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Editorial

New Water Regimes: An Editorial

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Abstract: This editorial is an introduction to the special issue of *Resources* on New Water Regimes. The special issue explores legal geographies of water resource management with the dual goals of providing critiques of existing water management practices as well as exploring potential alternatives. The papers in the special issue draw from numerous theoretical perspectives, including decolonial and post-anthropocentric approaches to water governance; social and environmental justice in water management; and understanding legal ecologies. A variety of themes of water governance are addressed, including water allocation, groundwater management, collaborative governance, drought planning, and water quality. The papers describe and analyze water issues and new ideas in multiple countries, including Australia, Ecuador, New Zealand, India, and the United States.

Keywords: water resource management; water rights; water quality; legal geography; political ecology

1. Introduction

In this special issue, we critically examine the legal and administrative structures of water control, with the goal of imagining alternatives to entrenched systems of capitalist and anthropocentric water governance. While concrete water infrastructure projects such as dams are readily recognized as difficult to change, the laws and legal principles that shape water management can represent equally deep-rooted structures that are just as hard to shift. However, as successful dam removal projects illustrate, even concrete is not immutable; similarly, legal structures can also change and evolve. This issue focuses on developing a better understanding of how existing laws and administrative structures shape water management, often in ways that preclude more sustainable and equitable practices, while also considering alternatives informed by perspectives such as post-anthropocentrism, decolonialism, and social and environmental justice.

The quantity and quality of water resources throughout the world are increasingly stressed by many intersecting factors, including climate change, urban and population growth, and economic and industrial development. The particular dimensions of the many struggles to manage water sustainably and equitably differ widely from region to region. However, a common thread linking water resource management challenges around the world is that these challenges are not just hydrological ones—they are socio-legal in nature as well.

2. Critical Legal Geographies of Water Resource Management

The socio-legal dimensions of water management challenges are readily evident; solutions are less forthcoming. For example, the struggles to manage the severe drought facing the Western United States from 2012 to 2016 sharply highlighted not only the region's socio-ecological vulnerability to future climate change, but also shortcomings in the abilities of the existing legal system to handle

contemporary challenges of water supply and allocation. Water allocation practices in this region, namely the prior appropriation system, are based largely on a century-old set of assumptions about water valuation and management: that the 'highest and best use' of water was to be put to use by colonial settlers for economic gain, and that water users must continually put their water to 'productive' use or risk losing their right. Today, this legal water rights system arguably hampers the ability to manage water in congruence with contemporary understandings and realities of climate change in order to meet the diverse needs of human and non-human water users. Yet, changing the system is by all measures nearly unimaginable; proposals for how to adapt to climate change and contemporary water needs typically assume the immutability of this system and are limited to imagining strategies that work within the existing water rights system.

Outdated water rights systems that limit adaptive capacity in the face of socio-ecological change are not the only problems facing water governance today. Unequal access to adequate water supplies due to degraded quality, limited quantity, and/or high cost remains a problem for many water users. Legal systems that have evolved to separately manage water quality and quantity, as well as groundwater and surface water, also present barriers to integrated and sustainable water management practices. The rights of Indigenous communities, as well as the rights of nonhuman water users, have received woefully inadequate consideration in many systems of water governance as currently practiced. Water management remains deeply rooted in capitalist, colonialist, and imperialist structures.

Several areas of scholarship contribute to a deeper understanding of these critiques. In particular, scholarship on critical legal geographies has sought to develop a better understanding of the interactions between law and place/space [1,2]. Legal geography, which starts from the premise that law, society, and space are co-constituted, has expanded significantly in recent years [2,3]. Of particular interest to this special issue, recent scholarship within legal geography has begun to examine the co-production of law and more-than-human environments [3]. Meanwhile, an often-separate literature on the "hydrosocial cycle" has examined political economies and ecologies of water resource governance [4,5]. Within this literature, scholars have developed critiques of modernist water resource management, which privileges scientific hydrologic expertise and concentrates control and management of water in agencies of the state [4–8]. Recently, scholars have taken up the challenge of merging the insights of legal geography with those of hydrosocial perspectives, examining water law(s) from a critical geographic perspective to better understand the socio-ecologies and socio-environmental injustices produced through interactions between multiple legal and hydro-social systems [9–12]. This literature emphasizes that water law is not a monolith: often, multiple overlapping socio-legal orders may exist simultaneously [12–14].

In this issue, we build upon this work, which aims to critically understand practices in modern water management, focusing on the intersections between water governance and law. We also argue that not only is it possible, it is necessary to imagine different futures for water governance. In recent decades, newer political theories such as eco-feminism, posthumanism, post-anthropocentricism, and decolonialism have produced different ideas about water valuation and management that challenge capitalist and imperialist goals and practices. This issue engages a variety of theoretical perspectives in critically examining water governance.

3. Contributions to the Special Issue

The papers in this special issue build upon this scholarship by providing a theoretical and empirical basis for change toward a more sustainable, less anthropocentric form of water governance, while also outlining the many barriers and constraints that stand in the way of actually attaining this kind of water governance. The papers describe and analyze water issues and new ideas in several countries, including Australia, Ecuador, New Zealand, India, and the United States. Several of the papers examine water issues in California, the biggest user of water in the United States and a place with continuing supply and quality problems. By utilizing detailed empirical case studies, the papers

in this special issue examine specific dimensions of opportunities and constraints for new water regimes rooted in particular places. In this introduction, we discuss the contributions of the articles in this special issue in light of several theoretical threads, including non- or post-anthropocentrism, post- or de-colonialism, social and environmental justice, and legal ecologies. In addition to describing the many challenges and barriers that are discussed in the articles, we attempt to highlight opportunities and points of hope within each piece.

3.1. Post-Anthropocentric Approaches to Water Governance

Post-anthropocentrism, a philosophical stance toward the Earth based on ecofeminism, animal philosophy, deep ecology, Indigenous thought, and certain strands of poststructuralism, envisages a world or worlds that are not human-centered but multi-centered. In these worlds or ontologies, beings other than humans may have legal standing [15]. Several of the pieces in this issue, including those by Jamie McEvoy et al. and Lidia Cano Pecharroman, specifically consider non-anthropocentric perspectives on water laws and management practices. As the authors of both papers claim, such recognition is slow to arrive and complex in administration. Yet both provide some optimism that a more-than-human approach to water governance is indeed possible.

In their article on "Ecological Drought: Accounting for the Non-Human Impacts of Water Shortage in the Upper Missouri Headwaters Basin, Montana, USA", McEvoy et al. write of the failure of U.S. water law to recognize water requirements for non-humans (both animals and plants), explaining that most drought planning efforts focus primarily on human water users. Where nonhuman water users are considered, they are given consideration in certain anthropocentric ways; the authors conclude that most practices in the watersheds of the Upper Missouri in Montana focus on instream flows and temperatures for certain species of sport fish. This paper illustrates the strong influence of commodity orientations toward water resources, even though instream flow requirements, which have been in place in Montana for over four decades, purportedly recognize more-than-human water needs. The authors suggest that despite these criticisms, drought plans do provide a potential starting point for recognizing the ecological impacts of drought, and that with a deeper consideration of ecological processes, a more-than-human orientation toward drought is indeed possible.

In "Rights of Nature: Rivers that Can Stand in Court", Pecharroman provides a hopeful perspective, discussing recent legal cases from multiple countries that give legal rights to rivers. In the article, she discusses numerous legal and philosophical groundings behind granting legal rights to nature, including several examples of Indigenous perspectives. Pecharroman then describes case studies that have emerged from New Zealand, Ecuador, India, and Colombia within the past five years, where mostly tribal or Indigenous groups have fought successfully in court for the recognition of rivers to possess legal rights. In the paper Pecharroman suggests that while legal recognition of the rights of nature is still in very early stages, and many uncertainties still exist, we are arguably witnessing an important process of legal confirmation of ecological values, as non-human subjects are granted legal rights.

3.2. Decolonial Water Governance and Legal Pluralism

What is sometimes termed decolonial water governance is actually non-European governance systems that are being asserted in the global south and in settler colonies. These so-called "worlding" systems of governance do not follow the European legal and infrastructure legacies imprinted across the imperialist track [16]. Negotiations between settler-colonial and Indigenous groups frequently reveal problems of "translation" or incommensurability as different ontological perspectives on water prove to be incompatible [17,18]. In addition, water laws are frequently layered strata [19], with pre-European systems and settler-colonial laws coexisting sometimes uneasily on top of one another. An approach of "legal pluralisms" [12,20] acknowledges the existence of these multiple-layered legal systems, even though the negotiations can, in practice, be difficult.

Lana Hartwig, Sue Jackson, and Natalie Osborne's article describes the challenges of working towards decolonial water governance in a settler-colonial state. The article "Recognition of Barkandji Water Rights in Australian Settler-Colonial Water Regimes" describes the attempts of Indigenous peoples in what is now called Australia to have their water rights recognized by Australian governments. As the paper describes, the river in question is central to the existence of the Barkandji People. However, recognition has been a long and complicated process given the extent of historical injustices, not only because of the explicit "loss" perceived by settler-colonists in "giving up" what they've actually stolen, but because ontologies collide in the existing legal system which identifies "water" as a particular economic artefact as opposed to the multidimensional and subject-centered conceptualization of water held by the Barkandji. Hartwig et al. describe the ways in which the misrecognition (i.e., oversimplified, restricted, overlooked, and stereotyped) or even altogether non-recognition of Aboriginal water rights perpetuates the status quo of colonial power. However, at the same time, they argue that in so doing, the legitimacy of state water regimes is actually undermined, as the state fails to generate genuine respect. Thus, there potentially exists a genuine motivation for settler-colonial governments to genuinely recognize Indigenous rights (and to consult Indigenous people meaningfully in the process).

3.3. Justice and Equity

While much scholarship and activism in terms of environmental justice and water focuses primarily on water quality concerns [21], the issue of equity in water allocation is also a long-standing concern of many water scholars [19,22]. Several papers in this special issue, including those by Ann Drevno, by Zachary Sugg, and by Andrés Martínez Moscoso, Víctor Gerardo Aguilar Feijó and Teodoro Verdugo Silva, focus specifically on justice and equity concerns related to water supply allocation as well as water quality. Sugg and Moscoso, Feijó and Silva focus on equitable water allocation, while Drevno's article focuses on water quality. All three of these papers speak to the existence of gaps between existing laws and equitable on-the-ground outcomes; they also point to the need for more nuanced and locally-sensitive systems in place of overly prescriptive approaches.

Sugg, in "An Equity Autopsy: Exploring the Role of Water Rights in Water Allocations and Impacts for the Central Valley Project during the 2012–2016 California Drought", argues that strict adherence to a priority system for water allocations produces inequitable socio-ecological outcomes during drought. In California's recent drought, thousands of water users had their water rights curtailed, with highly uneven socioeconomic and ecological impacts. Sugg points out that the current water governance system is too laden with conflict to be considered effective or well-adapted. The concept of equitable apportionment, which involves allocating water according to multiple relevant criteria beyond simply a priority system, is recommended as a more just way of allocating water in drought.

In their paper on "The Vital Minimum Amount of Drinking Water Required in Ecuador", Moscoso, Feijó and Silva illustrate the difficulties of implementing a new approach to water allocation in Ecuador. Ecuador recently recognized water as a fundamental human right, and in doing so, established a minimum quantity of water that is guaranteed as a constitutional right. However, this raises questions of how much water is guaranteed, and who will be responsible for paying for the water. The authors find that the effort to ensure water for all can have counterintuitive results, and may even widen gaps in equity, as inefficient water providers transfer the costs of providing services to those who are already economically vulnerable. They note that the water provisioning system must take better account of regional variations in order to avoid this pitfall.

Drevno, focusing on water quality, also speaks to the need to take into account local specificities in water management practices. Drevno's article, "From Fragmented to Joint Responsibilities: Barriers and Opportunities for Adaptive Water Quality Governance in California's Urban-Agricultural Interface", discusses the consequences of managing urban and agricultural water quality separately in a location where urban development and agricultural lands are in close proximity to one another. By examining a case study at the urban-agricultural interface, she illustrates the problems with

California's current system addressing urban water quality and agricultural water quality under different systems. Drevno calls for agricultural water quality, in particular, to be addressed more rigorously, and for the two systems to be aligned more closely in order to alleviate environmental justice concerns of poor water quality.

3.4. Legal Ecologies

A final theme of this special issue is that of legal ecologies, which we define as the specific places and more-than-human ecosystems that are co-produced along with laws, contracts, and their implementation. The ecologies of water law include the ecosystems and species impacted by the transfer of water from one place to another, along with the new ecologies produced in urbanized and irrigated areas.

Julia Sizek's communication on "California's Groundwater Regime: The Cadiz Case" discusses a proposed groundwater extraction project that would transfer water from the desert of Southeastern California to urban Southern California, with potentially dramatic impacts on fragile desert ecosystems. The Cadiz project is a notorious one, an idea that has long been considered a failure, only to be resurrected under the Trump administration. Sizek describes the underlying politics behind the project, including the role of hotly contested science in justifying/challenging the project. Sizek demonstrates that in California, groundwater law is fundamentally linked to private property ownership of land, meaning that legal ecologies are, in this case, not only shaped by water laws but by landed property regimes—themselves an artefact of settler-colonial states—as well.

4. Concluding Remarks

In conclusion, nearly all of the papers in this special issue illustrate the difficulties of actually implementing new visions of water governance. They demonstrate the powerful continuity and hegemony of certain legal systems, particularly in the settler-colonial legal systems rooted in European traditions. Yet they also provide examples of how water laws are changing—or could change—and are being pushed in new directions that recognize the rights of Indigenous people, the rights of nature, and the values of more just, less anthropocentric, and more integrated systems for water management.

Looking forward, we encourage critical scholars to continue to consider legal and administrative systems of water governance from a broad range of theoretical perspectives. Seeking to transform the entrenched water laws that were inaugurated in a period when capitalists and engineers considered rivers and aquifers nothing but plumbing opportunities to transfer huge volumes of water to agriculture and urban centers is not a light task. Recognizing existing alternatives and proposing new alternative legal structures and principles that take into consideration Indigenous rights and more pluralistic understandings regarding humans in natures remains a difficult but important area of work. Critical scholars can propose legal reforms that go beyond a contemporary fixation with market-based imperatives as the main solution for prior appropriation water allocation systems. They can also examine the intersection of water law and governance with other related important issues, such as climate change, food and water security, and food and water sovereignty. Comparative studies can contribute to constitutional reform and political resistance around the globe. The papers in this special issue represent an important contribution, yet there remains much to be done, theoretically, empirically, and practically.

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