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# Waters Resist

## Modernity, Aridity, and the Fight Over the Orme Dam

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Modern ideology strips water of its sociocultural and political contexts, reducing it to the scientific abstraction of H<sub>2</sub>O. This reductivist approach to water has erased longstanding ontologies and physically transformed America's aridlands to advance modern political and economic agendas. By studying the 1947 proposal for the Orme Dam and the Yavapai Nation's forty-year resistance to it, this paper reveals the interconnected relationship between modern ideology and the design, development, and management of the environment. I also suggest that the inclusion of alternative ontologies can inspire the design of more just and resilient environments.

**Keywords:** landscape, infrastructure, critical theory

On the edge of the Fort McDowell Yavapai Nation reservation, at the confluence of the Salt and Verde Rivers, a battle over a dam project raged for nearly forty years. Between 1947 and 1981, the Bureau of Reclamation, backed by state and federal legislators, lobbied for the construction of the Orme Dam in central Arizona despite evidence that the project would dispossess the Yavapai Nation from their reservation lands and destroy the vital riparian habitat of endangered flora and fauna. Proponents of the dam argued not only that the Orme Dam was central to the growth of Phoenix and its economy but also that the infrastructure would help ensure

Arizona's claim to every drop of its apportioned share of Colorado River water.

The dam's proposal and the decades-long battle over its construction is one powerful example in which modern ideologies of water take physical form, triggering patterns of social injustice and ecological devastation. In this paper, I analyze the ways in which modernity has fundamentally shaped the development of America's aridlands, and I suggest that the inclusion of alternative ontologies can inspire the design of more just and environmentally resilient places. The dam's proposal is confirmation that the definition of water is neither predetermined nor given; it is constructed by, contingent on, and fundamentally

rooted in modern ideology.<sup>1</sup> Further, the Yavapai Nation's successful resistance to the dam's construction is proof of the agency and political validity in other ways of knowing water, especially those ways that challenge the modern episteme.<sup>2</sup> Orme Dam's proposal is an important precedent for those designing environments wherein implicit assumptions, politics, and ethics manifest themselves physically for the communities they affect. The struggle over the Orme Dam suggests that designers can use their influence over the built environment to substantiate the significance of and possibilities for incorporating alternative historical, cultural, and philosophical perspectives into broader decision-making processes.

The notion of modernity contains a theoretical and conceptual ideology that has, for the last two hundred years, permeated nearly all sociospatial practices in the Western world, including that of environmental design.<sup>3</sup> Modernity prioritizes scientific reasoning, objectivity, instrumental rationality, and mathematical formulae as the mechanisms to make sense of the world conceptually and to establish its spatial logic. Within this formulation, water becomes "modern water," a term to describe the role of modern ideology in the construction and reification of conceptions of water, wherein water is reduced to its chemical compound of H<sub>2</sub>O, and its flows and fluxes are described through the systematized hydrologic cycle.<sup>4</sup> The discipline of hydrology structures knowledge to pursue "universally applicable 'laws' of nature based upon practices

that guarantee accuracy and lack of political bias.”<sup>5</sup> In the environmental design fields, where scientific methods and metrics are revered and accounted for in design thinking and processes, a critical engagement with the underlying assumptions embedded within the sciences is required.

Under systems of modern thought, governmental bureaucracies and institutions employ the logics of empiricism and scientific reasoning to radically simplify, quantify, and standardize complex environments in ways that benefit their political agendas and promote economic development.<sup>6</sup> Geographer Kenneth Olwig explicates the deep connections between government, economy, and environmental management when he writes that “landscape is the expression of the practices of habitation through which the habitus of place is generated and laid down as custom and law upon the physical fabric of the land. A landscape is thus a historical document containing evidence of a long process of interaction between society and its material environs.”<sup>7</sup> With a specific focus on water landscapes, Olwig’s statement is a reminder that water’s flows and fluctuations are the result of water as an actant<sup>8</sup> on the broader landscape and the consequences of other social, political, economic, and environmental processes acting upon water.

Over the last two hundred years, these sociopolitical forces have worked to convert arid America into a bountiful agricultural landscape through the standardizing, privatizing, and diverting of water. The modernist belief that profitability and efficiency benefit more people than they harm has resulted in the proliferation of hydroelectric dams, pumps, reservoirs, and concrete aqueducts, producing social inequities and asymmetric power dynamics. These infrastructures, made to appear as if borne from pure objectivity and rationality, are instead formed from political agendas, economic potentials, legal

frameworks, and social values. Understanding water exclusively through this modern ideology falsely abstracts it; inadequately simplifies the complex sociocultural, political, economic, and legal systems that govern its movement through the world; and neglects to acknowledge the weaponization of water to exert control and power in arid America. Further, technodeterministic and reductivist approaches to water erase and delegitimize longstanding ontologies in order to advance modern agendas. Incorporating alternative views on water has the potential to produce more equitable systems of water management and aridland development. Thus, this paper reveals the interconnected relationship between modern ideology and the design, development, and management of the environment.

#### **Remembering and Forgetting Water**

To many, the very idea of defining, theorizing, or historicizing water may seem unnecessary. This is because, under modernist ideology, water has been made to appear conceptually fixed, scientifically defined, and universally understood.<sup>9</sup> In doing so, water is carefully controlled, measured, and regulated. Yet free-flowing waters move according to topography, vegetation, and soil permeability. As they pass through the landscape, they indelibly mark and form it—a process Toni Morrison calls “remembering.” She writes, “You know, they straightened out the Mississippi River in places, to make room for houses and livable acreage. Occasionally the river floods these places. ‘Floods’ is the word they use, but in fact it is not flooding; it is remembering. Remembering where it used to be. All water has a perfect memory and is forever trying to get back to where it was.”<sup>10</sup>

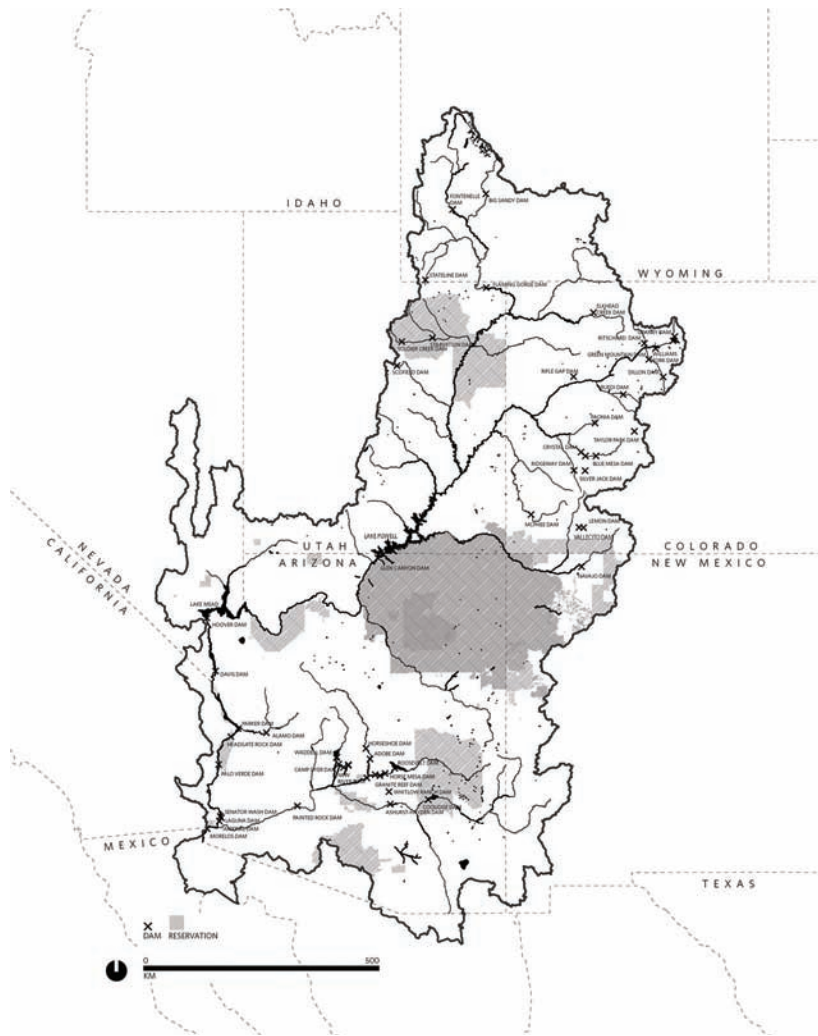
Morrison’s description reiterates that the names and labels assigned to things shape the way we perceive them and, in turn, how those interpretations physically

materialize in the landscape. The way we categorize the landscape through names, concepts, and physical structures is codified with values and politics, whether overtly or implicitly. Ascribing a particular term to the process of water flowing onto land that is usually dry suggests that “flooding” is an abnormal event rather than an inherent one. The connotation that inundation is somehow dangerous, unproductive, or unnatural helps to warrant infrastructures and policy that inhibit water’s “remembering.” It follows then that these infrastructures and policies are active participants in water’s “forgetting.”

To propose alternatives to the technodeterministic approaches offered by the natural sciences and engineering, environmental design disciplines must invent new ways to describe and represent the landscape. The term “flood” conflates the inundation that occurs as part of water’s natural cycle with the result of water resisting modern control of it. Separating these two actions, remembering and flooding, allows for a subtle but potentially potent shift in the ways water landscapes are perceived and constructed.

#### **Water as Resource: Reclaiming Aridlands**

The settler migration to and cultivation of aridlands has historically been entwined with modernist conceptions that nature and its ecologies can, and should, be controlled and restrained through rational technological advancements and in service of the growth of a nation’s population and economy. Vis-à-vis this historical approach, nature and society are placed in stark opposition to one another, and natural elements are viewed as natural resources. The term “natural resources” implies a utilitarian ethos wherein all the Earth’s matter is an asset available for human consumption and commodification. In 1947, Gifford Pinchot, first chief of the United States Forestry Service, reinforced this point when he



**Figure 1.** Damming the Colorado River Watershed. Nearly every waterway in the Colorado River watershed is controlled through hydraulic infrastructures that carefully regulate the pace, direction, and quantity of water moving through region. (Image by author.)

Aztecs ever had in their palmy days in Mexico and Central America. Irrigation is the magic wand which is to bring about these great changes.<sup>12</sup>

Noble’s prediction proved prescient, and the implementation of large-scale irrigation technologies, which relied on the assumption of water as a natural resource, supplanted all other strategies for living with and in aridlands.<sup>13</sup> Throughout the modern era, powerful political backing and major financial investment has continued to spur the construction of large, highly complex networks of irrigation infrastructure. Initial efforts to irrigate the aridlands had primarily been private enterprises but were largely unsuccessful in creating Noble’s agrarian empire. As a result, when Congressman Francis Newlands proposed to invest profits from the sale of public lands into a federal irrigation fund, President Teddy Roosevelt enthusiastically championed the policy.

Roosevelt believed that Newlands’s National Reclamation Act, and the resulting Bureau of Reclamation, was the first step in preventing western water to “run to waste” by harnessing it in hydraulic infrastructures and directing it toward more efficient and productive use.<sup>14</sup> From this modern perspective, an undammed river delivered all its waters to the sea, thus wasting precious resources needed for agriculture and limiting economic development, population growth, and the reclamation of the aridlands. Using the term “reclamation” to indicate both the implementation of hydraulic infrastructure and the federal agency to oversee it was intentional for two reasons that upheld modernist ideology: first, the word denotes an improvement on land for productivity; second, the word has strong associations with “a moral discourse of civilizing nature, of ordering the world and making it economically productive, and

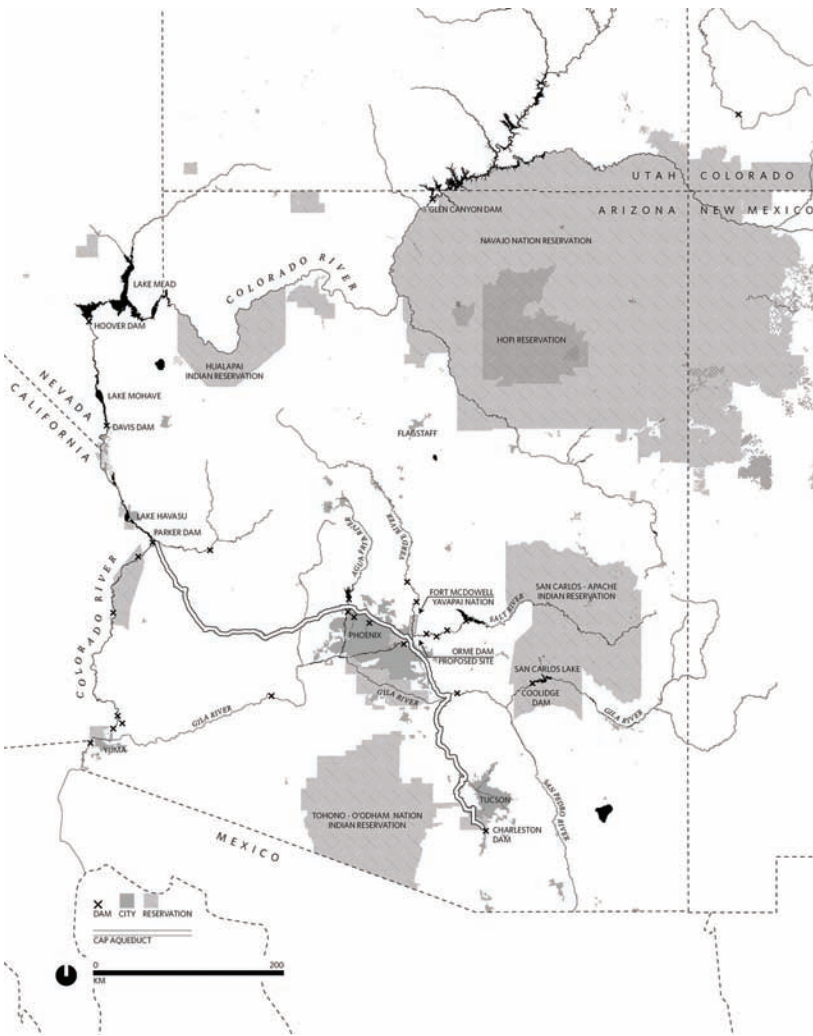
famously declared, “There are just two things on this material earth—people and natural resources.”<sup>11</sup> Pinchot’s proclamation signaled modern America’s approach to the environment—that the environment’s value is derived exclusively from its ability to support a growing, market-driven economy.

In efforts to generate profitability in, for, and from aridlands, America’s official response to its dry regions has been to approach aridity as a condition in need of amelioration—a problem to be fixed through modern processes of scientific rationality and technodeterminism. In 1893, Secretary of the

Interior John W. Noble expressed the economic and political desire to overturn the arid ecology when he said,

A hundred years hence these United States will be an empire, and such as the world never before saw, and such as will exist nowhere else upon the globe. In my opinion the richest portion of it, and a section fully as populous as the East, will be in the region beyond the Mississippi. All through that region, much of which is now arid and not populated, will be a population as dense as the





**Figure 2.** Central Arizona Project in context. The federal approval of the Central Arizona Project in 1968 solidified Arizona's powerful role in the control of Colorado River water. As part of CAP, water is brought into Arizona via a 336-mile concrete aqueduct that works in coordination with hydro-electric pumps, reservoirs, holding ponds, and diversion channels. Along the way, water passes over, under, and through Indigenous lands, urbanized areas, and agricultural fields. (Image by author.)

thus [reclamation] was the basis of a civilized society.”<sup>15</sup>

Efforts toward reclamation ushered in an era of federal water infrastructure projects aimed at realizing modern ideas of water as a resource through technocratic solutions to scarcity. Subsequently, the National Reclamation Act of 1902 allocated funds to build reservoirs to store surface water flow, canals to convey water to farmers and ranchers, and ditches to drain excess water. The transformation of the Colorado River watershed best typifies how the conception of water

as a resource in America's aridlands physically manifested as an extensive network of infrastructures. Despite its modest size in terms of volume, as the only meaningful “natural” source of water in the dry region, the Colorado's cultural, economic, and political significance was, and continues to be, the arid region's most important geographic feature.

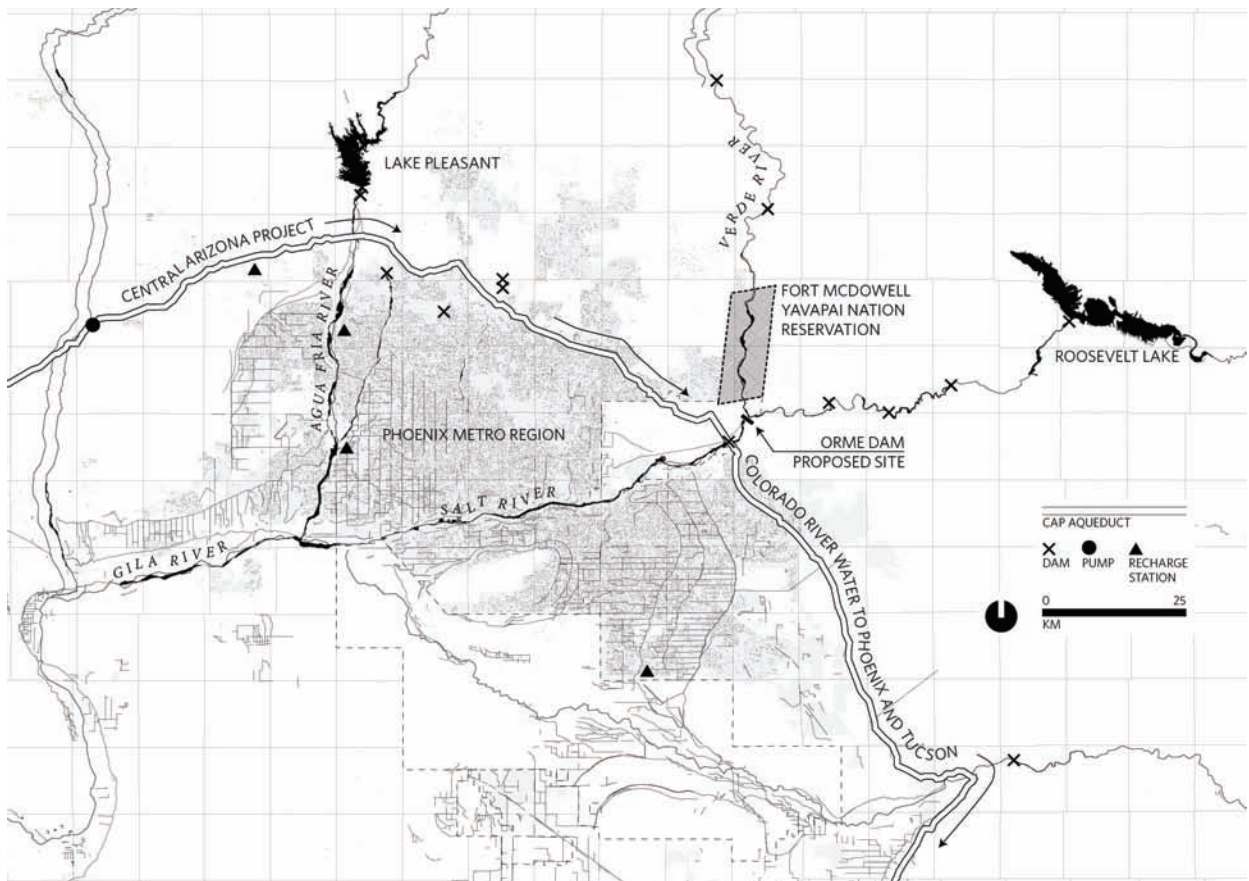
**Modern Water in Action: The Central Arizona Project and Orme Dam**

Before it was controlled through complex systems of hydraulic engineering, the Colorado River

had been notorious for its erratic nature. In the spring, the river was wild, violent, and seemingly uncontrollable, while in dry seasons, the flow could be little more than a trickle. With modern advancements in hydraulic engineering and the financial backing of the Bureau of Reclamation, the Colorado became measurable, predictable, and highly lucrative.<sup>16</sup> With the construction of the Hoover Dam in 1935 and the eighteen subsequent dams that followed, hundreds of miles of concrete aqueducts and diversion canals, reservoirs, pumping plants, and power generation stations allowed the Colorado River to generate reliable and inexpensive irrigation, electricity, water storage, and flood control (Figure 1).

Precisely because of the Colorado's undeniable role in regional and national aspirations for economic growth, its waters were and continue to be the subject of tangled battles among diverse interest groups—between the United States and Mexico over national water rights; among western states that share point sources; among urban centers, conservationists, and the agriculture industry over how water should be distributed; and between farmers upstream and down. At all levels of policy and for nearly a century, efforts to allocate Colorado River water, to advance economic interests, and to control labor and resource profitability have been met with contradictory agendas from governments, Indigenous nations, corporations, advocacy organizations, and individuals.

Today, the river and its tributaries are credited with supplying water to nearly forty million people in seven US states, irrigating over 5.5 million acres of agricultural land, producing over four billion kilowatt hours of energy per year, and attracting more than seven hundred thousand visitors annually.<sup>17</sup> In the manipulation and control of Colorado River water, the hydrological sciences have prevailed as the



**Figure 3.** Orme Dam. 30 miles north of the Phoenix metropolitan area, the site of Orme Dam was strategically selected in an effort to control the Verde and Salt Rivers, the most important rivers in the region. The proposed site was located at the edge of both the Fort McDowell Yavapai Nation and the Salt River Pima Maricopa Indian Community reservations. (Image by author.)

primary means of legitimizing its control. Texas congressman Jim Wright expressed the necessity to control water in the aridlands when he announced in 1977, “Water is man’s most indispensable commodity and man’s most useful servant. Trapped, harnessed, and directed by human intelligence, it runs our mills and grows our crops; it powers our machinery and lights our homes; cleanses our waste and moves our commerce. Unharnessed and left to rampage, it can inundate our cities and our farms, destroy our homes and our hopes, afflict us with disease and death, and carry away to the seas the fertile topsoil upon which our vaunted civilization rests.”<sup>18</sup>

Wright’s statements represented how economic potential and social progress dictated federal and state

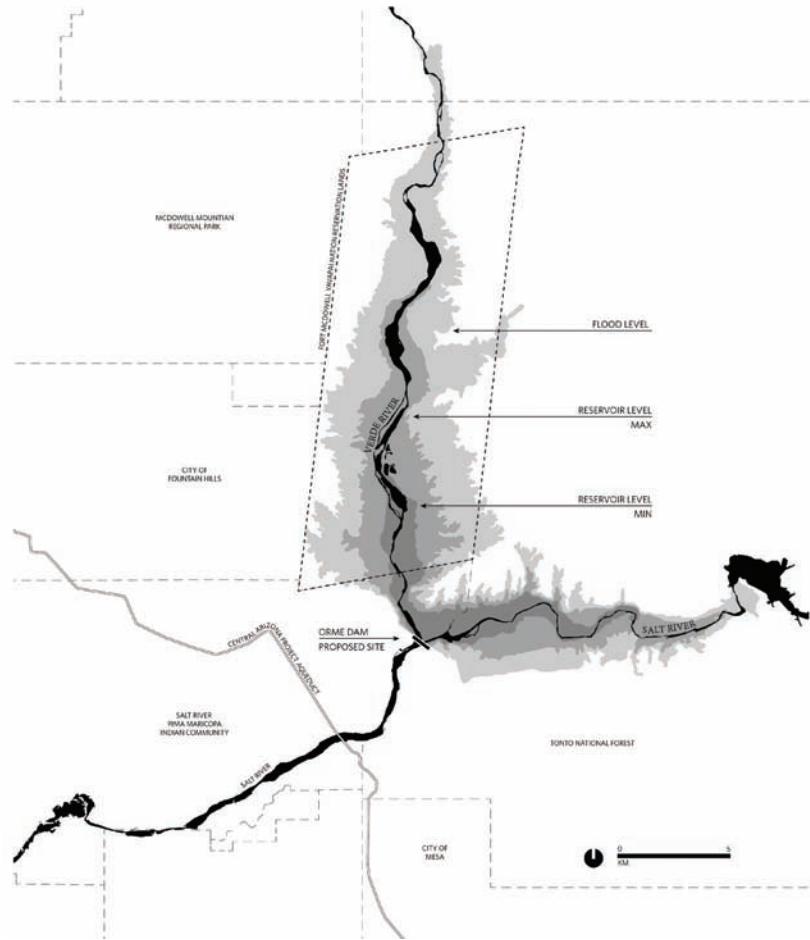
water policies—a practice that continues today. Such modern conceptions of water were embedded within the political and spatial plans for the Central Arizona Project (CAP) and Orme Dam. Initial plans for CAP proposed channeling Colorado River water from Lake Havasu in northwest Arizona to the Phoenix metropolitan area and then to Tucson in the southern part of the state through a 336-mile-long aqueduct and a series of pumps, recharge basins, dams, and reservoirs. With an estimated price tag of USD 1.2 billion, CAP was approved in 1968, stewarded by Arizona congressman Carl Hayden and authorized by President Lyndon B. Johnson (Figure 2).<sup>19</sup> The Orme Dam, one of CAP’s four proposed multipurpose

dams, was to be strategically located at the confluence of the Salt and Verde Rivers, which would allow one structure to efficiently control, channelize, and commodify the waters of the Salt, Verde, Agua Fria, and Gila Rivers (Figure 3).

As early as 1890, the Bureau of Reclamation had its sights set on this very same site and revived the proposal in 1947 in response to mounting pressure from Arizona leaders who believed it to be key for boosting economic growth and development in Phoenix.<sup>20</sup> Under the approved plan, Orme would store CAP water for managed distribution to the Phoenix metropolitan area, control the flow rate and speed of Salt and Verde waters, and offer recreational facilities on the reservoir behind the dam.<sup>21</sup> The dam was to

be one mile long and 190 feet high, impounding nearly one million acre-feet of floodwater and providing 350,000 acre-feet of storage.<sup>22</sup> But the Orme Dam would also inundate nearly two-thirds of the Yavapai Nation's reservation lands at Fort McDowell, forcing their relocation and the loss of between twelve thousand and fifteen thousand acres of the Yavapai's irrigated lands, as well as destroying the historic Fort McDowell, 120 prehistoric Hohokam sites, and the Yavapai tribal cemetery (Figure 4).<sup>23</sup> Anticipating the consequences to their livelihood, the Yavapai Nation opposed construction of the Orme Dam.

The same year that Wright described water as “man’s most useful servant,” Arizona senator Barry Goldwater famously warned that without CAP, “this Valley is going out of business.”<sup>24</sup> Both Wright and Goldwater emphasized an economic argument for water infrastructure in the aridlands, despite continued predictions for the long-term and devastating social and ecological consequences for the Yavapai Nation. They were not alone; in 1975 an editorial published in the *Arizona Republic* concluded, “It is inconceivable that any court would fail to place the needs of more than a million people above those of 456 people.”<sup>25</sup> The 1976 Federal Environmental Impact Statement of Orme Dam, the first official document to explicitly or indirectly reference the Yavapai Nation, stated, “The fact that the Fort McDowell Yavapai society was able not only to withstand any but all of these threats is indicative of the presence of vigorous survival elements in its culture.”<sup>26</sup> The report used the Yavapai’s “vigorous survival” as political leverage to advocate for Orme’s construction by directly referencing the endurance of the Yavapai Nation in the face of repeated attempts to disenfranchise and dispossess them of their ancestral lands, attempts that had been perpetrated by the federal government.<sup>27</sup>



**Figure 4.** Flooding the Yavapai Nation. The proposed Orme Reservoir would have flooded nearly two-thirds of the Yavapai Nation reservation lands. Despite being offered compensation, the Yavapai resisted the construction of Orme Dam for nearly 40 years and successfully impeded it in 1981 (Image by author, after Bureau of Reclamation, 1972.)

### Resisting Modern Ontologies: The Second Trail of Tears

Despite modernity’s reliance on stark divisions between what is “natural” and what is “cultural,” human-made transformations in the environment unavoidably produce new socionatural assemblages and conditions.<sup>28</sup> In the aridlands, water is a socionatural element that intersects issues of justice and equity. In September 1981, after nearly forty years of opposing the Orme Dam, one hundred members of the Yavapai Nation marched for three days in protest from the Fort McDowell Yavapai Nation reservation to Arizona’s capitol building in Phoenix, thirty miles

south (Figure 5). Upon arrival, they delivered a handwritten letter to Governor Bruce Babbitt, detailing their opposition to the dam and explicating their connections to the land that Orme would inundate. Named the “Second Trail of Tears,” the march reenacted the earlier, involuntary Trail of Tears, which had been instrumental in the brutal resettlement of the Yavapai Nation in 1875. The original march from Camp Verde to the San Carlos Apache Reservation had forced nearly 1,400 Yavapai people to walk approximately two hundred miles over nearly two weeks, in blistering winter weather and over rugged terrain. Ceahanna, a Yavapai



woman who had survived the trek as a child, wrote the following of her experience: “We were many moons on the trip. With bleeding feet, weary in body and sick in heart, many wanted to die. Many did die. Rations were meager. . . . We were not allowed to take the time and strength to bury the dead, and who would want to bury the dying? We waded across many streams. . . . Some of the weaker ones washed away down the river to a watery grave. Those of us who did survive the crossing were more like drowned rats than human beings.”<sup>29</sup>

The original Trail of Tears remains a pivotal event in Yavapai oral history, and the Second Trail of Tears highlighted the conspicuous parallels between the earlier forced resettlement and the impending one if the Orme Dam was constructed. On recounting the parallels between the first and the second Trail of Tears, sociologist Wendy Nelson Espeland argues that the reenactment was “more than an example of clever political strategy, an astute manipulation of powerful images and symbols. This march was part of a complex process of the symbolic appropriation and reinterpretation of their past.”<sup>30</sup> By October 1981, less than a month after the march, the Yavapai succeeded in impeding the construction of the Orme Dam. The Yavapai Nation’s successful protest of the dam affirms assertions that resistance to water’s participation in injustice can be successful, even in the most totalizing hegemonic contexts.

#### **Alternative Ontologies and Commensurate Exchange**

As part of their proposal for the Orme Dam, the Bureau of Reclamation included land concessions and financial remunerations to the Yavapai Nation. The bureau’s plan was based on what they believed to be a commensurate exchange of land, water, and money—in exchange for their lands, the Yavapai Nation would be financially compensated,

resettled, and given an additional 2,500 acres of nearby land.<sup>31</sup> From the perspective of the Yavapai Nation, however, the bureau’s proposal was not an equal or fair exchange, and because the bureau did not recognize or even acknowledge that the Yavapai people do not share the same ontological framework for understanding land and water, these differences proved irreconcilable. The bureau’s proposal operated under two false assumptions: first, that all lands are equivalent in material, spiritual, and cultural terms for the Yavapai Nation; second, that any additional reluctance to the proposal could be assuaged through financial compensation.

The Yavapai Nation had struggled for the past 150 years to keep their lands, repeatedly resisting forced resettlement and dispossession. Most Yavapai understand their relationship to land and water as temporally and geospatially specific.<sup>32</sup> Returning to Olwig’s declaration that landscape is a historical document makes clear the importance of the lands at Fort McDowell in the memory and creation of Yavapai history. One member of the Yavapai Nation told Nelson Espeland, “It’s about still being here. It’s about this land. A lot of things have happened here. We remember with the land.”<sup>33</sup> Another member of the Yavapai Nation noted, “The Indian knows that his land and life is intertwined, that they are one unit. Without the land, the Indian cannot survive and without the Indian the land cannot be land, because the land needs to be taken care of in order to survive life.”<sup>34</sup>

Conceived through this ontological framework, the “cost” of losing their lands at Fort McDowell could not be calculated through an empirical analysis of water rights, land use, property value, or any other metric to measure the economic value of their environment. Yavapai elder Hiawatha Hood reiterated the incompatibility

between the Yavapai conception of land ownership and the modernist, economic perspective held by the United States when he said, “You could fill this whole room with money and I’d still want land.”<sup>35</sup> Compounding the difficulties of establishing commensurate metrics by which to evaluate the Orme Dam was a widespread distrust among the Yavapai Nation for the federal government. Yavapai chairman Vincent Smith exclaimed, “They took away nine million acres from us; then they said we’ll give you this 24,000 acres and let you alone. Now they want to take half of that. My people are starting to think that they won’t stand by their word.”<sup>36</sup> The fight over the Orme Dam illustrates how worldviews and perceptions of nature shape the politics, ethics, and physical infrastructures of its transformation.

Once the Orme Dam proposal had been thwarted, an alternative plan was adopted in its stead.<sup>37</sup> Plan Six, the chosen alternative proposal, elevated the height of the Roosevelt Dam on the Salt River by seventy-six feet, modified the existing structure of the Stewart Mountain Dam on the Gila River, and constructed the New Waddell Dam on the Agua Fria River.<sup>38</sup> The story of the Orme Dam and the Yavapai Nation’s resistance to it reveals what historian Ron Schilling called “the interplay of politics, economics, technology, environmental activism, and tribal sovereignty in twentieth-century water issues.”<sup>39</sup> Further, the adoption of Plan Six suggests that even after the resistance had prevented construction of Orme at the confluence of the Salt and Verde Rivers, the modern ontology of water simply reinvented itself somewhere else.

Despite modernity’s prevailing influence over the environment, exposing modern ideologies as constructed, not predetermined, given, or universal, permits the recognition of other ontologies that ascribe value to land and



**Figures 5, 6, 7.** Resisting Orme Dam. In 1981, 100 members of the Yavapai Nations marched in protest from their lands on Fort McDowell to Arizona’s capital building in Phoenix. The walk, named “The Second Trail of Tears,” intentionally referenced the past and involuntary “Trail of Tears” of 1875 through which the Yavapai were forced into resettlement. (Published with permission from the Fort McDowell Yavapai Nation, September 26, 1981).

water. Alternative ontologies support Bruno Latour’s argument that no thing—person, object, or process—falls neatly into the categories of “nature” and “society” but rather moves between them as hybrids.<sup>40</sup> Thinking of all things as siconatural hybrids allows for a more nuanced approach to the environment that reflects biochemical processes and sociopolitical contexts.

### Competing Values of Water

The emergence of hydrology as an environmental science has had two prevailing and interrelated effects on the sociopolitical and spatial landscape of arid America. First, by representing water in terms of its “natural” circulation devoid of any sociopolitical context, the hydrologic cycle implies that water moves in a uniform, rational, and predictable manner. The natural state ascribed to water allows conditions of inundation or scarcity to be regarded as part of water’s “natural” cycle rather than as a result of society’s manipulations of the environment. Viewed through this lens, drought conditions have often provoked, modified, or intensified infrastructural systems to harness more water with more predictable frequency, rather than the drought signaling how human interventions have produced a shortage of water in the first place.<sup>41</sup> Second, the abstraction of water from its social and cultural contexts reinforces that water’s value is ultimately derived from its role in bolstering economic agendas. In the era of modern water management, technocrats have become the leading providers of environmental information for design interventions and planning processes. The resulting political and social power gained through these policies has been continually reinforced through perceptions of scientific neutrality, allowing social inequities that emerge from environmental policy to be dismissed. Scientific hydrology



bolsters water's role as a commodity to be bought, sold, regulated, and distributed according to market value and opportunity, even if the "wetting" of one place results in ecological or social desiccation in another. In the context of aridity, the movement of water to spaces of high economic potential (urban centers, sites of extraction, and agricultural landscapes) coincides with intensified concentrations of social and political power.<sup>42</sup> As a result, these infrastructures have not only continued to fundamentally change the way people occupy the aridlands but also necessitated a new class of technocrats who deploy the authority of hydrologic knowledge to radically reconfigure the relationship between water and society.<sup>43</sup>

Social processes are often excluded as points of consideration in environmental science research and in planning documents and policies. Instead, this research has primarily focused on assessing physical and ecological conditions as if the environment exists in isolation or can be neatly separated from its sociopolitical contexts. Understanding water requires ecological, cultural, and political dimensions; every drop of water is saturated with meaning and value. Premodern conceptions of water were multiple, mutually existent, and situated within temporal, geographic, and sociocultural contexts.<sup>44</sup> With modernity, water came under the calculating eye of the state through bureaucratic systems that standardized measurements and instituted new forms of accounting based on scientific rationality. Modernity marked a turning point in society's relationship to the environment when multiple ontologies of water were replaced with a singular, stripped down, rationally governable kind of water.

Once other ways of knowing water were made irrelevant or inconsequential because of prevailing modern conceptions of water,

water itself became hegemonic.<sup>45</sup> Building from a Gramscian definition of hegemony in the specific context of water, the Orme Dam can be understood as an example of "hydro-hegemony," in which water politics are deeply connected to and influenced by dominant power relations and authority.<sup>46</sup> Control over water, in a modern paradigm, is achieved through a battery of power tactics and strategies that rely on the public acceptance that water is a resource to be managed to benefit economic and political agendas.

Despite ever-present dryness in most of the American West, dependence on a continuous, reliable source of water, coupled with an established confidence in technodeterminism, has legitimized the engineering of almost every major water source for productivity, predictability, and profitability. Countless episodes across the American West corroborate Valerie Kuletz's observation that "those paying the highest price for advanced technologies are often those for whom technology offers the least benefits."<sup>47</sup> While these major irrigation projects continue to provide water and power to millions of people, sustain growth and economic development in urban centers, and feed millions of acres of agriculture, they also have been the source of social, cultural, and environmental injustices generating widespread social and economic unevenness.<sup>48</sup> It is this imbalance that leads historian Donald Worster to define the American West as an "increasingly coercive, monolithic, and hierarchical system, ruled by a power elite based on the ownership of capital and expertise."<sup>49</sup> The Orme Dam proposal and its anticipated sociocultural and environmental consequences on the Yavapai Nation illustrates how this unevenness upends the ideological divide between society and nature by providing evidence of the ways that the two are profoundly entwined and enmeshed.

### Imperatives for Design

Today, water remains a symbolic representation of opportunity, security, and power in the American West. The continued financial and political investments in large-scale irrigation projects expose cultural norms and suggest that implementing advanced engineering technologies is the only option for sustained economic and social progress in modern arid America. The Orme Dam is one example of many that reveals how implicit assumptions, politics, economics, and ethics about the environment manifest physically through the ways that space is ordered, planned, designed, and constructed.

Including nonmodern water ontologies into design considerations is a necessary practice in creating more just and resilient landscapes and cities. Overturning the normalization of modern water within the environmental design disciplines requires both incorporating stories like the Orme Dam into the canon of didactic case studies and critically engaging with nonmodern worldviews. In doing so, designers can acknowledge and evaluate their own assumptions throughout the design process. Further, this type of cultural design process allows for multiple and alternative ontologies to fundamentally guide decisions made about the environment through the ways that designers envision the landscape.

Landscape architect James Corner asserts that design is "a value-laden activity that not only reflects, but also constitutes the ethos of a culture."<sup>50</sup> The successful resistance to the Orme Dam demonstrates that designers have agency in changing both the physical form of the landscape and the perceptions of it by advocating for alternative historical, cultural, and philosophical contexts in decision-making processes. In designing spaces that directly respond to alternative ways of engaging with the environment, designers not only expand the

cultural ethos but also normalize these ontologies as valid considerations in the design process.

### Postscript

This paper was written from my office at the University of California, Berkeley, on unceded lands that were the ancestral territory of the Chochenyo Ohlone Nation prior to their forced and violent removal. I recognize that as a member of the Berkeley community, I benefit from the use and occupation of this land. I also acknowledge that I do not have a direct relationship with the Yavapai Nation, around whom much of this research is centered. Their successful resistance to the Orme Dam is a vital example to understand how insidious modern ontologies of water and land are in shaping socioenvironmental relationships and in providing an alternative to such relationships. My research depends on the scholarship of others to whom I am deeply grateful.<sup>51</sup>

### Author Biography

Danika Cooper is an assistant professor of landscape architecture and environmental planning at the University of California, Berkeley, where the core of her research centers on the geopolitics of scarcity, alternative water ontologies, and designs for resiliency in the world's arid regions. Her work incorporates historiographical research methods, landscape architecture design and visualization, and theories of urban infrastructure to evaluate and design arid landscapes for environmental and social justice. Specifically, Cooper is focused on finding alternatives to the prevailing nineteenth-century conceptions that the aridlands should be overturned through technocratic solutions and neoliberal politics. Her work has been published and exhibited around the world, and she has practiced in both the United States and India.

### Notes

- 1 See, e.g., Jamie Linton, *What Is Water? The History of a Modern Abstraction* (Vancouver: UBC Press, 2010); Jeremy J. Schmidt, *Water: Abundance, Scarcity, and Security in the Age of Humanity* (New York: NYU Press, 2017); Veronica Strang, *The Meaning of Water* (Oxford: Berg, 2004); and Astrida Neimanis, *Bodies of Water: Posthuman Feminist Phenomenology* (London: Bloomsbury, 2017).
- 2 There were many others involved in the resistance movement. For the purposes of this paper, I chose to highlight the specific role of the Yavapai Nation's successful impediment of the Orme Dam. There were, however, environmentalists, Arizona citizen groups, academic researchers, and other Indigenous nations and activists who all participated in the long battle against Orme. See Maria Kaika, *City of Flores*, 1st ed. (New York: Routledge, 2004), 11–26.
- 3 “Modern water” is a term developed by geographer Jamie Linton to describe the ways that modern ideology is embedded within the definition, perception, and manipulation of water. See Linton, *What Is Water?*
- 4 Timothy Forsyth, *Critical Political Ecology: The Politics of Environmental Science*, 1st ed. (London: Routledge, 2002), 92.
- 5 See Erik Swyngedouw, *Liquid Power: Contested Hydro-Modernities in Twentieth-Century Spain* (Cambridge, MA: MIT Press, 2015); and James C. Scott, *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed* (New Haven, CT: Yale University Press, 1999).
- 6 Kenneth Olwig, *Landscape, Nature, and the Body Politic: From Britain's Renaissance to America's New World* (Madison: University of Wisconsin Press, 2002), 226.
- 7 For the purposes of this paper, the term “actant” is used with Bruno Latour's definition in mind. Latour defines “actant” as those nonhuman, nonindividual entities that add “information on the relations of humans in a social and natural world.” See Bruno Latour, “On Actor-Network Theory: A Few Clarifications,” *Soziale Welt* 47, no. 4 (1996): 369–81.
- 8 See Linton, *What Is Water?*
- 9 Toni Morrison, “The Site of Memory,” in *Inventing the Truth: The Art and Craft of Memoir*, ed. William Zinsser (Boston: Houghton Mifflin, 1995), 98–99.
- 10 J. Baird Callicot, “The Implication of the ‘Shifting Paradigm’ in Ecology for Paradigm Shifts in the Philosophy of Conservation,” in *Reconstructing Conservation: Finding Common Ground*, ed. Ben A. Minteer and Robert E. Manning (Washington, DC: Island Press, 2003), 244.
- 11 Donald Worster, *Rivers of Empire: Water, Aridity, and the Growth of the American West* (Oxford: Oxford University Press, 1992), xi.
- 12 There is a long history of premodern and/or non-Western societies living in the aridlands with hydraulic engineering systems. Many of these societies are described in Donald Worster, *Shrinking the Earth: The Rise and Decline of American Abundance* (Oxford: Oxford University Press, 2016), 17–60.
- 13 Patrick Carroll, “Water and Technoscientific State Formation in California,” *Social Studies of Science* 42, no. 4 (August 2012): 497.
- 14 Carroll, 497.
- 15 In 1922, the seven states of the Colorado River watershed—Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming—negotiated the Colorado River Compact, which legally divided the watershed into an Upper and Lower Basin and apportioned each basin's 7.5 million acre-feet of water in perpetuity. The regulation of the Colorado water was a major step in securing the immense population growth and economic prosperity of the aridlands.
- 16 U.S. Department of the Interior, Bureau of Reclamation, *Colorado River Basin Water Supply and Demand Study: Executive Summary* (Washington, DC: U.S. Department of the Interior, Bureau of Reclamation, 2012).
- 17 Wendy Nelson Espeland, *The Struggle for Water: Politics, Rationality, and Identity in the American Southwest* (Chicago: University of Chicago Press, 1998), 10.
- 18 Espeland, 8.
- 19 See Ron K. Schilling, “Indians and Eagles: The Struggle over Orme Dam,” *Journal of Arizona History* 41, no. 1 (2000): 59–60.
- 20 See Rich Johnson, *The Central Arizona Project, 1918–1968* (Tucson: University of Arizona Press, 1977), 223.
- 21 See Schilling, “Indians and Eagles,” 58.
- 22 See Schilling, 58, 60.
- 23 Philip L. Fradkin, *A River No More: The Colorado River and the West* (Berkeley: University of California Press, 1996), 10.
- 24 Espeland, *Struggle for Water*, 210.
- 25 U.S. Department of the Interior, Bureau of Reclamation, *Orme Dam and Reservoir Environmental Statement, Draft INT DES 76-17* (Washington, DC: U.S. Department of Interior, Bureau of Reclamation, May 21, 1976), 126.
- 26 The Yavapai's legacy of social disenfranchisement and land dispossession is long. The Yavapai Nation was forcefully relocated in 1872 from their ancestral lands to Camp Verde after gold and copper were discovered in the San Francisco Mountains. Three years later, in 1875, they were moved again to the San Carlos reservation. In 1903, President Theodore Roosevelt approved the Fort McDowell reservation, forcing the Yavapai Nation to relocate for the third time in approximately twenty years. According to historian William R. Coffeen, the Yavapai population dwindled from 1,500 people in 1875 to five hundred in 1900. Detailed accounts of the Yavapai Nation's history of resettlement can be found in Timothy Braatz, *Surviving Conquest: A History of the Yavapai Peoples* (Lincoln: University of Nebraska Press, 2003); and William R. Coffeen, “The Effects of the Central Arizona Project on the Fort McDowell Indian Community,” *Ethnohistory* 19, no. 4 (1972): 345–77.
- 27 See Swyngedouw, *Liquid Power*.
- 28 Braatz, *Surviving Conquest*, 174–75.

- 30 Wendy Espeland, "Legally Mediated Identity" *Law & Society Review* 28, no. 5 (1994) 1154.
- 31 See Coffeen, "Effects of the Central Arizona Project," 357–59.
- 32 See Espeland, *Struggle for Water*, 200–205.
- 33 Espeland, 200.
- 34 Espeland, 201.
- 35 Schilling, "Indians and Eagles," 69.
- 36 Schilling, 65.
- 37 After much protest from members of the Fort McDowell Yavapai Nation reservation, environmentalists, and other advocacy groups, federal funding for the construction of the Orme Dam was officially revoked in 1981. In 1977, President Jimmy Carter and Secretary of the Interior James G. Watt had removed the Orme Dam and sixteen other federal water projects from the federal appropriations bill because of environmental or economic concerns.
- 38 See "Central Arizona Project, Project Webpage," U.S. Department of the Interior, Bureau of Reclamation, <https://www.usbr.gov/projects/index.php?id=504>.
- 39 Schilling, "Indians and Eagles," 57.
- 40 See Bruno Latour, *We Have Never Been Modern*, trans. Catherine Porter (Cambridge, MA: Harvard University Press, 1993), 10, 30.
- 41 Jamie Linton called this process "manufactured scarcities." See more in Linton, *What Is Water?*, 68–72.
- 42 See Janine MacLeod, "Water and the Material Imagination: Reading the Sea of Memory Against the Flows of Capital," in *Thinking with Water*, ed. Cecilia Chen, Janine MacLeod, and Astrida Neimanis (Montreal: McGill-Queen's University Press, 2013), 42.
- 43 See Worster, *Rivers of Empire*, 51.
- 44 See Astrida Neimanis, "Hydrofeminism: Or, On Becoming a Body of Water," in *Undutiful Daughters: New Directions in Feminist Thought and Practice*, ed. Henriette Gunkel, Chrysanthi Nigianni, and Fanny Söderbäck (New York: Palgrave Macmillan, 2012), 85–99; Julian S. Yates, Leila M. Harris, and Nicole J. Wilson, "Multiple Ontologies of Water: Politics, Conflict and Implications for Governance," *Environment and Planning D: Society and Space* 35, no. 5 (2017): 797–815; Deborah McGregor, "Traditional Knowledge: Considerations for Protecting Water in Ontario," *International Indigenous Policy Journal* 3, no. 3 (September 2012): 1–23; Chen, MacLeod, and Neimanis, eds., *Thinking with Water*; and Veronica Strang, "Conceptual Relations: Water, Ideologies, and Theoretical Subversions," in Chen, MacLeod, and Neimanis, *Thinking with Water*, 185–211.
- 45 Linton, *What Is Water?*, 9, 51.
- 46 Filippo Menga, "Reconceptualizing Hegemony: The Circle of Hydro-Hegemony," *Water Policy*, (September 14, 2015): 401–418; Mark Zeitoun and Jeroen Warner, "Hydro-Hegemony – a Framework for Analysis of Trans-Boundary Water Conflicts," *Water Policy* 8, no. 5 (October 2006): 435–460.
- 47 Valerie L. Kuletz, *The Tainted Desert: Environmental and Social Ruin in the American West* (New York: Routledge, 1998), 14.
- 48 This unevenness relies on the theory of uneven development, as advanced by Neil Smith in his foundational text, *Uneven Development: Nature, Capital, and the Production of Space*, 3rd ed. (New York: Verso, 2010).
- 49 Worster, *Rivers of Empire*, 7.
- 50 M. Elen Deming, "Value Added: An Introduction," in *Values in Landscape Architecture and Environmental Design: Finding Center in Theory and Practice*, ed. M. Elen Deming (Baton Rouge: Louisiana State University Press, 2015), 1.
- 51 In particular, I am indebted to the work of Wendy Nelson Espeland, whose *Struggle for Water* provided both a useful theoretical framework for understanding the underlying sociopolitical context of the Orme Dam and a collection of stories from the Yavapai community that acknowledge their long-fought history to retain their culture and land.