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Kate A. Berry & Teresa Cavazos Cohn

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Space, Time, and Hydrosocial Imaginaries: Water Quality Governance of the Pyramid Lake Paiute Tribe

Kate A. Berry 

University of Nevada, USA

Teresa Cavazos Cohn 

University of New Hampshire, USA

We examine ways in which space and time, as well as governance, are embedded in and revealed by hydrosocial imaginaries. As conceptions of space and time are fundamental to the establishment of sociocultural-political relationships, they are central to water governance in providing a framework on which overall hydrosocial relations are constructed. We also recognize the ways in which Tribes continually redraw trajectories of power through engaging and reshaping complex governance networks. Our focus is how tribal governance of water quality connects a core value of the Pyramid Lake Paiutes to two of their hydrosocial imaginaries. Both hydrosocial imaginaries motivate governance practices and actions through which social meaning is constituted for the Pyramid Lake Paiutes and relationships are built with respect to water. We find that water quality governance is an avenue in which the Pyramid Lake Paiute Tribe move beyond partial and abstracted rights of inclusion by incorporating multidimensional Indigenous systems of obligation that span time and space. **Key Words:** hydrosocial imaginaries, Pyramid Lake Paiute Tribe, spatiotemporalities, tribal environmental governance, water quality.

The Pyramid Lake Paiutes or *Kooyoe Tukadu* are situated along the end of the Truckee River and around Pyramid Lake, a deep, terminal, desert lake in the western Great Basin (Figure 1). Tribal members understand that no matter how hard the struggle is, water must be protected to ensure the continuity of tribal culture, fish, and the water itself, including water quality. As Joe Ely, former Pyramid Lake Paiute Tribal Chairman, put it, “at the heart of the struggle, which turned to battle, is water: water, the obvious element necessary to recover and sustain the existence of the *cui-ui* [fish]. … The preservation of that culture and tradition is what is embraced as the heart of this struggle” (Ely 1992, 60–61). This value is fundamental to both their hydrosocial imaginaries and water quality governance.¹

Pyramid Lake Paiute tribal members are not alone in valuing vigilance in protecting water. In the past decade, the actions of Indigenous water protectors throughout North America have made news headlines and inspired scholarship (Ornelas 2011; Hoover 2017; Norman 2017; Luby et al. 2021). Such thinking and actions underscore *hydrosocial* dynamics, which combines “hydro” with “social” to intentionally complicate facile notions of water and ensure that water remains marked by its social relations, conditions, and potential (Linton 2010; Linton and Budds 2014). Recent scholarship on the hydrosocial dynamics associated with tribal and Indigenous water governance (Phare 2013; Cavazos

Cohn et al. 2019; Curley 2019) informs our thinking, as does scholarship on the hydrosocial dynamics of settler colonialism in the United States (Espeland 1998; Schmidt 2017; Berry and Jackson 2018; Perramond 2019; Curley 2021). This study contributes to this literature by addressing gaps in scholarship about the hydrosocial dynamics associated with water quality (Ross and Chang 2020) and Indigenous water knowledge practices (Clark et al. 2017).

Taylor (2002) pointed out that social imaginaries extend far beyond a simple set of ideas. As a guide to making sense of the world, an imaginary makes social order possible as ordinary people deploy imaginaries in decisions about how to act and convey them to one another through interactions, images, and stories. Shared by many, a social imaginary is embedded in common knowledge, enabled through social practices, and delineates what is legitimate (Taylor 2002). Hydrosocial imaginaries² explicitly connect water with society and in so doing drive actions, shape outcomes, and allow collectives of people to recognize a common purpose (Boelens, Hoogesteger, and Swyngedouw 2016; Hommes and Boelens 2017). In other words,

Water is not simply a transparent chemical substance, nor is it just an objectified resource governed by the state. Recent scholarship asserts that water constitutes and conveys cultural precepts and sociopolitical relations. Conceived of as a coproduced entity, water is mediated by and

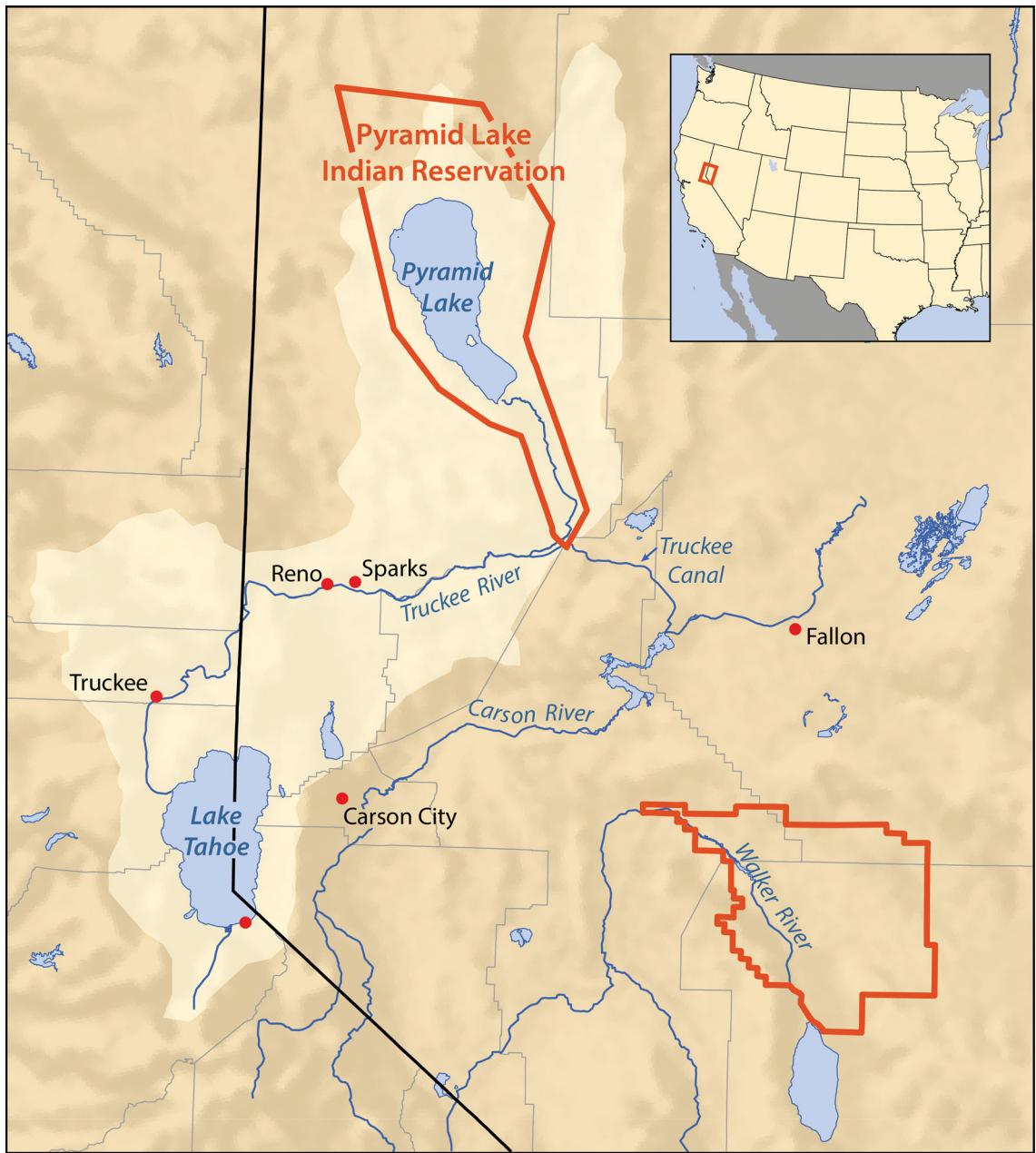


Figure 1 Map of the Truckee River basin with Lake Tahoe in the headwaters and Pyramid Lake and the Pyramid Lake Paiute reservation at the terminus. Source: Pyramid Lake Paiute Tribe Water Quality Program (2015).

circulates within natural processes and social relations imbued with power; shaped by hydro-technologies, human labor and symbolic meanings; and regulated by institutions that are often capitalist in form. (Berry and Jackson 2018, 5)

Hydrosocial imaginaries are integral to the socio-natural processes in which water coconstitutes social relationships (Linton and Budds 2014; Krause and Strang 2016) and how water conveys and embeds

spatial and temporal meanings. We are interested in how Pyramid Lake tribal governance reflects value and hydrosocial imaginaries because governance is a primary although not the only means through which the Tribe acts in support of water. Although we are not the first to recognize that “values pervade all approaches to water governance” (Groenfeldt and Schmidt 2013, 14) and that explicitly bringing values into an analysis improves our understanding of water quality governance (Berry et al. 2018), we build on

this literature by anchoring values with hydrosocial imaginaries and by attending to their spatiotemporalities.

For the Pyramid Lake Paiute Tribe, the value of working on behalf of water, and when necessary fighting for water, necessarily spans time and implicates many places that extend beyond the boundaries of their contemporary reservation. We consider how understandings and actions attached to space and time are integral to the Pyramid Lake Paiute Tribe's core value and are reflected within their hydrosocial imaginaries and tribal water quality governance. In this study we specifically ask this: What are the hydrosocial imaginaries of the Pyramid Lake Paiutes? How do these hydrosocial imaginaries connect both to the value that tribal members place on vigilance in protecting water and to their water quality governance? How are these hydrosocial imaginaries influenced by and embedded in space and time?

We are informed by a cadre of scholars who have explored differences between space and time as constructed within Indigenous nations and communities as contrasted with settler colonialism spatiotemporalities. In keeping with Rifkin (2017), we recognize the importance of differing temporal orientations. Povinelli (2011) tackled temporal orientations through her notion of the "governance of the prior," in which Indigenous peoples become enmeshed within an imaginary imposed by the settler-colonial state of homogenous, "modern" time. Reinforcing (and reinforced by) a formation of power, this settler-colonial imaginary serves to undermine Indigenous social systems by pushing them into a past deemed to be of little relevance. We find common purpose with her argument that Indigenous access to partial and abstracted rights of inclusion are insufficient and hope to contribute toward explanations of multidimensional Indigenous systems of obligation that span time (Povinelli 2011).

In focusing through the lens of water and governance we draw on Clark et al.'s (2017) recognition that water is "time-substance" and acknowledge that a sense of (im)permanence could be generated through water's ability to connect, contain, and embrace the social. Of equal importance are tribal spatialities of being situated in place (Larsen and Johnson 2016); recognizing that not all spaces are equally significant; and the ability of water to (re)configure and be reconfigured by spatial relationships connected to tribal governance (Bruyneel 2007; Cavazos Cohn et al. 2019). In sum, we argue that space and time are woven into and (re)constructed through the social, political, and cultural networks associated with water and tribal water quality governance. In this article we examine the ways in which this occurs for the Pyramid Lake Paiutes through focusing on their

values, hydrosocial imaginaries, and water quality governance.

Methods

This research has been supported through a project funded by the National Science Foundation on time, space, and tribal water quality governance conducted in partnership with the Pyramid Lake Paiute Tribe. In this article we rely on data collected between 2018 and 2020, including surveys, interviews, and field trips with tribal members, tribal government representatives, and others associated with the tribal communities ($n=42$). We have also drawn from a rich collection of historic and contemporary documents and electronic materials related to governance of water quality by the Tribe, including a number of oral histories recorded in the 1990s and 2000s with people involved in Truckee and Carson River water issues ($n=21$).

Our methods involved three types of coding and analysis. First, we coded comments from and discussions with tribal members, leaders, or representatives (which includes people who worked on behalf of the Pyramid Lake tribal government) about water, water quality, or water infrastructure that related in some way to the lower Truckee River and Pyramid Lake.

Second, we took results from the initial coding and analyzed them with respect to the values expressed about water and water quality, paying attention to the attributes about rivers and lakes that tribal leaders, members, and representatives cared about and found important (Berry et al. 2018). Although the ways it was stated varied somewhat with different people, we found a single recurring value that we identified here as a core value. This is not to suggest that this core value is the only value related to water or water quality that is significant for all Pyramid Lake Paiutes, but rather this came up repeatedly in our analysis and was identified as inspiring the actions of many tribal members, leaders, and representatives.

Third, the results from the initial coding process were recoded if they related to space or time to identify the spatiotemporal configurations of water quality. For example, we identified discussions about spatial patterns observed about water quality and experiences that related to changes in water quality over time. The results from this analysis were designed to better understand how water, people, geography, and time aligned, and this coding became the basis for identifying two important hydrosocial imaginaries. As such, the two hydrosocial imaginaries we identified reveal spatiotemporalities associated with water quality and the Pyramid Lake Paiute people. We do not claim that these are a comprehensive listing of all hydrosocial

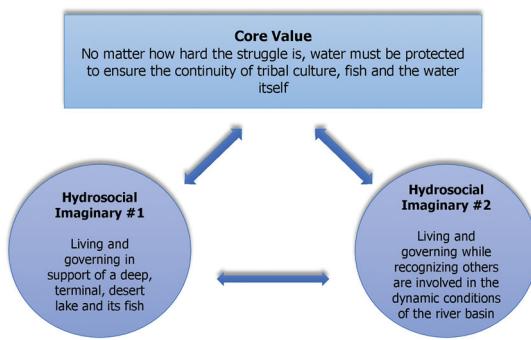


Figure 2 Core value and hydrosocial imaginaries of the Pyramid Lake Paiutes.

imaginaries related to the Pyramid Lake Paiute people; rather, these are what emerged through this project.

In the following discussion, we pay particular attention to examples that relate to or influence governance of water quality by the Pyramid Lake Tribe as well as examples that illustrate how space and time are embedded or reflected within tribal decision-making and complex water governance networks. Moreover, we consider the connections between the core value and the two hydrosocial imaginaries in the discussion that follows.

Results and Discussion

As depicted in Figure 2, the two hydrosocial imaginaries emerging from our analysis connect to a single core value: No matter how hard the struggle is, water must be protected to ensure the continuity of tribal culture, fish, and the water itself, including water quality. This value not only underscores the importance of water quality in connecting tribal culture and fish, but it emphasizes actively and continuously developing ways to protect what is significant to the Pyramid Lake Paiutes about water and what water connects with. The core value both inspires and directs actions associated with water governance.

Each hydrosocial imaginary conveys components of interactive social and natural dynamics associated with the waters of the Pyramid Lake Paiutes. As evidence by the verbs *living* and *governing*, both imaginaries reflect an understanding of collective purpose that integrates with practice and action. As such, governance becomes significant as a juncture through which these hydrosocial imaginaries overlap with one another and align with the core value. As shown in Figure 2, supporting their deep, terminal, desert lake, and its fish (Hydrosocial Imaginary 1) leads the Pyramid Lake Paiute to also simultaneously recognize others who are involved in the dynamic conditions of the river basin (Hydrosocial

Imaginary 2). The next subsections provide details about these hydrosocial imaginaries, particular with respect to how spatiotemporalities are embedded within and revealed by these imaginaries.

Pyramid Lake Paiute Hydrosocial Imaginary 1: Living and Governing in Support of a Deep, Terminal, Desert Lake and Its Fish

Having long lived and governed in this area, the lake and river are central to Pyramid Lake Paiute's political, historical, and cultural geographies, as are the lake's two native migratory fish, the *cui-ui* (or *Kooyooe*) and Lahontan cutthroat trout. As one survey participant made explicit, "I care about fisheries—Lahontan cutthroat trout and *Kooyooe* (our namesake). Without the lake and *Kooyooe* we are no longer the *Kooyooe Tukadu*."

Yet tribal members have had to contend with an opposing hydrosocial imaginary by some non-Indigenous people that casts them as stuck in the past and wastefully using water to support the lower river, lake, fish, and themselves (oral history). Even the U.S. Indian Service/Bureau of Indian Affairs spent decades actively discouraging the Paiutes' attachment to the lake and fish, which were disparaged as being antimodern and unprogressive, simultaneously encouraging them to be farmers (Townley 1980).

Yet the Pyramid Lake Paiute Tribe's core value remains and tribal leaders persist. Approaches taken over the years by the Tribe to support Pyramid Lake explicitly recognize the spatial distribution of waters, much of which originates as snowpack around Lake Tahoe and the upper basin, then flows down the river through an urban area, before making it to the reservation and into Pyramid Lake (oral history). The Tribe actively governs "to take into account everything that's happening upstream. ... We really have to be mindful and try to be proactive ... we're at the very end and no one really takes into account what they're doing upstream, as far as you know, beyond the reservation" (interview participant 2019). Both time and space are significant influences. As several survey and interview participants pointed out, during the late spring the amount of snowpack in the upper basin directly influences river flows, lake levels, and water quality. Because the snowpack varies tremendously from year to year, so, too, does water quality in the river and lake on the reservation.

In water quality governance, not all spaces and times are equally significant to the Tribe. For example, the Tribe rejected a proposed water quality initiative that did not specifically improve water quality conditions in the lower river and lake, which are the waters they value (oral history). In another instance during the early 1990s, the Tribe initiated litigation to curb urban water quality contamination that

Table 1 Comparison of water quality beneficial uses between tribe and state

Pyramid Lake Paiute Tribe beneficial uses for water quality management	State of Nevada beneficial uses for water quality management
Cold freshwater habitat	Aquatic life
Indigenous aquatic life	
Maintenance and restoration of native fish species	
Rare, threatened, and endangered species	
Aquaculture	
Spawning, development, and recruitment	
Sports fishing	
Riparian habitat	
Wetland habitat	Wetland habitat
Wildlife and wildlife habitat	Propagation of wildlife
Primary contact ceremonial use	
Freshwater replenishment	
Groundwater recharge	
Water contact recreation	Recreation involving contact with the water
Noncontact water recreation	Recreation not involving contact with the water
Water quality enhancement	Enhancement of water quality
Water of special ecological significance	Water of extraordinary ecological or aesthetic value
Extraordinary aesthetic value	
Irrigation	Irrigation
Livestock watering	Watering of livestock
	Municipal or domestic supply
	Industrial supply

Source: Pyramid Lake Paiute Tribe Water Quality Program (2015); Nevada Administrative Code 445 A.122.

could harm native fish, but then later opted to negotiate with the city governments and state agencies. The outcome of the negotiations was a settlement agreement in 1996 designed to improve water quality by increasing the amount of water in the river during the driest times through cooling water temperatures, increasing flows to the lake, and diluting nitrogen and phosphorus from urban sources (oral history). In the first example, the Tribe made governance decisions based on their specific spatial orientation and in the second instance, a collaborative water quality governance initiative had a clear temporal target: drought periods.

The Pyramid Lake Paiute water quality program provides an example of a governance action that organizes the spatiotemporal relations of water, while acting on the Tribe's core value. Although the Pyramid Lake Paiute Tribe started monitoring water quality in 1981, it was not until 2007 that the U.S. Environmental Protection Agency (EPA) granted the Tribe status under the Clean Water Act's Treatment in the Similar Manner as a State (TAS) to establish water quality standards on the reservation, making them one of forty-four Tribes nationwide with this status (Diver 2018; Pyramid Lake Paiute Tribe 2020; interview participant). As a result, the tribe has a water quality plan along with a monitoring program that currently has twenty sites and water quality standards (Pyramid Lake Paiute Tribe 2020).

Of particular note in their plan are the Tribe's beneficial uses for water quality that form the backbone for place-specific numeric standards. As these beneficial uses reflect the current and probable future ways that the Tribe values and uses water within the reservation, they capture both a glimpse of the present and a vision for the future, while identifying spaces for

water in specific ways. The Tribe's twenty beneficial uses simultaneously serve to translate their core value and Hydrosocial Imaginary 1 into the language of institutions and regulations.

As shown in Table 1, the Tribe has twice as many beneficial uses as the State of Nevada that surrounds them, although the Tribe, unlike the state, has no waters designated for municipal or industrial supplies. Whereas the state has a single "Aquatic Life" standard, the Tribe has an array of eight different beneficial uses related to fisheries and aquatic habitats. The Tribe also includes primary contact ceremonial use, which by "protecting quality of water specifically for ceremonial, cultural, holistic, religious and traditional purposes for members of the PLPT" (Pyramid Lake Paiute Tribe 2015, 11), reinforces their ontologies of water and bolsters a distinctive vision of spatiotemporal relations. These twenty beneficial uses, along with the rest of the water quality program, reflect the core value and the first hydrosocial imaginary. Not only is the Tribe's approach culturally oriented, but it is more precise and contributes to their institutional credibility (interview participant). The beneficial uses are an institutional means through which tribal governance of water quality influences the spatiotemporal relations of water in ways that envision the future while remaining consistent with its core value and Hydrosocial Imaginary 1.

Pyramid Lake Paiute Hydrosocial Imaginary 2: Living and Governing While Recognizing Others Are Involved in the Dynamic Conditions of the River Basin

As numerous survey, interview, and field trip participants and oral histories note, water quality has been

affected for more than a century by a sequence of different activities upstream of Pyramid Lake. In the late nineteenth century, silver and gold mining operations proliferated in northern Nevada, some of which used mercury in processing the ore that was transported in river sediments and deposited within channels in the midbasin. Mining was also the main impetus for widespread deforestation around Lake Tahoe and throughout the upper basin. Logging caused erosion and milling contaminated river flows, so sediments, sawdust, and unclaimed parts of trees flushed downstream, clogging the lower river and impeding upstream spawning of the *cui-ui* and Lahontan cutthroat trout (Pisani 1977). Not long afterward, water diversions for irrigated agriculture in the midbasin reduced the amount of water and decreased the quality of water. After Derby Dam was built in 1905 as a reclamation project to supply irrigation water to an adjacent basin, river flows to the lake were reduced by about half, which had the effect of dropping levels in Pyramid Lake precipitously (at one point by over eighty feet in depth), increasing salinity, and impeding fish spawning (Berry 1997). Another major activity took place in the mid-twentieth century when the Army Corps of Engineers channelized parts of the lower Truckee River, removing several impediments to flow and taking down cottonwood trees along the lower river, all of which led to more flooding and erosion within the reservation. In the more recent past, increasing urban development in the midbasin significantly altered water quality, most particularly through contaminants conveyed in municipal stormwater systems and releases of treated urban sewage effluent. More residential and industrial development now creeps downstream along the lower river corridor (along with expanding throughout the river basin) and with this comes the potential to mobilize contaminants from earlier activities, initiate new forms of residential and industrial pollution, further reduce water flows, and introduce invasive aquatic species (survey, interview, field trip participants, and oral histories).³

In addition to the magnitude of each upstream activity, the timing, spatial extent, and location factor into the impact on the lower river, the lake, and the Tribe. Upstream activities, along with the resulting impacts, mark time in their own way. Each represents an event or incursion, usually socially as well as environmentally, that characterizes the interval when it occurred.⁴ For example, there was a time before Derby Dam was built and transbasin diversions began and this time differed from the periods afterward. Diversions from Derby Dam proved to have enduring effects on water quality, fish, and the Pyramid Lake Paiutes and this was noted by many survey participants. Moreover, diversions from Derby Dam not only initiated major changes to water conditions—including influencing the water

chemistry of Pyramid Lake—but the diversions also resulted in the total loss of Winnemucca Lake, which before this event and time had been hydrologically connected to Pyramid Lake (survey and interview participants). Thus, the period that Winnemucca Lake existed is marked differently from subsequent times when the lake ceased to exist. Spatiality is important in this example as well. The upstream diversions that eradicated Winnemucca Lake reconfigured the spaces that the Pyramid Lake Paiutes live in and govern. Especially since the mid-twentieth century, upstream activities and their impacts have prompted the Tribe to take active approaches to governance in support of water, fish, and people.

Understandings of space and time are embedded in the Tribe's responses to upstream activities and their impacts. As a result, Hydrosocial Imaginary 2 is evident when looking at how tribal governance options were both constrained and enabled in the development and use of dams and storage of water in reservoir. Between 1913 and 1971, seven dams were built in the headwaters of the Truckee River to store water for downstream users and control flood waters, including a dam that changed Lake Tahoe from a natural lake into a reservoir (California Department of Water Resources 1991). Much of the water stored in the reservoirs was used in ways that reduced flows to the lower river and lake and reduced the quality of water. Consistent with their core value and Hydrosocial Imaginary 2, the Tribe worked strategically for decades to get water stored in the upper basin reservoirs released for Pyramid Lake. The Tribe was particularly interested in releasing stored water upstream during the spring fish spawning season and in getting flows timed in ways that encourage the *cui-ui* and Lahontan cutthroat trout to leave the lake and head upstream to spawn (field trip participants). Fish are encouraged to migrate upstream to spawn in part by increased flows in the lower river and in part by cool water temperatures, reduced nutrients, and decreased salinity (interview participant and oral history). Relying heavily on the Endangered Species Act, the Tribe became involved in litigation and negotiations that resulted in successfully getting waters stored in two upstream reservoirs, Stampede and Prosser Creek, dedicated to support the fish (interview participant and oral history). The timing of releases is critical in changing water quality and enhancing conditions for fish reproduction and this often differs from the timing of flows requested by other water users. In opening up spaces within the river at strategic times to facilitate native fish spawning, these water releases are evidence of how Hydrosocial Imaginary 2 facilitated a translation between technocratic processes and institutions and the Tribe's core value.

At times the Tribe opposes upstream communities or governments; other times they negotiate or collaborate with them; sometimes they do both. The congressional passage of Public Law 101-618 in 1990 may be the best known result of water governance that involved the Pyramid Lake Paiute Tribe (Wilds 2010; Wilkinson 2010), but this negotiated agreement-turned-law resulted in another round of water negotiations as well. For more than two decades, the Tribe actively participated in settlement negotiations that ultimately resulted in the Truckee River Operating Agreement (TROA). Municipal governments wanted further dilution and to make sure they held onto groundwater in the midbasin, and the Tribe wanted more water to remain in the river continuously so it would reach Pyramid Lake without being diverted for municipal uses (oral history). Despite parties having different spatial orientations and separate interests in water quality, the agreement that went into effect in 2015 allocated an additional 6,700 acre feet targeted for Pyramid Lake and the Tribe (Federal Register 2008). Although TROA is basically designed to provide the guidelines for water allocation in the basin, it aligns water allocations in concert with water quality improvement and recognizes support for native fish in ways that fit with the Tribe's core value and are compatible with their spatial orientation around the lower river and lake. These illustrate ways in which tribal presence and governance both adapts and contributes to the changing spatial and temporal conditions of the basin, as tribal members and leaders deal with other people, institutions, and impacts in the Truckee River basin.

Conclusions

In this article we bring together four things that are not often combined: water values, hydrosocial imaginaries, tribal water quality governance, and spatiotemporalities. Being explicit about values—what people care about and what motivates them—is significant because of the importance of recognizing values in water quality governance, especially because values are frequently misrepresented as uses of economic importance (Groenfeldt and Schmidt 2013; Berry et al. 2018). As illustrated in Figure 1, we identify the Pyramid Lake Paiutes' core value as connected to both hydrosocial imaginaries, which in turn connect with one another. Both hydrosocial imaginaries motivate governance practices and actions through which social meaning is constituted for the Pyramid Lake Paiutes and relationships are built with respect to water. We take a spatial and temporal approach in considering values and hydrosocial imaginaries as well as addressing these empirically in our case study. We hope that other geographers will further build on this approach through examining values and hydrosocial imaginaries.

Our observations underscore the cultural, political, and material factors involved in the socio-spaces that connect the Pyramid Lake Paiutes with the lower Truckee River and Pyramid Lake. Being situated in a place that encompasses a terminal desert lake ties the Tribe through river flows to the snowpacks in the upper basin, to upstream reservoirs, and to the people and upstream activities—past and present—that change the conditions and quality of water. This is not meant to suggest, however, that all spatiotemporal relationships are equally significant. Through governance actions (e.g., litigation, negotiation, and creating tribal policy) the Tribe has made it clear that not all spaces or times are equal, prioritizing actions, practices, and relationships that directly support water associated with their protection of the lower river and lake.

Of equal importance are the ways water can reconfigure and be reconfigured by spatiotemporal relationships connected to tribal governance. In the case study, this is evident in tribal actions associated with upstream dam construction and operations. After years of litigation and negotiation by the Pyramid Lake Paiute Tribe over upstream dams, the Tribe was able to change reservoir storage releases so that the timing and amount of upstream water releases improve conditions for their fisheries and water quality. Another dimension of reconfiguration relates to Clark et al.'s (2017) understanding that water serves as "time substance," which can generate a sense of (im)permanence while connecting, containing, or embracing the social. We see this as the Pyramid Lake Paiute Tribe deploy beneficial uses for water quality, which reinforce their ontologies and bolster a distinct vision of spatiotemporal relations while supporting their core value and Hydrosocial Imaginary 1. We encourage others to study how space and time are woven into and (re)constructed through the networks associated with water and tribal governance.

In uncovering spatiotemporal understandings that are embedded in and revealed by tribal governance of water quality, we recognize the ways in which Tribes continually redraw trajectories of power in engaging and reshaping complex governance networks (Bruyneel 2007). In this case, despite a series of historic upstream activities that serve as spatiotemporal markers and continue to influence options for the Pyramid Lake Paiute Tribe, tribal water quality governance provides a means to (re)configure spatial relationships and temporal orientations. Practices associated with and connections between the core value, hydrosocial imaginaries, and governance could serve as means to resist Povinelli's (2011) "governance of the prior." As such, water quality governance is an avenue in which the Pyramid Lake Paiute Tribe move beyond partial and abstracted rights of inclusion by incorporating multidimensional Indigenous systems of obligation that span time and space. ■

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ORCID

Kate A. Berry  <http://orcid.org/0000-0002-7903-0012>
 Teresa Cavazos Cohn  <http://orcid.org/0000-0003-0295-3684>

Notes

- ¹ We use the term *water quality governance* to mean the broad variety of formal and informal processes, institutions, and practices employed to measure, regulate, transport, utilize, manage, control, and appreciate water quality (Berry et al. 2018).
- ² In contrast with Taylor (2002), we view social imaginaries as being less fully encompassing. In our view, they are often not singular but multiple and might interlock with one another.
- ³ This is only a partial list of major upstream activities.
- ⁴ We are aware that the impacts from activities interact with one another but avoid emphasizing cumulative impacts because this tends to coarsely aggregate the impact of various activities. Instead, our point is to represent activities as distinct incursions or events, with their own spatio-temporal trajectory, recognizing that these necessarily interact with one another.

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KATE A. BERRY is a Professor in the Department of Geography, University of Nevada, Reno, NV 89557. E-mail: kberry@unr.edu. Her research focuses on water governance, the cultural politics of water, Indigenous water issues, and environmental justice issues associated with contemporary mining.

TERESA CAVAZOS COHN is an Associate Professor in the Department of Natural Resources and the Environment, University of New Hampshire, Durham, NH 03824. E-mail: Teresa.Cohn@unh.edu. Her research focuses on Indigenous water, human dimensions of fire, and science communication and the environment.