detriment of neighboring farms and communities.¹⁷¹

Corporate farms, like Paramount, also influenced water politics indirectly, and by extension, local economies as well. In 2007, Paramount Farms was able to put an end to the twenty-six-year old California Pistachio Commission. This was possible even though two-thirds of the pistachio growers in California voted to keep it. Voting was tallied, not by the number of growers, but by the percentage of crop, and Paramount continued to lead the state in pistachio production in 2016.¹⁷² Such measures of power really did underscore the ways in which capitalism undermined the one person, one vote doctrine that American democracy is based upon. This also harkens back to tactics used by Miller & Lux to avoid paying the correct amount of property tax on their land by getting men who were friendly to them elected or appointed to key positions at the state and local level. Paramount may have used more modern and sophisticated measures to achieve their goals, but that was only a measure of degree as their influence was still garnered through the amount of land and wealth they had.

Equally important was the fact that a sustained focus on farming, especially by agribusiness, limited the diversification of the economy in the San Joaquin Valley, even within agricultural production itself. In fact, by 2015 roughly 70 percent of farms in California produced only a single crop for market. Reminiscent of the study conducted by Goldschmidt, U.S. Census data regarding poverty in America from the 2010s revealed that, not only had the economic opportunities not increased in many parts of the San Joaquin Valley, but they had gotten worse in

¹⁷¹ Ibid.

¹⁷² Harry Cline, "Paramount Farming kills California Pistachio Commission," *Western Farm Press*, March 1, 2007. <http://westernfarmpress.com/paramount-farming-kills-california-pistachio-commission>

some cases. In the city of Arvin, where Goldschmidt found less opportunity, lower wages, and poor living conditions for agricultural workers in 1944, the number of people living below the poverty line was 36 percent between 2002 and 2012. The national average for people living below the poverty line for the same years was 15 percent.¹⁷³ In Dinuba, which Goldschmidt described as the model of a family-farming community, the poverty level reached 30 percent as farming became more corporatized. Larger cities with farming hinterlands, like Fresno, have poverty levels of just over 18 percent. In 2010, *The Economist* ran an article in which poverty in the San Joaquin Valley was compared to that in Appalachia.¹⁷⁴ This appears to bear out the argument put forth by both McWilliams and Worster, which was that communities with an economy largely dependent on agribusinesses tended to have more wage workers and fewer professionals and educated residents. This created a cycle of poverty and dependence which was difficult to break and is exactly what historians, including Taylor and Goldschmidt, warned would occur if corporate growers were left unchecked.

What may be even more striking was that in the land of plenty, many residents, especially those that were the most vulnerable, experienced high rates of food insecurity. In 2015, Bakersfield and Fresno, cities at either end of the San Joaquin Valley, ranked in the top five cities with populations who faced food scarcity, as illustrated in the table on page 109.

Bakersfield is located in Kern County which was the fourth most productive agricultural county

¹⁷³ “Farms and Farmland, 2012 Statistical Abstract.” *The United States Census Bureau* www.census.gov

¹⁷⁴ “California’s Central Valley: The Appalachia of the West.” *The Economist*, Jan. 1, 2010. This article is not flattering in the least for the Central Valley in general and for Fresno in particular. Information harkens back to the Goldschmidt report from 1947 in which two agricultural communities were studied. The study indicated that communities dependent upon corporate farming tended to have less professionals and less amenities in their towns than did communities which developed around smaller, family-run operations. The article in the *Economist* focuses on education and opportunity for laborers and residents in communities that have strong ties to industrial agriculture in addition to the other social and economic factors that Goldschmidt examined.

in California in 2105, producing melons, lettuce, almonds, nectarines, etc., which were shipped to more than eighty-five countries worldwide, and yet it ranked number one in food hardship for that same year.¹⁷⁵ Fresno, located in at the northern end of the San Joaquin Valley, was number one in agricultural production for California in 2015. For that same year, Fresno also ranked fifth in food hardship. According to the United States Department of Agriculture, California had a food insecurity index of one out of every eight homes for 2015, which was an improvement from previous years. Their research indicated that food insecurity tended to be higher in homes with children and increased when the family was Hispanic. Much of the seasonal labor in California had traditionally been comprised of immigrants from Mexico, although first and second generation citizens and permanent residents often continued to work in agriculture. It was within these communities, seasonal, earning low wages, and with little political voice, that food scarcity hit the hardest. Corporate farms continued to make billions off the backs of such groups but kept pay so low that buying food for laboring families was sometimes a hardship.

¹⁷⁵ “New Poverty Data: A Closer Look at California’s Food Insecurity and Poverty | California Association of Food Banks.” Accessed October 29, 2016. <http://www.cafoodbanks.org/blog/new-poverty-data-closer-look-california%E2%80%99s-food-insecurity-and-poverty>.

Table 2 Food Hardship. State ranking from the Food Research and Action Center and the California Association of Food Banks.¹⁷⁶ This table indicates the food hardship rates in the top nineteen cities in the U.S. for 2015. California has two cities in the top five, both of which are located in highly developed agricultural areas. There was enough food produced in California during that same year to reach an output of 47 million dollars, which was down from the previous year. During both years, California ranked number one in agricultural production in the nation, and yet residents in the heart of agricultural productivity went hungry.

Top 20 MSAs with Worst Food Hardship Rates in 2015		
	Food Hardship Rate	Rank
Bakersfield, CA	24.2	1
Lakeland-Winter Haven, FL	23.2	2
Memphis, TN-MS-AR	22.6	3
Jackson, MS	22.6	3
Fresno, CA	22.4	5
Augusta-Richmond County, GA-SC	22.4	5
Youngstown-Warren-Boardman, OH-PA	22.3	7
New Orleans-Metairie, LA	22.3	7
Greensboro-High Point, NC	22.2	9
Columbia, SC	22.0	10
Dayton, OH	21.7	11
Baton Rouge, LA	21.3	12
Chattanooga, TN-GA	21.1	13
Winston-Salem, NC	20.6	14
El Paso, TX	20.2	15
Albuquerque, NM	20.1	16
Tulsa, OK	19.9	17
Tucson, AZ	19.6	18
Miami-Fort Lauderdale-West Palm Beach, FL	19.4	19
Birmingham-Hoover, AL	19.4	19
Pensacola-Ferry Pass-Brent, FL	19.4	19

Unlike the field laborers that work on the land, owners of agribusinesses experienced a steady increase in profits since the 1950s. In 2012, growers in Fresno County alone made \$6.8 billion in revenues. In addition, most farms, large and small, typically employ some number of migrant workers, primarily Hispanics, whom, as noted earlier, they paid low wages for back-breaking work.¹⁷⁷ Although some growers claimed laborers could earn eighteen dollars an hour, agricultural wages were based on output and high wages could only be achieved by those with

¹⁷⁶ "Hunger Fact Sheet | California Association of Food Banks." Accessed October 29, 2016. <http://www.cafoodbanks.org/hunger-factsheet>.

¹⁷⁷ Hope Yen "Cycle of poverty in San Joaquin Valley may offer clues to future of U.S. " *Lodi News-Sentinel*. Posted: Tuesday, June 11, 2013. <http://www.lodinews.com>

the most speed and experience. Slower, weaker, or older laborers made far less than this and wages were typically determined by piecework which varied by crop. And, as these types of agricultural jobs were also seasonal, they did not translate well into average daily or annual wages for most laborers. In addition, workers often found it difficult to find housing near the fields in which they worked due to the transient nature of their labor. Occasionally, some resorted to staying in their cars, outside in tents, or building some type of temporary structure.¹⁷⁸ Many of the laborers were poorly educated and had very little control over their own lives, let alone local or state politics. This meant that it was very unlikely that they would be able to take any action to remedy low wages and poor working and living conditions.

For the most part, social and economic conditions agricultural laborers found themselves in fed the cycle of poverty that some in the Central Valley continued to face as late as 2016. Even more, laborers were directly impacted by the drought as fewer acres planted also meant fewer jobs or lower wages. This was a difficult situation for a group in which more than a fifth already lived below the poverty line.¹⁷⁹ Social stratification had long-term consequences for entire communities and local economies as workers had less money to spend in the markets, reducing revenues for local businesses and circulation of monies within the community. However, corporate farms continued to make profits as much of the agricultural production was for distant markets, not for local consumption.

¹⁷⁸ Eduardo Stanley, "California Farm Workers Stuck Between Poverty And Neglect, Suffer From Low Wages And Lack Of Organization," *The Huffington Post*, Updated Oct 10, 2011. http://www.huffingtonpost.com/2011/08/10/california-farm-workers-low-wages_n_923941.html

¹⁷⁹ Amy Vanderwarker "Central Valley Water Woes," *Poverty & the Environment*, Vol. 16, no 2, (Fall 2009), pp. 72-74. This piece by Vanderwarker focuses on the social and economic plight of workers in the Central Valley. This is especially valuable when viewed alongside the report by Goldschmidt, in which the economic and social conditions faced by residents in Dinuba and Arvin are examined. Vanderwarker's report is almost identical to what Goldschmidt found and addresses the far reaching consequences of corporate farming on the environment and economics of the state.

As early as the 1970s, but even more so during the 2011 drought, many farmworkers also had to put up with contaminated drinking water. Many families were forced to spend their hard-earned money on bottled and filtered water to ensure they had clean drinking water for their families. The very jobs fieldworkers depend upon contaminated the ground water that they could once drink. Pesticides and fertilizers used on fields and in orchards ran off and made their way into the groundwater.¹⁸⁰ When surface or subsidized water was not available, the use of underground sources by farms became prolific. As a result, the more farmers pumped water from aquifers for irrigation, the more concentrated the contamination became. Families that were working all day in the fields and then still finding it difficult to afford food were now forced to purchase clean drinking water or take the risk of drinking contaminated well water.

Problems with water contamination did not only impact the human population, but plant and animal life were affected as well. There were numerous attempts to remedy contaminated water supplies, over salinization, and water shortages that impacted the environment and the humans that depended upon them. For example, in 1992, Congress passed the Central Valley Project Improvement Act which requires changes made to water management within the system. The purpose of this Act was to remedy water shortages that limited the ability of certain fish species to migrate and spawn and to make sure that water was clean enough for human consumption and to sustain native plant and animal life. Efforts to maintain clean water supplies were in the public eye at both the state and national level beginning in the 1970's, and yet they continued to be issues as the drive for profits repeatedly overrode environment concerns.

Not only did ground water become contaminated by runoff from farms, but salinity levels in the soil also seeped into the water supply. Salinity levels had been increasing in aquifers and soil all across the state, but most notably in the San Joaquin Valley since farming began in the

¹⁸⁰ Ibid p. 73.

area.¹⁸¹ Due to the aridity in the lower part of the Valley combined with intense irrigation and the already high amounts of salt in the soil, salinity levels became even more concentrated. There was simply too little rainfall, too much evaporation, and constant absorption of water by crops that led to increased amounts of salt left in the soil. When salinity levels get too high or are experienced for prolonged periods, plants will eventually not be able to grow well as high levels of salt make it difficult for roots to absorb nutrients and water for proper growth. In fact, this was already a problem for many almond and pistachio growers, some of whom saw the number of empty pistachio shells increase by 50 percent in 2015.¹⁸² It was normal to have some amount of empty shells during every harvest, but due to the prolonged drought that began in 2011 and the level of salt concentrated in the soil the number of empty shells increased considerably for nut growers in the Valley. In an effort to remedy salinity concentration, farmers were able to leach out minerals by using more water in order to force salt below or away from the root system of their crops, but did so at the risk of reducing the already low water table.¹⁸³

Furthermore, as many farmers switched over to year-round crops, they exacerbated the salinity problem because irrigation and absorption took place all year, leaving more salt than if it were a seasonal occurrence. This was very difficult to resolve with fruit and nut trees as their

¹⁸¹ Salinity in the Sacramento-San Joaquin River Delta has been an issue since the 1880s, and efforts have been made on a continuous basis to ensure that farms in the Delta are protected. The problem of soil salinity is not unique to the Delta, and has become increasingly more important in the Central Valley as farms have expanded. Salt is present in the soil and water, even rainwater, but can become concentrated during irrigation. As plants use the water, they leave behind the salt which can build up in the soil. Evaporation of freshwater also leaves salt behind in the soil. Salt buildup from naturally occurring evaporation and increased use of fresh water by crops then makes it difficult for the roots of the plants to absorb water and nutrients, leading to low crop yields. In order to keep plants healthy and yields high, farmers must flush the soil by putting more water down to leach the salt, forcing the salt away from the roots of the plants. This means more water has to be used in an already arid climate to get the same crop yields than do crops planted in areas with more readily available water supply.

¹⁸² Ezra David Romero, "Salt Is Slowly Crippling California's Almond Industry," *The Salt, KNPR*. July 24, 2015. There are also reports of pistachio trees producing higher than normal numbers of empty shells throughout the Central Valley for the same reasons.

¹⁸³ John Letey, "Soil salinity poses challenges for sustainable agriculture and wildlife" *California Agriculture* 54(2):43-48. March-April 2000.

root systems were very deep and they already required a great deal of water to produce a harvest. However, nuts were a very profitable commodity and many growers were willing to take the risk of empty shells and depleted water sources for the potential of increased earnings. In effect, farmers created their own worst-case scenario in the San Joaquin Valley with the farming practices they employed. Given that it was already difficult to get water to the southern half of the state, demands to increase water use in order to leach out the salts made matters even worse.

Even though farmers needed more water to reduce salinity, during the drought growers saw a reduction in the amount of water they received from the CVP. As such, many farmers put forth great effort to limit the amount of water they wasted while irrigating. In fact, new methods of irrigation were put into place by most farmers in California in order to help save both water and money long before the 2011 drought began. Drip systems had replaced irrigation ditches that used flooding methods, and sprinkler systems could be seen in use along the I-5 or CA-99 almost any time of the year. However, according to studies conducted at the University of California, Davis in 2015, many almond growers were once again looking at flooding fields as an irrigation technique.¹⁸⁴ This was done by some vineyards in the region with good results. Grapevines typically experience tremendous growth and higher yields during dry years when they have received water via controlled flooding during wet seasons. Reducing the rate of soil salinization was also a possibility when using this process, but the best news seemed to be that this process might also lead to a recharge of depleted aquifers. This remained to be seen as of 2016, but hopes were high amongst farmers and residents who had traditionally depended upon water from these dwindling resources.

¹⁸⁴ Diane Nelson, "Farmland May Provide Key To Replenishing Groundwater," *UC Davis College of Agricultural and Environmental Sciences*. University of California, Davis. Sep 09, 2015. <http://www.caes.ucdavis.edu/> This article also addresses water quality for human consumption.

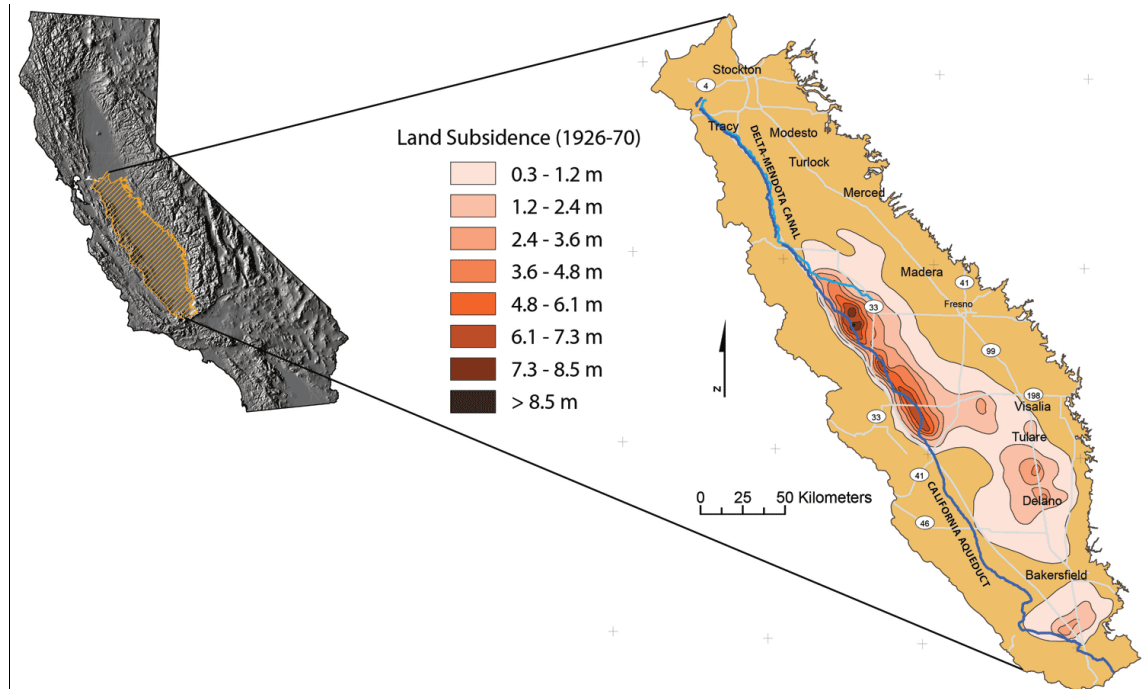


Figure 6.5 State Subsistence. This map shows the levels of subsidence in the San Joaquin Valley from 1920 to 1970.¹⁸⁵ The image of Dr. Poland in Chapter Two provides a real-life example of what this illustration shows. New reports indicate that land had sunk even more during the 2011 drought, due no doubt, to the collapse of more aquifers. If this pattern of subsistence continues, it is not an absurd notion that this area will no longer be viable for farming to the degree it had been, even with irrigation water from the CVP or SWP. The expansion of farmland that has occurred thus far will simply be too great to be sustained during periods of drought without any reliance upon underground sources, and those could well be gone in the near future.

If it these methods worked, flooding fields would ensure more water availability during dry periods and keep aquifers intact helping to limit land subsidence.¹⁸⁶ Figure 6.5 illustrates just how much of the Valley experienced subsidence between 1920 and 1970. During the 2011 drought even more aquifers were pumped dry causing subsidence in many of the same areas, indicating loss of subterranean resources. Trying this older method of periodic flooding made sense as this was the way Central Valley aquifers recharged naturally but was not used often as it

¹⁸⁵ “Delta-Mendota Canal: Evaluation of Groundwater Conditions & Land Subsidence.” *United States Geological Survey, California Water Science Center.*

¹⁸⁶ Land subsidence occurs when aquifers collapse, and the ground drops along the aquifer. Land subsidence has been an issue for California for decades, and yet farmers have continued to pump water to their own peril.

seemed counter intuitive and appeared incredibly wasteful during drought years. For farmers, the problem that remained was that much of the water they used for irrigation actually came from someplace else and might not always be available in the quantities necessary to achieve vine growth, reduced salinity, or aquifer recharge on a regular basis. Thus, periodic flooding of fields was still a risky venture for many San Joaquin growers.

As a consequence of the drought, farmers were not the only ones asked to cut back on water use in California after 2011. In fact, restrictions on water use within urban areas and rural communities were imposed almost every time there was a drought in California, and there was no exception in this case. It is important to note that water restrictions imposed on urban and rural residents were most often met by the residents and were even surpassed in some locations. In other words, not only were residents able to meet the requirement, but very often they actually conserved more than was expected. To be fair, urban, suburban, and rural communities had expanded all over the state, especially in the southern and central part, but the percentage of water allocated to them had not.¹⁸⁷ And, although it is true that by 2011 California was even more urban than it was fifty years prior, much more had been done preemptively to lessen the impact urban and suburban developments had on water supplies. For instance, in 2016, roughly ninety-four percent of California's nearly 40 million residents lived in or around urban centers, with only six percent residing in rural areas, however, within urban areas water use per person had actually gone down considerably between 1995 and 2015, from 232 gallons per person each day to 178 gallons per day.¹⁸⁸ Even though the difference in population between 1995 and 2016 had increased by roughly 7.1 million people, the reduction in water use per person was

¹⁸⁷ Edward Thompson, Jr., "California Agricultural Land Loss & Conservation: The Basic Facts" *American Farmland Trust*, 2009. www.farmland.org.

¹⁸⁸ Jeffery Mount and Ellen Hanak, "Just the Facts: Water Use in California" *Public Policy Institute of California*, July 2016. http://www.ppic.org/main/publication_show.asp?i=1108.

significant enough to make the total amount of water used by residents to be less than it had in 1995. Thus, residents had made changes to water usage during years of normal water supply which should have translated into more water storage to be used during years with less than normal precipitation. Instead, more restrictions were eventually imposed and some rural communities ran out of water altogether.

As a result of increased population and urban growth, some agricultural publications predicted that the amount of farmland that would be lost to urban development by 2040 was disturbingly high. Fear regarding crop production, price, and water use was considerable in such publications. In truth, urban centers would continue to grow over time as did suburban sprawl, but farmers had been employing new farming techniques and specialized crops for a very long time. Such measures allowed farmers to grow more food in increasingly smaller spaces. Higher yield crops, drought and disease-resistant plants, hydroponic farming, not to mention specially formulated fertilizers and pesticides, all made it possible for more crops to make it to market. Besides, the greater numbers of residents in urban areas also meant more consumers to buy those crops once they reached those markets. Of course, none of this would matter if there was no longer enough water to sustain urban centers or agricultural production.

Concerns regarding water shortage were well founded by 2016, as the lack of rainfall and snow pack in the Sierra Nevada Mountains, which had begun in 2011, led to extremely low levels of surface water. As a consequence, large landholders, small farmers, and residents alike began to rely heavily on underground sources once again. In the drier half of the San Joaquin Valley, roughly 85 percent of the residents relied on groundwater to meet their daily needs.¹⁸⁹ Although some growers were forced to limit the number of acres they planted because they did

¹⁸⁹ Janny Choy and Geoff McGhee, “Groundwater: Ignore It, and It Might Go Away. Understanding California’s Groundwater,” *Water in the West, Stanford Woods Institute for the Environment*. Last Update: Dec. 19, 2014. <http://waterinthewest.stanford.edu/groundwater>.

not have access to enough water, still others continued to shift to crops that required a great deal of water year round. This may have been due, in part, to the fact that many developers and agribusinesses in California knew that the state was entitled to water from the Colorado River as long as there was 7,500,000 acre feet available, as California had senior legal rights to river water.¹⁹⁰ In fact, California could claim up to fifty percent of the water that flowed through the Colorado River during periods of heavy rain and runoff, but was even able to claim senior water rights as the water level in Lake Meade dropped below 39 percent of capacity. There were seven states that utilized water from the Colorado River Basin; however, California was able to garner the lion's share of this resource at the southern end of the river system. This imbalance in distribution led to tension between California, Arizona, and Nevada in the 2000's as the entire Southwest suffered water shortages. However, the Colorado River seemed to serve as a "safety valve" for farmers and residents in some parts of California, allowing them to deal with issues concerning their own water at some future date. As such, parts of the state that utilized water from the Colorado River included some of the only cities in the state that did not meet their water restriction goals.

¹⁹⁰ Amanda Zamora, Lauren Kirchner, and Abrahm Lustgarten, "California's Drought Is Part of a Much Bigger Water Crisis. Here's What You Need to Know" *Propublica*. June, 2015. www.propublica.org/article/california-drought-colorado-river-water-crisis-explained.

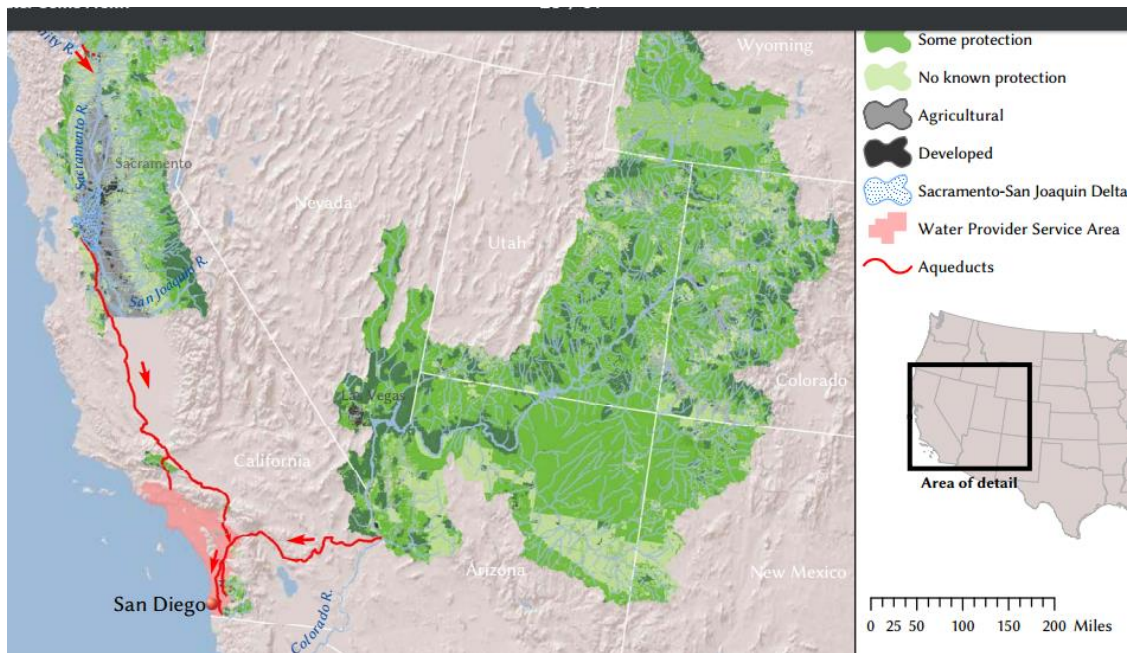


Figure 6.6 Water from the Colorado River to California Residents. This map shows where drinking water comes from for San Diego. It is interesting to note that this part of the state was the only area that did not meet the water restrictions imposed by the governor, perhaps because the residents understood that they would be able to get water from outside of the state.¹⁹¹

Problems with water supply, water quality, and land use were caused by both nature and man and had been occurring in California for over one hundred years. And yet, no long-term solutions regarding water use and land development had been reached as of 2016. Every time there was a drought, tensions between Northern and Southern California flared, but even the general public was divided over what to do about water issues as water restriction laws aimed at farmers seem undemocratic, un-American, and anticapitalistic. Further muddying the waters, agribusinesses tried to appeal to the public by presenting themselves as simple farmers just trying to make a living and get produce to markets at a decent price. Millions of dollars were spent each year on commercials and other advertisements encouraging consumers to purchase “heart healthy” walnuts, or “antioxidant boosting” pomegranate juice and these tactics were highly successful. Once again, the California State Grange was at the forefront of efforts aimed to

¹⁹¹ Final Drought Report

maintain some economic and political balance between small farmers and industrial farms. Members of the California Grange were opposed to agribusinesses taking over markets, utilizing farming techniques that were harmful to the environment, and use of genetically modified organisms in farming. This time around, the State Grange found itself in opposition to the National Grange who had embraced the farming methods used by corporate farms as they were seen as efficient and simply a consequence of progress. Grangers in California pushed back against the use of certain pesticide and the expansion of orchards in more arid parts of the Valley.¹⁹² For the most part, there was no shift in policy or the market; however, many residents were more open to organic and sustainable farming techniques.

It was within this period of confusion and conflict, brought about by drought, that some state politicians and national pundits began to use water as a means to oppose government regulation. Water limits imposed by the state or federal government to stave off water shortages or environmental damage were presented as examples of “government overreach.” The notion that the free market should be applied to water and that farmers should have access to what they needed in order to make food grow sounded noble indeed. As such, in the early years of the drought farmers could be seen on the nightly news discussing how the delta smelt was ruining their farms and that the government cared more about fish than farmers. This may have appeared ridiculous to the average American not privy to the nuances of water use in the state. Such spectacles only served to change discussions respecting water restrictions from the realm of the practical and into a debate over the ideological. What was not presented to the audience at large was that there were limits to the amount of water available at any given time, and applying the term “free market” to a publicly funded project was misleading at best.

¹⁹² Collins, John. 2015. “West Coast Grange Wars: A Reborn Farmers’ Movement Takes on Corporate Agriculture.” June 14. <http://inthesetimes.com/rural-america/entry/18029/a-grange-war-what-goes-around-comes-around-the-west-is-wild>.

Growers made billions of dollars using water from publicly funded water projects and received millions each year in federal subsidies.¹⁹³ They continued to grow crops that needed more water in order to make more profits, and yet, when state and federal officials attempted to act responsibly by limiting resources, growers cried foul and clamored for less government intervention and regulation. It would have been impossible for farmers or agribusinesses to be able to, or want to, fund the CVP or SWP on their own. Taxpayers funded the construction of dams, canals, pumps, and hydroelectric power stations all through the Central Valley. It was this funding that allowed farmers and agribusinesses to become so successful. That did not mean a lot of hard work did not go into cultivating the land, what it does mean however, is that the land would not be worth cultivating without the water. Large landholders were aware of this predicament since they began consolidating land in the San Joaquin Valley in the late 1800's and had skirted water regulation even before construction of water projects was initiated. They continued to pump water from aquifers at an alarming rate because such resources were available and proved difficult to regulate. In many cases this allowed for agricultural monopolies to gain control sectors of agricultural markets, this may have been true in many states, but was especially so in California.¹⁹⁴

Long and short-term solutions were not popular with most farmers and other residents in California. More dams, reservoirs, and other holding facilities seemed necessary to ensure water for further development and population growth. The construction of such facilities would come

¹⁹³ Vandarwarker. p. 74. De Roos, he uses calculations by Paul S. Taylor with which Taylor demonstrates the value of the water that farmers get versus what they actually pay. The difference between the results of the two equations is impressive.

¹⁹⁴ Jon Lauck, "American Agriculture and the Problem of Monopoly". *Agricultural History* 70 (2). Agricultural History Society: 1996. pp. 196–215. <http://www.jstor.org/stable/3744533>.

at a great financial cost to California residents via taxation. At this point, it seemed unlikely that citizens would happily pay for more construction of water storage systems in order for farmers, on the large or small scale, to continue to make profits. Such ideas went against all notions of how a free market was supposed to function and were contrarian to the arguments in opposition to government overreach. It was clear that new construction projects would have to be sold to the public as a means to provide water for urban and rural areas and to keep food costs down for consumers, not ensure profits in the agricultural sector if they were to be considered at all. Farmers themselves were even less likely to fund such structures, nor would they be able to fund such them on their own. More water storage facilities remained a viable option, but one that would likely be addressed in the distant future.

Another solution would be restricting ground water usage, but this did not appeal to most growers, especially those able to afford deep-well drilling. Supporters of restrictions often faced hostility from other growers, like one owner of a small walnut farm in Kings County that expressed his support of the new regulation which was passed in 2015 and was asked “Can you afford a bodyguard?”¹⁹⁵ The new requirements were set to take effect in 2020, too far away to have an impact on the situation occurring in the 2010’s, but indicated that some lawmakers and farmers were willing to take the steps necessary to limit the impact of drought in the future. Unfortunately, because the law was not set to be enforced until 2020, those that were able to dig new wells or deepen those they already had, did so without permission from local, state, or federal agencies. Farmers were not required to inform any agencies when they deepened existing or dug new wells, so the potential remained for some to try and dig as many deep wells as they were able to before the law took effect. Although there were some obvious weaknesses with

¹⁹⁵ Ryan Sabalow, “Tensions, threats as California’s New Groundwater Law Takes Shape,” *The Sacramento Bee*, November 21, 2015. <http://www.sacbee.com/news/state/california/water-and-drought/article45802360.html>

implementation, limiting how much water a grower was able to remove from the ground might eventually have the added benefit of naturally limiting the number of acres that could be planted. This would also impact the type of crops grown, potentially reducing the number of year round crops planted by farmers in the San Joaquin Valley.

Simply restricting the type of crops or number of acres that can be planted in arid regions is also a viable solution. However, both this and the previous option led to controversy as they were seen by some as an overstep by the government, never mind that it was government funding which provided much of the water used for farming. It was also augmented that limiting crops for export would have a negative impact on food prices as well. Corporate farms would still need to make profits for investors so it seemed likely that domestic prices would go up to recoup the difference. Another argument against this solution was that by reducing the amount of crops grown, but allowing for inflated prices for exports to make up for lost revenue might cause some countries to get farm goods from someplace else and undermine the goal altogether. This scenario could lead to major job loss and reduction in tax revenue for California, which was already cash strapped.

Although it made up only two percent of state revenue, sustainability of agriculture had long been an important issue, especially for policy makers and farmers. However, there did not seem to have been any discussion regarding limiting the number of acres a farmer or agribusiness should be allowed to plant during drought. In fact, in a thirty-seven page report put out by American Farmland Trust to the California Department of Food and Agriculture published in 2010, a twelve step vision for promoting agricultural sustainability was presented, none of which mentioned limiting farming acreage. Some of the steps listed were reminiscent of old remedies which led to more stored water, but did nothing to stop a water crisis from

occurring again. If nothing else, there seemed to be a general fear that urban development would eventually push farming out of the Valley altogether and cause food prices to skyrocket.

None of those promoting fear over government overreach and high food prices seemed to have a grasp of the historical roots of government intervention in agriculture. During the Great Depression, emergency measures were taken to ensure stability to the economy via stabilized farm prices. The Agricultural Adjustment Act was passed in 1933, then again in 1938, which provided farmers with subsidies to leave land fallow. Many critics of this policy claimed that it helped agribusinesses far in excess of family farmers. This may be true, but a similar plan may eventually be necessary to help curtail water use by farmers in California in years of crisis, but also to prevent a crisis from occurring in the first place. The 1996 Farm Bill offered a safety net for farmers across the United States willing to commit to three year crop rotations. Historically, most California farmers had not subscribed to this type of farming; instead, farmers themselves made the decision whether or not to limit the number of acres they planted during the 2011 drought. No doubt, the decision to self-regulate was made most often when there were limited water supplies. Nonetheless, farmers across the state fallowed thousands of acres of row crops which did have a negative impact on farm revenue and agricultural employment throughout the Valley. The image below illustrates how each region of the Central Valley was impacted by this process and does appear to support the point that less farmland would have a negative impact on farm revenue and the economy in general. However, this was not a well-planned or organized endeavor to boost production prices and limit risk to farmers, it was reactionary at best. In addition, there was no great change in food prices in the marketplace during this period. A government program would allow for subsidies, prices supports, and guaranteed income in a targeted manner, with sustainability as a priority.

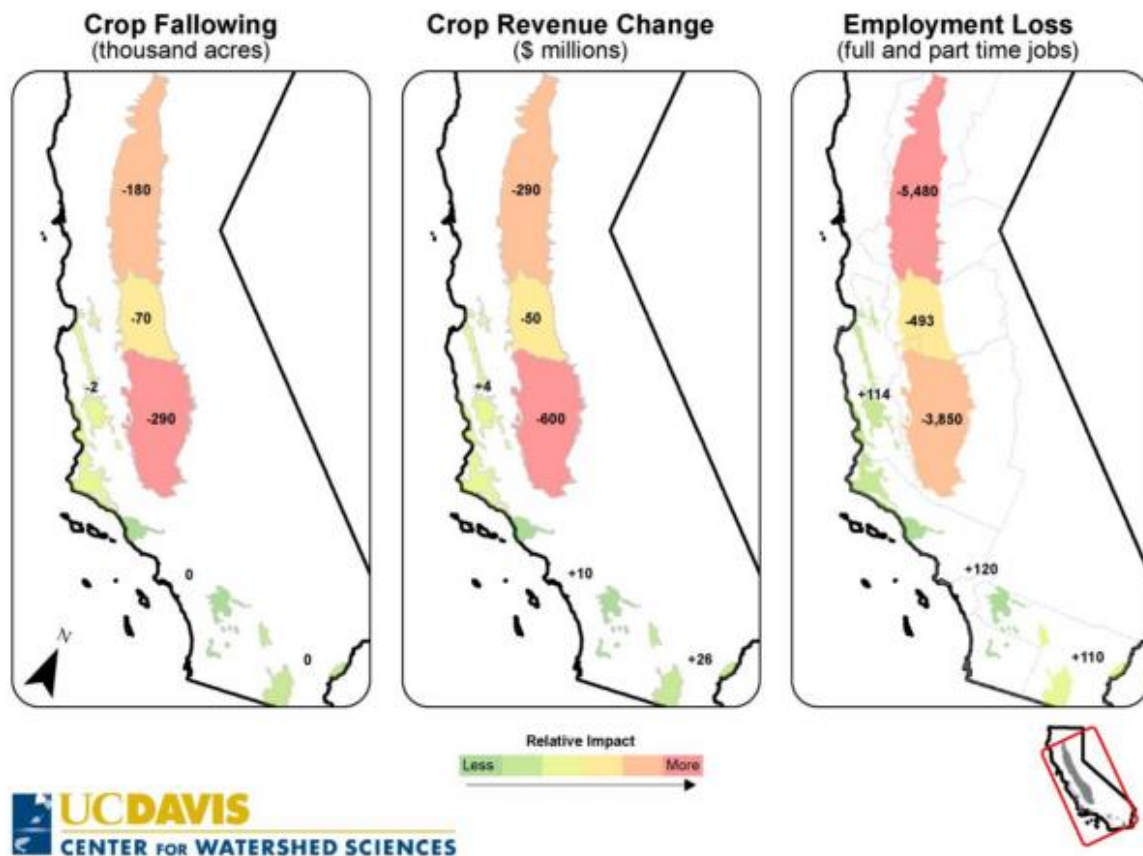


Fig 6.7 Estimated impacts of the 2015 California Drought on Crop Fallowing, Revenues, and Employment.¹⁹⁶ Each of section of this image represents a different estimated impact for the state of California. However, crop prices, on average, did not increase dramatically in 2015 nor did they in 2016. If the drought continued past 2016, it would seem highly likely that there would be some price increase for farm goods produced in the Central Valley, but not in other areas of the country.

Although many California residents might have been opposed to government intervention, to continue with water policy as it had been established was clearly dangerous and impractical. About twenty percent of California’s exports came from agriculture. In the Central Valley many people relied on farming directly or indirectly for their incomes. Lack of water regulation had put the San Joaquin Valley in a precarious situation for a very long time. Farmers and, more significantly, agribusinesses had increased the number of acres they planted,

¹⁹⁶ Richard Howitt, Duncan MacEwan, Josué Medellín-Azuara, Jay Lund, and Daniel Sumner “Final_Drought_Report_08182015_Full_Report_WithAppendices.pdf.” 2016. Accessed October 30. https://watershed.ucdavis.edu/files/biblio/Final_Drought%20Report_08182015_Full_Report_WithAppendices.pdf.

converted to high profit, water- thirsty plants, and overused readily available underground water sources. The more aquifers that were depleted the more likely it was that they collapsed, rendering them forever useless. When there were especially wet years this issue lost momentum and disappeared from public discourse, but the problem did not resolved itself because of an increase in precipitation. Additionally, whenever there was “surplus” water, it was eventually allocated to be used for *something*, thus there was really no such thing as extra water. Corporate farms and developers had always found a way to use their wealth and political influence to garner access to the “extra” water. If water supplies were depleted and the drought continued past 2016, many small farmers would likely be driven out of business and agricultural monopolies would continue to consolidate land across the West. In addition, prolonged drought would cause the price of agricultural products to increase for consumers across the country. More farm laborers would likely be unemployed and sink deeper into poverty, increasing the strain on financial assistance programs in the state while reducing tax revenues.

The California water crisis was a disaster-in-the making for more than a century. Some sort of balance needed to be reached between how water was used and efforts to generate ever higher profits in the agricultural sector. The warning signs that Taylor, Gates, and Goldschmidt hoped would lead to real change in water policy were the same signs apparent in 2011 but had become more compounded and complicated over time. Regardless of the level of difficulty this problem presented, it was clear to many that drastic measures needed to be taken. And, although restrictions on aquifer use were passed in 2015, for the most part little had been done to address the underlying causes of water shortages in California. What was lacking, in general, was a close examination of a culture in which profits were more important than the ideals of democracy. Americans needed to come to terms with the idea that capitalism may not have been what

continued to propel the success of the United States in twenty-first century, but rather such principals impeded rational people from making reasonable decisions regarding water use. Until the limits of capitalism are recognized and can become part of a broader discussion about the use of resources, it is unlikely that California will see any meaningful change to water policy, and water scarcity will continue to be a problem for residents of the state.

Bibliography

Abel, Edson. "The Central Valley Project and the Farmers." *California Law Review* 38, no. 4

(October 1, 1950): 653–65. doi:10.2307/3477997.

"Agriculture: Farms and Farmland," *Giannini Foundation*

Anderson, Terry L. *Water Crisis: Ending the Policy Drought*. Baltimore: Johns Hopkins University Press, 1983.

Beard, Nick. Wallace M. Beard Pump Co., Inc., Woodland California. Interviewed by Tracy Neblina on Sept. 12, 2014.

Billington, David P., Donald Conrad Jackson, and Martin V. Melosi. *The History of Large Federal Dams: Planning, Design, and Construction in the Era of Big Dams*. Government Printing Office, 2005.

Bryce, James. *The American Commonwealth*. Indianapolis: Liberty Fund Inc., 1995.

"Bureau of Reclamation: Water Marketing Activities and Costs at the Central Valley Project: GAO-01-553." *GAO Reports*, May 4, 2001, 1.

Cagle, Daryl. 'California Imposes Water Restrictions' *Cagle Cartoons at the Comic News*. Accessed October 31, 2016.

<http://thecomicnews.com/edtoons/2015/0408/california/04.php>.

California Department of Water Resources. Last modified August 4, 2009.

<http://www.water.ca.gov/rivers/sanjoaquin/program/>

"California Drought: Feds Say Farmers Won't Get Any Central Valley Project Water This Year." Accessed October 7, 2014.

http://www.mercurynews.com/portal/science/ci_25201634/california-drought-big-cut-backs-announced-water-that?_loopback=1.

“California Drought: San Joaquin Valley Sinking as Farmers Race to Tap Aquifer.” Accessed October 8, 2014. http://www.mercurynews.com/drought/ci_25447586/california-drought-san-joaquin-valley-sinking-farmers-race.

California., James Ben Ali Haggin, Charles Lux, Elisha Williams McKinstry, and Kern River Land and Canal Company. *Charles Lux et Al. vs. James B. Haggin et Al. Opinion Filed April 26, 1886. Stetson & Houghton, Plaintiffs’ Attorneys. McAllister & Berin, of Counsel. Louis T. Haggin, Defendant’s Attorney. Garber, Thornton & Bishop, Flournoy & Mhoon, of Counsel.* San Francisco?, 1886.
<http://catalog.hathitrust.org/Record/007697188>.

“California’s Central Valley: The Appalachia of the West” *The Economist*, Jan. 1, 2010

California State Board of Agriculture, *Biennial Report of the State Board of Agriculture for the years 1870 and 1871*.

Carman, Hoy. “California Corporate farms: Myth and Reality”, *Giannini Foundation of Agricultural Economics*: University of California, 2007.

Case, Elizabeth. “Well Levels Drop around the County as Drought Presses On”, *Davis Enterprise* (Davis, California), Sept. 12, 2014.

“Central Valley Project,” *Water Education Foundation*. 2014. Accessed October 15, 2015.

“Change In Depth of Wells.” *Davis Enterprise*. Accessed October 7, 2014.

<http://www.davisenterprise.com/media-post/well-graphs/attachment/changeindepthw/>.

Choy, Janny and Geoff McGhee, “Groundwater: Ignore It, and It Might Go Away.

Understanding California’s Groundwater,” *Water in the West, Stanford Woods Institute for the Environment*. Last Update: Dec. 19, 2014.

<http://waterinthewest.stanford.edu/groundwater>

- Cline, Harry. "Paramount Farming Kills California Pistachio Commission," Western Farm Press, (March 1, 2007)
- Collins, John. 2015. "West Coast Grange Wars: A Reborn Farmers' Movement Takes on Corporate Agriculture." June 14. <http://inthesetimes.com/rural-america/entry/18029/a-grange-war-what-goes-around-comes-around-the-west-is-wild>.
- Dale, R.H., James J. French, and G.V. Gordon, "Ground-Water Geology and Hydrology of the Kern River Alluvial-Fan Area, California." *California Department of Water Resources* (Menlo Park, California: 1966) <http://pubs.usgs.gov/of/1966/0021/report.pdf>.
- "Di Giorgio Secures Controlling Interest in the Earl Company" *San Francisco Call*, Vol. 109, Num. 109, 19 March 191. <http://cdnc.ucr.edu/>
- De Roos, Robert William. *The Thirsty Land ; the Story of the Central Valley Project*. New York: Greenwood Press, 1968.
- "Delta-Mendota Canal: Evaluation of Groundwater Conditions & Land Subsidence." *United States Geological Survey, California Water Science Center*.
- Donnelly, William F. *American Economic Growth: The Historic Challenge*. Ardent Media, 1973.
- Downey, Sheridan. *They Would Rule The Valley*. Kessinger Publishing, LLC, 2010.
- Eiselen, Elizabeth. "The Central Valley Project: 1947." *Economic Geography* 23, no. 1 (January 1, 1947): 22–31. doi:10.2307/141651.
- Ely, Richard Theodore. *Monopolies and Trusts*. The Macmillan Company, 1906. <http://archive.org/details/monopoliesandtr04elygoog>.
- Evans, Stefani. Photos of fruit and nut trees and dry hills in the San Joaquin Valley. Spring of 2015.

Ewing, Harris &. “Senator Sheridan Downey, Calif., 1940.” Still image, 1940.

<http://www.loc.gov/pictures/item/hec2009015638/>.

Jay Famiglietti, “How Much Water Does California Have Left?” *Los Angeles Times*, July 8, 2014.

“Farms and Farmland - The 2012 Statistical Abstract - U.S. Census Bureau.” Accessed October 13, 2014. https://www.census.gov/compendia/statab/cats/agriculture/farms_and_farmland.html.

Felde, Kitty and Viveca Novak, “The Politics of Drought: California Water Interests Prime the Pump in Washington” *Open Secrets.org: Center for Responsive Politics*. April 10, 2014. <http://www.opensecrets.org/news/2014/04/the-politics-of-drought-california-water-interests-prime-the-pump-in-washington/>.

“Final_Drought_Report_08182015_Full_Report_WithAppendices.pdf.” 2016. Accessed October 30. https://watershed.ucdavis.edu/files/biblio/Final_Drought%20Report_08182015_Full_Report_WithAppendices.pdf.

Flores, Christina. “They Rule the Valley: The Story of How Large Central Valley Landholders Became the Primary Beneficiaries of the Central Valley Project.” *UC Berkeley Library*, March 1, 2011. <http://escholarship.org/uc/item/7s79r340>.

Galloway, Devin and Francis S. Riley “San Joaquin Valley, California: Largest Human Alteration of the Earth’s Surface” *U.S. Geological Survey*. Menlo Park, CA. pubs.usgs.gov

Gates, Paul W. “Public Land Disposal in California.” *Agricultural History* 49, no. 1 (January 1, 1975): 158–78.

- George, Henry. *Our Land and Land Policy*. Edited by Kenneth C. Wenzer. East Lansing: Michigan State University Press, 1999.
- Goldschmidt, Walter Rochs. “As You Sow: Three Studies in the Social Consequences of Agribusiness. Reprint of 1947 Edition.
- Goodwyn, Lawrence. *Democratic Promise: The Populist Moment in America*. New York: Oxford University Press, 1976.
- Graham, Leland O. “The Central Valley Project: Resource Development of a Natural Basin.” *California Law Review* 38, no. 4 (October 1, 1950): 588–637. doi:10.2307/3477995.
- “Ground Water Atlas of the United States, Central Valley Aquifers” *United States Geological Survey*, Last modified February 9, 2009. <http://pubs.usgs.gov/ha/ha730/>
- Hanak, Ellen, Jay Lund, Ariel Dinar, Brian Gray, Richard Howitt, Jeffrey Mount, Peter Moyle, Barton Thompson, “Ch.1 Floods, Droughts, and Lawsuits: A Brief History of California Water Policy.” *Managing California’s Water From Conflict to Reconciliation*. San Francisco: Public Policy Institute of California, 2011.
- http://www.ppic.org/content/pubs/report/R_211EHR.pdf
- Harris and Ewing, Library of Congress Prints and Photographs Division Washington, D.C. 20540 USA <http://hdl.loc.gov/loc.pnp/pp.print>
- Hine, Robert V. and John Mack Faragher, *Frontiers: A Short History of the American West*. New Haven: Yale University Press, 2007.
- Hofstadter, Richard. *The Age of Reform: From Bryan to F.D.R.* New York: Vintage, 1995.
- Howitt, Richard, Duncan MacEwan, Josué Medellín-Azuara, Jay Lund, and Daniel Sumner,

“Final Drought Report08182015 Full Report with Appendices .pdf.” 2016. Accessed October 30.

https://watershed.ucdavis.edu/files/biblio/Final_Drought%20Report_08182015_Full_Report_WithAppendices.pdf.

Hundly, Norris Jr., *The Great Thirst: California and Water: A History*. Berkeley: University of California Press, 2001.

Hyatt, Edward. “The Central Valley Project of California.” *Journal (American Water Works Association)* 30, no. 3 (March 1, 1938): 389–401.

“Hunger Fact Sheet | California Association of Food Banks.” 2016. Accessed November 6.

<http://www.cafoodbanks.org/hunger-factsheet>.

Igler, David. *Industrial Cowboys: Miller and Lux and the Transformation of the Far West*. Berkeley: University of California Press, 2001.

Interior, United States Dept of the. *Decisions of the Department of the Interior and the General Land Office in Cases Relating to the Public Lands*. U.S. Government Printing Office, 1892.

Johnson, David Alan . *Founding the Far West: California, Oregon, and Nevada, 1840-1890*. Berkeley: University of California Press, 1992.

Kahrl, William. *Water and Power: The Conflict Over Los Angeles*. Berkeley: University of California Press, 1982.

Kirkendall, Richard S. “Social Science in the Central Valley of California: An Episode” *California Historical Society Quarterly*, Vol. 43, no. 3, (Sept. 1946)

- Knoesen, Emma C. and Rachael E. Goodhue. "How California Farms Measure Up in the 2012 Census of Agriculture: Smaller in Size with Higher Value of Production ." ARE Update 17(5)(2014):5-8. University of California Giannini Foundation of Agricultural Economics.<http://giannini.ucop.edu/publications/are-update/issues/2014/17/5/how-california-farms-meas/>
- Krieger, Lisa M. "California Drought: San Joaquin Valley sinking as farmers race to tap aquifer", *San Jose Mercury News* (San Jose, California), March 29, 2014.
- Lee, Lawrence B. "California Water Politics: Opposition to the CVP, 1944-1980." *Agricultural History* 54, no. 3 (July 1, 1980): 402–23.
- Letey, John. "Soil Salinity Poses Challenges for Sustainable Agriculture and Wildlife." *California Agriculture* 54, no. 2 (March 2000): 43–48. doi:10.3733/ca.v054n02p43.
- Lauck, Jon. "American Agriculture and the Problem of Monopoly". *Agricultural History* 70 (2). Agricultural History Society: 1996. pp. 196–215. <http://www.jstor.org/stable/3744533>.
- Madrigal, Alexis C. "American Aqueduct: The Great California Water Saga." *The Atlantic*, February 24, 2014. <http://www.theatlantic.com/features/archive/2014/02/american-aqueduct-the-great-california-water-saga/284009/>.
- Management Landscapes FRAP Maps. *Department of Forestry and Fire Protection*. State of California, 2014. <http://frap.fire.ca.gov/>
- "Map of California to Accompany Printed Agreement of S. O. Houghton as to the Rights of the Southern Pacific R.R. Co. of Cal. to Government Lands under Acts of Congress Passed July 27, 1866 and March 3, 1871 Made before the Committee of the Judiciary of the Senate and Ho. of Reps. in May 1876." Map. Accessed February 22, 2016. <https://www.loc.gov/resource/g4361p.rr005680/>.

McWilliams, Carey. *California: The Great Exception*. Berkeley: University California Press, 1999.

“Modesto Bee Heavily Biased in Water Discussion Says Vance Kennedy.” *Eye On Modesto*.

Accessed October 9, 2014. <http://eyeonmodesto.com/2013/04/30/modesto-bee-heavily-biased-in-water-discussion-says-vance-kennedy/>.

Moehring, Eugene. *Urbanism and Empire in the Far West, 1840-1890*. Las Vegas: University of Nevada Press, 2004.

Morrison, Patt. “Jay Famiglietti’s Mission: To Rescue Us from Our Bad Water Habits.” *Los Angeles Times*, February 19, 2014. <http://articles.latimes.com/2014/feb/19/opinion/la-oe-morrison-famiglietti-20140219>.

Mount, Jeffery and Ellen Hanak, “Just the Facts: Water Use in California” *Public Policy Institute of California*, July 2016.
http://www.ppic.org/main/publication_show.asp?i=1108.

Nelson, Diane. “Farmland May Provide Key To Replenishing Groundwater,” *UC Davis College of Agricultural and Environmental Sciences*. University of California, Davis. Sep 09, 2015. <http://www.caes.ucdavis.edu/>

“New Poverty Data: A Closer Look at California’s Food Insecurity and Poverty | California Association of Food Banks.” 2016a. Accessed November 6.
<http://www.cafoodbanks.org/blog/new-poverty-data-closer-look-california%E2%80%99s-food-insecurity-and-poverty>.

Ohman, Jack. “The Scarlet Letter.” *The Sacramento Bee*, 2016. Accessed October 20.
<http://thecomicnews.com/edtoons/2015/0408/california/04.php>.

- Philpot, Tom. "A Reflection on the Lasting Legacy of 1970s USDA Secretary Earl Butz," *The Grist*, February 8, 2000. <http://grist.org/article/the-but-z-stops-here/>
- Pisani, Donald J. *From the Family Farm to Agribusiness: The Irrigation Crusade in California, 1850-1931*. 1st Edition edition. Berkeley: University of California Press, 1984.
- . "Land Monopoly in Nineteenth-Century California." *Agricultural History* 65, no. 4 (October 1, 1991): 15–37.
- Reisner, Marc. *Cadillac Desert: The American West and Its Disappearing Water, Revised Edition*. Revised edition. New York, N.Y., U.S.A: Penguin Books, 1993.
- Romero, David Ezra. "Salt Is Slowly Crippling California's Almond Industry," *The Salt, KNPR*. July 24, 2015.
- "The Rosedale Colony" Bakersfield Magazine, August 11, 2015.
<http://bakersfieldmagazine.net/2015/08/the-rosedale-colony/>.
- Sabalow, Ryan. "Tensions, threats as California's New Groundwater Law Takes Shape," *The Sacramento Bee*, November 21, 2015.
<http://www.sacbee.com/news/state/california/water-and-drought/article45802360.html>
- "San Joaquin River Restoration Program," *California Department of Water Resources*.
Last modified August 4, 2009. <http://www.water.ca.gov/rivers/sanjoaquin/program/>
- Seckler, David, ed. *California Water: A Study in Resource Management*. Berkeley: University of California Press, 1972.
- Service, Robert F. "California's Water Crisis: Worse to Come?" *Science*, New Series, 323, no. 5922 (March 27, 2009): 1665.

Sorvino, Chloe. "America's Nuttiest Billionaire Couple: Amid Drought, Stewart and Lynda Resnick Are Richer Than Ever," *Forbes*. November 23, 2015.

<http://www.forbes.com/sites/chloesorvino/2015/11/04/americas-nuttiest-billionaire-couple-amid-drought-stewart-and-lynda-resnick-are-richer-than-ever/3/#55c527125ef7>

Stanley, Eduardo. "California Farm Workers Stuck Between Poverty And Neglect, Suffer From Low Wages And Lack Of Organization," *The Huffington Post*, Updated Oct 10, 2011.

http://www.huffingtonpost.com/2011/08/10/california-farm-workers-low-wages_n_923941.html

Statistical Report / California. State Board of Agriculture., n.d.

<http://hdl.handle.net/2027/uc1.b3535334>.

Taylor, Paul S. "Central Valley Project: Water and Land." *The Western Political Quarterly* 2, no. 2 (June 1, 1949): 228–53. doi:10.2307/441998.

———. "Excess Land Law on the Kern?: A Study of Law and Administration of Public Principle vs. Private Interest." *California Law Review* 46, no. 2 (May 1, 1958): 153–84. doi:10.2307/3478638.

———. "The 160-Acre Water Limitation and the Water Resources Commission." *The Western Political Quarterly* 3, no. 3 (September 1, 1950): 435–50. doi:10.2307/443354.

Thompson, Edward Jr. "California Agricultural Land Loss & Conservation: The Basic Facts" *American Farmland Trust*, 2009. www.farmland.org.

United States. Congress. "Will the Family Farm Survive in America? : Joint Hearings before the Select Committee on Small Business and the Committee on Interior and Insular Affairs, United States Senate, Ninety-Fourth Congress, First Session," 1976 1975.

United States Department of the Interior. *Landownership Survey on Federal Reclamation Projects*, 1946. <http://archive.org/details/landownershipsur00unit>.

“USDA Economic Research Service - California Drought 2014: Crop Sectors.” Accessed October 6, 2014. http://www.ers.usda.gov/topics/in-the-news/california-drought-2014-farm-and-food-impacts/california-drought-2014-crop-sectors.aspx#.VDMmD_ldXX4.

“USDA Economic Research Service - California Drought 2014: Farms.” Accessed October 6, 2014. <http://www.ers.usda.gov/topics/in-the-news/california-drought-2014-farm-and-food-impacts/california-drought-2014-farms.aspx#.VDMmQfldXX4>.

Vanderwarker, Amy. “Central Valley Water Woes.” *Race, Poverty & the Environment* 16, no. 2 (October 1, 2009): 72–74.

Vossen, Paul. “California Climate Zones for Growing Temperate Tree Fruits and Nuts” Growing Temperate Fruit and Nut Trees in the Home Garden. UC Davis, 2014
<http://homeorchard.ucdavis.edu/>

Waldschmidt-Nelson, Britta. “Henry Miller: The Cattle King of California.” *Immigrant Entrepreneurship: German-American Business Biographies, 1720 to the Present*. German Historical Institute, September 5, 2013.
<http://www.immigrantentrepreneurship.org/entry.php?rec=153>.

“Well Levels Drop around the County as Drought Presses on.” *Davis Enterprise*. Accessed October 7, 2014. <http://www.davisenterprise.com/local-news/ag-environment/well-levels-drop-around-the-county-as-drought-presses-on/>.

Wenzer, Kenneth C Ed., Henry George, *Our Land and Land Policy: Speeches, Lectures, and Miscellaneous Writings*. East Lansing: Michigan University Press, 1999.

- “Whither California Agriculture: Up, Down or Out? Some Thoughts about the Future.” III. The Changing Structure of California Agriculture, Statistics, and Financial Indicators: 1950–2000. *The Giannini Foundation of Agricultural Economics, University of California*. <http://giannini.ucop.edu/pdfs/giannini04-1c.pdf>
- Wilson, Edwin E, Marion Clawson, United States, and Bureau of Agricultural Economics. *Agricultural Land Ownership and Operation in the Southern San Joaquin Valley*,. Berkeley, Calif., 1945.
- Worster, Donald. *Rivers of Empire: Water, Aridity, and the Growth of the American West*. _____. *Dust Bowl: The Southern Plains in the 1930s*. New York: Oxford University Press, 1979.
- Yen, Hope. “Cycle of poverty in San Joaquin Valley may offer clues to future of U.S.” *Lodi News-Sentinel*. Posted: Tuesday, June 11, 2013. <http://www.lodinews.com>
- Zamora, Amanda, Lauren Kirchner, and Abrahm Lustgarten, “California’s Drought Is Part of a Much Bigger Water Crisis. Here’s What You Need to Know” *Propublica*. June, 2015. www.propublica.org/article/california-drought-colorado-river-water-crisis-explained.

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