3-2020

Hydrosocial Hinterlands: An Urban Political Ecology of Southern California's Hydrosocial Territory

Alida Cantor
Portland State University, acantor@pdx.edu

Citation Details

Cantor, A. (2020) [Post-print version]. Hydrosocial hinterlands: An urban political ecology of Southern California's hydrosocial territory. Environment and Planning E: Nature and Space

Hydrosocial hinterlands: An urban political ecology of Southern California's hydrosocial territory

Alida Cantor

acantor@pdx.edu

Abstract:

Urban political ecology (UPE) has conceptualized the city as a process of urbanization rather than a bounded site. Yet, in practice, the majority of UPE literature has focused on sites within city limits. This tension in UPE evokes broader conversations in urban geography around city-as-place versus urbanization-as-process. In this paper, I bring a UPE analysis to examine co-constitutive urbanization and ruralization processes, focusing on sites beyond city boundaries in three empirical case studies located within the broader hydrosocial territory of urban Southern California. By focusing on the rural components of hydrosocial territories, I show that each of the three case studies has been shaped in very different ways based on its enrollment within urban Southern California's hydrosocial territory; in turn, the rural has also shaped the cities through flows of politics and resources. The paper demonstrates how UPE can be usefully applied to understand rural places, illustrating how processes of urbanization can be involved in the production of distinctly rural – and distinctly different—landscapes. The cases demonstrate the utility of urban political ecology as an analytical framework that can examine co-constitutive urbanization/ruralization processes and impacts while maintaining enough groundedness to highlight place-based differences.

Key words: Urban political ecology, urbanization, ruralization, hydrosocial territories, hydrosocial cycle, California

Highlights:

- Urbanization processes are implicated in socioenvironmental change beyond city boundaries; urban political ecology is useful for understanding these changes.
- Rural areas can experience change very differently based on their hydrosocial relationships with urban areas.
- Urbanization/ruralization are multidirectional processes through which rural areas can also shape cities through flows of politics and resources.
- The paper explores three rural places shaped in unique ways through enrollment within urban Southern California's hydrosocial territory.

1. Introduction

Urban political ecology (UPE) examines not only biophysical 'nature' within cities, but also the processes of urbanization and the production of urban spaces, focusing on the exercise of power through socioecological relationships (Cousins and Newell, 2019; Heynen et al., 2006; Swyngedouw and Heynen, 2003). UPE scholars have conceptualized the city as more than a site, instead examining the uneven processes of urbanization. The urban is described as a "socio-spatial process whose functions are predicated upon ever longer, often globally structured, socio-ecological metabolic flows that not only fuse objects, nature and people together, but do so in socially, ecologically and geographically articulated, but depressingly uneven, manners" (Swyngedouw and Kaika 2014, p. 462). However, in practice, the majority of urban political ecology literature has focused on sites *within* city limits, treating the city as a container for research and, in doing so, implicitly conflating 'urban' with 'city' (Angelo and Wachsmuth, 2015; Zimmer et al., 2017).

These debates within urban political ecology relate to broader conversations in urban geography around city-as-place versus urbanization-as-process (Shin, 2017). A common theme throughout these conversations is the under-examination of the 'rural.' In response to the proposed concept of a ubiquitous 'planetary urbanization' (Brenner and Schmid, 2015), urban geographers have noted that even extensive urbanization processes do not necessarily render categories of urban and rural as obsolete concepts (Walker, 2015), and the rural remains an analytically useful category (McKinnon et al., 2017). Some scholars have even proposed the concept of 'ruralization' as a way to decenter the urban (Krause, 2013; Mercer, 2017). Meanwhile, empirical examinations of the impacts of urbanization processes in sites beyond the 'city proper' have been largely addressed through separate bodies of literature outside of either urban

geography or urban political ecology (such as an emergent literature on exurban political ecology) (McKinnon et al., 2017).

Urban metabolism refers to the extensive networks of resources, including food, energy, water, and other materials, that are integral to the development and maintenance of urban areas (Heynen et al., 2006). As a classic flow resource, water represents a frequent object of study in urban political ecology (e.g., Gandy, 2003; Kaika, 2004; Swyngedouw, 1999). Recent literature has used the term 'hydrosocial territories' (Boelens et al., 2016) to emphasize spatial dimensions of hydrosocial relationships: that is, the processes through which socioecological spaces are made at multiple scales through interactions and material flows of water. By focusing on the diverse spatial configurations and relationships created through the metabolic flows of a particular resource, the concept provides a useful model for demonstrating how urban political ecology can move beyond city borders (Hommes, Boelens, et al., 2019; Hommes, Veldwisch, et al., 2019).

Drawing on concepts of urban political ecology and hydrosocial territories, this paper examines urbanization processes beyond city boundaries. The paper focuses on three empirical case studies located within the broader hydrosocial territory of urban Southern California but outside of city bounds. The three distinctly rural case studies are all part of the same hydrosocial territory, yet they are shaped in markedly different ways through their watery entanglement with Southern California's coastal cities. Together, the cases provide a basis for an empiric examination of how a highly diverse range of rural places are produced through enrollment within an urban hydrosocial territory. The cases also demonstrate the utility of urban political ecology as an analytical framework that can examine urbanization processes outside the city while maintaining enough groundedness and nuance to highlight place-based differences.

The paper first reviews several recent scholarly conversations, including debates in urban political ecology literature around 'methodological cityism' and related conversations in urban geography around planetary urbanization. I then discuss the concept of hydrosocial territories and describe the three cases of Southern California's 'hydrosocial hinterlands,' analyzing how processes of urbanization have shaped the distinctly rural cases under consideration, and demonstrating the diversity of places and relationships produced within a broader hydrosocial territory.

2. Urban political ecology beyond the city

Urban Political Ecology (UPE), a subfield of political ecology, traces the production of urban spaces through unequal socio-environmental power relations, and challenges the notion that urban spaces are separate from nature by examining cities as socio-ecological processes (Heynen, 2014; Heynen et al., 2006; Keil, 2005; Rocheleau et al., 1996). UPE's key insights about urban socio-ecological processes and change, the role of capitalist political economy in producing environmental inequality, urban metabolism, and scale have made important contributions to political ecology and the discipline of geography as a whole (Heynen, 2014; McKinnon et al., 2017).

UPE has two main goals: first, to use political ecology as a tool to understand socio-environmental dynamics within urban settings; and second, to re-imagine the 'urban' as a set of *processes* rather than a place located within city boundaries (Heynen et al., 2006). Regarding the second goal, UPE draws from Lefebvre's contestation that when urban studies is limited to the study of 'city' spaces, it is insufficient to understand urbanization and industrialization processes (Lefebvre 2003 (1970)). Early inspirations to the development of UPE included some

investigations of the co-production of urban and rural places: for example, Cronon's *Nature's Metropolis* (1991) served as an early inspiration to the development of UPE in its emphasis on the co-production of Chicago's metropolis and the simultaneous development of the rural Midwest through processes of material resource transformation in city formation (Heynen et al., 2006). Yet, recently geographers have argued that while UPE has succeeded in its first goal (bringing political ecology to urban settings), UPE has thus far focused almost exclusively on city sites and in doing so has failed to address broader questions of urbanization processes outside the scope of traditional city/country binaries, neglecting the question of what makes city spaces more 'urban' than the hinterlands implicated in urbanization processes through dynamics such as resource flows (Angelo and Wachsmuth, 2015). Yet, this task of moving beyond so-called methodological city-ism has proven difficult to implement in practice.[i]

Meanwhile, broader debates about the scope and scale of urbanization have been taking place within the field of urban studies. Recent scholarship on 'planetary urbanization,' also inspired by Lefebvre's ideas of the 'complete urbanization' of society, has renewed calls for attention to – and heated debates over the meaning of—urbanization (Peake et al., 2018; Ruddick et al., 2018).[ii] Like urban political ecologists, planetary urbanization scholars have argued for a focus on urbanization as process instead of a focus on cities as form (Brenner, 2013; Brenner and Schmid, 2015, 2017; Merrifield, 2013). However, planetary urbanization has been critiqued by urban geographers who argue that the approach lacks nuance: its sweeping claims are seen as lacking grounding in empirics (Walker, 2015), and the approach is viewed as overly universal and not well-equipped to handle the issues of difference raised by postcolonial and feminist scholars (Derickson, 2015).[iii] Geographers have also critiqued planetary urbanization for conceptualizing urbanization as an overdetermining presence (Ruddick et al., 2018) in which

urbanization is conflated with too many factors, e.g., globalization (McCarthy, 2008), capitalism (Merrifield, 2013), neoliberalism and/or climate change (Keil, 2018).

As part of the critique of planetary urbanization as an overly totalizing perspective, urban geographers have raised questions around what, precisely, constitutes the 'urban'—and in contrast, what constitutes the 'rural.' According to urban geographers, planetary urbanization lacks a definition of what, precisely, is meant by the urban, other than that they are *not* talking about a simplistic and bounded city (Walker, 2015). As Walker (2015; p. 185) notes, planetary urbanization leaves the urban ill-defined: "If nothing is outside the urban, then the urban is everything, and if it is everything, it is nothing in particular and therefore not an interesting problem." According to both urban and rural geographers, rural and urban remain useful categories with analytical power because these categories still exist in peoples' lived experience—even if they are ill-defined, socially constructed, and mutually constitutive of one another. Urban geographers have argued that although cities have always relied upon broader territories for their flows of resources, this does not render the entire concept of city meaningless (Davidson and Iveson, 2015; Scott and Storper, 2015). Likewise, rural geographers have noted that even though the rural is difficult to define in precise terms, it remains an important experiential category that persists as a useful categorical distinction because people continue to identify as rural (Cloke et al., 2006; Woods, 2004). As Chen et al (2017) point out in their examination of contemporary rural China, "When we downplay the rural, we elide the lived experiences of millions of people" (p. 83). Contemporary empirical research continues to demonstrate that rural transformation processes are dynamic, diverse, and worthy of attention in their own right (e.g., Chen *et al.* 2017, Guin 2018).

Geographers have further argued that urbanization, while undoubtedly an important process, is not the only dynamic worth studying (Jazeel, 2018; Kipfer, 2018). A few scholars have pushed back on the one-way formulation of planetary urbanization by mobilizing the parallel term 'ruralization' to decenter the city, describing multidirectional, co-constitutive processes of sociospatial transformation (Krause, 2013; Mercer, 2017). Krause (2013) makes the case that "if the whole world is urbanizing, it *must* also be ruralizing." She argues that, while a focus on urbanization as process has been useful in moving beyond country/city binaries, it is unhelpful to approach all social-ecological relations as primarily urban ones. The idea of ruralization was brought up by Walker (2007) a decade earlier in *The Country in the City*, describing the "double sense of an urbanized country and a ruralized city" in which the countryside includes processes of urbanization—farms, reservoirs, dumps, etc.—and the city includes 'rural' characteristics such as open space and greenery. Scholars have also noted the importance of considering the production of other spaces between those typically categorized as urban and rural: for example, Kiel and others explain the global expansion of suburban environments using the language of 'suburbanization' (Hamel and Keil, 2015; Keil, 2017).

These debates raise several questions. A first question is about whether urban and rural (and other forms such as suburbia) should be understood in terms of *place*—defined by lived experience and identity as well as form— or in terms of *processes* of urbanization (and parallel processes such as ruralization and suburbanization) as processes of sociospatial change. Urban political ecology has embraced both approaches (Cousins and Newell, 2019). In Table 1, I attempt to summarize these debates through a typology of urban and rural as place and process.

Table 1: Typology of urban and rural as place and process

		Urban	Rural
Place-centered: Characterizations, stereotypes, and experiential aspects (poles on a spectrum)	***Physical or built form***	Densely populated; dominated by built environment; centered around a core (Krause 2013)	Sparsely populated; lack of built infrastructure; does not have a core or center (Krause 2013)
	Livelihood and economic drivers	Industry, manufacturing, culture and arts, finance, service economy	Land-based, agriculture, primary resource production, subsistence
	Lived experience	Louder; faster; more built environment; crowded; more human culture	Quieter; slower; less built environment; less crowded; more nonhuman nature
Process-centered: Different ways in which processes might work in different spaces	***Urbanization processes***	Densification, development of built environment, gentrification, inequity	'Urbanized country'- Source or sink for urban metabolism (resource extraction, dump for waste) (Walker 2007) Amenity migration, exurban development, sprawl (McKinnon et al 2017)
	Ruralization processes	'Ruralized city'- Urban agriculture, urban wildlife, urban green space (Walker 2007) 'Boring cities' (Krause 2013), low-density suburban development (Mercer 2016), shrinking cities	Maintaining open space and farmland Out-migration of population to cities

This typology is not meant to reify binary categories; the goals are to summarize and compare place-based versus processes-based definitions, and to highlight the ways in which co-constitutive urbanization/ ruralization processes are not limited to their respective spatially-defined categories.

A second question raised within these debates is how to study urbanization without falling into the trap of universalism. Scholars have recently emphasized the need to pay close attention to multiple socio-spatial formations and processes, rather than automatically privileging urbanization as the dominant process at work (Derickson, 2018; Jazeel, 2018; Ruddick et al., 2018). In moving towards a more grounded examination of relationships and processes of urbanization/ruralization in and out of city sites, UPE scholarship offers a potentially useful path forward. UPE, like other sub-fields of political ecology, emphasizes empirics and attentiveness to the details of on-the-ground power dynamics and diverse processes of socio-ecological change

(Connolly, 2019). Recent UPE scholarship has placed specific emphasis on difference and lived experience by expanding from a primarily Marxist-inspired framework to an UPE that mobilizes a wide range of poststructural, feminist, postcolonial and posthuman approaches (Biehler, 2013; Gabriel, 2014; Gandy, 2012; Heynen, 2018; Lawhon et al., 2014; McKinnon et al., 2017). These feminist and poststructural approaches highlight the importance of difference and multiple lived experiences of urban places and urbanization processes (Derickson, 2015; Lawhon et al., 2014). In this vein, a situated UPE that moves beyond 'methodological cityism' while refusing a universal theory of urbanization holds promise. UPE offers an analytical framework well-equipped to examine the specific ways in which processes of socio-environmental change related to urbanization are differentially experienced by people as these processes unfold in actual places.

3. Urban Southern California's hydrosocial hinterlands

Water is a nonsubstitutable flow resource that is frequently moved from rural to urban areas to support urban development. Scholars in the field of UPE have developed a significant body of literature calling attention to the struggles to control water and the unequal distribution of benefits and costs associated with water resources (e.g., Swyngedouw 1997, 2009, 2015, Swyngedouw *et al.* 2002, Bakker 2003, Gandy 2004, 2014). In recent years, a robust literature has emerged using the concept of the hydrosocial cycle to study the dynamic relationships between material water resource flows and social, technological, and political systems (Linton and Budds, 2014; Swyngedouw, 2009). The concept of the hydrosocial cycle has been used in connection with that of urban metabolism to examine the networked relationships of water

supply infrastructure that frequently link urban and rural areas (Cousins, 2017; Cousins and Newell, 2015).

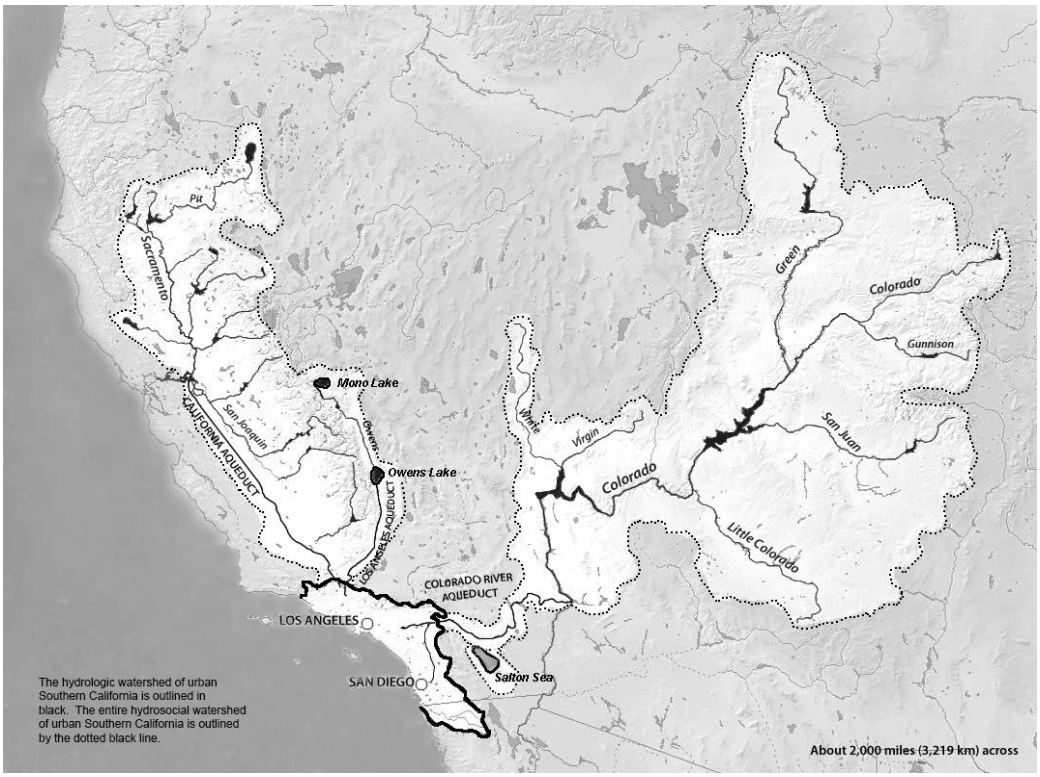
Most recently, the concept of 'hydrosocial territories' has been defined as "socially, naturally, and politically constituted spaces that are (re)created through the interactions amongst human practices, water flows, hydraulic technologies, biophysical elements, socioeconomic structures and cultural-political institutions" (Boelens et al., 2016). The concept of the hydrosocial territory provides a useful way to examine the spatial dimensions of the hydrosocial cycle, making the case for a vision of "territory" based on material flows. Hydrosocial territories can be understood as both place-based and process-based: they consist of territories that are 'rooted' in particular places (e.g., Rocheleau and Roth 2007, Rocheleau 2016, Cantor, Stoddard, *et al.* 2018); but territories that are simultaneously produced and (re)created through interactions amongst a variety of actors across multiple scales. The concept of hydrosocial territories has been usefully applied to explore rural-urban water relationships in particular (Hommes, Boelens, et al., 2019; Hommes, Veldwisch, et al., 2019; Hommes and Boelens, 2017). Because water infrastructure so often reaches beyond city bounds, water frequently links urban and rural places, providing a useful illustration of how urbanization processes stretch beyond the city. At the same time, a territorial focus emphasizes place-specificity, employing a nuanced understanding of territories as diverse, imbued with power, both material and imagined, and constantly being renegotiated (Hommes, Boelens, et al., 2019).

In this paper, I examine several case studies within a broader hydrosocial territory, the extended hydrosocial watershed of Southern California. The links between water and politics throughout the history of California have been well documented in several classic accounts describing the evolution of water systems in the region (e.g., Worster 1992, Reisner 1993, Hundley 2001), as

has the issue of urban-rural relationships within the California context (e.g. Henderson 1999, Brechin 2006, Walker 2007). Together, these accounts provide excellent histories of California's water development, urban and environmental politics, and broader political-ecological landscape, which I do not attempt to repeat here. Instead, I focus on a detailed examination of three specific case studies located within the hydrosocial territory of urban Southern California's water supply. Through my case studies I develop an empiric understanding of the intimate connections between California's cities and rural areas, focusing on water to demonstrate how urbanization and hydrosocial relationships are involved in producing a highly diverse range of distinctly rural places.

California's hydrosocial landscape is characterized by spatial mismatch: the state's heavily populated cities and intensive agricultural regions are both located far from water resources (Hanak, 2011). The disconnect between water supply and demand has led the state to rely upon vast infrastructural networks to divert and transfer water for both urban and agricultural uses since the beginning of the 20th century (Cousins and Newell, 2015; Reisner, 1993; Worster, 1992). Urban Southern California's water supply draws upon a broad hydrosocial territory that extends far beyond urban watershed boundaries to include much of California, including the Eastern Sierra Nevada Mountains and the Sacramento Bay-Delta watershed, as well as the entire Colorado River watershed spanning seven states (Figure 1).

Figure 1: Map of extended hydrosocial territory of urban Southern California. (Adapted image from Wikimedia Commons: https://commons.wikimedia.org/wiki/File:SoCal_Watershed.jpg)



This paper explores the contexts and histories of three large terminal lakes—Owens Lake, Mono Lake, and the Salton Sea—impacted by water transfers and diversions. Economic analyses of rural-to-urban water transfers and diversions typically show that costs and benefits measured on a regional scale balance out to a net positive, since cities are willing and able to pay more for water (Michelsen and Young, 1993; Taylor and Young, 1995). But, such analyses hide uneven costs to air quality, rural economies, and wildlife habitat, all of which tend to fall disproportionately to rural areas from which the water is sourced (Cantor, 2017; Howe et al., 1990; Howe and Goemans, 2003). The impacts of this uneven development (Smith, 2010) have led to resistance and contestation of water transfers by rural residents, environmental organizations, and environmental justice advocates. The lakes are similar in that all have been impacted by the diversion and transfer of water from rural areas to cities (Horowitz, 2012).

However, as Table 2 illustrates, they vary significantly in their histories and current respective social-ecological statuses.

Table 2: Description and comparison of case studies

	Case 1: Owens Valley (former Owens Lake)	**Case 2: Mono Lake**	**Case 3: Salton Sea**
Lake size	108 sq miles (pre-diversion)	70 sq miles	400 sq miles
Water source	Owens River, fed by mountain runoff (before water transfer)	Several creeks, fed by mountain runoff	Lake created in 1905 from irrigation canal breach; current water source is inflow from irrigation runoff
Location & 2017 county population	Inyo County (pop. 18,026)	Mono County (pop. 14,168)	Imperial County (pop. 182,830) and Riverside County (pop. 2,423,000)
Water diversion history	1913: Owens River diverted to LA via LA Aqueduct; by 1924 lake and 50 miles of river were dry. 1970: added groundwater pumping.	1941: Creeks feeding Mono Lake diverted to LA via extension of LA Aqueduct	1990: Water rights transfer from Imperial Irrigation District to Metropolitan Water District. 2003: Water rights transfer from Imperial Irrigation District to San Diego County Water Authority
Basis of diversion	LA bought land with associated water rights in early 1900s	LA bought land with associated water rights in early 1900s	Market transfer from agricultural water users to urban Southern California water providers
Actors driving water diversions	LA Department of Water and Power	LA Department of Water and Power	Metropolitan Water District (LA); San Diego County Water Authority
Actors opposing water diversions	Ranchers, environmentalists, Owens Valley Committee	Environmentalists, Mono Lake Committee	Small environmental justice movement; limited environmental presence; local farmers/ranchers opposed to transfers
Contemporary lake status	Has been mostly dry lakebed since 1920s; largest US source of PM10 dust. LA is remediating, which has reduced but not solved dust problems.	Since protection order was implemented, shoreline has risen; today the lake is generally a healthy ecosystem and a tourist destination.	Salton Sea inflow has been reduced from water transfers. Effects include rising salinity and shrinking shorelines, habitat loss, and dust pollution, which presents a significant health hazard.

The research used a qualitative case-study approach (Hay, 2000; Yin, 2009) and draws upon 16 months of initial fieldwork which took place from 2013-2015. I conducted 52 in-depth semi-structured interviews with people working with urban and rural water districts, environmental and environmental justice organizations, community organizations, government agencies at both local and state levels, and water lawyers. All names of study participants have been changed in this paper to protect privacy. Interviews were supplemented with participant observation, including attendance at community meetings, organizational board meetings, events, and guided

tours. I have also reviewed archival documents including newspaper articles and op-eds, historical documents, scientific and technical documents, policy documents, court cases, legal documents, and legal reviews. Since the period of initial fieldwork I have continued to review and incorporate current events and documents related to the three cases.

In the rest of this section, I discuss each of the cases in turn to illustrate the diversity of rural places that make up an urbanized hydrosocial territory. The cases are presented chronologically, in order of incorporation within the hydrosocial territory of urban Southern California. In the first case, Los Angeles's acquisition of land in the Owens Valley a century ago for the purposes of securing water rights continues to generate conflict, but also serves to maintain the rural character of the area as the city limits development. In the second case, the city of Los Angeles also secured water from the Mono Lake basin, but relationships between urban and rural are more cooperative as environmental advocates have worked to make urban water users aware of their impacts on the broader hydrosocial territory. And in the third case, the more recent impacts of agriculture-to-urban water transfers on Salton Sea have been inadequately addressed, but urban residents may be forced to confront the lake's decline as it generates dust and odors that may affect the broader region. Together the cases illustrate the diversity of socio-spatial formations that can emerge from processes of urbanization, specifically the process of enrollment of rural areas into a city's hydrosocial territory as a water source. The cases also demonstrate processes of ruralization at work. The material and political flows involved in urban-rural relationships are bidirectional: for example, civil society organizing stemming from the rural regions has impacted the cities, as have material flows such as odors.

3.1 Urban land acquisition causes ongoing resistance yet preserves 'rural character' in the Owens Valley

In the early years of California's urban development, limited local water supplies seemed to limit the prospects of growth for the city of Los Angeles (LA) (Kahrl, 1983). At the beginning of the 20th century, water managers from LA sought to expand the city's hydrosocial territory to allow the city to continue to grow into a major metropolis, and identified the Owens Valley as a source (over 200 miles north of LA on the Eastern side of the Sierra Nevada mountain range). The story of how LA surreptitiously bought land from local ranchers to secure urban water supplies is told in accounts detailing the 'rape' and 'theft' of the Owens Valley water resources by the city of LA (Kahrl, 2000). The construction of the Los Angeles Aqueduct, a gravity-fed engineering marvel of its time, was completed in 1913. In the Owens Valley, the water diversions sparked furious protests by local ranchers and residents who saw their farms and businesses drying up. The aqueduct was bombed by local Owens Valley protestors in 1924 and 1927. In 1970, the Los Angeles Department of Water and Power (LADWP) completed construction of a second aqueduct in order to carry pumped groundwater from the Eastern Sierra region to LA.

The relationship between Owens Valley and Los Angeles has been dominated by conflict over the past century, including legal battles over the impacts of water extraction on local vegetation and air quality. In particular, dust has been a major point of conflict. LA's water diversions cut off Owens Lake's inflow, causing the lake to dry up by 1926. On windy days, the lakebed's fine sediment blows from the lakebed, creating massive dust storms and making Owens Lake one of the largest sources of harmful PM-10 dust in the United States. The local Great Basin Air Pollution Control District has been working for decades to hold LA responsible for dust mitigation. Since 2000, LA has spent over $1.3 billion on dust control. Today, relationships

between local Owens Valley residents and the LADWP range from uneasy cooperation to outright hostility. In 2013, while the city of LA held celebrations for the 100-year anniversary of the aqueduct's construction, members of the Owens Valley Paiute tribe led protests.

The contemporary relationship between Owens Valley and LA is shaped largely by a century-old strategy: to secure access to water in the early 20th century, LA simply bought much of the Owens Valley land. This dynamic of absentee landowner continues to irk Owens Valley residents to the present day. In interviews, some residents referred to Owens Valley as a 'resource colony' for the city of LA. Michael, a local lawyer involved in the Inyo County lawsuits, described the impacts of the water diversions on the local Owens Valley economy. According to Michael, in the 1920s and 30s,

> **Michael:** Owens Valley demanded that LA pay reparations because car dealers, tractor dealers, markets, everything went out of business. LA said, "We won't pay reparations. We'll just buy your businesses." So, they bought most of the businesses in the Owens Valley… they wound up owning the town, and a lot of residences in town. So, even today, a lot of the main street here, if you wanted to do something, you have to get permission from the City of Los Angeles. It actually affects how the town looks. LA has a really pervasive influence in this area. They effectively control almost every aspect of life.

Resistance to LA's control of Owens Valley water resources continues into the present. For example, the Owens Valley Committee (OVC) is a nonprofit organization representing a constituency of residents struggling to keep water in the valley. Their mission statement explicitly addresses the water conflict between Owens Valley and LA: "We envision a valley in which existing open space is protected, historic land uses sustained, and depleted groundwater reserves and surface water flows restored as Los Angeles phases out its dependence on Owens Valley water." As Christopher, a member of the OVC, explained:

> **Christopher:** They [LA city officials] talk about reducing their dependence on imported water. They talk about sustainability. Water recycling, water conservation, storm water capture can and will dramatically reduce [the city of LA's] need for imported water if they seriously invest in it. To me that's our only hope… It fundamentally also addresses the issue of justice, because were they to—*when* they do that, they will then be in a position to give back the land, because they won't need it. The environmental devastation derives directly from the political injustice… we are a colony and we have no control, there's no checks or balances down there that control what they do to us.

Yet, somewhat paradoxically, residents also pointed out that LA's ownership of local land has allowed the valley to retain a desirable rural character and abundant open space for public recreation. Literature on the political ecology of exurbia has focused largely on population influx and the changes associated with amenity-migration-driven development of rural areas (Cadieux and Hurley, 2011; McCarthy, 2008; McKinnon et al., 2017; Taylor and Hurley, 2016; Walker and Fortmann, 2003). In contrast, 'suburbanization' has skipped over the Owens Valley largely due to LA's land ownership: the city has sharply limited development so as to limit competition for water resources (Libecap, 2007). The city of LA controls development in the Owens Valley in order to maintain control of water supplies. Interviewees simultaneously articulated resentment of this control along with an appreciation of the valley's rural charm and open space, which are directly attributable to the city's ownership of land. Interviewees described the tensions implicit in this arrangement: while Owens Valley residents resent LA's control over the region's development, at the same time many valley residents do not want more growth:

> **Michael:** A lot of people look at things in Owens Valley like it's a colonial rule. You've got to go down to the city and ask for permission to put in a taco stand, cemetery, sewer pump, or whatever, because there's just no land. It has both sides. The county supervisors and the town counsel here in Bishop, they would probably like to see some more growth because it brings in sales tax, businesses,

> and all that. But the public's not real supportive of big growth. People have gotten used to it the way it is. If you are fortunate enough to live here and you like it, you don't want it to change.

In this case, hydrosocial relationships of resource extraction and the city's practice of purchasing far-away land in order to secure water rights have shaped not only LA's urban and suburban development through provision of abundant water, but have also secured the rural character of the Owens Valley. Seen through a lens of urbanization, the Owens Valley has been rendered part of the urban fabric through urban metabolic processes of resource extraction. However, paradoxically, the incorporation of the Owens Valley into LA's hydrosocial territory has simultaneously resulted in ruralization: precisely because the city of LA controls much of the region's land, the Owens Valley has maintained open space, rural character, and low population densities even as much of the rest of California has undergone intense development.

3.2 Regulation and activism build hydrosocial awareness and urban-rural cooperation at Mono Lake

Mono Lake, a 70 square mile body of water located approximately 150 miles north of Owens Lake, is also a part of the hydrosocial territory of Los Angeles, but has a very different relationship with the city. Mono Lake, like Owens Lake, is a terminal saline lake in its own hydrologic basin. In 1930, LADWP gained permission to build an extension of the LA Aqueduct reaching north from the Owens Valley to Mono Lake to divert water from Mono Lake's four main tributary streams into the LA Aqueduct, and diversions from the Mono Lake Basin began in 1941. In 1978, environmentalists became concerned over the lake's receding shoreline, increasing salinity, and potential impacts on wildlife, especially migratory and nesting birds (Hart, 1996). They formed the Mono Lake Committee, and through a subsequent series of

lawsuits, leveraged the Public Trust Doctrine to protect Mono Lake (Cantor, 2016; Hart, 1996). In response to the lawsuits, the state's Water Resources Control Board issued a decision which ties LA's water exports to Mono Lake's levels: if the lake level is high, a certain amount of water can be exported, but once the lake level falls below certain 'trigger points,' water exports are limited or cease altogether. This arrangement means that the Mono Lake Committee and the LADWP share the goal of raising the lake level.

In the wake of the lawsuits, the working relationships between the Mono Lake Committee and the LADWP have shifted from conflict to cooperation. In contrast to the Owens Valley area, those active in the environmental community in the Mono Basin have a more cooperative working relationship with the LADWP: the suspicion and conflict that characterize Owens Valley is less pronounced at Mono Lake. Gary, who works with the Mono Lake Committee, explained:

> **Gary:** One of the big contrasts between Mono Basin and Owens is here, because we have the Water Board decision, we're all working together, and we all have the same goals. There's a lot less conflict here, at least on that higher level… For the most part, we have the same goals. We all want Mono to survive. Clearly the Mono Lake Committee is interested in the lake being higher and all the ecosystem benefits there are for people here. DWP wants it to rise, because they get more water when it's higher. When I think of the Owens Basin, they don't have the Water Board decision… there's a lot more conflict there.

Beyond the common goals created by California's state regulatory bodies, the Mono Lake Committee has also worked directly with urban residents of LA to build common interests. In the 1990s, the Mono Lake Committee built awareness of LA's hydrosocial territory when they used images of Mono Lake to promote a low-flow toilet rebate program in LA. In building connections between LA and Mono Lake, the Mono Lake Committee put particular emphasis on

building strong partnerships with LA's low-income communities. As several advocates involved with the Mono Lake Committee in its early years explained:

> **Lucy:** Many of the people who did the distribution of the low-flow toilets were community groups from disadvantaged communities. They had pictures of Mono Lake with them when they would go door to door asking people if they wanted a free low-flow toilet. They said, "Not only will you get a new toilet and it'll spiff up your bathroom, but you'll be saving this lake in the process."
>
> **Elizabeth:** We worked closely with the LADWP and citizen groups who began to understand that Mono Lake was part of the LA ecosystem. They would actually go door to door with pictures of themselves at Mono Lake and say, this is where the water comes from, and if you put in this toilet… you're helping to protect this lake. It was just genius because the Mothers of East LA, and the Korean youth communities, and a whole bunch of different groups at the time, were working with their churches and community groups to get the toilets distributed. It was very effective. And it created a linkage between people's understanding of where the water comes from and how you're using that water, and the choices that we make that can create a different future.

Elizabeth, a water policy expert involved in the initial Mono Lake campaign, specifically emphasized the key tenet of avoiding "NIMBY" environmentalism by finding solutions that did not simply transferring the issues of water supply to other regions.

> **Elizabeth:** One of the real tenets of the Mono Lake campaign was to try and find a replacement water supply for the city of Los Angeles. As we were reducing the amount of water being taken from Mono Lake, we didn't want to transfer the problem to anywhere else in the state. And that meant going beyond just shaking our finger at LA... We actually wanted to make partners with the city of LA and try to find a replacement water supply. Because if you're going to reduce the water going [from Mono Lake] to the city of LA, there was going to be a replacement coming from somewhere. And we didn't want to transfer the problem to another place. We wanted to solve the problem.

The case of Mono Lake demonstrates the potential for limiting harmful resource extractivism through raising hydrosocial awareness. As Cantor, Emel and Neo (2018) note, networks of

consumption can stretch across long distances, making it easy for consumers to disengage from the far-away impacts of resource extraction and production. Yet networks of resistance and activism can also cover long distances (Rocheleau, 2015). By compelling urban water users to recognize the consequences of their water use on the far-flung corners of the hydrosocial territory, Mono Lake advocates were able to change resource use behavior in ways that ultimately benefitted the lake and avoided transferring the problem to another region. The emphasis on hydrosocial awareness remains an important goal of the Mono Lake Committee: today, the organization regularly brings youth groups from the Los Angeles area up to Mono Lake to build awareness and to experience the hydrosocial territory firsthand. The case also provides a concrete example of ruralization at work by showing how rurally-sited issues and people can actively influence and impact the city. The low-flow toilet initiative, in particular, reshaped the urban form, changed the material flows between city and countryside, and shifted the environmental politics of the city.

3.3 Advocates struggle for attention amidst impending socioecological crisis at the Salton Sea

The Salton Sea, a 350 square mile lake in inland Southern California's Imperial Valley, represents the most recent incorporation into urban Southern California's hydrosocial territory. Echoing the past cases of Owens Lake and Mono Lake, the Salton Sea is currently experiencing receding shorelines, increasing salinity, and air quality threats as a result of water transfers to the cities of Southern California. However, the Salton Sea is different from the other cases in several important ways.

First, the saline lake has a somewhat unusual origin story. Located below sea level, it has filled up and evaporated multiple times over geologic history with the fluctuations of the Colorado

River Delta. The lake's current iteration was formed in in 1905, when a project to bring irrigation water from the Colorado River to the Imperial Valley went awry, diverting the Colorado River's entire flow into the Salton Sink for several years. The resulting lake—which is frequently referred to as 'accidental' or 'manmade'—was expected to dry up shortly, but runoff from irrigated agriculture in the surrounding Imperial Valley has served as inflow to the lake ever since, and the Salton Sea has persisted (Cohen et al., 1999; DeBuys, 2001; Delfino, 2006).

During the 1950s and 60s, the lake became a popular recreational spot for boating and fishing, but in the 1970s and 80s, unstable lake levels flooded shoreline property and unstable ecological conditions caused die-offs of fish and birds. Throughout the 1980s and 90s, a series of negotiations involving the Imperial Irrigation District (IID) and urban Southern California's water providers (including LA's Metropolitan Water District and the San Diego County Water Authority) resulted in several large-scale agriculture-to-urban water transfers (see Cantor 2016, 2017 for more details). Under the water transfer agreements, LA's Metropolitan Water Agency and the San Diego County Water Authority each pay IID for water; IID then pays farmers to not use the water so that it can instead go to the cities.

As farmers use less water through fallowing fields or implementing water efficiency practices in order to provide more water to the cities, the inflow to the Salton Sea is reduced. This reduced inflow is currently causing receding shorelines, increasing salinity, and harmful impacts to wildlife health and air quality (Cantor, 2017; Cohen, 2014). Salton Sea managers are now scrambling to draw attention to the impending problem, and are struggling to raise awareness, support, and money to implement solutions (Cantor and Knuth, 2018). The lake and the surrounding region arguably serve as a 'sacrifice zone' within the hydrosocial territory, as the

region's health is put at risk so that urban Southern California can continue to have a secure water supply (Cantor and Knuth 2018).

Given that it is a saline lake imperiled by water transfers to urban areas, the Salton Sea is frequently compared to both Owens Lake and Mono Lake. Yet the Salton Sea's situation is uniquely difficult and complicated. As Laura, an ecological restoration specialist involved in issues at both Owens Lake and the Salton Sea, noted in an interview, the complexity of the Salton Sea situation distinguishes it from the other cases:

> **Laura:** The thing that's so different about [the Salton Sea] is there isn't any single, obvious, deep pockets to go to. Owens Lake has cost the City of Los Angeles over a billion dollars. The City of Los Angeles has the billion dollars. It was a clear, legislative thing of whose issue this was. The city built the aqueduct, dried up the Owens Lake. The Owens Lake is the city's problem. There's nothing so clear in the Salton Sea. The Salton Sea is connected to many, many more users than the Owens Lake. The Owens Lake really just has ranches upstream, which I shouldn't say just, but in terms of numbers of people, square miles drained, it's miniscule compared to the whole watershed of the Colorado River. That all feeds into the Salton Sea issues.

Residents and advocates of the Salton Sea have had difficulties rallying a cohesive social movement, not to mention broad political support. As Jim, a water policy expert, noted:

> **Jim:** Mono Lake, they managed to get a huge public campaign, and people got very excited about Mono Lake. Mono Lake is perhaps even more remote than the Salton Sea, but somehow they managed to capture public attention, and people have bumper stickers that say "Save Mono Lake." You don't see too many "Save the Salton Sea" bumper stickers. But there's a lot more people living around the Salton Sea than Mono Lake.

Interviewees cited several reasons for this lack of engagement, including complexity of the situation, lack of visual appeal in comparison to Mono Lake, and, in particular, the lack of political influence in a largely poor and Latino community. Several interviewees emphasized the

issue of a lack of political influence as a key factor in explaining the inaction of state politicians in addressing the issues of the Salton Sea. For example, as Brian, an ecologist involved in Salton Sea management, and aforementioned water policy expert Jim both commented:

> **Brian:** There aren't enough people who live around the Salton Sea that carry enough political clout to make a lot of difference. That's a fact.
>
> **Jim:** There's just not the political will. It's off in a po-dunk corner of southeast California, it's got a couple of representatives, state legislators, state senators, who have other problems. Most of Imperial County is desperately poor. It's an environmental justice problem, it's Latino, which is another strike against it, because, well... if it were right next door to [the wealthy community of] Rancho Mirage, which isn't that far away, it would be getting a lot more attention. But it's not.

Carlos, a local environmental justice advocate who works with farmworkers in the Imperial Valley, explains:

> **Carlos:** They think we're stupid. We don't have the population or wealth base to get attention. The politicians throw small bits of funding for a feasibility study or a pilot project which is just enough to distract people and keep them from realizing what a big problem it is, but not enough to actually do something real. The people who live here aren't influential enough.

When Carlos says "we don't have the population," it must be kept in mind that in fact, the area surrounding the Salton Sea is far more densely populated than the area around Owens or Mono Lake. The Imperial Valley does not lack in population—rather, it does not have a population that is wealthy and white enough to be considered worthy of attention and material resources by many state lawmakers and environmental advocates (see Cantor 2017 for an analysis of biopolitical and environmental justice issues at the Salton Sea).

However, the Salton Sea may be impossible for the broader region to ignore for long. In 2012, eutrophication caused hydrogen sulfide gases to bubble up from the bottom of the Salton Sea.

The foul-smelling gases were carried by the wind for over 150 miles to the greater LA area, where residents gained sudden olfactory awareness of the issues involved in broader Southern California's water supply. The 'Big Stink,' as it became known, inadvertently helped to gain attention and support for fixing the issues at the Salton Sea. Will, a local water manager, explained:

> **Will:** Have you heard the 'Big Stink' story? If something doesn't happen fairly soon at the Salton Sea that is going to happen a lot. People in LA and Ventura County are going to smell the Salton Sea. And perhaps then they'll want to help take care of it.

Jessica, a local author, concurred:

> **Jessica:** For the people in Los Angeles, it was definitely a big wake up call. And people started realizing that, yeah, we do not live in a bubble… And in a sense that event alone has definitely helped with policy in the last few months.

This event brought to light the connections between water transfers and environmental consequences. Despite the awful stench, locals suffering from the smelly hydrogen sulfide gas celebrated the fact that far-away urban residents were finally forced to confront the impacts of their water use.

The case of the 'big stink' at the Salton Sea illustrates that hydrosocial relationships are shaped by more-than-human dynamics; they are dynamic assemblages in which lively nonhuman actors can play critical and unpredictable roles (Bear and Bull, 2011; Gibbs, 2013; Linton and Budds, 2014). Moreover, the 'big stink' illustrates the multidirectionality of material flows between urban and rural areas. Where local residents and advocates have struggled to raise awareness throughout the broader hydrosocial territory, unpleasant odors have made the connections more concrete for far-away urban residents. This dynamic also further underscores the environmental

justice and sacrificial dimensions of the Salton Sea's enrollment in the broader hydrosocial territory (Cantor and Knuth, 2018): despite the potential for severe public health impacts at the local scale, the problems at the Salton Sea are considered unworthy of attention until they affect more affluent urban residents in a direct way.

4. Synthesis: The production of diverse hydrosocial territories in Southern California

Hydrosocial relationships of water have fundamentally shaped – and continue to shape— both urban and rural places. Cities are able to grow and thrive on imported water, while, as this paper demonstrates, the rural areas that serve as water sources for Southern California's cities have been impacted (and have resisted) in a variety of ways. As this close empirical examination shows, the broader hydrosocial territory is not simply 'urbanized' in an undifferentiated way. Instead, hydrosocial relationships—the intra-actions within a broader hydrosocial territory—have been instrumental in producing a diverse range of places which relate to their urban counterparts in very different ways (Table 3).

Table 3: Comparing case studies: Diversity of hydrosocial territories and relationships

	Case 1: Owens Valley (former Owens Lake)	**Case 2: Mono Lake**	**Case 3: Salton Sea**
Urbanization (focus on processes)	Enrollment into hydrosocial territory of Los Angeles: water diverted to city as drinking water source (surface water 1913; groundwater 1970)	Enrollment into hydrosocial territory of Los Angeles: water diverted to city as drinking water source (1941)	Enrollment into hydrosocial territory of San Diego and Los Angeles: agricultural water rights transferred to urban areas (2003)
Rural community characteristics (focus on place)	Small ranching community: very low-density development; very little sprawl or exurban development.	Wilderness area: very little development; wilderness-based tourism economy based on Mono Lake	Several small towns: economy dominated by industrial agriculture; increasing renewable energy economy.

		landscape and proximity to Yosemite National Park	
Urban-rural relationships	Contentious and paradoxical: rural antagonism toward urban landowner, yet appreciation for lack of urban sprawl	Collaborative: recognition of co-benefits of water conservation; encouraging awareness of Mono Lake to reduce urban water consumption	Distrustful: views on water transfers are divided within farming community. Unpredictable: politics impacted by uncontrollable more-than-human dynamics (e.g. "the big stink")

Each of the three cases in this study has been shaped through enrollment into urban hydrosocial territories as a drinking water source. However, at the same time they represent distinctly different places, and different versions of what it means to be 'rural' (Table 3). Mono Basin is the least developed, and it is distinguished by its wilderness character and sparse development. Imperial Valley represents a more industrialized rural landscape dominated by agribusiness and, more recently, renewable energy generation. Of the three cases, Owens Valley represents the most paradoxical relationship between urbanization and ruralization. In Owens Valley, local desire for economic development and local control of the valley's land conflicts with desire to maintain the valley's rural character and open space—which is itself facilitated by LA's ownership of land. Returning to the analysis of urbanization and ruralization processes presented in Table 1, Owens Valley can be understood as simultaneously produced by processes of urbanization (enrolled as a source of resources for urban metabolic processes) and also processes of ruralization (through the maintenance of open space and lack of development).

In each case, resistance is also at play: environmentalists, environmental justice advocates, and residents of rural areas have strongly resisted water diversions and transfers. Resistance to water diversions has taken different forms, with varying degrees of success. At Owens Lake, relationships between urban and rural constituents are still tense after over a century of water diversion. At Mono Lake, lawsuits against the city have resulted in restoration of lake levels,

while community partnerships between Mono Lake advocates and LA-based water users have built urban appreciation of the hydrosocial hinterlands. The contestation of water transfers and diversions through legal strategies and social movements has shifted power dynamics between urban and rural actors within the hydrosocial territory: urban water managers have been forced to reduce water diversions (at Mono Lake), and pay for cleanup and mitigation of negative consequences (at Owens Lake). In Imperial County, local opinions on the water transfers are mixed, and rallying a cohesive social movement in support of the Salton Sea has proved more difficult; locals are struggling to gain political attention but may inadvertently benefit from events such as the "big stink," which viscerally emphasize rural-urban connections while underscoring environmental justice dimensions.

Each region faces a range of different futures, as well. Mono Lake's inflows are more or less guaranteed to remain protected due to the landmark court case and the ongoing work of the Mono Lake Committee. At Owens Lake, agreements between the local air pollution control district and LADWP are expected to mitigate dust problems from the lakebed, and LADWP is currently working on a habitat conservation plan for the lake. However, there remain tensions between local Owens Valley residents and the city over Los Angeles's control of water and land in the region, with some residents and advocacy groups believing the only opportunity for true justice involves the unlikely scenario of LA relinquishing control of Owens Valley resources. The Salton Sea's future is the most uncertain: while some still hope for a large-scale, large-budget restoration that will bring economic development to the region (Cantor and Knuth 2018), others simply are hoping for a livable community with breathable air. Together, the cases illustrate the diversity of places that can be produced through urban-rural relationships, as well as

the multidirectional processes of urbanization/ruralization through flows of resources such as water.

5. Conclusions

Urban political ecology conceptualizes cities not as bounded spaces but as socioecological processes of resource metabolization (Heynen, 2014; Heynen et al., 2006), yet in practice UPE scholarship has focused more on city sites themselves (Angelo and Wachsmuth, 2015). In this paper, I have focused on three very different non-city sites, all of which have been fundamentally shaped in different ways through urbanization as they have been enrolled into a broader urban hydrosocial territory as sources of urban drinking water. In doing so, I demonstrate how UPE can be usefully applied to understand rural sites and rural-urban relationships, illustrating how processes of urbanization and ruralization have produced distinctly different landscapes through relationships of resource flows.

Urban political ecology and planetary urbanization have both emphasized the importance of conceptualizing urban as process. Through this lens, urban metabolic processes of extracting resources from broader geographic territories for urban growth and development can be viewed primarily as processes of urbanization-- even when they take place in sites that are experienced as rural. Yet both urban and rural geographers have insisted that despite the expansion of such urbanization processes, urban and rural cannot be understood as one and the same, since to do so belies lived experiences. Through this latter lens, urban is defined as a place as well as a process. In this paper, I have examined these dynamics by looking at both (a) rural as place, defined by experiential aspects including physical or economic form or lived experience; and (b) urbanization/ruralization processes at work, demonstrating the ways in which non-city places are

transformed as they are subsumed into cities as sources of metabolic flows, as well as the ways that non-cities actively transform city spaces through various political and material flows.

To sum, I emphasize three points. First, both interpretations (urban as place and urbanization as process) are simultaneously possible: that is, on the one hand (as geographers have emphasized) the urban and the rural exist as *places* that resonate with people's lived experiences and identities and cannot be conflated into an "urban without an outside"; but on the other hand, *processes* of urbanization impact places both within and beyond city sites as rural places are enrolled as sites of resource extraction or sinks for waste (McKinnon et al., 2017; Walker, 2007). That is, as Cousins and Newell put it, we can have both an UPE *in* the city and an UPE *of* the city that complement one another (Cousins and Newell, 2019). Second, I argue that urban political ecology provides a more useful scholarly framework than planetary urbanization for tackling these tensions and contradictions in an empirical manner. Because UPE retains political ecology's groundedness in empirics, UPE allows us to analyze a diverse range of on-the-ground urban and rural places to understand the socioenvironmental changes, material flows, and processes associated with urbanization/ruralization taking place within those specific places. The huge variation in socioecological conditions, power dynamics, and urban-rural relationships described in the three case studies in this paper illustrates the importance of using theoretical and empirical tools that are attentive to place-based difference and nuance. Third, I argue here that the concept of hydrosocial territories provides a way to think beyond the limits of place-bound city/countryside dichotomies by emphasizing how resource flows can shape relationships at multiple scales, including transcending rural/urban divides (Boelens et al., 2016; Hommes, Boelens, et al., 2019; Hommes, Veldwisch, et al., 2019; Hommes and Boelens, 2017). An emphasis on territorial dimensions stresses the ways in which multi-directional processes of

urban metabolism are ‘rooted’ in particular, actually-existing places (Cantor, Stoddard, et al., 2018; Rocheleau, 2015; Rocheleau and Roth, 2007) in a diversity of forms.

While water serves as an obvious focal point for hydrosocial territories, a myriad of other metabolic flows of resources (including food and energy) could also be analyzed through such a territorial lens, examining their co-constituted urbanization and ruralization processes, as well as the unique and specific urban and rural territories created through these resource flows. This project is currently under way. For example, recent scholarship has used the tools of urban political ecology to examine, for example, urban flood hazardscapes as extending beyond the city (Saguin, 2017). Other scholars seek new language to help articulate scalar and territorial relations of resource flows and processes. For example, Gustafson uses the term ‘megapolitan political ecology’ to describe Appalachia’s urban metabolism and the socio-ecological impacts of exurban development at a regional scale (Gustafson, 2015; Gustafson et al., 2014). Meanwhile Newell and Cousins propose a ‘political-industrial ecology’ approach that builds upon urban metabolism in order to map networks of resource flows while also taking into account power dynamics (Cousins and Newell, 2015; Newell and Cousins, 2015). As these multiple terms illustrate, political ecologists are seeking tools and language to understand the connections and contradictions of resource flows, urbanization processes, and sometimes-blurry territorial boundaries.

Moreover, while this chapter focuses on direct hydrosocial relationships between cities and the surrounding regions providing water to support urban water users’ needs, it is also important to note that water is also indirectly involved in urban metabolic relationships through agriculture. In California, only about 20% of water used by humans is used for urban water supply; the remaining 80% goes to support irrigated agriculture (Mount and Hanak, 2019). Many of

California's agricultural products and produce are exported out of state to feed the entire nation and, indeed, the world. Future research on hydrosocial territories and urbanization should continue to engage with water not only in its form as H2O, but also in the form of 'virtual water' used to produce agricultural commodities.

To conclude, political ecology continues to provide a useful empirical and theoretical approach for examining the nuanced dynamics of socio-ecological change in specific places, including dynamics of urbanization outside of the city proper. Urban political ecology presents an analytical framework for better understanding socio-ecological dimensions of power and political economy associated with urbanization processes within and beyond city limits. Applying this framework to sites outside of the city, including rural dimensions of hydrosocial territories—or other broader territories linked through urban metabolism processes—demonstrates how dynamic *processes* of urbanization can produce diverse, specific, and contested *places* experienced as rural.

6. References

Angelo H and Wachsmuth D (2015) Urbanizing urban political ecology: A critique of methodological cityism. *International Journal of Urban and Regional Research* 39(1). Wiley Online Library: 16–27.

Bakker KJ (2003) *An Uncooperative Commodity: Privatizing Water in England and Wales*. Oxford Geographical and Enviro.

Bear C and Bull J (2011) Water matters: agency, flows, and frictions. *Environment and Planning A* 43(10). Pion Ltd, London: 2261–2266.

Biehler DD (2013) *Pests in the City: Flies, Bedbugs, Cockroaches, and Rats*. University of Washington Press.

Boelens R, Hoogesteger J, Swyngedouw E, et al. (2016) Hydrosocial territories: a political ecology perspective. Taylor & Francis.

Brechin G (2006) *Imperial San Francisco: Urban Power, Earthly Ruin*. Univ of California Press.

Brenner N (2013) Theses on urbanization. *Public culture* 25(1 (69)). Duke University Press: 85–114.

Brenner N (2018) Debating planetary urbanization: For an engaged pluralism. *Environment and Planning D: Society and Space* 36(3). SAGE Publications Sage UK: London, England: 570–590.

Brenner N and Schmid C (2015) Towards a new epistemology of the urban? *City* 19(2–3). Routledge: 151–182.

Brenner N and Schmid C (2017) Planetary urbanization. In: *The Globalizing Cities Reader*. Routledge, pp. 479–482.

Cadieux KV and Hurley PT (2011) Amenity migration, exurbia, and emerging rural landscapes: Global natural amenity as place and as process. *GeoJournal* 76(4). Springer: 297–302.

Cantor A (2016) The public trust doctrine and critical legal geographies of water in California. *Geoforum* 72. Pergamon: 49–57. DOI: 10.1016/J.GEOFORUM.2016.01.007.

Cantor A (2017) Material, Political, and Biopolitical Dimensions of "Waste" in California Water Law. *Antipode* 49(5): 1204–1222.

Cantor A and Knuth S (2018) Speculations on the postnatural: Restoration, accumulation, and sacrifice at the Salton Sea. *Environment and Planning A: Economy and Space*. SAGE Publications Sage UK: London, England.

Cantor A, Emel J and Neo H (2018) Networks of Global Production and Resistance. In: *Food and Place: A Critical Exploration*. Rowman & Littlefield, pp. 35–51.

Cantor A, Stoddard E, Rocheleau D, et al. (2018) Putting Rooted Networks Into Practice. *ACME: An International Journal for Critical Geographies* 14(4): 958–987.

Chen J-C, Zinda JA and Yeh ET (2017) Recasting the rural: state, society and environment in contemporary China. *Geoforum* 78. Elsevier Ltd: 83–88.

Cloke P, Marsden T and Mooney P (2006) *Handbook of Rural Studies*. Sage.

Cohen MJ (2014) *Hazard's Toll: The Costs of Inaction at the Salton Sea*. Pacific Institute.

Cohen MJ, Morrison JI and Glenn EP (1999) *Haven or Hazard: The Ecology and Future of the Salton Sea*. Pacific Institute for Studies in Development, Environment and Security.

Connolly C (2019) Urban Political Ecology Beyond Methodological Cityism. *International Journal of Urban and Regional Research*. Wiley Online Library.

Cousins JJ (2017) Structuring hydrosocial relations in urban water governance. *Annals of the American Association of Geographers* 107(5). Taylor & Francis: 1144–1161.

Cousins JJ and Newell J (2019) Urban political ecologies of and in the city. In: *Handbook of Urban Geography*. Edward Elgar Publishing.

Cousins JJ and Newell JP (2015) A political–industrial ecology of water supply infrastructure for Los Angeles. *Geoforum* 58. Elsevier: 38–50.

Cronon W (1991) *Nature's Metropolis: Chicago and the Great West*. New York: WW Norton & Company.

Davidson M and Iveson K (2015) Beyond city limits: A conceptual and political defense of 'the city'as an anchoring concept for critical urban theory. *City* 19(5). Routledge: 646–664.

DeBuys W (2001) *Salt Dreams: Land and Water in Low-down California*. UNM Press.

Delfino K (2006) Salton Sea restoration: Can there be salvation for the Sea. *Pac. McGeorge Global Bus. & Dev. LJ* 19. HeinOnline: 157.

Derickson K (2018) Masters of the universe. *Environment and Planning D: Society and Space* 36(3). SAGE Publications Sage UK: London, England: 556–562.

Derickson KD (2015) Urban geography I: Locating urban theory in the 'urban age'. *Progress in Human Geography* 39(5). SAGE Publications Sage UK: London, England: 647–657.

Gabriel N (2014) Urban political ecology: Environmental imaginary, governance, and the non-human. *Geography Compass* 8(1). Wiley Online Library: 38–48.

Gandy M (2003) *Concrete and Clay: Reworking Nature in New York City*. MIT Press.

Gandy M (2004) Rethinking urban metabolism: water, space and the modern city. *City* 8(3). Taylor & Francis: 363–379.

Gandy M (2012) Queer ecology: nature, sexuality, and heterotopic alliances. *Environment and Planning D: Society and Space* 30(4). SAGE Publications Sage UK: London, England: 727–747.

Gandy M (2014) *The Fabric of Space: Water, Modernity, and the Urban Imagination*. MIT Press.

Gibbs LM (2013) Bottles, bores, and boats: agency of water assemblages in post/colonial inland Australia. *Environment and Planning a* 45(2). SAGE Publications Sage UK: London, England: 467–484.

Guin D (2018) From large villages to small towns: A study of rural transformation in new census towns, India. *International Journal of Rural Management* 14(2). SAGE Publications Sage India: New Delhi, India: 87–109.

Gustafson S (2015) Maps and contradictions: Urban political ecology and cartographic expertise in southern Appalachia. *Geoforum* 60. Elsevier: 143–152.

Gustafson S, Heynen N, Rice JL, et al. (2014) Megapolitan political ecology and urban metabolism in southern Appalachia. *The Professional Geographer* 66(4). Taylor & Francis: 664–675.

Hamel P and Keil R (2015) *Suburban Governance: A Global View*. University of Toronto Press.

Hanak E (2011) *Managing California's Water: From Conflict to Reconciliation*. Public Policy Institute of CA.

Hart J (1996) *Storm over Mono: The Mono Lake Battle and the California Water Future*. Univ of California Press.

Hay I (2000) Qualitative research methods in human geography.

Henderson GL (1999) *California and the Fictions of Capital*. Oxford University Press.

Heynen N (2014) Urban political ecology I: The urban century. *Progress in Human Geography* 38(4). Sage Publications Sage UK: London, England: 598–604.

Heynen N (2018) Urban political ecology III: The feminist and queer century. *Progress in Human Geography* 42(3). SAGE Publications Sage UK: London, England: 446–452.

Heynen N, Kaika M and Swyngedouw E (2006) *In the Nature of Cities: Urban Political Ecology and the Politics of Urban Metabolism*. New York: Routledge.

Hommes L and Boelens R (2017) Urbanizing rural waters: Rural-urban water transfers and the reconfiguration of hydrosocial territories in Lima. *Political Geography* 57. Elsevier: 71–80.

Hommes L, Veldwisch GJ, Harris LM, et al. (2019) Evolving connections, discourses and identities in rural–urban water struggles. *Water International* 44(2). Taylor & Francis: 243–253.

Hommes L, Boelens R, Harris LM, et al. (2019) Rural–urban water struggles: urbanizing hydrosocial territories and evolving connections, discourses and identities. Taylor & Francis.

Horowitz H (2012) Aral sea analogs in the American West. In: *Disaster by Design: The Aral Sea and Its Lessons for Sustainability*. Emerald Group Publishing Limited, pp. 89–103.

Howe CW and Goemans C (2003) WATER TRANSFERS AND THEIR IMPACTS: LESSONS FROM THREE COLORADO WATER MARKETS 1. *JAWRA Journal of the American Water Resources Association* 39(5). Wiley Online Library: 1055–1065.

Howe CW, Lazo JK and Weber KR (1990) The economic impacts of agriculture-to-urban water transfers on the area of origin: a case study of the Arkansas River Valley in Colorado. *American Journal of Agricultural Economics* 72(5). JSTOR: 1200–1204.

Hundley N (2001) *The Great Thirst: Californians and Water—A History*. Univ of California Press.

Jazeel T (2018) Urban theory with an outside. *Environment and Planning D: Society and Space* 36(3). SAGE Publications Sage UK: London, England: 405–419.

Kahrl WL (1983) *Water and Power: The Conflict over Los Angeles Water Supply in the Owens*

Valley. Univ of California Press.

Kahrl WL (2000) Part I: The Politics of California Water: Owens Valley and the Los Angeles Aqueduct, 1900-1927. *Hastings Environmental Law Journal* 6(2): 239.

Kaika M (2004) *City of Flows: Modernity, Nature, and the City*. Routledge.

Keil R (2005) Progress report—urban political ecology. *Urban Geography* 26(7). Taylor & Francis: 640–651.

Keil R (2017) *Suburban Planet: Making the World Urban from the Outside In*. John Wiley & Sons.

Keil R (2018) The empty shell of the planetary: re-rooting the urban in the experience of the urbanites. *Urban Geography*. Taylor & Francis: 1–14.

Kipfer S (2018) Pushing the limits of urban research: Urbanization, pipelines and counter-colonial politics. *Environment and Planning D: Society and Space* 36(3). SAGE Publications Sage UK: London, England: 474–493.

Krause M (2013) The ruralization of the world. *Public culture* 25(2 70). Duke University Press: 233–248.

Lawhon M, Ernstson H and Silver J (2014) Provincializing urban political ecology: Towards a situated UPE through African urbanism. *Antipode* 46(2). Wiley Online Library: 497–516.

Libecap GD (2007) *Owens Valley Revisited: A Reassessment of the West's First Great Water Transfer*. Stanford University Press.

Linton J and Budds J (2014) The hydrosocial cycle: Defining and mobilizing a relational-dialectical approach to water. *Geoforum* 57: 170–180. DOI: 10.1016/j.geoforum.2013.10.008.

McCarthy J (2008) Rural geography: Globalizing the countryside. *Progress in Human Geography* 32(1). Sage Publications Sage UK: London, England: 129–137.

McKinnon I, Hurley PT, Myles CC, et al. (2017) Uneven urban metabolisms: Toward an integrative (ex) urban political ecology of sustainability in and around the city. *Urban Geography*. Taylor & Francis: 1–26.

Mercer C (2017) Landscapes of extended ruralisation: postcolonial suburbs in Dar es Salaam, Tanzania. *Transactions of the Institute of British Geographers* 42(1). Wiley Online Library: 72–83.

Merrifield A (2013) The urban question under planetary urbanization. *International Journal of Urban and Regional Research* 37(3). Wiley Online Library: 909–922.

Michelsen AM and Young RA (1993) Optioning agricultural water rights for urban water supplies during drought. *American Journal of Agricultural Economics* 75(4). Oxford University Press: 1010–1020.

Mount J and Hanak E (2019) *Water Use in California*.

Newell JP and Cousins JJ (2015) The boundaries of urban metabolism: Towards a political–industrial ecology. *Progress in Human Geography* 39(6). SAGE Publications Sage UK: London, England: 702–728.

Peake L, Patrick D, Reddy RN, et al. (2018) Placing planetary urbanization in other fields of vision. *Environment and Planning D: Society and Space* 36(3). SAGE Publications Sage UK: London, England: 374–386.

Reisner M (1993) *Cadillac Desert: The American West and Its Disappearing Water*. Penguin.

Rocheleau D (2015) Networked, rooted and territorial: Green grabbing and resistance in Chiapas. *Journal of Peasant Studies* 42(3–4). Taylor & Francis: 695–723.

Rocheleau D (2016) Rooted networks, webs of relation, and the power of situated science: Bringing the models back down to earth in Zambrana. In: *The Palgrave Handbook of Gender and Development*. Springer, pp. 213–231.

Rocheleau D and Roth R (2007) Rooted networks, relational webs and powers of connection: Rethinking human and political ecologies. *Geoforum* 3(38): 433–437.

Rocheleau D, Thomas-Slayter B and Wangari E (1996) *Feminist Political Ecology: Global Issues and Local Experience*. London: Routledge.

Ruddick S, Peake L, Tanyildiz GS, et al. (2018) Planetary urbanization: An urban theory for our time? *Environment and Planning D: Society and Space* 36(3). SAGE Publications Sage UK: London, England: 387–404.

Saguin K (2017) Producing an urban hazardscape beyond the city. *Environment and planning A* 49(9). SAGE Publications Sage UK: London, England: 1968–1985.

Schmid C (2018) Journeys through planetary urbanization: Decentering perspectives on the urban. *Environment and Planning D: Society and Space* 36(3). SAGE Publications Sage UK: London, England: 591–610.

Scott AJ and Storper M (2015) The nature of cities: the scope and limits of urban theory. *International journal of urban and regional research* 39(1). Wiley Online Library: 1–15.

Shin HB (2017) Geography: Rethinking the ‘urban’ and ‘urbanization’. In: Iossifova D, Doll C, and Gasparatos A (eds) *Defining the Urban : Interdisciplinary and Professional Perspectives*. London: Taylor & Francis.

Smith N (2010) *Uneven Development: Nature, Capital, and the Production of Space*. University of Georgia Press.

Swyngedouw E (1997) Power, nature, and the city. The conquest of water and the political ecology of urbanization in Guayaquil, Ecuador: 1880–1990. *Environment and planning A* 29(2). SAGE Publications Sage UK: London, England: 311–332.

Swyngedouw E (1999) Modernity and hybridity: nature, regeneracionismo, and the production of the Spanish waterscape, 1890–1930. *Annals of the Association of American Geographers* 89(3). Taylor & Francis: 443–465.

Swyngedouw E (2009) The Political Economy and Political Ecology of the Hydro-Social Cycle. *Journal of Contemporary Water Research & Education* 142(1): 56–60. DOI: 10.1111/j.1936-704X.2009.00054.x.

Swyngedouw E (2015) *Liquid Power: Contested Hydro-Modernities in Twentieth-Century Spain*. MIT Press.

Swyngedouw E and Heynen NC (2003) Urban political ecology, justice and the politics of scale.

Antipode 35(5). Wiley Online Library: 898–918.

Swyngedouw E and Kaika M (2014) Urban political ecology. Great promises, deadlock… and new beginnings? *Documents d'anàlisi geogràfica* 60(3): 459–481.

Swyngedouw E, Kaika M and Castro E (2002) Urban water: a political-ecology perspective. *Built Environment (1978-)*. JSTOR: 124–137.

Taylor LE and Hurley PT (2016) *A Comparative Political Ecology of Exurbia: Planning, Environmental Management, and Landscape Change*. Springer.

Taylor RG and Young RA (1995) Rural-to-urban water transfers: measuring direct foregone benefits of irrigation water under uncertain water supplies. *Journal of Agricultural and Resource Economics*. JSTOR: 247–262.

Wachsmuth D and Weisler A (2018) Airbnb and the rent gap: Gentrification through the sharing economy. *Environment and Planning A: Economy and Space* 50(6). SAGE Publications Sage UK: London, England: 1147–1170.

Walker P and Fortmann L (2003) Whose landscape? A political ecology of the 'exurban'Sierra. *Cultural geographies* 10(4). Sage Publications Sage CA: Thousand Oaks, CA: 469–491.

Walker R (2007) *The Country in the City: The Greening of the San Francisco Bay Area*. University of Washington Press.

Walker R (2015) Building a better theory of the urban: A response to 'Towards a new epistemology of the urban?' *City* 19(2–3). Routledge: 183–191.

Woods M (2004) *Rural Geography: Processes, Responses and Experiences in Rural Restructuring*. Sage.

Worster D (1992) *Rivers of Empire: Water, Aridity, and the Growth of the American West*. Oxford University Press, USA.

Yin RK (2009) *Case Study Research: Design and Methods (Applied Social Research Methods)*. London and Singapore: Sage.

Zimmer A, Cornea N and Veron R (2017) Urban political ecology: Landscapes of power. In: Iossifova D, Doll C, and Gasparatos A (eds) *Defining the Urban : Interdisciplinary and Professional Perspectives*. London: Taylor & Francis.

[i] For example, recent empirical work by Wachsmuth, one of the authors of the critique of 'methodological cityism' focuses on politics and practices of short-term housing rentals such as Airbnb in New York City, a traditionally 'urban' site of analysis (Wachsmuth and Weisler, 2018).

[ii] While my paper briefly describes the contours of the planetary urbanization debate, there is a large volume of recent literature that addresses the topic in much more detail. For readers with a deeper interest in the debates around planetary urbanization, these conversations have been moved forward significantly by a special issue in

Environment and Planning D: Society and Space (Vol 36, Issue 3, 2018) in which the topic is tackled by a diverse group of scholars coming from various theoretical backgrounds. The issue also includes responses from Brenner and Schmid, who defend the planetary urbanization approach, push back against allegations of planetary urbanization as a 'totalizing' approach, and call for continued productive dialogues.

[iii] These critiques have been rebutted by Brenner and Schmid in the aforementioned issue of *Environment and Planning D: Society and Space* (Vol 36, Issue 3, 2018). In these rebuttals, both Brenner and Schmid push back on the characterization of planetary urbanization as totalizing (Brenner, 2018; Schmid, 2018).