Indigenous water governance: Insights from the hydrosocial relations of the Koyukon Athabascan village of Ruby, Alaska

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ABSTRACT

Water is fundamental to Indigenous ways of life. Specific Indigenous peoples maintain distinct and multifaceted sociocultural relations to water, yet the legacy of colonialism globally means that communities around the world face similar challenges to protecting these relations. The role of Indigenous peoples and their sociocultural relations to water is currently under acknowledged in the water governance literature. Through a case study of the Koyukon Athabascan people of Ruby, Alaska, this article examines how the explicit analysis of hydrosocial relations facilitates conceptualization of Indigenous water governance. Participatory research methods involving semistructured interviews and traditional use mapping were employed to document the hydrosocial relations of the people of Ruby, which water law and policy in Alaska does not adequately recognize. This study contributes to the literature in two ways. First, an engagement with the hydrosocial literature makes explicit the distinct sociocultural relations to water maintained by all human communities and the existence of these multiple normative orders within the same political space, where the hydrosocial relations of some populations are privileged over others. Second, it contributes to the conceptualization of Indigenous water governance by exploring the extent to which Indigenous peoples in the Yukon River Basin, including the people of Ruby, are engaging in multiple strategies to assert their sovereignty. These strategies include recognition-based approaches such as litigation to gain legal recognition of Indigenous water rights and Indigenous alternatives without reference to state recognition such as the development of community-based water monitoring programs.

Introduction

Indigenous peoples[2] are in the process of asserting various roles in water governance in order to protect their relationships to water (Phare, 2009; Thorson et al., 2006; von der Porten and Loë, 2013), which are challenged by water scarcity, impaired water quality (Gleick and Cooley, 2009; Rosegrant et al., 2002) and ongoing colonialism (Boelens et al., 2006). Water governance is defined as "[t]he range of political, organizational and administrative processes through which communities articulate their interests, their input is absorbed, decisions are made and implemented, and decision makers are held accountable in the development and management of water resources and delivery of water services" (Bakker, 2003, p. 3). Given the incredible amount of diversity within each of these traditions, it would be overly simplistic to assert that there is an essential dichotomy between Indigenous and Western approaches to water governance. However, Indigenous conceptions of water governance do tend to differ from mainstream Western approaches (Boelens, 2003; Boelens et al., 2006; Perreault, 2005, 2008), which view water as a resource available for human exploitation (Bakker and Cook, 2011). These approaches differ from the perspectives of Indigenous peoples, who often value water as a living entity that carries deep spiritual and cultural meaning (for example, Barbera-Hernandez, 2005; Blackstock, 2001; Boelens et al., 2006; McGregor, 2012). Furthermore, Indigenous peoples' worldviews influence their patterns of water use and management, and their relationships to water, as well as other elements of the environment, fundamentally contribute to their distinct identities (Barbera-Hernandez, 2005). Without explicit acknowledgement, sociocultural relations to water that differ from mainstream Western perspectives and community strategies to protect them, go unrepresented within water

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[2] Indigenous peoples around the world are diverse. I use the term Indigenous peoples to refer to these populations for two reasons: First, to acknowledge that Indigenous peoples are members of "Nations," however complex this term may be to define; second, to refer to Indigenous peoples' shared experiences of colonization and resistance (Corntassel, 2003; Smith, 1999). Where necessary, I use the legal term Alaska Native to refer to Indigenous peoples recognized under the *Alaska Native Claims Settlement Act* (ANCSA), which will be discussed in detail later in this article. I use specific names when referring to a particular community. For example, I refer to the people of Ruby as Koyukon Athabascan rather than Alaska Native or Indigenous in order to acknowledge their distinct identity.

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governance literature. Using a case study of the hydrosocial relations of the Koyukon Athabascan village of Ruby, Alaska, the objectives of this paper are twofold: First, to examine how the explicit analysis of hydrosocial relations can facilitate understandings of approaches to Indigenous water governance. Second, to draw on novel concepts from the Indigenous governance literature to make explicit the ways that Indigenous peoples are currently engaging in Indigenous water governance, often in spite of legal recognition by colonial states.

Indigenous water governance

The Indigenous governance literature is essential to any discussion of water governance. Indigenous governance refers to a vast field of study related to Indigenous peoples and decision making that is generally considered to include Indigenous identity, sovereignty, self-determination, values, ways of knowing, and race, as well as historical and ongoing colonialism and the resulting consequences of marginalization (Alfred, 2005; Corntassel and Witmer, 2008; Coulthard, 2008; Ford and Rowse, 2012; Porter, 1998; Simpson, 2000; Smith, 1999; von der Porten, 2012). The ability to choose how they relate to water and other resources is a fundamental sovereignty issue for Indigenous peoples (Boelens et al., 2006). Therefore, concepts from the Indigenous governance literature are essential in order to avoid the problems found in the collaborative water governance literature, where Indigenous peoples are often treated as "stakeholders" rather than self-determining or sovereign peoples (von der Porten and Loë, 2013).

Self-determination and sovereignty are critical concepts within this field. In the *Indigenous Peoples Kyoto Water Declaration*, self-determination for Indigenous peoples is defined as "the right to control [their] institutions, territories, resources, social orders, and cultures without external domination or interference" (UNESCO, 2003). While many Indigenous scholars employ the term self-determination (for example, Alfred, 2005; Coulthard, 2008; Tully, 2000), others, especially in the United States, use the concept of sovereignty in a similar manner (for example, Barker, 2005; Brooks, 2008; Lomawaima, 2013; Ouden and O'Brien, 2013; Rickard, 2011; Simpson, 2011; Warrior, 1992).

Sovereignty is a concept of European origin that assumes states exercise the ultimate authority over a given territory, yet absolute sovereignty no longer exists due to increasing interconnection between domestic and international politics (Shaw, 2008; Wilkins and Kiiwetinepinesiik Stark, 2011). The role of sovereignty in decolonization has been much debated (von der Porten, 2012). According to Alfred (2001, 2006), sovereignty should not be the goal of Indigenous communities because it is a European concept rooted in an "adversarial and coercive notion of power" that depends on recognition from colonial states (2006, p. 325), and seeking recognition perpetuates dependent and reactionary relationships between Indigenous peoples and the state (Alfred, 2001, 2006; Coulthard, 2008). Sovereignty has also been redefined or "rearticulated" in ways that are meaningful to Indigenous peoples, in spite of the colonial legacy associated with the term (Barker, 2005). Audra Simpson emphasizes the importance of sovereignty in the strategies employed by Indigenous peoples: "Indian sovereignty is real; it is not a moral language game or a matter to be debated in ahistorical terms. It is what they have; it is what, in the case of the United States, they have left; and thus it should be upheld and understood robustly—especially as Indians work within, against, and beyond these existing frameworks" (2011, p. 211). While critiques of sovereignty raise important issues about developing Indigenous alternatives without dependence on or reference to colonial states or agendas (Alfred, 2001, 2006; Coulthard, 2008), Simpson (2011) refers to the idea that sovereignty is achieved through employing multiple approaches that include strategically seeking state recognition while simultaneously building Indigenous alternatives.

Indigenous water governance is often approached via the topic of water rights. State recognition of Indigenous water rights and sovereignty varies widely between contexts (Boelens, 2003; Boelens et al., 2006; Goodman, 2000; Phare, 2009; Thorson et al., 2006). However, it is crucial to begin with the assumption that Indigenous peoples hold inherent water rights, which flow from their relationships to their traditional territories and include the "power to make decisions, based upon [their] laws, customs, and traditional knowledge to sustain [their] water, for all life and future generations" (Phare, 2009, p. 46). In other words, water rights are not conferred upon Indigenous peoples by colonial governments; rather, "[t]ribes exercise rights based on their original and indigenous sovereignty" (Wilkins and Lomawaima, 2001, p. 121). The United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) affirms this notion through the recognition of the rights of Indigenous peoples to their "lands, territories and resources" (Article 26), including the right to determine the development course for these lands, territories, and resources, including water (Article 32) (2008). While these rights do not lose their meaning when unrecognized by colonial governments, acknowledgment by other legal regimes can make inherent rights more effective.

Indigenous hydrosocial relations

Interdisciplinary literature regarding relationships between humans and water (for example, Orlove and Caton, 2009; Strang, 2004, 2009) is useful for understanding the ways that human relationships to water are socially constructed, or ascribed meaning and values within a given context, and the influence of these meanings on people's actions must be considered (Budds, 2009; Orlove and Caton, 2010). Human relationships to water simultaneously comprise material and socially constructed dimensions (Orlove and Caton, 2010). Three concepts from this literature combine social, cultural, and ecological relations to water: First, the term "waterscape," analogous to the term landscape, was coined in the 19th century to refer to "the culturally meaningful, sensorially active places in which humans interact with water and with each other" (Orlove and Caton, 2010, p. 408). Eric Swyngedouw (1999) popularized the term, and it has been used extensively since (For example, Adams et al., 2010; Budds and Hinojosa, 2012; Stansbury, 2007). Second, the totality of relationships between people and water, or hydrologic connectivity, in a given context has been referred to as a "waterworld" (Hastrup, 2009), a concept that implies human interactions with water can delineate the borders of human communities (Orlove, 1993; Orlove and Caton, 2010). Third, the existence of both the material and the socially constructed dimensions of water, and the interactions between the two (Budds, 2009; Linton and Budds, 2013), reveals a hybrid or "hydrosocial cycle" of water, contrasting with hydrologic notions of water, which conceptualize water as a material or physical substance (H_2O) circulating through the hydrologic cycle (Forsyth, 2003). The hydrosocial cycle is not politically neutral; rather, it is shaped by interactions among water users based on power differentials and cultural politics (Boelens, 2013). Each of these three concepts—waterscape, waterworld, and the hydrosocial cycle—highlights the existence of both material and sociocultural relations to water and can be used to differentiate the distinct ways human communities relate to water.

The sociocultural significance of water for Indigenous peoples and their knowledge of water and water management have been documented in a variety of contexts (Adams et al., 2010; Basdeo and Bharadwaj, 2013; Blackstock, 2001; McGregor, 2012; Rawat and Sah, 2009). For Indigenous peoples, Indigenous knowledge is crucial to understanding hydrosocial relations. While there is no concise definition of Indigenous knowledge, the term is generally used to refer to the distinct bodies of knowledge, values, beliefs,

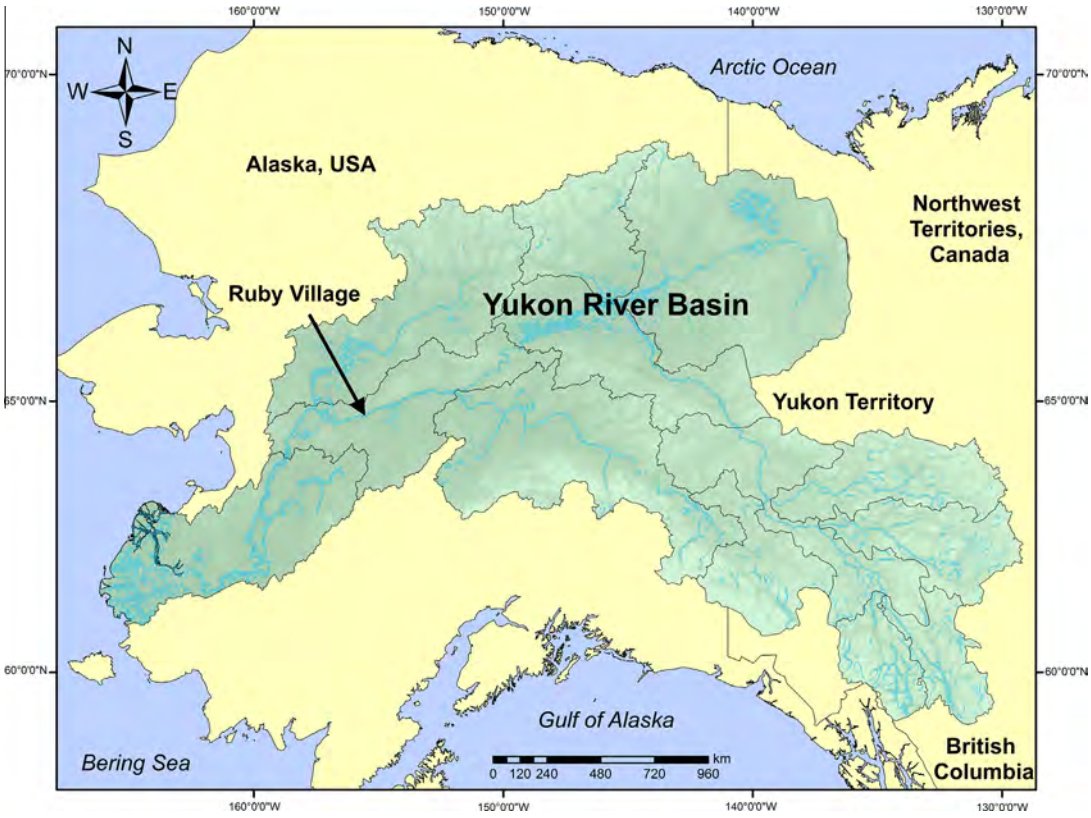

Fig. 1. Location of Ruby village in the Yukon River Basin.

and practices that are passed down through generations of Indigenous peoples (Battiste and Henderson, 2000; Berkes, 2008; Kassam, 2009), which include specific knowledge of water values, use, and management (Blackstock, 2001; McGregor, 2012; Singh, 2006, 2009; Toussaint et al., 2005). Through a case study of the people of the Koyukon Athabascan village of Ruby, Alaska, I examine the elements of hydrosocial relations of the people of Ruby in order to contribute to a discussion regarding the need to acknowledge sociocultural relations to water within the water governance literature and to facilitate an understanding of Indigenous approaches to water governance aimed at protecting these hydrosocial relations.

Case study

Ruby, Alaska is situated in the middle river region of the Yukon River (64°44′22.00″N, −155°29′13.00″W) (Fig. 1).[3] This region, in the interior of Alaska, is characterized by plentiful streams, rivers, lakes and wetlands, open spruce forests, and shrublands. This landscape diversity provides habitat for a rich variety of fish and wildlife including salmon, moose, diverse species of migratory waterfowl, bears, wolves, beaver, and other small game. The Yukon River and its tributaries are defining features of the landscape and are complexly interconnected with the lives and livelihoods of its Indigenous inhabitants (Nelson, 1982).

During the 20th century, the Koyukon Athabascan people of Ruby and other Indigenous peoples in Alaska experienced massive sociopolitical changes resulting in a transition from living a mobile life, moving according to seasonal harvesting patterns, to living in fixed village locations (Clark, 1974, 1975; Nelson, 1982; Sullivan, 1942; VanStone, 1974). While the area around Ruby has been part of the traditional territory of the Koyukon Athabascans for millennia, the settlement itself was founded as a supply point for gold prospectors during the mining booms of 1906 and 1910, which attracted thousands of prospectors to the area (De Laguna, 2000). The current population is 166 persons, living in 62 households. The residents are 88.6% American Indian or Alaska Native (U.S. Census, 2010). Ruby is primarily an Alaska Native, Koyukon Athabascan village today.

Beginning in the 1960s, the political struggles of Indigenous peoples in the Arctic and Subarctic of North America, including those in Ruby, have focused on land claims and subsistence rights (Berger and ANRC, 1985; Brody, 1982; Nadasdy, 2003). Whereas Indigenous water rights are more clearly defined in some contexts, such as the arid Western United States through the *Winters* Doctrine (*Winters v. United States*, 1908),[4] in the North American Subarctic and Arctic, Indigenous water rights and participation in water governance have with few exceptions been treated implicitly within other political struggles. For example, in Alaska, water rights were not explicitly addressed within in the *Alaska Native Claims Settlement Act* (ANCSA) (1971). However, in recent years, Alaska Natives have actively sought to define their water rights and assert various roles in water governance in order to protect the waters within their traditional territories (The Center for Water Advocacy, 2013; YRITWC, 2012). In Alaska, various threats to water have been identified by communities including climate change (McNeeley, 2009, 2011; McNeeley and Shulski, 2011) and environmental degradation caused by mining, municipal, and military waste (YRITWC, 2002). Given the sociocultural importance of water and

[3] All maps were created by the author.

[4] For further reading on *Winters* Doctrine, see Pevar (2002) and Shurts (2000).

its relationship to Indigenous sovereignty, understanding Indigenous peoples' hydrosocial relations is critical to the analysis of Indigenous peoples' approaches to water governance. The following section describes the methodologies used in this study of the hydrosocial relations maintained by the Koyukon Athabascans of Ruby village within their traditional territory.

Methods

Participatory Action Research (PAR) is an iterative approach to research used to generate knowledge through cycles of action and reflection (Greenwood and Levin, 2008). Furthermore, PAR is a fundamentally ethical research philosophy that informs research methods and design in order that science can serve as the basis for social change (Greenwood and Levin, 2008). This study was designed and conducted in partnership with the Yukon River Inter-Tribal Watershed Council (YRITWC), whose goal is to meet the needs of the 70 Indigenous governments it serves in the Yukon River Basin. Furthermore, the YRITWC facilitated a research partnership with the Ruby Tribal Council (RTC), and the project was modified to fit the needs of Ruby village. All research data and outputs were validated by and shared with the YRITWC and the RTC. The research presented in this paper describes aspects of this PAR project, including the iterative collection, validation and sharing of data and findings, but it does not touch on the ways that my research partners, RTC and YRITWC, have been used this research in Ruby and other contexts.

Research was conducted during two field seasons, the first of which took place between June and October 2010 and the second in July and August 2011. During this time, semistructured interviews were conducted with 20 community experts, including Elders, subsistence harvesters, and tribal administrators. Participants included eight women and twelve men whose ages ranged from 49 to 92 years. Interview participants were recruited using a snowball method (Patton, 2002).

At least three meetings were held with each interview participant. Interviews focused on the use and perception of water, among other topics largely related to the subsistence livelihoods maintained by the people of Ruby. Interviews were conducted in two parts. During an initial interview, participants were asked to describe how they use and value water, including specific questions related to drinking water, subsistence livelihoods, and their perception of the Yukon River. Follow-up questions were asked to clarify responses.

Typed versions of interview narratives were validated during a second interview. Interview narratives were read out loud to each interview participant. At the time of validation, interview narratives were updated to add any important information that was left out during the initial interview. During a third visit, printed versions of final of interview narratives were given to participants for their records. Interview narratives were coded for observations of change.

Traditional land use mapping was conducted as part of interviews. Interview participants were asked to place icons representing key species, livelihood activities, and drinking water sources on a 1:250,000 scale topographic map encompassing the traditional territory of the people of Ruby.[5] This map was then digitized using ArcGIS. Printed versions of the digitized maps were then presented to interview participants during follow-up interviews, where they added additional icons and place names and provided feedback regarding the layout. Research results were then presented for validation during a public meeting held in July 2011.

[5] Icons were adapted, with permission, from previous human ecological mapping projects conducted in Wainwright, Alaska and Hay River, Northwest Territories (Kassam and SEFC, 2001; Kassam and WTC, 2001).

Results and discussion

The Koyukon Athabascan people of Ruby maintain complex hydrosocial relations as a result of their ever-evolving subsistence way of life within their traditional territory. The Yukon River, its tributaries, and its associated waters are important to the people of Ruby in multiple and complex ways. A quote from one community expert illustrates many of these uses:

> The Yukon River is important in a lot of ways, I guess. We travel on it to get back and forth. In summertime, we do what I am doing now. We go up the river to gather driftwood. We make a raft of the logs and float them back to the village. I do this three to four times a season. People also fish on the river. I don't do this so much myself anymore. The river is important for hunting. Everything we hunt is on the river. Sometimes people go out the road [to hunt], but mostly it's on the river. Most of my trapping camps are on the river.

Research findings reveal the Yukon River, its tributaries, and its associated surface and subsurface waters are used in the following ways: transportation, habitat for subsistence species (food), drinking water, sanitation, spiritual use, recreation, and domestic uses such as watering gardens (Table 1). While these findings are consistent with previous documentation of Koyukon Athabascan subsistence livelihoods (Andersen et al., 2004; Marcotte, 1986; McNeeley, 2009; Nelson, 1982; Sullivan, 1936, 1942), this study adds to this literature through the study of present hydrosocial relations. The people of Ruby value water in more than a utilitarian manner. They value water for economic, ecological, and cultural reasons, which tend to converge in the practice of subsistence livelihoods. Similar to other Indigenous peoples, the people of Ruby's subsistence livelihoods are not only a means to meet basic nutritional needs but the basis for a traditional "way of life" or culture (Wheeler and Thornton, 2005). Defining subsistence in this manner reveals distinct sociocultural and ecological relations to water. The land use pattern that emerged from the mapping exercise demonstrates the role of water in subsistence livelihood practices, which connect the people of Ruby to an extensive traditional territory (Fig. 2). Icons indicate that subsistence harvesting is largely concentrated along the rivers and other bodies of water. Furthermore, traditional drinking water sources, including various springs and rivers, are found throughout the landscape. The following section examines the specific attributes of the people of Ruby's relations to water, which are *complexly connected, context specific*, and *dynamic and adaptive*, and describes the implications of acknowledging these attributes for water governance in theory and practice.

Complex connectivity

Complex connectivity signifies a sense of "kindredness" with all aspects of the ecology, which creates no separation between people, water, and land (Kassam, 2009, p. 85). This connectivity stands in contrast to instrumental connectivity to water, which fails to acknowledge the complex material and socially constructed meanings of water. Complex connectivity is illustrated through the relationship of the people of Ruby to the Yukon River, the most prominent feature on the landscape. The people of Ruby rely on the river for all aspects of their lives and livelihoods. The quotes below illustrate their complex connectivity to the Yukon River. One community expert stated, "the Yukon River is life itself for the people of Ruby. It brings life and it brings death. It feeds us. It's a transportation highway in the winter. It is full of fish in the summer." Further illustrating the point, another community expert stated, "we have lived so long on the river. It's part of our family so

Table 1
Elements of the hydrosocial relations of the Koyukon Athabascan people of Ruby, Alaska.

Use	Description
Transportation	Since Ruby is not located on the Alaska road system, the Yukon River is the main transportation corridor for Ruby residents. People travel on the river by boat during times of open water and by snowmobile when it is frozen over. The barge system is the main way that supplies are transported to Ruby. People also travel on the Yukon River and its tributaries for all subsistence livelihood activities including hunting, trapping, and fishing
Habitat (food)	The Yukon River and its tributaries provide habitat for subsistence species that are relied upon as a source of food including fish, such as salmon, and riparian habitat used by many other animals, such as moose. Wetlands also provide important habitat for gathered plants and berries including blueberries, cranberries, and salmon berries
Drinking water	Drinking water from several sources is in regular use. Many people get their water from either the municipal treatment plant or private wells located near their houses. Secondary drinking water sources are also used including water taken directly from the Yukon, small streams with minimal sediment loads, and springs
Spiritual	The overall relationship to water is a spiritual one that requires that people respect water as they do all other living beings
Recreation	The Yukon and its tributaries are used for recreational purposes. Swimming is the main recreational use of water
Firewood	Large quantities of driftwood are transported by the Yukon River each year when high waters associated with spring breakup occur. This driftwood is an important source of firewood for the people of Ruby. It is gathered in the spring and dried for later use during the winter
Sanitation	Water from the municipal water supply and private wells is used for washing and bathing in the village. Other sources are used for this purpose when people are at fishing, hunting, and trapping camps
Watering gardens	Approximately a dozen households in Ruby maintain a small vegetable garden. Water for these gardens is taken from various sources. The public spring located in Ruby is used for this purpose. While the spring is contaminated by *fecal coliform* bacteria, which is unsuitable for drinking, it is safe for watering gardens. Water from the Yukon River is also used, although it is known that residents cannot use it too often because of its high sediment level. Water from the municipal supply or private wells is also used

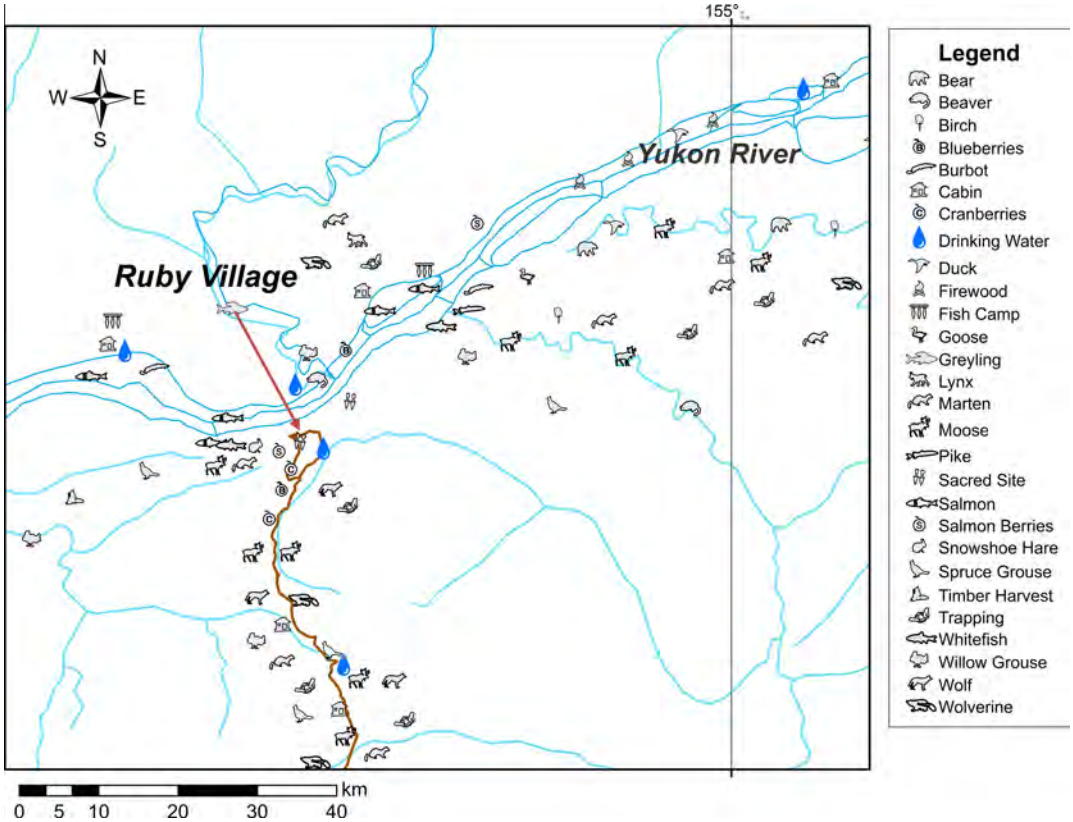

Fig. 2. The traditional use map for Ruby village illustrates present hydrosocial relations in one portion of their traditional territory.

we treat it that way." Finally, an Elder from Ruby discussed aspects of the spiritual relationship to the Yukon River: the people of Ruby do not "worship the river, [they] respect the river," as they do all other living beings. Koyukon notions of respect have been well documented (Nelson, 1982), largely in the context of reciprocal relationships to beings, such as animals, that are attributed personhood. On the Koyukon relationship to rivers, Richard K. Nelson (1982) states, "[a]lthough rivers are paramount features of the Koyukon landscape, they are not regarded as great sources of supernatural power. Nevertheless, they do have consciousness [and during spring breakup rivers] must be supplicated" (pp. 36–37). From a Western perspective, water is often treated as an abiotic, or nonliving, element of the physical world. In contrast, the people of Ruby emphasize valuing or respecting the Yukon River and its tributaries as a living, or animate, entity. In this sense, the Yukon River is not merely valued instrumentally, or for its importance as a means of obtaining the minimum ends of human life. Instead, the people of Ruby's complex connectivity to water is indicated through their relationship to the Yukon River, which is of deep sociocultural significance, and in particular, through the view that they are engaged in reciprocal relations of respect with the river.

Context specificity

Context specificity refers to the manner in which relations to water are particular to specific groups of people who occupy a defined territory. Relations to water are embedded within a web of interactions between humans, animals, plants, and other elements of the landscape, such as water. Therefore, social relations to water are fundamentally informed by their ecological context (Kassam, 2009, p. 85).

The various uses of water described above connect the people of Ruby to many bodies of water within their traditional territory. For example, throughout history, the people of Ruby have collected drinking water from a variety of sources depending on their location, the season, and other factors. Traditional sources of drinking water include the Yukon River, three of its main tributaries (the Melozitna, Nowitna, and Yuki Rivers), several smaller tributaries or "clear creeks," springs, and aquifers (Fig. 2). While all human communities require access to safe drinking water, it is significant that the use of traditional drinking water sources continues despite access to the municipal water supply in Ruby. Traditional drinking water sources are often located near fish camps and other sites occupied during subsistence harvesting. The use of each body of water has context-specific sociocultural and ecological meanings and uses within the traditional territory of the people of Ruby. In contrast to the idea that water is simply a material substance (H_2O) that does not differ between contexts, the context-specific use and meaning of traditional drinking water sources illustrates that particular sources of water have specific meanings and uses and are therefore not substitutable.

Dynamic and adaptive

The people of Ruby have developed relations to water through long-term use and occupancy within a given territory. These relations are cumulative, and therefore, relations to water maintained by previous generations presently influence the people of Ruby. Relations to water based on traditions are not fixed in a particular historical period. They are dynamic, and the practitioners of these traditions are capable of adapting to change (Kassam, 2009).

Evolving perceptions of drinking water demonstrate the dynamic and adaptive nature of relations to water in Ruby. As described above, the people of Ruby continue to rely on traditional sources of drinking water despite massive social change. Certain techniques for obtaining water for drinking and other domestic purposes are not practiced anymore. For example, in the summer when the Yukon River contains a high sediment load, people used to collect water from this source by digging a hole on the beach that would fill with clear water. In the late fall and winter, when the sediments have largely settled out of the river, people would cut a hole in the ice and use a bucket to obtain drinking water; the river ice itself also can be collected and melted. It is no longer common for people to practice these methods for obtaining drinking water, but community experts noted that if it were necessary, they would obtain water in this manner.

Two major historical changes have influenced sociocultural relations to drinking water. First, sedentarization, or the shift from seasonal migration to living in a centralized village location, meant that community members were relying on fewer drinking water sources when they were in the village. Second, another major change cited was the introduction of technology in the 1970s that allowed access to groundwater through private and municipal drinking water wells to the residents of Ruby. Many community experts referred to the convenience of well water as a factor that reduces the likelihood that they will obtain water from other sources. However, the increased reliance on municipal water supplies does not negate the use of traditional water sources or the community's sociocultural relations to them. Community experts indicated that they continue to consume water from a wide variety of traditional sources. Water is consumed from small "mountain" creeks and springs when people are out on the land hunting and trapping or at fish camp. Water from these sources, especially springs, is preferred to water from the municipal water supply, as it is considered healthier and does not have the taste that is often present in chlorinated drinking water. The continued use of traditional drinking water sources is influenced by a variety of factors including the extent to which people spend time on the land and individual knowledge of these traditional sources.

Implications of hydrosocial relations for water governance

The unique hydrosocial relations of the people of Ruby are illustrated by the above analysis of the *complex connectivity*, *context specificity*, and *dynamic and adaptive* character of relations to water. While this case study focuses on the hydrosocial relations of the Koyukon Athabascan people of Ruby Alaska, it is critical to acknowledge the location of all human communities within a hydrosocial system that has both material *and* sociocultural dimensions. The hydrosocial literature makes clear that all human communities are engaged in complex relationships with water that have both material as well as sociocultural dimensions (Linton and Budds, 2013; Orlove and Caton, 2009; Strang, 2004). While the importance of sociocultural dimensions of water are increasingly acknowledged (Linton and Budds, 2013; Sivapalan et al., 2012), a focus on hydrologic understandings, which acknowledges the material dimensions of water alone, remains prevalent. Consequently, sociocultural relationships to and values of water are often unacknowledged.

Analysis of the hydrosocial can illuminate the similarities and differences in sociocultural and material relations to water between and among human communities and the conflicts that may occur as a result of the differences. For example, the uses and values of water maintained by Indigenous peoples, such as the people of Ruby differ significantly from the normative orientation of mainstream Western water governance, which view water as a resource available for human exploitation, rather than a living entity with which they are engaged in reciprocal relations of respect. Differences in hydrosocial relations become significant in contexts where dominant perspectives conflict with Indigenous peoples' hydrosocial relations in a manner that threatens their ability to maintain these relations, which are fundamental to their way of being.

Acknowledging the existence of multiple normative orders within the same political space and the interactions between these orders, which are often shaped by power relations where the state privileges some normative orders over others (Boelens et al., 2005) is fundamental to the study and practice of water governance. An engagement with the hydrosocial literature contributes to the development of water governance by making explicit the existence of distinct sociocultural relations to water. At the same time, understanding Indigenous approaches to water governance requires analysis beyond the acknowledgement of differences in hydrosocial relations, but extending to those that influence the unequal power relations and the multiple strategies that Indigenous peoples employ to protect their hydrosocial relations. The following section discusses Indigenous water governance in Alaska including both an examination of the current state of Indigenous water policy and law and the ways Indigenous peoples are engaging with water issues that go beyond recognition-based strategies.

Indigenous water governance in Alaska

Indigenous peoples in Alaska, elsewhere in the United States, and around the globe are employing a variety of strategies to transform water governance in a manner that acknowledges their hydrosocial relations and historical power inequalities (Boelens, 2003, 2013; Boelens and Doornbos, 2001; Getches, 2005; Hoverman and Ayre, 2012; Perreault, 2005, 2008).[6] Discussions of Indigenous peoples and water often focus on the need for legal recognition of Indigenous water rights (for example, Boelens and Doornbos, 2001; Boelens, 2003; Thorson et al., 2006), the Indigenous governance literature reminds us that inherent water rights (defined above) exist independent of state recognition and do not lose their meaning in contexts where colonial states refuse to acknowledge them. As discussed above, critiques of recognition-based approaches to Indigenous governance examine the ways that seeking recognition can perpetuate dependent and reactionary relationships between Indigenous peoples and the state (Alfred, 2001; Coulthard, 2008, 2010). Therefore, a certain level of skepticism is required when discussing strategies for achieving decolonization through processes that require colonial states to acknowledge Indigenous water rights and sovereignty, where the recognition of sovereignty is not necessarily in the interest of these states. Still, similar to the approach to asserting sovereignty discussed by Simpson (2011), Indigenous peoples are engaging in multiple strategies that often involve litigation with the goal of gaining state recognition of rights, but also include the creation of Indigenous alternatives that seek to protect their hydrosocial relations. In the following discussion, I review the current state of water law and policy in Alaska and the use of litigation strategies to advance these rights. Given the limitations of strategies that seek legal recognition of Indigenous peoples' inherent water rights, I then provide examples of other strategies being employed in the Yukon River Basin to assert Indigenous peoples inherent water rights and roles in water governance. Finally, I provide several recommendations for future areas of research related to Indigenous water governance.

Legal recognition of Indigenous water rights in Alaska

The United States has long recognized Indigenous water rights as the basis of historical use and occupancy and treaties. The *Winters* Doctrine was established through what is widely considered the most important Native water law case in the United States, *Winters v. United States* (1908) (Pevar, 2002; Shurts, 2000). However, the unique legal context of Alaska makes the application of *Winters* Doctrine complex.

ANCSA, passed by an act of Congress in 1971, is the most influential legislation affecting Indigenous peoples in Alaska. Consequently, it is the starting point for a discussion on Indigenous water rights. ANCSA consisted of a cash settlement of $962.5 million and 44 million acres of land, meaning that the remaining lands in Alaska were ceded for $3 an acre to the United States Government. The settlement also resulted in the creation of 13 regional and many more village corporations to administer these claims (Berger and ANRC, 1985). Section 4 (b) of ANSCA explicitly extinguished all aspects of aboriginal title (U.S. Public Law 92-203, 1971). The courts have never ruled on the extinguishment of Native water rights and the significance of ANCSA for water rights continues to be debated. It might be argued that the loss of water rights is implied within the extinguishment of title to land. The potential for the recognition of Indigenous water rights is also complicated by the legal decision in *Alaska v. Native Village of Venetie*, which ruled that lands held in fee simple by Native corporations are not "Indian country" (Carpenter, 1999). In this context, where tribal governments are a collection of people unconnected to a land base, it becomes difficult to apply a *Winters* Doctrine–type argument.

Subsistence rights in Alaska provide an alternative avenue for recognizing Indigenous water rights. ANSCA included a vague promise that Indigenous subsistence rights would be protected, not realized until 1980 with the passage of *Alaska National Interest Lands Conservation Act* (ANILCA), which was designed to promote subsistence rights to wild resources over recreational and commercial uses on federal lands (Wheeler and Thornton, 2005). Title VIII of ANILCA creates a rural subsistence priority, meaning subsistence rights are not exclusive to Alaska Natives. Instead, they are granted on the basis of rural residency. ANILCA acknowledges the importance of subsistence rights for cultural existence and therefore includes allowances to hunt and fish for "customary and traditional uses" (Berger and ANRC, 1985; U.S. Congress, 1980). The possibility of protecting waters pertinent to subsistence uses has been argued using ANILCA.

The Federal reserved water rights doctrine is an extension of the *Winters* Doctrine that asserts water rights are reserved through the creation of federal lands (ADNR, 2014). In Alaska, it has been argued that federal reserved water rights were implied in the creation of Title VIII public lands. However, the extent of these water rights hinges on the much-debated definition of "public lands," the subject of the *Katie John* legislation. ANILCA defines federal "public lands" to include "those lands, waters, and interests therein" (U.S. Congress, 1980). The federal government initially asserted that Title VIII applied to federal lands and not waters. Beginning in 1990, the *Katie John* case discussed "whether navigable waters fall within the statutory definition of public lands and are thus subject to federal management to implement ANILCA's subsistence priority" (F. 3d, 1995). The US federal government supported the view that public lands include waters. The State of Alaska holds title to navigable waters and views the US federal government's perspective as a challenge to state sovereignty (Nockels, 1996). An initial ruling, in 1999, that federal reserved water rights exist in Alaska left these rights undefined. The federal government reissued regulations pertaining to the scope, extent, and purpose of water rights within or adjacent to a federal land reserve for the purpose of fulfilling the subsistence priority assured by ANILCA Title VIII. This definition continues to be debated. While the *Katie John*[7] case argues that the federal government's definition is too narrow and asserts federal reserved water rights should extend to all navigable waters upstream and downstream from federal reserves (F. 3d, 2001), the State of Alaska claims that if reserved water rights exist, they should only pertain to waters directly adjacent to federal reserves. The Ninth Circuit Court recently ruled to uphold the 1999 decision (09-36122, 2013). Although the recent ruling is considered a positive step for Alaska Natives, the State of Alaska continues to contest this legislation and filed documentation in November 2013, clarifying its intentions to file an appeal with the Supreme

[6] While this case study of the Koyukon Athabascans of Ruby village examines the hydrosocial relations of one Indigenous community within their traditional territory, Indigenous peoples' experiences of colonization and resistance (Smith, 1999) make this discussion regarding protecting sociocultural relationships to water meaningful to other Indigenous peoples. For example, there is an incredible diversity among Alaska Native communities, yet these communities are collectively challenged to assert their inherent water rights and sovereignty within the political context of Alaska.

[7] Katie John was an Athabascan Elder from Mentasta, who along with other villagers, fished at the convergence of the Copper Rivera and the Tanada Creek at a traditional fish camp called Batsulnetas, now located in Wrangell-St. Elias National Park and Preserve in Southcentral Alaska. The state closed all fisheries on the Copper River in 1964, permitting Katie John and others to fish only the smaller tributaries of the Copper River, which provide insufficient habitat to meet the nutritional and cultural needs of these rural residents (Nockels, 1996).

Court of the United States (Dispatch, 2013). While the definition of federal reserved water rights continues to be debated, these rights offer a possible means of protecting water quality, quantity, and rate of flow necessary for subsistence uses of water.

Given this complex legal landscape, debate continues regarding the best approach for gaining recognition of federal reserved water rights from the State of Alaska and the US federal government. While advances in the *Katie John* case provide hope, in the United States and other contexts the legal tools available most often require Indigenous peoples to define their relationships to water based on laws rooted in the dominant culture (Getches, 2005) rather than on their own terms. The *Katie John* case also highlights that the pursuit of litigation also requires the investment of substantial time and financial resources. Although the continued pursuit of legal recognition of Indigenous water rights in Alaska is almost inevitable, Indigenous peoples are also employing other strategies to protect their hydrosocial relations and assert a role in water governance.

Beyond recognition – Indigenous water governance in practice

Indigenous peoples are actively finding ways to protect their hydrosocial relations despite the challenges they have faced in seeking legal recognition of inherent water rights. For nearly two decades, the people of Ruby, along with other Indigenous peoples, have been working collectively through the YRITWC and other organizations to assert a role in water governance within Alaska and internationally. The YRITWC—a grassroots organization based on a treaty between 70 Indigenous governments from Yukon Territory and British Columbia, Canada and Alaska, US—exemplifies the potential for an Indigenous institution to support the assertion of sovereignty and self-determination by individual Native tribes and First Nations as they seek to "initiate and continue the clean up and preservation of the Yukon River for the protection of [their] own and future generations of [their] Tribes/First Nations and for the continuation of [their] traditional Native way of life" (YRITWC, 2014). Through various environmental programs and projects, they combine Indigenous and scientific knowledge, through the practice of "traditional science," in order to respond to the threats posed by climate change and environmental degradation in the Yukon River Basin. In addition to various citizen science–based projects, the YRITWC has also sought to develop collective efforts aimed at asserting the inherent water rights of tribes and First Nations within the Yukon River Basin. In particular, they have developed a Watershed Plan based on a suite of water quality standards, and begun to engage with the other sovereign governments in the Yukon River Basin regarding the implementation of the plan, and established future plans to develop water strategies specific to particular communities and subwatersheds (YRITWC, 2013).

The above case study of the Koyukon Athabascan people of Ruby reveals that hydrosocial relations are context specific, complexly connected, as well as dynamic and adaptive. While the Indigenous communities who collaborate through the YRITWC are unique and maintain distinct hydrosocial relations, the interconnections between each of these Indigenous peoples' ways of life and their traditional territories make maintaining water quality and quantity fundamental to their cultural survival. Consequently, the organizations' work to protect the waters of the Yukon River Basin is fundamentally guided by the goal to maintain their partner communities' unique hydrosocial relations. The work of the YRITWC and other similar organizations can contribute to the assertion of sovereignty by individual Alaska Native tribes and First Nations and facilitate the formulation of collective responses at the watershed scale to mitigate or adapt to alterations in water quality, quantity and rate of flow. Furthermore, the YRITWC's work with Alaska Native Tribes and First Nations in the Yukon River Basin can be understood as an example of Indigenous water governance that seeks to assert Indigenous sovereignty and inherent water rights through strategies that are not necessarily dependent on legal recognition. While tribes are engaging with legal processes, developing capacity to understand and make decisions about the waters within their traditional territories, in order to protect their hydrosocial relations, necessarily goes beyond litigation as a strategy.

Future research directions in Indigenous water governance

This research has identified several key areas that should be the focus of future research. First, this case study of Ruby village identified three attributes of Indigenous hydrosocial relations, which are *context specific*, *complexly connected* as well as *dynamic and adaptive*. Given that specific Indigenous peoples maintain distinct relationships to water, further case studies would add empirical evidence to further guide this discussion of the ways that hydrosocial relations inform Indigenous water governance. Second, Indigenous peoples' existing efforts to address threats to their hydrosocial relations, regardless of recognition by colonial states, should be understood and supported as a critical aspect of Indigenous water governance. Further research should be conducted in order to document these community-initiated assertions of inherent water rights and their relationship to recognition-based approaches. Third, while this case study has largely concentrated on Indigenous water governance in Alaska, water governance is jurisdictionally complex in transnational watersheds (Bakker et al., 2012; Norman, 2012), such as the Yukon River Basin. The presence of additional actors in water governance cases that span national borders adds complexity to the goal of obtaining explicit recognition of water rights by state governments. Given that neither water resources nor the traditional territories of Indigenous peoples conform to state borders (Norman, 2012), Indigenous water governance in transboundary contexts should be the topic of extensive research and consultation. Finally, while the goal of Indigenous water governance is to achieve decolonization in a manner that allows Indigenous peoples to protect their hydrosocial relations by asserting sovereignty over the waters within their territories, this does not negate the potential for co-governance between Indigenous peoples through intertribal cooperation or with state, territorial, and federal governments to contribute to the achievement of mutually beneficial goals (Phare, 2009). Further research on examples of successful co-governance could contribute to empirical understanding of how this might be achieved in other contexts.

Conclusion

The goal of this paper was to examine the benefits associated with the explicit analysis of hydrosocial relations for understanding approaches to Indigenous water governance. A case study of the Koyukon Athabascan people of Ruby, Alaska, reveals hydrosocial relations that include distinct uses and values and are complexly connected, context specific, dynamic and adaptive. Analysis of current water law and policy in Alaska shows that while there are opportunities for Alaska Native tribes to pursue litigation as a strategy to gain recognition of their inherent water rights, recognition is presently inadequate. At the same time, this case study illustrates that the people of Ruby and other Alaska Native tribes are actively asserting their inherent water rights and sovereignty within their traditional territories using various strategies. While Alaska Native communities are engaging in litigation to gain legal recognition of their water rights, they are simultaneously working to protect their hydrosocial relations by engaging in grassroots and

intertribal efforts that create opportunities to participate in water governance beyond the scale of their own traditional territory, by leveraging the collective rights and knowledge of multiple Indigenous communities.

This case study contributes to the literature in two main ways. First, an engagement with the hydrosocial literature contributes to the water governance literature by making explicit the existence of distinct sociocultural relations to water maintained by all human communities and the presence of multiple normative orders within the same political space, where the hydrosocial relations of some populations are privileged over others; a necessary step towards developing approaches to water governance that overcome these inequalities. For example, Indigenous and mainstream Western approaches to water governance often differ in the ways that they value and use water. In this study, a focus on one Indigenous people, the Koyukon Athabascan village of Ruby reveals distinct hydrosocial relations, which are not sufficiently acknowledged or protected by water law and policy in the state of Alaska. The study of hydrosocial relations is useful in this context as it makes explicit these differences in a manner that enables a discussion of approaches to Indigenous water governance.

Second, this paper contributes to the conceptualization of Indigenous water governance through examining multiple strategies employed by Indigenous peoples in Alaska and elsewhere to protect their hydrosocial relations. Inherent water rights flow from Indigenous peoples' relationships to their traditional territories and include decision-making power based on Indigenous laws, customs, and knowledge, and these rights are not conferred upon Indigenous peoples through recognition by colonial governments. Critiques regarding the manner in which recognition-based strategies can perpetuate dependent and reactionary relationships between Indigenous peoples and the state, urge caution in the pursuit of litigation and other recognition-based strategies. Furthermore, there are significant challenges involved in the pursuit of litigation strategies including the need to invest substantial time and financial resources. While Indigenous peoples are asserting their inherent water rights and sovereignty using strategies that involve engaging in litigation to gain legal recognition of Indigenous water rights, they are also pursuing Indigenous alternatives without reference to state recognition. Examples discussed in this paper include the creation of community-based water monitoring programs based on Indigenous peoples in the Yukon River Basin's distinct values and uses of water. The struggle to protect Indigenous peoples' relationships to water will likely continue to include both strategic engagement with states to gain recognition of Indigenous water rights alongside the pursuit of Indigenous alternatives that assert inherent water rights and sovereignty regardless of state recognition.

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