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978-1-107-13465-2 - Water Histories and Spatial Archaeology: Ancient Yemen and the American West

Michael J. Harrower

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## CHAPTER 1

## Introduction

Comparing water histories of America and Arabia

*You visit the earth and water it, you greatly enrich it; the river of God is full of water; you provide their grain, for so you have prepared it.*

(Bible – New Revised Standard Version Psalm 65:9)

*There was for Saba' in their dwelling place a sign: two gardens one on the right and one on the left. They were told, eat from the provisions of your Lord and be grateful to him. A good land you have and a forgiving Lord. But they turned away refusing, so God sent upon them the flood of the dam, and replaced their two gardens with fields of bitter fruit, tamarisks, and sparse lote trees.*

(Quran – Surah Saba 34:15–16)

For thousands of years in many different contexts worldwide, people have sought to control and have been subject to the unpredictabilities of water. While the contexts of water histories around the world widely differ, many of the key elements – climate, environment, culture, politics, religion – are arguably very similar, yet are interconnected and expressed in very different ways. Amidst the long mundane rhythm of everyday human struggles to capture and control water, great achievements and terrible catastrophes often demarcate histories. The year 2013 marked the 100-year anniversary of the Los Angeles-Owens Valley aqueduct that drained and largely desiccated a landscape to supply what would become one of the world's largest cities. In 1928, fifteen years after the creation of the aqueduct, the collapse of the St. Francis Dam just north of Los Angeles – one of the worst disasters in American history – sent a 200-ft wall of water rushing down Santa Clarita Valley that killed as many as 600 people. This terrible catastrophe, which followed on Manifest Destiny, rapid colonization, and watering of the American West, is not as different as it might seem from the calamity described above in the Holy Quran. The collapse and final abandonment

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FIGURE 1.1. The Great Dam at Ma'rib. This massive waterwork was constructed and reconstructed over more than 1,300 years. It spanned more than 600 m between bedrock outcrops and stood approximately 19 m high. Rather than impounding water, the north sluice (shown left, as recently reconstructed by a German team) and south sluice (shown right) at the dam's extremities diverted water into an extensive series of primary, secondary, and tertiary canals that irrigated as much as 9,600 hectares (photos by the author).

of the Great Dam at Ma'rib in Yemen (Figure 1.1 and Plate I) ca. AD 575 after more than 1,300 years of construction and reconstruction was similarly a pivotal turning point in the history of Arabia linked to the rise of Islam. In both cases, these important junctures are interspersed throughout long histories of human toil and struggles to harness water, which illustrate some of the central commonalities and contrasts among human societies of past and present.

Water and its histories reveal deep similarities and pivotal differences among human societies that are critical to understanding the human past and our future. Environments are often defined by water availability and periodicity; water is a frequent theme of religious traditions and a common point of politics. Anthropology has long been marked by a dichotomous tension between interests in commonalities among human cultures on the one hand, alongside emphasis on human cultures as unique, contingent, and exceptional on the other. Concordantly, this book examines the role of water and irrigation in long-term ancient histories of Southwest Arabia (3500 BC–AD 600) contrastively juxtaposed against other unique contexts worldwide, most prominently the American West (2000 BC–AD 1950). These two cases are strikingly different culturally and historically

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and span dramatically different time scales. Rather than building an analogy that aims solely to demonstrate likeness and similarity between two very different spans of history, the following chapters contrast and juxtapose these extremely different cases to illustrate how they are unique in similar ways, and reveal some of the essential characteristics of water histories. Arabs and Arabia have long served as a central anthropological archetype of nomadic and tribal societies, whereas American frontier settlers and the American West have similar longevity as a historical stereotype of the mythical West and Western civilization. The natural and political importance of water is of well-known, deeply embedded significance in the history of the American West both in ancient and more recent times. In contrast, the ancient history of Yemen, including the important role of water, is far less widely documented. While shaped by profound differences and contingencies, these cases are mutually informative in exhibiting environmental, cultural, political, and ideological factors that are expressed, weighted, and interconnected through space and time in different ways.

There are a number of key reasons the unconventional juxtaposition of America and Arabia in this book is not only warranted but is necessary and effective (also further explored in Chapter 2). Scholars have long sought to explain factors responsible for the rise and fall of civilizations; however, with a dramatically expanding wealth of data available for regions worldwide, global comparisons are challenging as they often overlook critical historical and cultural particularities and contingencies. Amidst a wide range of approaches, from particularistic to universally comparative, studies that contrast two or a few histories or cultures have proved to be highly revealing (e.g. Adams 1966; Earle 1997; Geertz 1972; Sahlin 2004), and, I argue, have a critically important and expansive scholarly future. Histories of the American West (including as related to water) are some of the best documented and most studied histories of the world; they are widely known (albeit often mischaracterized) via American popular culture, and offer a powerful lens through which to view the role of water in other contexts (e.g. Hundley 2001, 2009; Kahrl 1983; Reisner 1986; Worster 1979, 1985; White 1995). Since ancient Yemen (3500 BC–AD 600) and the American West (2000 BC–AD 1950) are two intervals almost as outwardly culturally and historically different as any cases one could select, commonalities between these histories are well suited to reveal deep underlying patterns characterizing other histories worldwide. Finally, and perhaps most importantly, in a contemporary era of profound turmoil and concern focused on the Middle East, we confront what many troublingly portray as a clash of Western (Occidental) and Eastern (Oriental) civilizations, and Americans'

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and Arabs' vast misunderstandings of each other's histories and cultures contribute to conflict worldwide (Barber 1995; Johnsen 2013; Morris 2010, 2014; Pagden 2009). We arguably have far more in common than we realize and overestimate differences that are in part the result of explanations of the past that divide the world into East–West factions contributing to conflicting visions of the present and the future. While widely differing, antithetical views of recent histories of the Middle East are difficult to overcome, the ancient past offers powerful means to build shared interests and understandings that resist and counteract East–West framing and serve as a powerful foundation for dialogue, diplomacy, and peacemaking (Luke and Kersel 2012).

This book's core arguments focus on spatial analysis, spatial theory, and spatial politics of water resources. Throughout the southwestern corner of the Arabian Peninsula – what is today the Republic of Yemen – water figured prominently in the lives of the earliest human migrants to the region and retained deep importance through the rise of pastoralism, agriculture, and ancient states (Plate II). As in the American West, water's significance in such an arid region is difficult to overlook, yet details of Yemen's water histories and their wide scholarly relevance are scantily appreciated beyond the comparatively few archaeologists with experience in the region. In addition to water's wide thematic importance in Near Eastern archaeology and, ancient physical and human geographies analyzed in this book are employed to convey deeper cross-cultural understanding of water histories and societal dynamics worldwide. In terms of the beginnings of agriculture, I critique origins and spread “frontier” conceptions and related primary/secondary designations that have dominated archaeology for more than fifty years (Sauer 1952; Vavilov 1951). I contend that greater attention to the spatial role of water is needed to better understand early agricultural societies, and that spatial heterogeneity of water resources alongside perceptions, anxieties, and politicized narratives of water scarcity are often central to the ways complex polities in arid regions rationalize, justify, and perpetuate their influence through water control and major waterworks.

A wealth of evidence and methods analyzed in this book helps illustrate ancient Yemen's water histories, and their relevance worldwide. Empirical spatial analysis, social theory, epigraphy, ethnography, historical narrative explanation, and multiscale landscape history offer insights on the socio-political dynamics of water in Yemen. Paleoclimatology, hydrology, geomorphology, geospatial science, and perhaps most centrally archaeological survey and excavation illuminate the environmental contexts of water politics. Contrastive juxtaposition, that is, pairwise comparison of cases to reveal

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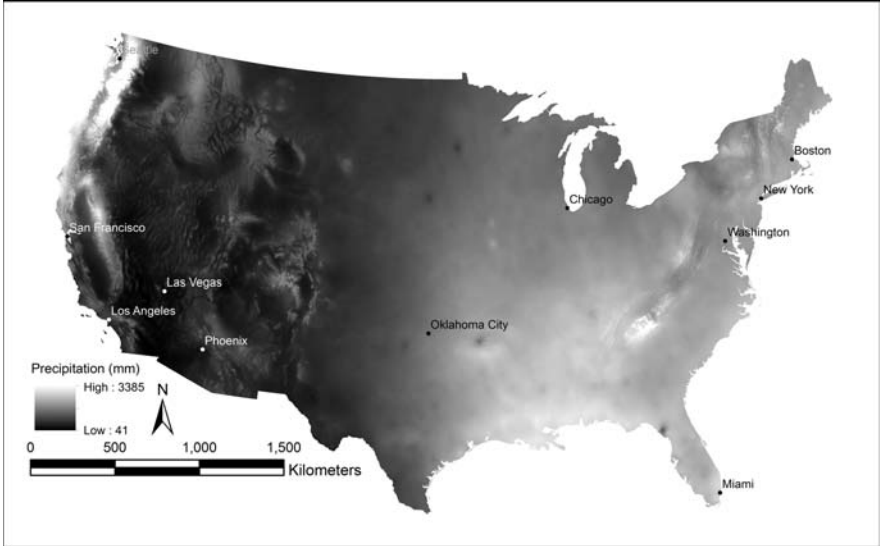


FIGURE 1.2. Average annual precipitation across the United States. Image is based on WorldClim data (Hijmans et al. 2005). The western half of the country receives far less precipitation, which makes rainfed agriculture precarious in many areas (image by the author).

similarities and differences, highlights how environmental and political dynamics of ancient Yemen and the American West, while outwardly very different, exhibit foundational commonalities. The physical geography of the eastern United States (Figure 1.2) is marked by considerable continuity in undulating topography and continental climates with hot, humid summers and cold winters, dense vegetation, and abundant rain and snowfall. Yet the same is not true of the western United States, which is far more arid, inhospitable and diverse with high mountain ranges, rugged topography, profound climatic differences, arid deserts, dense forests, and palimpsest of summer and winter timed precipitation. The American West is also home to great watercourses, such as the Columbia, Missouri, Rio Grande, and Colorado Rivers, as well as vast drylands, including the Mojave, Sonoran, Great Basin, and Chihuahua Deserts, which contributes to pronounced geographic diversity and spatial heterogeneity. Wide diversity and spatial heterogeneity is also true of Yemen (Figure 1.3), which is characterized by rugged terrain up to 3,652 meters that includes the highest rainfall areas of the Arabian Peninsula (which receive as much as 800 mm of annual precipitation) flanked by hyper-arid sandy deserts that are fed by massive flash floods from enormous highland watersheds. In light of these varied

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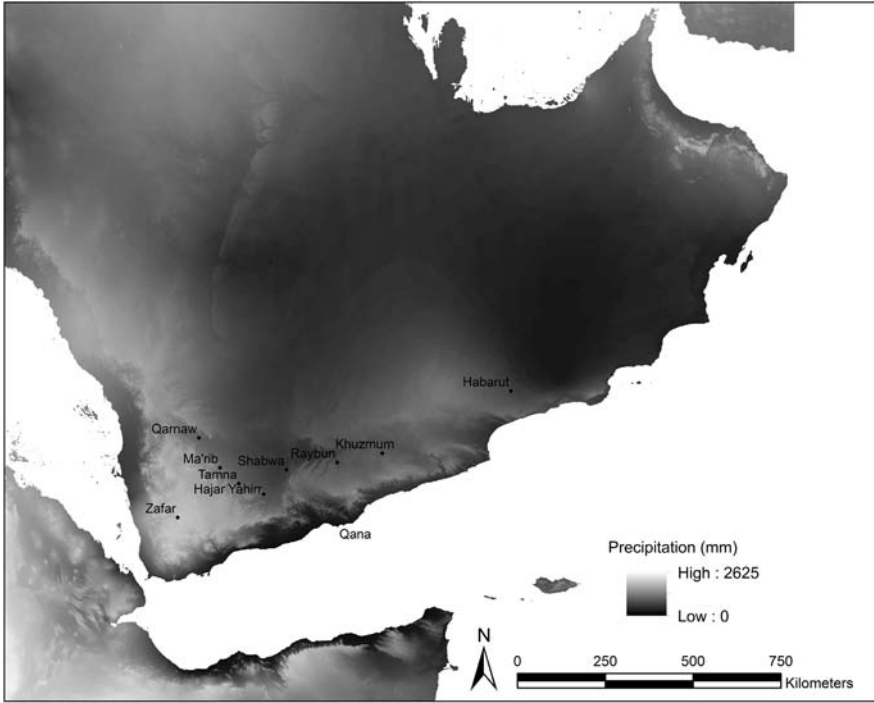
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FIGURE 1.3. Average annual precipitation across southern Arabia. Image is based on WorldClim data (Hijmans et al. 2005). The highlands of Southwest Arabia in some places receive as much as 800 mm of precipitation per annum facilitating rainfed agriculture, yet lower elevation areas require supplementary water (image by the author).

American and Arabian topographies, Chapter 2 examines the past and future of comparative methods in anthropological archaeology. Attention and critique concentrates on traditional conceptions and explanations for the beginnings of agriculture and the emergence of the world's earliest states, with a particular focus on spatial patterning of water. Chapter 3 then goes on to juxtapose water histories of ancient Yemen and the American West set within a global comparative context of ancient hunting-gathering, pastoralism, crop cultivation, and small- and large-scale irrigation. In conjunction with acknowledgment of incalculable global diversity, characteristics shared among widely disparate cases are seen as particularly revealing.

When viewed through the lens of water histories, key transformations in Southwest Arabia including the beginnings of agriculture (Chapter 4) and the rise and decline of ancient states in Yemen (Chapter 5) are substantially clarified and unraveled. Domesticated animals appear as early as the sixth

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millennium BC, followed by crops and irrigation by the mid-fourth millennium BC. Archaeologists have long framed the appearance of the earliest plant and animal rearing societies as the origins (invention) and spread (adoption) of rainfed farming, to which irrigation and pastoralism were later added. Recent investigations illustrate a far more complex picture in which crop cultivation and animal herding were closely tied to water-rich areas; and rather than simply receiving domesticates from elsewhere, new life-ways were reconfigured and reinvented to suit very different environmental and social contexts. As irrigation systems in Yemen developed through time over subsequent millennia, food production practices increased in scale and technological complexity and became increasingly interconnected socially, politically, and ideologically with natural water availabilities and conceptions of shortage and abundance. Near the end of the second millennium BC, roughly 2,000 years of experience with irrigation propelled the rise of five powerful kingdoms, Ma'in, Saba, Qatabān, Awsan, and Hadramawt, around the margins of Yemen's Ramlat as-Sab'atayn Desert interior – the lowest rainfall portion of the region. In a groundbreaking study published twenty-five years ago, Brunner and Haefner (1990) used German MOMS (Modular Optoelectronic Multispectral Scanner) satellite imagery to map 26,000 hectares of ancient irrigation and postulated a total of 44,500 hectares of once irrigated oases along Yemen's inland desert that would have supported roughly 200,000 people. These ancient kingdoms and their achievements in water control are impressive by any archaeological standard; however, their histories are scantily known beyond a relatively small cohort of archaeologists who specialize on the region, and the factors responsible for their rise and decline remain obscure and controversial. Beyond desert oases, smaller-scale terrace agriculture and runoff cultivation also sustained many people in highland areas as they do today, but the earliest, most powerful cities quite surprisingly emerged in Yemen's driest areas. Rather than states developing because of the unavoidable need for massive irrigation works, I argue it was not only the environmental obstacle of water scarcity per se but social construction of the perceived environmental necessity and its solution (large-scale water control) that promoted large, complex, self-perpetuating aggregations of people. It was not the need for centrally managed large-scale irrigation (which in neither the American West nor ancient Yemen was unavoidably necessary) that propelled the rise of complex polities, but rather the spatial heterogeneity of water (comparative abundance in some areas and comparative scarcity in others) that polities used to dominate agricultural production, guide the flow of commerce, and perpetuate their influence.

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Agency is most seminally recognized in individuals (Giddens 1984) and more recently in objects (Feldman 2010), yet I argue politics also take on a proactive, self-perpetuating character as collections of environmental, economic, technological, political, and ideological rhetoric and logic. Water is just one of the variables often implicated in trajectories of history that enables and propagates differential power. In both the American West and ancient Yemen, agricultural production focused not in areas where rainfed agriculture was possible, but in hyper-arid areas where attention focused on geographies of water scarcity and the need to colonize water-scarce areas rationalized massive state-constructed irrigation schemes that helped generate state identities, religiosities, and sovereignties. Contrastive juxtaposition of these distinct histories helps illustrate the societal dynamics of water and how a combination of scientific and humanistic research techniques are best suited to generate deeper, nuanced understanding of histories that are superficially incomparable yet share foundational commonalities.

### Water histories and Orientalism

Portrayals of the Oriental East by scholars of the Occidental West have a long and contentious history; yet enduring critique of Western bias and prejudice has unintentionally come to reiterate a highly problematic, binary East–West dichotomy. An indisputable turning point in the study of the Middle East, Edward Said’s (1978) *Orientalism* stridently challenged Western scholarship on the East and revealed wide ranging improprieties from pompous ethnocentrism to self-serving racism. Said’s seminal commentary exposed deep subjectivities of research and literature that long served to bolster and sustain British, French, American, and other colonialist and neocolonialist designs for the Middle East. The transformative value of *Orientalism* and Said’s subsequent work is undoubtedly extraordinary. Yet, as Daniel Varisco (2007: 291) remarked in his lengthy and judicious review of Said’s famous book and its consequences, “*Orientalism* is frequently praised for exposing skeletons in the scholarly closet, but the book itself provides no blueprint for how to proceed.” Said’s analysis centers on critique rather than outlining means to more appropriately or affirmatively investigate histories of the region. His work and its scholarly descendants challenge a wide swath of scholarship and literature as unduly essentializing; as eloquently extended, for example, in Said’s (1993) *Culture and Imperialism*. Yet in emphasizing the creation and reification of stereotypes of the East, Orientalism as denunciation overlooks similarly disparaging caricatures the Occidental West spewed against its own impoverished and



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unseemly populations within the West (Makdisi 2014); and Orientalism often neglects opportunities to explore what might be shared or amicable among seemingly antipodal East–West histories and cultures, which are depicted in perpetual conflict (Turner 1994). In essence, Orientalism’s condemnation so thoroughly and so successfully eviscerates Western scholarship on the East that it incapacitates and renders inept any analysis that disavows the diametric power geographies of East and West, and the polemic established comes to reiterate and reproduce the very East–West dichotomy Said set out to expose as so deeply misguided and flawed (Varisco 2007: 290–305).

What is it to be Western? What are Western History, Western Civilization, the Western Hemisphere, and the American West? Are these cultures and histories truly categorically different than those deemed Oriental and Eastern? Is the essence of Western ultimately to be found exclusively in Greek and Roman classical civilizations and their descendants in Europe? Pop-culture images and Hollywood stereotypes of the American West more recently borrow and re-create ideals of heroic, triumphalist Western culture. Interestingly, arguments that seek to define a Western type perpetuate its antithesis – a category or type of non-Western perspective. The colonized and the colonizers become inescapably interlocked with views of one relying on views of the other. Continuing efforts to evade reifying archetypes of the East by pointing out bias of the West have come to rely on the notion that there must be some sort of non-Western perspective that departs from Western bias and thus falls victim to the same misconceptions that Said sought to undermine. As Stockhammer (2012) argued, Bhabha’s (1994) postcolonial conceptualization of hybridity problematically implies that somewhere we can find cultures that are less hybrid, less adulterated, and more authentically or typically pure. It would seem that we know, or we think we know, what Western is and means so that analysis that eschews the opposition of East and West is seen as misinformed and misguided. Yet misrepresentations of Eastern Others accordantly rely on a vainglorious superficial foundation of archetypical Western histories that are so well rehearsed and choreographed that they obscure recognition of commonalities and differences. Even more problematically, Eastern and Western archetypes impair our ability to envision shared interests and futures that in light of current violence, turmoil, and concern focused on the Middle East are increasingly essential, including with respect to water (Moore 2011). If we aim to confront and avoid bias, then one important means to do so is by more thoroughly considering the similarities and differences between what are seemingly diametrically opposed Eastern and Western geographies.

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One of the most influential early scholars in the study of water and ancient civilizations, Karl Wittfogel's writings on ancient waterworks exemplify the highly problematic distinction scholars often draw between Western and Eastern societies. Drawing on Marx's Asiatic mode of production, Wittfogel (1957) claimed that the organizational requirements of large-scale irrigation led to the world's earliest states and a form of governance he called Oriental Despotism. While many of his central assertions have been discredited on a variety of grounds, his work has dominated studies of ancient irrigation for more than half a century. Many (myself included) have still felt compelled to further repudiate Wittfogel's model (e.g. Adams 2006; Harrower 2009; Wilkinson and Rayne 2010) in part because it has yet to be replaced by a widely acknowledged alternative and therefore continues to play a major role in structuring scholars thinking about water and complex polities. Surprisingly, Wittfogel's theory has even been revived in attempts to explain water histories of the nineteenth- and early-twentieth-century American West (Worster 1985), in direct contradiction to his central premise about categorical differences between Western and Oriental societies. Nevertheless, Wittfogel (1957) and the preeminent anthropologist Julian Steward (1930, 1949) were instrumental in recognizing the importance of water control among early states. While Steward simply considered irrigation a potential cross-cultural parallel worthy of further investigation, Wittfogel forcefully proposed a deterministic explanation. Wittfogel eventually deemphasized the distinction between Western and Eastern types and began referring to "Hydraulic" rather than "Oriental" societies, but he retained the uncausal basics of his model – that the need for large-scale waterworks was the primary cause behind the rise of the world's earliest civilizations (Wittfogel 1972). One of his central assertions – that large-scale irrigation invariably *requires* centralized bureaucratic coordination – has been thoroughly invalidated (Mabry 2000), yet Wittfogel unfortunately remains a recurrent distraction in studies of irrigation as analysts continually feel obliged to renounce his explanation for the origins of civilizations (e.g. Adams 1981: 243–244, 2006; Butzer 1976, 1996; Hunt 2007: 105–128; Wilkinson and Rayne 2010). Ultimately, a more sophisticated, accurate, and nuanced theory of irrigation's role is required, but most studies have focused on particular historical cases, and those with a cross-cultural focus have yet to achieve widespread affirmation. Given the rapidly expanding and overwhelming wealth of information on water-use among ancient civilizations worldwide (e.g. Marcus and Stanish 2006; Mithen 2012; Scarborough 2003) and the importance