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IMPERMEABLE ASSEMBLAGES: FLOODING, URBAN INFRASTRUCTURE, AND STORMWATER POLITICS IN SÃO PAULO, BRAZIL

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IMPERMEABLE ASSEMBLAGES: FLOODING, URBAN INFRASTRUCTURE, AND STORMWATER POLITICS IN SÃO PAULO, BRAZIL.

Dissertation

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the College of Arts and Sciences at The University of Kentucky

By
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Lexington, Kentucky

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ABSTRACT OF DISSERTATION

IMPERMEABLE ASSEMBLAGES: FLOODING, URBAN INFRASTRUCTURE, AND STORMWATER POLITICS IN SÃO PAULO, BRAZIL.

This project analyzes efforts to remake the relationship between water and city in São Paulo, Brazil. Currently experiencing overlapping problems of flooding, scarcity, and pollution, São Paulo illustrates the challenges of managing water in a contemporary mega-city. This dissertation subsequently considers the city’s water management through an approach that borrows from urban political ecology, social studies of science, and post-colonial urban theory. With an epistemological grounding in these literatures, this project analyzes ongoing conversations about water management in São Paulo, and focuses on how water is encountered and engaged with in the landscape by engineers, artists, and activists. This project touches on many aspects of the city’s waterscape, but its specific focus is on the management of stormwater and efforts to deal with flooding in the city, both historically as well as in the contemporary moment. By considering urban infrastructure not as a technical system for managing water but rather a deeply political intervention that ties together the social and natural landscapes of the city, this project offers a textured, critical look at the forms in which water is made legible through diverse processes of representation and engagement. Through an understanding of urbanization as a deeply political process of landscape change that folds together social and natural processes, this project argues for an approach to water management that takes seriously the relationships between inequality, infrastructure, and urban development in considering how water is governed. More specifically, it argues that the city’s water crisis is fundamentally a crisis of urban inequality and inadequate housing provisioning, which is coupled with a propensity towards large-scale, monofunctional infrastructures. São Paulo makes clear how urban inequality influences management, complicating efforts to implant necessary infrastructure and equitably distribute drinking water.

Key words: Brazil, water, infrastructure, urban political ecology, landscape, megacities
IMPERMEABLE ASSEMBLAGES: FLOODING, URBAN INFRASTRUCTURE, AND STORMWATER POLITICS IN SÃO PAULO, BRAZIL.

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Acknowledgments

In describing her fictional childhood in Naples, the Italian author Elena Ferrante notes that:

To gather oneself, so to speak, was physically impossible. One learned very early to have the greatest concentration amid the greatest disruption. The idea that every “I” is largely made up of others and by the others wasn’t theoretical; it was a reality. To be alive meant to collide continually with the existence of others and to be collided with, the results being at times good-natured, at others aggressive, then again good-natured. The dead were brought into quarrels; people weren’t content to attack and insult the living—they naturally abused aunts, cousins, grandparents, and great-grandparents who were no longer in the world.

In the most absolute tranquility or in the midst of tumultuous events, in safety or danger, in innocence or corruption, we are a crowd of others. And this crowd is certainly a blessing for literature.

To start this dissertation with this long quotation is to admit to the collective nature of academic production, the personal bonds that have sustained this long project of writing, reading, and research. As Donna Haraway notes, in reference to the many organisms that share our bodies with us, “To be one is always to become with many.” From the earliest attempts at developing a project to the final attempts at cohering and fine-tuning the words in the pages to come, this has been a collective project. I am deeply grateful for friends and colleagues, whose critical eyes, copyediting skills, and brilliance have infused the pages that follow.

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Chapter 1: Introduction

On May 18, 2014, floods were recorded in São Paulo, Brazil. While flooding is common in the city, especially for residents who reside in the city’s periphery, these floods came at a strange time: in the midst of a record drought that had plunged the city’s water reservoirs to dangerously low levels. As news commentators and journalists called attention to the city’s rapidly diminishing reservoirs during what was increasingly being referred to as a water crisis, residents throughout the city wondered if the rain would have a positive effect on the city’s water supply. In a testament to the often-disjointed logic that characterizes São Paulo’s fluvial landscape, it did not. Instead, after nearly a century of river channelization, rainwater that lands in São Paulo is largely deposited into the polluted Tietê River, where it ultimately flows out of the city and is used for hydroelectric power. The city’s primary potable water reservoirs—all of which are located at some distance from the city—can subsequently bear little relationship to the water that falls in São Paulo’s urban center (See figure 1.1).

This dissertation considers ongoing efforts to remake the relationship between water and city in São Paulo, Brazil. São Paulo’s water crisis extends past the scarcity that threatened the city in 2014 and 2015 to include the broader dynamics of flooding, pollution, and inconsistent access that characterize everyday engagements with water in the city. In this dissertation I subsequently focus on the historical production of the city’s waterscape and analyze how the ongoing crisis is being responded to and grappled with by differently positioned actors. Given the breadth of possibilities for analyzing the management of water in São Paulo and the sheer scale of the city, this dissertation takes the form of a series of argument-driven chapters that are contextualized through a sustained historical and geographical engagement with the production of São Paulo’s landscape. As a broadly defined landscape geographer and political ecologist, my task in these chapters is to consider the
complex terrain of water in the city, to offer insight into a series of issues that characterize how water comes to matter for residents of São Paulo. As a result, this dissertation is specifically wide-ranging. It pulls from playwrights and residents, engineers and activists, urban geographers and neighborhood scholars. Its purpose is not to offer a comprehensive overview of the water crisis. Instead, the chapters in this dissertation expand out from the central theme of water to make broader points about urbanization, land use, and inequality.

I consider a series of responses to the overlapping crises of flooding, water scarcity, and pollution, and ask what these efforts and their associated conversations offer to the broader understanding of the politics of water management in São Paulo. In addition to a historical engagement with the production of the city’s hydrological landscape, I focus on consistent efforts on behalf of civil society representatives to articulate the city’s ongoing and overlapping water crises as failures not of ecology but of governance. Working against attempts to “render technical” (Li, 2007) the variegated dynamics of the ongoing crisis, actors in São Paulo have demanded that the crisis be understood as a political crisis. In doing so, they call attention to what I refer to in the title of this dissertation as stormwater politics. By this I refer to the ways in which the management of stormwater intersects with and contributes to broader social, ecological, and economic processes and realities in the city. While urban water systems are often narrated as strictly technical solutions to the distribution of water, this dissertation starts from the foundation that managing water is a deeply political process, one that intersects with the social and natural dynamics of the existing urban landscape.

The responses and projects highlighted in the text are multi-faceted, and include artist engagements and creative projects focused on highlighting the city’s often marginalized rivers, state-led development projects designed to provide infrastructure against flooding,
and grassroots attempts to make the city’s water management regime more transparent. All of them, though, begin from the foundational premise that São Paulo’s system of managing water is in need of change, even if the forms that those changes will take remain under debate. The cases that I highlight are not designed to offer a comprehensive accounting of the city’s strategy of water management, but rather to give insight into how the overlapping dynamics of the water crisis are being engaged with by specific actors in the city. While I do consider the historical production of that crisis and its relationship to the city’s landscape more broadly, I am ultimately interested in how residents of São Paulo are wrestling with the implications.

What binds these chapters together beyond their thematic interest in the city’s water crisis and the management of stormwater more generally is an abiding interest in what Brian Larkin (2013) calls the “politics and poetics of infrastructure.” By infrastructure, he is referring to the material networks that underlie our collective lives, the technological systems that enable other technological systems to function. Infrastructures are mediators between the social and the natural, and they are essential components in the production and experience of urban space. A focus on the political and ecological dimensions of networked infrastructures can subsequently serve to cohere disparate ways of looking at cities drawn from the social sciences, the natural sciences, and the humanities. It is hard to overstate the importance of struggles over infrastructural provisioning within contemporary cities (specifically in the global south). Indeed, it is often through the making of demands for infrastructural provisioning that low-income residents lay claim to the urban landscape and articulate broader claims about citizenship and inclusion (See Makhulu, 2015; Silver, 2014; Von Schnitzler, 2016). More broadly, material infrastructures are central to the functioning of contemporary daily life, providing foundations that are often unseen yet deeply implicated
in our lives. As such, they are essential components of an urban geography that takes seriously the role played by “more-than-human” processes (Braun, 2005). For Braun (2014), in particular, the increasing degree to which governance is itself infrastructural is a demonstration of changing political formations on a global scale. As such, the contested functionality of infrastructural systems in cities of the global south is an increasingly important site for broader engagements with urban landscapes and their inhabitants.

With these broader considerations in mind, the organization of this dissertation is as follows:

First, I situate this project within the literatures that underlie it. These literatures form the epistemological underpinnings of the arguments found in this dissertation, and constitute the intellectual foundation for my understandings of central concepts such as urbanization, nature, and landscape. More than just forming the background for the empirical research that forms the foundation of this project, these literatures create the conceptual architecture of it. I consider three broad literature categories to which this dissertation draws from and contributes to: Urban Political Ecology and the Politics of Parks, Theorizations of Urban Infrastructure and Relational Cities, and Post-colonial Urban Theory.

Second, I discuss my research methodology and offer an introduction to the research site that forms the background for much of the research in this dissertation. I discuss my approach to qualitative methods, and my specific interest in semi-structured interviews, participant observation, participation in performative projects and events, and discourse analysis of archival materials. After detailing my methodological approach, I offer a brief introduction to the primary research site for this project: the várzea (See Figure 1.2). This is an area of the city in which São Paulo’s eastern periphery presses against a still meandrous stretch of the Tietê River, and presents a complex patchwork of irregular urbanisms,
industrial processes, and fluvial dynamics (See Figure 1.3). I focus specifically on the community of Jardim Pantanal, an occupation on the far eastern edge of São Paulo. I discuss the complex social and environmental geography that underlies the region and consider how the designation of an area of environmental protection has complicated the lives of residents.

In the next chapter, I offer a broader introduction to São Paulo: its history and contemporary form. This chapter is designed to offer some background into São Paulo for readers who are unfamiliar with the city and give a brief overview of its spatiality. As a city long defined by its inequality and purportedly divided landscape, I focus on the enduring division between the city’s center and its periphery. I consider how the geographies of this divide have shifted in the last three decades, moving from a bifurcated landscape of center and periphery to a more heterogeneous intermeshing of wealth and poverty. I draw on the work of Brazilian urbanists, but also consider how the changing geography of the city has been interpreted and represented by artists and citizens. I conclude with a discussion of the city’s contemporary political and social dynamics. I focus specifically on the tension between an emergent discourse of occupation with the enduring inequality that marks the city.

In chapters 5, I consider the development of the city’s stormwater management regime. I analyze the city’s history of flood prevention and the creation of its hydro-landscape more broadly. I describe the development of a city that I describe as impermeable, one that in effect gives no space to water. I argue that this impermeable city was created through two dueling processes: the overdevelopment of the city’s central floodplains and the marginalization and abandonment of the city’s peripheral watery edges. In highlighting these two overlapping processes, my interest is in contextualizing and nuancing existing readings of the city that stress how the problem of flooding was a result of an undifferentiated
process of disordered urban growth. By focusing on the specific processes through which an impermeable landscape was produced, this chapter is designed to offer insight into the city’s hydro-landscape as well as its histories of land use, water management, and infrastructural governance.

In Chapter 6, I focus on the contemporary management of stormwater in the city, and consider how the management of the city’s fluvial dynamics has been rendered political by activists and artists. I use Larkin’s (2013) accounting of the “politics and poetics of infrastructure” to consider the complex symbolism and functionality of São Paulo’s water management regime. I focus specifically on three components of its hydro-social cycle: córregos [streams], piscinões [dry detention ponds], and barragens [dams]. I highlight how these seemingly technical components of the city’s water management regime have been reframed as political technologies by activists and residents. I focus on the diverse strategies employed by activists and urban residents to call attention to specific infrastructural configurations as political interventions into their lives. Following Silver and McFarlane (2016) and broader work on the purported invisibility of infrastructural systems (Furlong, 2014), I consider the dynamics of rendering the seemingly invisible visible.

Next, in part three (Chapters 7, 8, and 9), I analyze three moments in which São Paulo’s water management regime is being discussed and changes to implementation and existing infrastructures are being attempted. In chapter 7, the longest of the dissertation, I focus on the ongoing attempts to implant the Parque Várzeas do Tietê [Tietê River Valley Park] (hereafter PVT), a contemporary project designed to develop the biggest linear park in the world. If São Paulo’s water crisis can be defined by the overlapping issues of flooding, scarcity, and water quality, this chapter focuses most specifically on the issue of flooding. I situate the PVT within ongoing attempts to create a more permeable city in São Paulo, part
of a nascent interest in strategies that do not just expel stormwater but instead attempt to accommodate it in the city itself. As flooding seems to be worsening, and will likely continue to worsen due to the city’s own microclimate and perhaps the broader dynamics of global climate change, a series of strategies are being deployed with the goal of reducing impermeability and making the city more sponge-like. These new imaginaries of a more permeable city are suggestive of the partial emergence of what we might call green infrastructure, a broad term for attempts to accommodate stormwater through multi-use retention ponds and green floodplains. These are methods of managing stormwater that suggest how natural systems are increasingly expected to play infrastructural roles (See Carse, 2012; Braun, 2014). In São Paulo, low intensity or green strategies for water management are slowly beginning to be used by engineers and urban designers interested in combatting flooding.

I analyze this project through the lens of urban political ecology, focusing on the discourses that underlie its attempted development. I focus on the arguments that removing low-income communities along the river will improve water quality, that the park will take residents out of risk, and that the project will aid in flood prevention for the city. Due to long-standing patterns of urban development that have pushed the poor into areas of environmental protection in search of low-income housing, riverine landscapes in the city are intimately connected to efforts by low-income residents to develop dignified housing. As such, efforts to implant hydrological infrastructure in the city often entail extensive removals of low-income communities. I argue in this chapter that while this project offers exciting possibilities for better relationships between the city and its watershed, its lack of transparency in its implementation and its call for extensive removals of low-income populations are cause for serious concern. More conceptually, I argue, following Mathur and
da Cunha (2014), that the project is founded on a bifurcated ontology of water and land that attempts to bring order to a complex social and environmental landscape. In doing so, the project ignores the history of accommodation to water in the region in favor of an attempt to create a new landscape. The result is a project that has potentially devastating consequences for low-income communities in the region.

In the next chapter (8), I consider the corollary to flooding in the city, the problem of water scarcity that brought the city to the edge of a profound water crisis in 2014 and 2015. I consider the response to the crisis on behalf of the state government, focusing on both the way that the crisis was narrated as well as responded to. First, I argue that a focus on the climatic causes for the water crisis were resisted by civil society actors, who demanded that the crisis be understood as a political failing of the state’s water management concern. As with chapter 6, I am interested in how residents of the city rejected technical explanations of the crisis and instead argued that it was a crisis of governance and management. Second, I consider the suite of actions taken to cope with scarcity, focusing specifically on the state’s employment of pressure reductions in the water pipes as opposed to a formal rationing. I argue that despite the state government’s claims that only a small minority was going without water, the reality was that residents of the urban periphery were facing consistent water shortages. I argue that these shortages are representative of the politics of infrastructure, in which the seemingly most logical of solutions to the crisis exacerbated inequality due to the inequity that is already built into the city’s hydrological infrastructure. Finally, I argue that while civil society organizations continue to call for greater transparency in the water system and the development of sustainable water management technologies, the ongoing response to the water crisis on behalf of the state threatens to deepen and sediment a hydraulic
paradigm focused around large-scale infrastructural provisioning and the continued degradation of local water sources.

In the chapter following (9), I consider a series of art-based engagements with São Paulo’s rivers, part of a series of performative practices that use the city’s waterways to make broader claims about its landscape and social geographies. While these projects are diverse and expansive in their approach, they use the problem of water pollution to make broader arguments about contemporary life in São Paulo. I focus largely on three ongoing projects: walking tours led by the group Rivers and Roads [Rios e Ruas], the imaginative cartographies of the etched map collective [Coletivo Mapa Xilográfico], and theater group Estopô Balaio’s multi-faceted performance project entitled The City of Invisible Rivers [A Cidade dos Rios Invisíveis]. I argue that these projects reflect ongoing efforts to grapple with the water crisis, and make clear that a conversation about water is ongoing in the city. I further argue that these projects use the city’s rivers to elucidate broader engagements with the city’s history, its public spaces, and broader dynamics of identity and positionality. In doing so, they call attention to the complex emotional terrain that accompanies the city’s topography, and gesture at the social dynamics that underlie more technical engagements with urban water.

Finally, I conclude by offering a series of conclusions to the water crisis in São Paulo. These are tentative suggestions for what is a difficult to resolve situation. Water management in São Paulo links together its land use histories, its unequal landscape, and the broader political economy of water governance. As such, solutions to the crisis need to take seriously the city’s landscape in a broad sense, and consider the relational nature of urban water. Expanding from these more conceptual suggestions, I make four broad suggestions to policymakers in São Paulo: First, I argue that the water crisis is fundamentally a housing crisis. As a result, any solution needs to take seriously the lack of affordable housing in the
city. Second, I call for an approach to water management that takes seriously the everyday dynamics of maintenance and repair of the urban landscape. Without a sustained commitment to the management of water in its everyday moments of breakdown, solutions to the water crisis will continue to push environmentally dangerous solutions that ignore the micro-dynamics of water management. Third, I echo calls for integrated water management that have long circulated within Brazilian water thinking. Water management in São Paulo remains siloed between different state entities with little hope for collaboration. As long as this situation persists, innovative solutions to water management will be hard to develop. Fourth, I call for a commitment to transparency and collaboration in the city’s water sector. I also make three broad suggestions for urban geographers and political ecologists going forward: First, that more engagement with the urban ‘edge’ is needed; Second, that a more sustained engagement with processes of housing provisioning and displacement is important to ongoing efforts to think comparatively about cities; And, third, for a continued focus on urban infrastructure in both local and transnational registers.

The water crisis of 2014 and 2015 saw the development of considerable activity and thought in regards to how best to manage the city’s water supplies (See Cruxen, 2016). Finding a way forward to the water crisis requires new avenues for these voices to be heard, and it is written with inspiration from the activists and artists who attempted to articulate new relationships with water throughout my time in São Paulo. This dissertation, then, is designed to offer texture to the city’s water crisis, to move past technical readings of infrastructural failure to consider the diverse ways in which water comes to matter for urban residents.
Figure 1.1: Reservoir Systems in the state of São Paulo. Source: Comitê da bacia hidrográfica do alto tietê, Conheça a Bacia do Alto Tietê: Sistema de abastecimento de água. Available at: http://www.comiteat.sp.gov.br/
Figure 1.2: Hydrological Map of the city of Sao Paulo, with approximate area of the várzea highlighted. Produced by the mayor’s office of Sao Paulo and the Fundação Centro Tecnológico De Hidráulica. Available at: http://www.aguaspluviais.inf.br/Mapas/Mapa_hidrografico_com_bacias.pdf
Figure 1.3: Várzea Landscape, 2014. Photograph by the author.
Chapter 2: Conceptual Framing

Introduction

This project was developed during a period of rich experimentation in the field of urban geography, a period in which the very category of the city is increasingly under debate (See Angelo, 2016; Angelo and Wachsmuth, 2016). Drawing from post-colonial theory and contemporary work under the broader rubric of hybridity, contemporary theorizations of the city have complicated long-standing binaries made between the city and its environment and brought new definitions of the urban into conversation. Scholars from the global south have made it clear that urban theory comes from somewhere, and that cities of the global south are more than just faulty versions of Euro-American models (See, for instance, Lawhon, Ernstson, and Silver, 2015; Mbembe and Nutall, 2004; Robinson, 2006; Roy, 2009). These have compelled new conceptualizations of the city that attempt to draw from the experiences of diverse urban dwellers throughout a rapidly urbanizing world.

In this project I take inspiration from this moment of conceptual experimentation and geographic expansion in order to develop a sustained engagement with the politics of São Paulo’s landscape. This project draws from and is conceptually oriented around three primary areas of literature that I refer to as: Urban Political Ecology and the Politics of Parks; Theorizations of Urban Infrastructure and Relational Cities; and Post-colonial Urban Theory and Representational engagements with Urban Policy. These three sets of literature function as conceptual orientations for this project. In a sense, these literatures and their attendant understanding of terms like cities, landscapes, and ecologies provide the vocabulary and epistemological frameworks that generate the analysis to come.
Urban Political Ecology and the Politics of Parks

Urban Political Ecology

With inspiration drawn from Cronon’s foundational 1991 monograph, *Nature’s Metropolis*, this project takes seriously the idea cities carry complex and deeply political relationships with their surrounding environments. Cities are dynamic social and ecological spaces, ones that metabolize natural processes and that bring environmental benefits and burdens to residents. While differing ways of considering the relationship between cities and their ecological foundations are currently circulating, this project draws primarily from the literature in the discipline of urban political ecology (hereafter UPE). Drawing on the seminal work in the tradition of political ecology (Blakie & Brookfield, 1987), UPE calls attention to urban landscapes as encounters between natural systems and human social organization in diverse ways (Gabriel, 2014; Gandy, 2005; Heynen, 2013; Heynen, Kaika, & Swyngedouw, 1996; Swyngedouw and Heynen, 2003). Access to nature in cities—whether in the form of floods, proximity to toxic byproducts, or access to urban green space—is always structured through political and economic processes (Bennett, 2011; Braun, 2005; Cronon, 1992a; Farias and Bender, 2011; Gandy, 2005; Graham and Marvin, 2001; Heynen, Perkins, and Roy, 2006; Kaika, 2005; Karvonen, 2011; Keil, 2003, 2005; McFarlane, 2011; Rademacher, 2011; Swyngedouw, 1996, 2004, 2009; Swyngedouw and Heynen, 2003; Swyngedouw, Kaika, and Heynen, 2006; Swyngedouw and Heynen, 2003). As Karen Bakker (2010) notes:

Urban nature is, in other words, visceral, embodied, and woven throughout the fabric of the city. This occurs, of course, in highly differentiated patterns: the urban poor who live within the interstices of the city (in floodplains and along riverbanks, on steeply eroded slopes and marshy land) often experience water as a threat to physical safety, both in terms of flooding and poor water quality (Location 372 in Kindle version).
As Bakker suggests, flooding is an extreme example of this relationship between the natural and the political, and decades of work in the environmental hazards tradition has focused on the socio-natural dimensions of floods (For work specific to flooding, see White, 1945; Smith & Ward, 1998; For broader work in the hazards tradition, see Cutter, 1996; Cutter et al., 2003; Smith & Petley, 2009). This project connects the hazards tradition to work in urban political ecology, which has largely focused on water as an uneven resource rather than a hazard (Gandy, 2003, 2014; Kaika, 2005; Swyngedouw, 1996, 2004; Truelove, 2011; For exceptions, See Jones and Macdonald, 2007; Karvonen, 2011). While not grounded in the hazards tradition, this project takes considerable insight from work in that tradition that has focused on governmental responses to hazards and the specific cases of disasters in megacities (Mitchell, 1995, 1999). Using the insights offered by political ecology—which makes clear that environmental degradation and catastrophe are products of not just the social and the natural but rather the differentiated and uneven nature of the social—in this dissertation I consider the ways in which water in São Paulo is mediated by broader dynamics of inequality, geography, and identity (Blaikie and Brookfield, 1987; Watts, 1983). This is especially important when analyzing governance strategies which privilege the ostensible neutrality of environmental planning. Such government strategies have been labeled “post-political” for the manner in which they subsume agonistic political conflict over resources and representation within managerial techniques grounded in an abstracted and fictional consensus about sustainability (Li, 2007; Latour, 1999; MacLeod, 2011; Mouffe, 2005; Swyngedouw, 2009). Recent challenges to the post-political call for a focus on the discourses and practices of engineers, scientists, and planners that produce environmental consensus (Swyngedouw, 2009). This project subsequently considers the technical
management of urban water systems as distinctly political interventions into the urban landscape.

**The Politics of Parks**

Grounded in the broad subdiscipline of UPE, this project is further interested in the political dynamics of urban green spaces in a moment in which cities are increasingly articulated as the primary actors within sustainability initiatives. This project takes seriously what Newman (2014) refers to as, “the political life of small urban spaces.” This takes the form of a localized interest in the development and use of specific urban sites, but also in a broader interest in the role played by public green spaces (and their associated discourses) within contemporary regimes of urban governance (See Millington, 2015). I argue that it is important to consider urban green spaces as not just normative goods but instead complex vectors for the development of urban policy.

In critical geography and urban studies, contemporary concern with green space has largely focused on the role played by green space in making cities more unaffordable. Literatures on (ecological) gentrification and green displacement have been used to complicate existing framings of urban public spaces as normative goods that are beyond criticism (See, for instance, Dooling, 2009; Patrick, 2014; Wolch, Byrne, & Newell, 2014). Geographers and urbanists have focused on the relationship between urban greening and processes of displacement. Dooling (2009), for instance, uses the term “ecological gentrification” to account for the ways in which notions of ecological rationality work to disguise the social outcomes of particular redevelopment schemes. In her case this refers primarily to the displacement of homeless people from zones designated as green space, and Dooling calls for a fuzzier or more relational understanding of land use categories to permit overlaps and slippages. Nature, as corrective, purifying presence, is here used to disguise the
particular class implications associated with park development. Wolch, Byrne, and Newell (2014) have recently advanced the idea of “just green enough,” a way of greening neighborhoods without furthering displacement.

Importantly, these critiques of the neutral values of park spaces work to de-naturalize urban parks as strictly spaces for community development and cohesion. Work by Geographers on public space (See Mitchell, 2003; Massey, 2005; Wright, 2004) has suggested that an understanding of public spaces as sites for community cohesion neglects the ways in which public space is always fractured by exclusion and identity. As Massey (2005) argues, “…the tendency to romanticise public space as an emptiness which enables free and equal speech does not take on board the need to theorise space and place as the product of social relations which are most likely conflicting and unequal” (152). Massey suggests that we need to question the increasing degree to which parks are being privatized, but we also need to be aware that navigating inclusion and exclusion is an implicit piece of the social regulation of (public) space. Of interest is the degree to which discourses surrounding public space construct an abstracted community that stands in for the divergent and multiplicitous nature of identities.

A normative appreciation for public space—and by extension, the public—implicitly assumes particular publics (See, for instance, Crossa, 2009; Hubbard, 2004; Hunt, 2009; Malone, 2002; Massey, 2005; Mitchell, 1997; Wright, 2004). As a result, specific public spaces can often be a means of cleansing the urban landscape of seemingly out of place elements such as sex workers, the homeless, or the urban poor (See Wright, 2014). While contemporary designers highlight the importance of public space as part of a broader urban sustainability program, it is important that we be critical of the ways in which public space can serve to exclude particular publics.
In São Paulo, the specificity of the city’s history of public space engagement further complicates engagements with green spaces. Given the histories of elite retrenchment and informal urbanization amidst structural inequality, green spaces in São Paulo are complex spaces. Public space in São Paulo is a fraught category, tying together a vital and vibrant street life with the scars of a violent and unequal city. As such, normative pronouncements about public space or green space can ignore the ways that public spaces are not places of harmonious collaboration but rather spaces where claims to exclusion and belonging are constantly being made. Furthermore, to assume that public life only happens in parks, squares, and sidewalks ignores the broader social geography of urban street life and public space in São Paulo (See Caldeira 2000). This is not only the case in São Paulo but in many cities of the broadly defined global south (See, for instance, Kim, 2015). Public space in São Paulo is often not strictly or formally public, but instead functions in an administrative or bureaucratic indeterminacy. As a result, efforts to construct public space that borrow from European and North American articulations of public space run the risk of missing out on the complex, overlapping ways in which public space in São Paulo is often much more about the lack of regulation than the existence of formally regulated or codified public spaces.

In a sense, this is a point made by Teresa Caldeira in her canonical 2000 monograph, City of Walls. In it, Caldeira highlights the tense and conflicting dynamics of public space in São Paulo, in which an insurgent democratization process unhappily coexists with a broader walling off and securitizing of the city’s urban landscape. For Caldeira, São Paulo’s streetscape bears the wounds of the city’s enduring inequalities, but she notes that the city’s formal public spaces like parks retain a democratic and dynamic public life that appeals to residents of varying class positions. Nevertheless, for Caldeira, the tension between an insurgent democratization led by the city’s poor and a retrenchment into securitized enclaves
has resulted in a tense public life that threatens the dynamics of citizenship and belonging that are necessary to the broader project of creating democratic cities and societies.

In order to examine São Paulo’s conflictual public space dynamics, Caldeira focuses on Praça da Sé, a public square [praça] located next to the historic Sé Cathedral [Sé is translated into English as “see” or “seat,” both references to Catholic Authority.) Given its symbolic and religious location, Praça da Sé is a site deeply linked into Brazil’s transition to democracy in the 1980s, functioning as the location for mass mobilizations against the military dictatorship. Yet while Sé retains a symbolic dimension, it is also representative of the changing contours of São Paulo’s downtown, where wealth and capital have continued to move southwards towards increasingly isolated, auto-dependent communities. The result is that Sé has become in many respects a non-elite space, bringing together evangelical preachers who share the square with many homeless and the occasional tourist. For Caldeira, Sé represents, “the political reappropriation of public space by citizens in the transition to democracy,” while also representing, “the deterioration of public space, danger, crime, anxieties about downward mobility, and the impoverishment of the workers who continue to use it for commuting, working in the informal market, and consuming its cheap products.” For her, “[Sé] symbolizes both the strength and deterioration of public space and, therefore, the disjunctive character of Brazilian democracy” (Caldeira 2000: 321). The result is that Sé and other parts of the historic core have long been subject to attempts at revitalization that have sought to purge the core of its reputation for violence and criminality (See Frugoli, Jr. 2006). That these attempts have largely failed is not only a testament to the political capacity of urban social movements, but also due to the broader geographies of capital and real estate speculation that continue to push into new territorial frontiers.
Sé makes clear that in many respects public space in São Paulo retains a distinctly popular feel, one that often exists uneasily with hygenicist discourses associated with neighborhood associations and other security-minded actors. As such, street life in São Paulo is often under threat, even as the notion of public space has come into vogue in recent years in spaces like the Minhocão, a functioning highway that is converted to an informal public space on weekends and at night (See Millington, forthcoming). That that space is currently under attack by neighborhood groups who are concerned about security and privacy makes clear that public space is a site for broader questions about identity, belonging, and land values in contemporary cities.

The complex geographies of spaces like the Minhocão and Sé suggest that while concerns about ecological gentrification are important for problematizing uncritical engagements with green space as a normative good, urban public space is more than just a mechanism for urban development. This project is concerned with expanding and deepening our understanding of the relationships between greening and displacement. As Newman (2016) notes:

Some scholars who focus on the very significant process of ‘green gentrification’ have a tendency to over-look the social importance of parks themselves because of the prominent historical role played by green spaces in real-estate speculation and gentrification. However, a view of parks as urban ‘greenwash’ and mere ornamentation is frequently disconnected from the reality of people who depend on them. As with many ‘public’ goods, parks and public spaces have a tendency to be more important for people who are excluded from private access to things as basic as open space, clean air, and other shared facilities (e.g., education, health care, child care) (Loc 1229 in Kindle edition; See also Kim, 2015).

This rings true in São Paulo, where despite broader concerns about gentrification, fortification, and (gendered) violence that shape the city, it is a place that retains an exciting, liberatory capacity, one reflected in the diversity of how the urban landscape itself is itself taken up by activists and residents (See Chapter 9). This can be found in the
work of urban interventionists who bring theater to city streets, the profound queerness of the urban core, the increasingly festive and celebratory carnival celebrations that grow every year, the 2015 occupations by high school students calling for greater investment in education, the streets currently closed to automobile traffic on Sundays to allow for promenading and recreation, and the presence of plastic chairs on every street corner for residents to relax and socialize. While experiences of high-profile urban green spaces like the High Line provokes a degree of cynicism about green space in contemporary moments, it is important to be clear that the right to the city includes a city that offers space for recreation, leisure, and conflict. In Brazil, this often occurs outside of the formal spaces of leisure, on sidewalks and spaces like the Minhocão. While cities of the global south are often articulated through their lacks, the degree of street-level sociability in a place like São Paulo is impossible to overstate. The city’s landscape is ripe for appropriation and for usage, even as these moments are often ephemeral. Important too is the degree to which urban public spaces are often integrated with infrastructural functioning (see chapter 7). This does not justify green spaces that further process of displacement, but it forces researchers to take seriously the ecological and political implications of ongoing landscape interventions (See Braun, 2014; Finewood, 2016).

**Theorizations of Urban Infrastructure and Relational Cities**

This project contributes to what Stephen Graham (2009, 10) refers to as the “infrastructural turn” within urban geography, a move towards an understanding of the important role played by often invisible infrastructural systems in the production of contemporary urban space (Gandy, 2004, 2006, 2008; Graham, 2009; Graham and Thrift, 2007; Kaika, 2005; Kaika and Swyngedouw, 2000; McFarlane and Rutherford, 2008; Nye, 2010; Swyngedouw, 1996, 2004; Thrift, 2005). Brian Larkin defines infrastructure as “objects
that create the grounds on which other objects operate,” a reference to infrastructure’s role as a material enabler of other functionalities (2013: 2-3; See too Carse, 2012, 2016). As such, infrastructure is understood in both material terms, referring to networks of water, energy, and waste that enable urban life, and in metaphorical or political terms, as part of a retheorization of cities that privilege processes of assembly and continual reconstitution.

Studying infrastructure rejects totalizing categories of the urban in favor of a processual understanding of the ways in which flows of matter and energy circulate to construct contemporary urban spaces. This project calls attention to the prominent role played by drainage in the urban environment, which remains a considerably understudied component of urban environmental research despite its importance in the daily lives of city residents (Finewood, 2016; Karvonen, 2011; Jones & Macdonald, 2007; Júnior, 2011).

The broad scholarship in the “infrastructural turn” has theorized infrastructure as an example of the socio-natural processes that produce cities (Gandy, 2004; Kaika, 2005; Graham, 2009), has looked at the uneven distribution of and access to urban circulatory systems (Swyngedouw, 1996; Gandy, 2008), the social and cultural histories of infrastructure failings and purposeful destruction of infrastructure as a weapon of war (Graham 2003, 2010; Nye, 2010), the dynamics of infrastructural breakdown (Chu, 2014; Ranganathan, 2016); discursive, representational, and embodied engagements with infrastructure and (post) industrial landscapes (Gandy, 2006), the importance of repair and banal repetition in the production of the urban (Thrift, 2005; Graham and Thrift, 2007), the political implications of infrastructure for urban residents in the global south (Amin, 2014; Bakker, 2010; Gandy, 2008; McFarlane and Rutherford, 2008; Ranganathan, 2014; Silver, 2014) and the conditions by which infrastructure comes to be naturalized or made visible (Kaika and Swyngedouw, 2000, McFarlane & Silver, 2016). Infrastructural theorists drawing more directly from the
social studies of science have focused on the political and ecological implications of infrastructures of standardization (Bowker and Star, 1999; Carse and Lewis, 2016; Easterling, 2014; Star, 1999). Broader work in the geography of infrastructure has called for a renewed understanding of materiality in urban geography through efforts to reconceptualize cities as cyborgs (Swyngedouw, 1996; Gandy, 2005), machinic (Amin and Thrift, 2002), or more-than-human (Braun, 2005). Similarly, urban environmental historians have long been interested in infrastructural systems and their relationship to processes of urbanization (Melosi, 1999). And finally, a distinct approach to infrastructure can be found in the work of African urbanists (See, for instance, Mbembe & Nutall, 2004). Simone (2004) conceptualizes the city through the idea of “people as infrastructure,” which grounds urban theorizing in the informal and flexible networks created by urban residents (See also Lawhon, Ernstson, & Silver, 2014; McFarlane, 2012; McFarlane & Silver, 2016; Parnell & Pieterse, 2015; Silver, 2014).

What ties this work together is a foundational interest in the city as a network of processes. Studying infrastructure rejects totalizing categories of the urban in favor of a processual understanding of the ways in which flows of matter and energy circulate to construct contemporary—and historic—urban spaces. Whether in the context of Marxist-inspired urban political ecology (Swyngedouw, 1999, 2004; Keil, 2003; Kaika, 2005), STS-inspired readings of hybridity and the networked city (Braun, 2005; Gandy, 2005), environmental history perspectives on the historical development of cities as socio-natural configurations (Biehler, 2013; Cronon, 1991; Mandelman, 2015; Orsi, 2004) or recent theorizations of assemblage theory (Bennett, 2011; McFarlane, 2011; Farias and Bender, 2011), this diverse scholarship has worked to complicate long-standing separations made between the city and the natural environment.
Assemblage theory, in particular, has focused on the diverse processes—cultural, discursive, and economic—that produce the urban. The idea of assemblage is most often associated with Actor Network Theory, a theoretical orientation dedicated to complicating binary distinctions, most notably between nature and society or artificial and natural (see Callon, 1986; Latour, 1993, 2007). The theory suggests an ontological leveling, one that insists on blurry boundaries between objects and subjects in favor of a concentration on webs of relations. This implies a commitment to a relational ontology focused on the development of networks through collaboration and contestation (Callon, 1986).

Fundamental to ANT is a rejection of ontological distinctions made between the material and the representational, or the human and the nonhuman. Whether considered in terms of actor-network-theory (Latour, 1996, 2007), as a mangling (Pickering, 2010), or as an example of the agentic dimensions of inert materials and nonhuman nature (Bennett, 2010), STS-inspired readings of contemporary life focus on the relationships between materiality, nonhuman nature, knowledge production, and the social (See Braun, 2005 and Gandy, 2005 for excellent overviews of STS-inspired work on the city and UPE).

For Colin McFarlane (2011), assemblage constitutes “an idea, an analytic, a descriptive lens or an orientation” (206), which suggests the sociomateriality of phenomena. For him, assemblage thinking is about understanding processes of gathering and interacting, in which the relation—rather than the constituent components—is important. For McFarlane, one of the central utilities of the assemblage idea seems to be its openness, and he understands assemblages as both particular objects in the world and as a broader theoretical orientation that “focuses on the interactive co-constitution of human and nonhuman agents through profoundly unequal relations of power, resource, and knowledge” (2011: 208). Prince’s (2010) work on policy assemblages focuses on the first part of McFarlane’s definition. Prince
argues that assemblages are momentary constellations of diverse “things”: peoples, networks, buildings, ideas, cities, institutions, policy programmes, and discourses, for instance. These work to constitute broader assemblages of assemblages in a post-structural ontology that constantly stresses becoming, emergence, and possibility. As Prince suggests (See too McFarlane, 2011), assemblage is both an object as well as an orientation: it is an ontology that stresses processes of assembly, but cities too (like other objects) are themselves assemblages. As he notes, in reference to urbanism:

Urbanism is produced through relations of history and potential, ie of the multiple and interrelated temporalisations of capital, social relations, cultures, materials, and ecologies that produce the city, but that have been and continue to be resisted and subject to alternative possibilities. Here, assemblage does not separate out the cultural, material, political, economic, and ecological, but seeks to attend to why and how multiple bits-and-pieces accrete and align over time to enable particular forms of urbanism over others in ways that cut across these domains, and which can be subject to disassembly and reassembly through unequal relations of power and resource (2011: 752).

This project builds on these general theorization of infrastructure and urbanism to consider the emerging disciplines of sustainable or low-intensity stormwater management, part of a broader approach within urban design towards green infrastructure (Braun, 2014; Cahill, 2012; Finewood, 2016; Herzog, 2013; Jones & Macdonald, 2007; Karvonen, 2011; Júnior, 2011; Watson & Adams, 2010). Projects highlighted in this work range from the utopian or experimental to the grounded, but represent new models for engaging with urban water that reject binary notions of water/land in favor of relational, hybrid modes of coexistence with watery landscapes (Mathur & da Cunha, 2001, 2009; 2014; Mandelman, 2015; Meyer, Dale, & Waggoner, 2009). While in some respects these new theorizations of urban water suggest new possibility for urban environmental politics—ones tied in the emergent unpredictability associated with global climate change—they too often rest on urban narratives that emerge from the global north, and often bypass or ignore the local political contexts in which they are inserted. As a result, they forget the ways in which past
interventions into the urban landscape weigh on the present (Santos, 1979; Roy, 2011). By starting from a sense of urban environments as always political, this project considers the process through which environmental projects—parks, dikes, retention ponds, canals, dams—are articulated through overlapping political dynamics that intersect with the environment in particular ways. While terms like ‘drainage infrastructure’ and ‘flood prevention’ may conjure up ideas of technical expertise that exist outside of social or political life, the reality is that intervening into the urban landscape is an always deeply political process, with many urban residents being severely impacted by the mechanics of urban water governance. The neutral categories used by urban planners and engineers cannot be separated from political-economic contexts that are central to the development of urban environmental projects and programs.

The same can be said for seemingly natural hazards that affect cities. As hazards researchers and political ecologists have made clear, flooding is a socio-natural process, one that implicates not just natural processes but also the political and social realities of particular landscapes. As Gilbert White (1945) famously noted, “Floods are an act of God, but flood losses are largely an act of man." In the case of São Paulo, this making impermeable of the city’s landscape was, of course, not a random factor of the city’s urbanization process but instead deeply conditioned by the city’s industrial and land use histories and broader policies of exclusion, marginalization, and segregation (Se Beaker, 2010). For Rodrigues (2015), flooding is a product of the city’s geomorphological underpinning and its fluvial dynamics, but also the particularities of its urban process in which developers and politicians have controlled the urbanization process (325; See also Seabra, 1987). Flooding is an environmental hazard produced through the interlocking dynamics of social and natural processes, an assemblage of material infrastructures, social processes, legal and land use
codes, and the discursive and embodied experiences of inhabiting floodprone regions. This turns much of São Paulo into, in the words of Mustafa (2005), a “hazardscape,” where social vulnerability overlaps with biophysical processes to yield uneven outcomes especially for peripheral communities. For Rodrigues, this is compounded by a long-standing culture of legal transgression and pardoning (Rodrigues, 2015: 326), which complicates efforts to construct expansive flood prevention infrastructure. This is linked to flooding’s historical production through a modernist vocabulary, one predicated on a making impermeable of the landscape (see chapter 4). This “promethean” approach to water management, to use Kaika’s (2007) phrasing, was coupled with an expansive process of low-cost, disorganized urbanization in the urban periphery, which yielded deeply impermeable landscapes of concrete and sprawling, horizontal urbanization. Through an understanding of the political implications of seemingly technical interventions, this project argues that flooding in São Paulo is a complex intermeshing of social and biophysical dynamics, with exist in a dynamic interplay with the city’s historically produced urban landscape (See Ab’Saber, 2007 [1957]; Rodrigues, 2015). Flooding is a complex problem in a city of twenty million people that grew explosively, and efforts to combat the problem need to engage with the dynamics of impermeability and land use that characterize the city.

Lurking in the background of these literatures and emphasis on watery landscapes is an interest in the imaginative, in the development of cities that push past pre-existing binaries of water and land to create distinctly new landscapes. These imaginative interests in watery urbanisms extend far past academic literatures to also include work produced by landscape designers, visual artists, and writers of fiction. This work emerges from the increasingly undeniable fact that climate change is remaking the cities we inhabit. As such, efforts to envision an urban porosity that is not metaphorical but instead deeply material are suggestive
of new urban ontologies, new ways of seeing the city that reimagine it through broader processes of flow and border crossing. These urban imaginaries exist uneasily with the ongoing culpability for climate change and the continued global inability to adequately deal with the already appearing affects of a changing climate.

A city that floods, that coexists with water, that celebrates the blurry urban edge, is suggestive of new imaginaries that embrace fluvial disruption. Matthew Gandy, for instance, has engaged extensively with the politics and aesthetics of ecological flood prevention, specifically in London. In his 2014 book, he engages with the shift away from classic command-and-control, technomanagerial approaches to flood risk towards ecological, holistic approaches that acknowledge the “fiscal and practical limits to reliance on physical defenses (206; See also Kinder, 2014). In lieu of this model, new forms of sustainable stormwater management are emerging, which use natural systems as forms of green infrastructure to absorb and purify water while also limiting the losses due to flooding. These forms of “nature becoming infrastructure,” to return Braun’s 2014 terminology (See also Carse, 2012), are suggestive of new approaches to nature that do not just flush water out but instead attempt to accommodate it through design. These strategies are inherently complex, demanding an engagement with a series of dynamics that extend past the mere manipulation of waterways towards a broader consideration of land tenure, vegetation, biogeography, and urban development.

Urban design strategies are matched by imaginative and avant-garde scenarios for imaging a new type of city, one that lives with disruptive water, one that floods regularly. Like the floating neighborhoods in Lagos, or the imaginative visions of authors like China Mieville and Paulo Bacigalupi, these representations suggest changing definitions of the city in the wake of climate change. These are, in a sense, “counterdystopian” imaginaries of a city
that floods, designed to work against the sorts of alarmist articulations of climate change induced flooding and sea level rise. Gandy situates these representations in a broader history of “utopian flooding scenarios,” but it is clear that contemporary imaginaries of flooded cities and their attendant representations are dealing specifically with new visions of flooding that are being provoked by climate change. Their images, which show cities reclaimed by vegetation but still livable, reflect new imaginaries of urban regeneration that eschew (at least aesthetically) the broader disconnection between cities and their natural environments. Yet in attempting to embrace the effects of global climate change, visions like these run the risk of further naturalizing anthropogenic climate change scenarios. There is something appealing about the vision of a city overrun, a city that floods and shifts according to natural rhythms, But like the images of Detroit, Michigan that have been analyzed under the term “ruin porn,” it is important that these images of urban hybridity are not stripped of their specific politics and geographies.

**Post-colonial Urban Theory and Representational engagements with Urban Policy**

**Post-Colonial Urban Theory**

As urbanization has come to define the 12st century—the so-called “urban age”—geographers and urban theorists have begun to investigate the models used to explain global processes of urbanization. Drawing from post-colonial thinkers and theorists (See, for instance, Comaroff and Comaroff, 2011), post-colonial urban critics have attempted to “displace” urban theory by building from existing cities often considered to be failed models of canonical urban typologies (Lawhon, Ernstson, and Silver, 2015; Mbembe and Nutall, 2004; Parnell & Robinson, 2012; Robinson, 2006, 2011; Roy, 2009, 2011; Watson, 2009). In contrast to purportedly universal theories of urbanization, post-colonial urban critics have
attempted to develop urban theories from the margins, to challenge existing narratives using insight drawn from new urban locales. This is by no means a rejection of urban theory as such, but instead a reiteration of the situatedness of theory making and the geography of theory’s production (see Haraway, 1988; Roy, 2009, 2011). Threatening a complex line between stressing the particularity and the universality of global south urbanisms (See Lawhon, Ernstson, and Dumminy, 2014), post-colonial urban theorists are engaged in a project to create a more reflexive urban theory that takes seriously where and through what categories urban theory is produced (See Pieterse, 2014). Alongside a turn towards comparative urban research and a conceptual willingness to invert long-standing binaries that privilege northern urbanisms over their southern counterparts, post-colonial urban theorists have attempted to develop “new geographies of theory” (Roy, 2009; See too Robinson, 2002, 2011). This has entailed a push to move past pre-existing narrative of urbanization through a focus on theory building that emerges from the global south.

Central to this is a rejection of seemingly fixed binaries such as formal/informal or legal/illegal in favor of more nuanced and more comparative engagements with contemporary urban landscapes. Drawing from feminist work, post-colonial urban thinkers have pushed past north/south binaries in favor of more topographical—or, perhaps, topological (Martin and Secor, 2013)—readings (See Katz, 2001; Datta, 2012; Kern and Mullings, 2013). Against narrow readings of southern cities as implicitly informal, for instance, post-colonial urban thinkers have considered the intermeshing of formal and informal in contemporary southern cities as well as the informality that characterizes northern cities (Ranganathan and Balazs, 2015; Roy, 2005; Varley, 2013; Wigle, 2014). This implies a methodological commitment to learning in place, in conversation with existing theories. As Lemanski (2014: 2957) argues, “comparative urbanism’s call for a more
egalitarian urban theory can be implemented by taking context-specific empirical trends and theoretical resources as an analytical starting point (rather than applying theories rooted in the one context to another) from which to challenge existing, and create new, urban theories.” Ranganathan and Balazs (2015) demonstrate the benefits of this approach in their study of water access in the urban fringe in North America and India (See too Jepson and Vandewalle, 2016).

Important too have been efforts to not just think outside the geographies of contemporary urban theory, but also its broader explanatory frameworks for the nature of urban governance. Against narrow readings of neoliberalization or other examples of explanatory process typically developed in global north contexts, post-colonial urban theorists have considered new modes of urban governance that extend past pre-existing narratives to encompass alternative logics for explaining the city (See, for instance, Lawhon, 2014). Normative categories like gentrification, for instance, have been challenged by post-colonial urban critics (Ghertner, 2015; Zeiderman, 2016). In the case of Bogotá, for instance, Zeiderman (2016) makes clear that certain models of urban politics—particularly the urban political economy approach associated with writers like David Harvey—does not adequately explain the sorts of small-scale processes happening at the edge of contemporary global cities. The case of removal, which has been largely theorized through the Marxist lens of “accumulation by dispossession,” is here instructive. While broader processes of global city development certainly play a role in state efforts to remove vulnerable populations from areas of environmental risk, to see all state efforts in urban peripheries through the lenses of dispossession ignores the complex dynamics at work in these regions. As he notes:

While our theories predispose us to expect those subject to the municipal government’s resettlement program to fight tooth and nail to remain in place, there are many more people who demand relocation than those who reject it. For it is within this program, not outside of or in opposition to it, that thousands of settlers on the urban periphery
engage in struggles for political recognition, incorporation, and entitlement. It might be tempting to understand the clamor for resettlement as reflecting a new variety of accumulation by dispossession or neoliberal governmentality that works through the very logics that might otherwise challenge it. But rather than treating cities of the global South as either continuations of or deviations from familiar scripts of urban transformation in Europe and North America, we must attend to dynamics that do not fit neatly within them.

Similarly, Ghertner (2015) has critiqued the application of the term gentrification within many cities of the global south where dynamics of land tenure and state ownership are different (See too Lemanski, 2014). For him, narratives of gentrification going global risk losing the specificity of urban processes of displacement by subsuming them into a type of globalized gentrification (See too Lees, 2012).

A necessary concern of post-colonial urban theory is the possibility of institutional collaboration across the north-south divide. As a project based in São Paulo, this project engages extensively with the rich body of scholarship by geographers, urbanists, and historians working in São Paulo (Caldeira, 2001; Fix, 2001, 2007; Frugoli, Jr., 2000; Jacobi, 2003, 2004, 2006; Kowarick & Marques, 2011; Holston, 2008; Maricato, 2013; Marques and Torres, 2004; Marques, 2016; Rolnik, 1997, 2015). It takes seriously the fact that post-colonial knowledge production requires a commitment to engaging with literatures across linguistic and geographic divides, even as it acknowledges the difficulties of ‘unlearning’ specific languages and conceptual orientations (See Lawhon et al, 2016). More broadly, it takes seriously the institutional and geographical complications implicit in the development of a comparative, situated urban theory. As Pieterse notes:

[The epistemic project in cities of the global South] cannot simply be about excavating indigenous theoretical lineages to elucidate the specificities of urban dynamics and cultures in these places. Of course, that is vital work in provincializing the claims of the canon, but it should form part of a broader endeavour to create the institutional infrastructures for autonomous knowledge production and thought. The very practice of institution building, positioning, is a form of theory building because it demands contamination; it demands immersion into profoundly fraught and contested spaces of power and control. It challenges us to think ourselves not apart
from the world, but rather deeply and irrevocably caught up in all of its contradictory entanglements (2014: 23).

Latin American cities remain profoundly underrepresented in contemporary post-colonial urbanism, and urbanist thinking in Brazil draws far more from Marxist and North American theory than from post-colonialist theory that primarily emerges from South Asia and Africa. Engaging with Brazilian urbanists is subsequently a way to correct for what Varley (2013) refers to as the “marginalization of Latin America” within post-colonial urban studies, which “remains anchored to the cities of the former British colonies” (5-6). By focusing on São Paulo, I am interested in continuing efforts to problematize the geography of theory and highlight the tensions implicit in locating theory in a globalized world.

**Representational engagements with Urban Policy**

Inspired by the openness afforded by post-colonial urban theorizing, contemporary urban theory is currently in a period of creative experimentation. This work has added to long-standing interests in the city drawn from cultural geography and feminist analyses of the city, readings of the city that foreground not just questions of spatiality and economic organization but also broader categories of belonging, identity, and place (See, for instance: Anderson, 1987; Derickson, 2015, 2016; Kern, 2010; Truelove, 2010; Wright, 2013). Cultural geographical approaches to the city call attention to the complex politics of urban landscapes and their representations (See, for instance, Hayden, 1995). Broader work in the social sciences on the representational dimensions of urban governance has focused on the important role played by images as part of urban governance strategies associated with the so-called entrepreneurial city (Harvey, 1989; Macleod, 2011). Often this work has focused on the role played by “representations of space” (Lefebvre, 1991[1974]) in selling urban sites in an effort to attract investment and tourism (Gillette, 2005; Pagano & Bowman, 1997). The
landscape tradition, too, has considered cultural landscapes as mediators between material, representational, and discursive processes (Duncan and Duncan, 2003; Mitchell, 1996; Schein 1997, 2003, 2006). The seminal work of Lefebvre, too, has made clear that the notion of representation extends past visual artifacts to include the complex interweaving of specific representational technologies with the cartographic practices of daily life (Lefebvre, 1991 [1974]).

More contemporary work has extended these arguments to focus on urban policy as itself a representational and spatializing process (Dikeç, 2007; Ghertner, 2014; Rancière, 2010). Inspiration for much of this work has come from the work of French philosopher Jacques Rancière, and his understanding of politics as an aesthetic project. Rancière is interested in how governmental regimes (what he calls “the police”) naturalize society into forms that appear as natural. This contingent distribution is naturalized through what he refers to as the distribution of the sensible, the:

…sensory self-evidence of the ‘natural’ order that destines specific individuals and groups to occupy positions of rule or of being ruled, assigning them to private or public lives, pinning them down to a certain time and space, to specific ‘bodies’, that is to specific ways of being, seeing and saying. This ‘natural’ logic, a distribution of the invisible and visible, of speech and noise, pins bodies to ‘their’ places and allocates the private and the public to distinct ‘parts’ (Rancière 2010, 139).

For him, then, aesthetics can be understood in the following way:

It is a delimitation of spaces and times, of the visible and the invisible, of speech and noise, that simultaneously determines the place and the stakes of politics as a form of experience. Politics revolves around what is seen and what can be said about it, around who has the ability to see and the talent to speak, around the properties of space and the possibilities of time (2013: 8).

Rancière’s framework is about the normative distribution of what is, a system of ordering that places particular subjects in their right places and determines the limits of what can be said or perceived. The task of politics is to call attention the distribution of the police and
construct new orderings and distributions: to construct a “dissensual ‘commonsense’” (Rancière, 2010, 139).

For Rancière, the essence of governance is not repression but spatial distribution (Dikeç, 2007; Rancière, 2010). As such, work in this tradition has focused on the ways in which urban governance is predicated often on visual or aesthetic logics, resulting in urban policy initiatives that conflate disorder with uncleanness in the service of slum clearance or the development of urban policy more broadly (See Dikeç, 2007; Gastrow, 2016; Ghertner, 2010, 2011, 2015; Harms, 2012; Rademacher, 2011). Ghertner (2015), in particular, has focused on the degree to which visual logics (of order/disorder, and of what constitutes a slum) have yielded particular interventions into the urban landscape. These techniques (and their associated technologies) build on longer histories of simplification and legibility that mark state practice (See Scott, 1998; Wigle, 2014). Ghertner (2015) argues that the governance of slums in Delhi was aesthetic in two ways: first, through the deployment of aesthetic codes to determine slum and not slum, in lieu of more complex cadastral and cartographic technologies commonly associated with postcolonial states; and second, through the shared aesthetic vision of a “world-class city” that was embraced both by planners as well as slumdwellers (185). For Gastrow (2012), writing in Luanda, Angola, aesthetic interpretations of ongoing construction projects are essential means through which political claims are worked through. As she notes, “it is precisely the study of urban aesthetics that provides a space for the investigation of the complexities of political orientations towards and engagements with the urban” (2016: 3). Engaging with the aesthetics of urbanization implies a commitment both to creative readings of the city but also more expansive understandings of governance. Urban politics is a creative process,
predicated not just on rational calculations but also broader commonsensical determinations of what urban landscapes should look and feel like.

**Conclusion**

The three literatures highlighted in this chapter orient the work that follows. They provide conceptual underpinnings for the arguments to come, and situate this research into ongoing questions about urbanization, landscape, and environment. Situated within this broader moment of urbanist thought, this project is based in an understanding of cities as socio-natural assemblages, products of the complex relationships between human social organization and the natural landscape. I stress the fact that these relationships are always political in nature, involving contestation and negotiation between differently positioned and differently empowered actors. These are engagements with urban landscapes that emerge specifically from scholarship in urban political ecology and contemporary work on the politics of infrastructure; as such, these literatures are essential to this project’s argumentation. Additionally, this product is informed by a theoretical willingness to see cities of the global south as essential to the development of global urban theory. In this sense, this project takes seriously the fact that São Paulo is a dynamic, always evolving place, one that does not just localize already existing urban theory but actively contributes to it.
Chapter 3: Methods, Research Design, and Site Description

Introduction

I conducted two years of research in São Paulo for this project. This included two long-term stays (nine months and eight months, respectively) as well as two preliminary trips that included language study and preliminary research and project development. I spent 22 months in São Paulo as part of this project, funded by two Fulbright fellowships (IIE and DDRA) and with an institutional affiliation with the University of São Paulo. As an urban geographer interested in landscape and place, extensive time in Brazil was an essential component to this project. Living in São Paulo gave me an intimate engagement with the patterns and rhythms of the city, and was essential to my ability to contextualize my research findings.

Based in an expansive understanding of urban governance and a commitment to seeing the urban environment as always mediated through political processes, this project employed a mixed methodological approach that combined semi-structured interviews with extensive textual analysis. Specifically, the methods for this project included in-depth interviews, participant observation, participation in walking tours and performances, and discourse analysis of archival documents. I conducted roughly 45 semi-structured interviews, which were complemented by a variety of informal conversations, walking tours, observation of meetings, and discourse analysis of texts and other forms of representation. Interview participants included state employees, activists involved in water politics, and neighborhood representatives. I participated in a variety of performative practices related to water in the city, including street performances, plays, and formal presentations/discussions. Additionally, this project involved extensive engagement with textual sources, including the extensive media coverage of the 2014-2015 crisis of water scarcity.
In-depth Interviews

In-depth interviews are a research method that uses narrative responses to elicit answers to particular research questions (Crabtree and Miller 1999, 93). As a qualitative method, interviews aim for depth of content rather than depth of participants (McDowell, 2009). Interviews are considered processes of knowledge creation that require a structured yet flexible approach (Crabtree and Miller 1999: 91). Following Kuzel (1992), sampling for interviews was done through purposeful means, meaning that interviewees were selected based on their capacity to provide data for the project rather than due to a pre-determined numerical amount. Using a semi-structured model of interview design, interviews followed a pre-determined set of questions while allowing for flexibility within the interview itself.

I conducted roughly 45 interviews as part of this project, and interviews typically lasted between one and two hours. Interviews were undertaken in Portuguese (with one exception), and were recorded using a Zoom H2 audio recorder when given permission by interview subjects. All interviews were transcribed, but were not coded. Instead, interview transcripts formed part of a broader textual archive that backgrounded the argumentation in the pages that follow. Most interviews were one-on-one, while some were conducted with two research participants. Interviews were typically conducted at a location chosen by the research participant, and the locations included personal homes, community or neighborhood spaces, churches, offices, and cafes. Interviewees were located through institutional networks that included universities, religious organizations, and social movements. State representatives were located through existing contacts as well as through publicly available contact information. Some follow-up interviews were conducted.

1 All Portuguese material referenced in this dissertation is here displayed in its translated form (including interview quotations, citations from literature, and references to documents written in Portuguese).
Interviews were conducted with representatives and employees of the following groups:

**Civil Society Representatives**

General Water & Urbanism

- Clear Water of the Pinheiros River Association [Associação Águas Claras do Rio Pinheiros]
- Coruja Project [Projeto Coruja] / Urban Acupuncture [Acupuntura Urbana]
- Green Mobility Institute [Instituto Mobilidade Verde]
- Movement for the Agua Podre Linear Park [Movimento Pró Parque Linear Água Podre]
- Ocupe & Abrace [Occupy and Embrace]
- Metropolitan Waterway Ring of São Paulo, University of São Paulo [Hidroanel Metropolitano de São Paulo]

Peripheral Water Dynamics & Housing

- Communicators of the Floodplain [Comunicadores da Várzea]
- Floodplain Committee [Comitê da Várzea]
- Movement for Urbanization and Legalization of Jardim Pantanal [Movimento por Urbanização e Legalização do Pantanal]
- Organized Cultural Action Afro East [Ação Cultural Afro Leste Organizada Afro-Leste]
- Movement for the End of Floods Itaim Paulista [Movimento pela fim das enchentes]
- Movement for Housing West II [Movimento pela Moradia Leste II]
- Observatory of Removals, University of São Paulo [Observatório de Remoções]

Public Space and the Minhocão

- Minhocão Park Association [Associação Parque Minhocão]
- Movement to dismantle the Minhocão [Movimento Desmonte do Minhocão]
- Santa Cecilia Sem Minhocão [Santa Cecilia without the Minhocão]

**Policymakers and State Representatives**

- Center for Emergency Management [Centro de Gerenciamento de Emergências]
- Foundation for Administrative Development [Fundação do Desenvolvimento Administrativo]
- Mayor of São Paulo’s Office of Geological Risk Management [Gerenciamento de Áreas de Risco Geológico]
- Secretary of the Environment (municipal) [Verde e Meio Ambiente]

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2 All interview subjects are identified only by their first name in the text of this dissertation.
These specific groups were targeted because of their connection to drainage policy-making and water management, their broader knowledge of water governance in the city, and their capacity to reflect on the political dynamics of water in the city, broadly construed. Interviews focused on the management of stormwater, histories of urbanization and neighborhood development, histories of political organizing and project development, as well as specific projects or organizations. Findings from these interviews are interspersed throughout this chapter, but figure most prominently in chapters 5 and 7. Interviews, it is worth pointing out, took many forms, often depending on the participants' personalities and the nature of their relationship to the issues at hand. Some were formal interviews in which questions were asked and responded to. One of my first interviews, with the director of an NGO, took this form: over the course of 45 minutes, I asked a series of questions, they were responded to, and we parted ways. Others, however, were more fluid, given the nature of daily life and people’s schedules more generally. Often, a secondary person would form part of the interview, someone not invited by me but rather by the research participant themselves. Often, families and friends would intrude. Occasionally, interviews that began as interviews slowly extended into daylong events.

**Participant Observation**

Participant Observation is a way of involving the researcher in the lived reality of decision makers in a more intimate, engaged way. It both opens up the possibility of a deeper understanding of how and why particular decisions and directions are chosen, while
also opening up space for collaboration and knowledge sharing across the bounds of researcher and subject. It takes seriously the collaborative ways in which decisions are made, and takes seriously the fact that decisions happen in daily life, in conversation. Participating in meetings allowed for diverse voices to be heard that moved past the often more declarative nature of interviews. As part of this project I participated in meetings organized by specific organizations and groups. At the meetings that I attended as part of this research, which were typically organized by peripheral social movements, I usually introduced myself as a researcher, and recorded the meetings if given permission by the organizers. These meetings were designed to give broader context to the interviews and textual analysis that forms the background of this text. Rarely do quotes from meetings appear in this dissertation.

I participated in meetings and events organized by following organizations and groups:

- Fight for Water [Lute Pela Agua]
- Floodplain Committee [Comitê da Várzea]
- Movement for the Agua Podre Linear Park [Movimento Pró Parque Linear Água Podre]
- Movement for the End of Floods Itaim Paulista [Movimento pela fim das enchentes]
- The Water Alliance [Aliança Pela Agua]
- Organized Cultural Action Afro East [Ação Cultural Afro Leste Organizada Afro-Leste]
- Our São Paulo Environmental Working Group [Nossa São Paulo GT Meio Ambiente]
- Movement for Housing West II [Movimento pela Moradia Leste II]

In addition to participant observation, I participated extensively in conversations and presentations dedicated to the water crisis, urban and environmental issues more broadly, and the participatory process to rewrite the city’s strategic plan. These events typically featured formal presentations that were coupled with informal conversation, group discussion, and q and a sessions. They were at times affiliated with universities (in particular
the University of São Paulo), but often were put on by civil society organizations. When I first arrived in São Paulo in 2013, I participated extensively in the participatory process to rewrite the city’s strategic plan. Meetings and public events that I attended included:

**Participatory meetings for the Rewriting of the Strategic Plan**

- 11/26/2015 (Theme: environment)
- 11/30 (Theme: central-west region)
- 12/3/2013 – (Theme: Vulnerability and Zones of Special Interest)
- 12/5/2013 – (Theme: Lapa Region)
- 12/9/2013 – (Theme: Ecosystem Services and Environmental Protection)
- 04/16/2014 – (Theme: Habitation)

**Round Tables and Presentations**

- Presentation by Rivers and Roads [Rios e Ruas] in Santos, São Paulo (11/29/2013)
- Process of Elaborating the Management Plan for the Tietê Floodplain Area of Environmental Protection, University of São Paulo [Processo de Elaboração do Plano de Manejo da APA Várzea do Rio Tietê], 06/11/2014
- The Water Crisis [A Crise da Água], Casa da Cidade, 9/4/2014
- Rios e Ruas Short Course: Social and Affective Mapping of São Paulo’s Rivers [Mapeamento social e afetivo dos rios paulistanos], October 2014 (four sessions)
- Seminar on Water Security, Federation of Industries in the State of São Paulo [Seminário sobre Segurança Hídrica, FIESP], 4/24/2015
- Release of *Volume Vivo* film, 9/3/2015
- Water Security in Debate [Segurança Hídrica Em Debate], Casa da Cidade, 9/8/2015
- Revitalization of Urban Rivers Symposium, University of São Paulo [Simpósio de Revitalização de Rios Urbanos], 10/26 – 10/28, 2015
- Sustainability in the Peripheries [Sustentabilidade Nas Periferias], Casa da Cidade, 11/9/2015
- Round Table: Hydric Crisis in São Paulo: A Political or Environmental Question? University of São Paulo, Department of Geography [Mesa Redonda: Crise hídrica em São Paulo: questão ambiental ou política?], 11/26/2015

Given the breadth of topics covered in both meetings that I attended as well as presentations or roundtables, insights from these events background extensive portions of this dissertation.

**Walking Tours and Participation in Performances**
Walking Tours and Participation in Performances were a central component of this project. I participated in a variety of walking tours and performative events, organized by community organizations and NGOs. These were a means of both deepening my understanding of research participants’ daily lives while also engaging in their political or performative projects. Walking tours and performative events subsequently functioned as both an introduction into particular neighborhoods as well as a source of analysis in its own right. Walking tours and participation in creative performances were distinct experiences, and involved differing positions for me as a researcher. With neighborhood walking tours, they largely functioned as a long, informal interview that allowed me to ask questions about daily life and the neighborhoods we were in. Performances, on the other hand, were more purposeful events. As such, my interactions were more limited, and I concentrated on understanding and interpreting the form of the event. After the performances, I typically talked informally with performers.

Specific highlights included:

- ZL Vorticé: Architect-led tour of the Eastern Zone (12/13/2013)
- Trip to Penha neighborhood with Cleuza (12/15/2013)
- Fluvial Block of Dead Fish [Bloco Fluvial de Peixe Seco] performance (3/12/2014, 12/13/2015)
- SuperAção nas Nascentes do Iquiririm, Butantá (3/22/2014)
- Walking tour in Jardim Pantanal with the Floodplain Communicators [Comunicadores da Várzea] (6/15/2014, 10/18/2014)
- A Cidade dos Rios Invisíveis, Jardim Romano (8/30/2014, 9/7/2014; and associated open-mic event, 12/12/2015)
- Walking Tour and home visit in Itaim Paulista with Anderson (10/28/2014)
- Open Mic in the Elbow [Sarau do Cotovelo] and performance of the Fluvial Block of Dead Fish [Bloco Fluvial de Peixe Seco], Jardim Pantanal (8/29/2015)
- Walking Tour of Córrego Agua Podre with Cesar (8/6/2015)
- Trip to Cantareira Reservoir System with Carol (08/30/2015)
- Protest against the layoffs at SABESP and for the Right to Water [Manifestação contra as demissões na Sabesp e pelo direito à água] (10/1/2015).
Both performances and walking tours (whose boundaries were often blurry) gave me insight into neighborhood dynamics and issues in an intimate, often relaxed way. As such, participation in collective performances was a crucial way for me to both learn the landscape of São Paulo and also gain insight into the work of activists and artists active in the city. These experiences yielded the empirical research found in Chapters 9 and 7, but they background much of the broader text as well. For the performances detailed in Chapter 9, I followed methodological commitments common to theatre studies and performance studies more broadly (See Schechner, 2013). As a cultural geographer interested in cultural production as an elucidator of geographies and identities, my approach to the interpretation of artistic production focused on interactions between performers and the surrounding landscapes. I participated in the performances, engaged in informal conversations with performers and fellow audience members when possible, and took detailed notes (both during the performance as well as afterwards). When possible I recorded the performances. Immediately after the performances I used my notes to develop a narrative of the event, and created an archive of all the materials related to the performance that were available to me. I made note of occurrences during the performances and attempted to accurately represent what had happened during the performances themselves. When possible, I made note of project funding sources.

While the performances I attended were typically site-specific and subsequently subject to change, I participated in all the performances that I write about more than once.
With the three performances that I detail in Chapter 9, my participation with their projects extended past formal participation in performances to include longer processes of relationship building and friendship that extend to the present. In the case of Estopô Balaio and their project A Cidade dos Rios Invisíveis, my participation in the project was more sustained, and I attended many of the group’s performances and spent time socially with the director and actors throughout my time in São Paulo. With the group Rios e Ruas [Rivers and Roads], I participated in three walking tours, which were supplemented by participation in a four week short course they organized as well as other presentations and informal conversation. With Mapa Xilográfico, I participated in five events organized by the collective between 2013 and 2016.

The interpretations of the performances are resolutely my own, but they were developed through an archival sensibility that attempted to situate the projects and understand their context. While some scholars of visuality are interested in audience response, my interest was in the performances themselves and their associated texts as specifically public interventions open to interpretation (See Atencio, 2014). As such, the interpretations betray my own positionality and view, even as all attempts were made to accurately reflect the events themselves as they happened.

**Archival Research Methods and Discourse Analysis**

Archival Research Methods and Discourse Analysis were essential to understanding both the empirical dynamics of water governance in São Paulo as well as the political projects of local organizations and activists. As a project focused on the contemporary nature of environmental governance in São Paulo, this project understands archives in a broad sense. Documents included newspapers and magazine articles, policy documents, and postings (both digital and print) produced by the organizations and entities engaged with
this project. Given scholarship in geography on archives as selective and contested sources of data (Schein, 2006; See also Cronon, 1992b; Hanlon, 2001; Domosh and Morin, 2003), and given my focus on pointed, often polemical pieces of writing, archives were be understood to contain both inclusions and exclusions. As such, they were engaged with as discourses and interventions, not mere evidence of the present moment. While formal archives did not form part of this research, I was often given access to documents by research participants (most notably Father Ticão’s community archive in Ermelino Matarrazzo and by both Anderson and Euclides in Itaim Paulista). These archives were interpreted as selective historical documents assembled by specifically positioned actors.

Sources for this project included:

Media representations dedicated to São Paulo’s water dynamics found in news coverage, including primarily:

- Folha de São Paulo
- Estado de São Paulo
- G1

Publications, postings, and other forms of cultural production produced by movements active in water dynamics, most notably:

- The Water Alliance [Aliança Pela Agua]
- Fight for Water [Lute Pela Agua]
- Floodplain Communicators [Comunicadores da Várzea]
- Mapa Xilográfico [Etched Map Collective]
- Rivers and Roads [Rios e Ruas]

Policy Documents and maps related to the Parque Várzeas do Tietê and water governance more broadly. Some of the central documents consulted included:

- City of São Paulo Strategic Plan [Plano Diretor Estratégico do Município de São Paulo]
- Drainage and Management of Stormwater Manual, vol. 1, 2, 3 [Manual de Drenagem e Manejo de Águas Pluviais]
- Management Plan: Tietê Floodplain Area of Environmental Protection [Plano de Manejo: Area de Proteção Ambiental, Várzea do Rio Tietê]
- Perimeter of the Tietê River Valley Park, DAEE [Linha de Perímetro do Parque Várzeas do Tietê]
Plan for the Alto-Tietê Hydrographical Basin [Plano da Bacia Hidrográfica do Alto Tietê]
Ten Years of the Strategic Plan for Drainage in the Alto Tietê Hydrographical Basin: The Tietê River Valley Park (author: Rui Brasil) [10 Anos do Plano Diretor de Macrodrenagem da Bacia Hidrográfica do Alto Tietê: O Projeto Várzeas do Tietê]
Tietê River Valley Park, Genivaldo Maximiliano de Aguiar (DAEE) [Parque Várzeas do Tietê]

At the start of this project I created a database of documents organized thematically (around such themes as flooding, Jardim Pantanal, Water Supply). These databases were added to throughout the duration of this project.

**Reflexivity and Positionality**

Research is a relational process that involves serious dynamics of trust and relationship-building. The positionality of researchers within broader dynamics of identity and geography matters and can determine both what sorts of research possibilities are available and what sorts of conclusions are developed. Research in the global south—in which cultural dynamics and difference can be profound, alongside more immediate questions of safety, violence, and resources—further complicate these issues. This is especially true given the long histories of colonialist research and exploitation that have marked the research practice for social scientists. A reflexive research practice takes seriously the implications of particular identity positions for the conducting of research, and takes seriously the ways in which identity matters in the development and conducting of specific research projects. As such, some engagement with reflexivity is important for thinking through what sorts of research possibilities were available to me and what sorts of access I had.
It is undeniable that being a (white, male) graduate student from the United States gave me privileged access to the research process, and enabled me to engage with very different research participants across various levels of education and profession. This was especially pronounced in regards to state entities, where my credentials and assumed impartiality gave me access that others would not have. Unlike my research participants from the urban periphery, my access to state entities gave me insight into the political processes that were ongoing in ways that they were very rarely able to access. Additionally, I was often given access to documents that were not always publicly accessible. As such, my research clearly benefited from my relationship to an American research university and my status as a visiting researcher. While my initial access to state entities such as DAEE was limited and required persistent pressure, once I had access I found employees and interview participants to be open and accessible. Indeed, one of my longest research days included a daylong trip to the source of the Tietê river with members of DAEE. This would have been highly improbable if not for my professional appearance, background, and perhaps gender. State representatives typically understood me to be in their side, and as such were willing to discuss specific projects in some detail. It is worth considering as well the degree to which being a student with a very noticeable accent rendered me fairly unthreatening as a researcher.

That said, to see this project as a story of an elite researcher and marginalized research participants ignores the complex interplay between knowledge, expertise, and identity that characterizes the research process in the contemporary moment. My research participants were savvy political actors, who understood the implications of my own positionality and understood the research process more broadly. Many of the state officials I spoke with had advanced degrees and were conceptually familiar with the issues I was
discussing. Many of the residents of the periphery that I spoke with were similarly familiar with political organizing, were currently affiliated with universities, and had dealt with many research participants over the years. The boundaries between academics, researchers, politicians, and artists were blurry throughout my research practice, and reveal the fact that research is less about the extraction of knowledge from participants and far more about the relational processes of relationship building and conversation. As such, my positionality was less about the direct politics of expertise and access that accompanied my status as a researcher, but more about the broader building of solidarities and relationships within the research process. To put it simply, people in São Paulo are busy, and rarely have time for extended visits from researchers. This meant that my research practice often happened in the cracks, at the ends of meetings, walking to and from the metro, quickly before a talk began. These momentary conversations were matched by a sustained attempt at relationship building. Over time I began to realize that my sustained engagement with a specific place had yielded a knowledge that was real, that offered an interpretation that was novel and could stand up to scrutiny. This came not from particular conversations but instead from a multi-year long engagement with themes of water, periphery, and urbanism in São Paulo. More broadly, it came from the broader attempts at building sustained relationships with my research participants in order to generate effective solidarities; at times, this was a successful enterprise and at other times it was not. The cumulative effect of all the conversations and encounters I had over the course of two years in São Paulo is this dissertation.

**Description of Research Site**

**The Várzea**
Much of the research detailed in this dissertation was conducted in a region of São Paulo colloquially referred to as the várzea\(^3\), and in particular the community of Jardim Pantanal. While the research for this product was conducted in a variety of neighborhoods with participants active throughout the city and state, I maintained an interest in Jardim Pantanal and the surrounding region throughout the project. As a long-standing occupation located on the banks of the Tietê that had struggled dramatically with flooding, Jardim Pantanal allowed me to cohere many of my research interests in one specific location. It was my first introduction to the urban periphery and the place that I returned to most frequently during the course of my research.

Jardim Pantanal\(^4\) is located in a region I refer to as the várzea, a reference to the neighborhoods that exist in the eastern floodplain of the Tietê where the river is not yet channelized. These neighborhoods are located to the east of the Penha Dam, a dam that marks the point at which the Tietê becomes formally rectified (See figure 3.1). Spread across 12 municipalities, the várzea is a fluvial landscape that combines areas of environmental protection with dense urbanization, extensive informal occupation including favelas, industrial development, and large-scale agricultural production. The portions of the várzea that make up this project’s study site are low-income neighborhoods at the edge of the city, marked by an expansive horizontal urbanism built in many cases by hand through the process of autoconstruction (See figure 3.2). They are located in what is commonly referred to as the Extreme Eastern Zone [Extremo Zona Leste], a designation for neighborhoods

\(^3\) The Portuguese word várzea translates to lowland or plane. For Aziz Ab'Saber, the usage of the word in the southeast of Brazil refers to the flat lowlands along the edges of fluvial channels. For the purpose of consistency, I either leave the word in its original Portuguese or translate it as floodplain.

\(^4\) Some who refer to Jardim Pantanal are referring not to the specific neighborhood that I highlight in this text, but rather a collection of seven neighborhoods located in the várzea of the Tietê. For the purposes of clarity, when I refer to Jardim Pantanal in this text I am referring to the specific neighborhood. When I refer to the broader neighborhoods of the Tietê floodplain, I use the Portuguese term várzea.
located at the eastern edge of the city. For the purposes of this dissertation, the várzea extends east from the Penha Dam to the border between São Paulo and the municipality of Itaquaquecetuba. Within São Paulo, it includes portions of the sub prefectures of Penha, Cangaiba, Ermelino Matarazzo, Vila Jacuí, São Miguel, and Jardim Helena. Due to the logistics of municipal and state complexity, the areas on the northern bank of the Tietê, specifically the city of Guarulhos, do not appear often in this project.

The Várzea is an urbanized delta where the boundaries between water and land are porous and ephemeral, most notably in the recurrent problem of flooding that marks many of these neighborhoods (See Figures 3.3). In these ways, the várzea is suggestive of the complex dynamics of areas where “water and land combine” (Langston, 2003: 1; See also Colten, 2006; Gandy, 2014; Lewis, 2015; Mandelman, 2015; Milligan, 2015; Maly, 2012; Orsi, 2004). Riverine landscapes complicate the binaries between land and water and between fixity and ephemerality (See, for instance Mandelman, 2015, Mathur and da Cunha, 2014). They are points of contact that defy existing ontological binaries made between the fluid and the fixed, in part due to the difficulties of representing and managing landscapes that are prone to movement. Urban wetlands complicate the dynamics of governance through their relationality and opposition to broadly modernist approaches to land management. As Mandelman (2015) argues, wetlands are places of ambiguity, sites that complicate borders made between the stable and the mobile, between the fixed and the fluid. He notes that, “Watery landscapes and their inhabitants do not easily conform to human categories; they are environments where, for many people, matter has often felt strangely “out of place,” unmoored from the more familiar taxa of ecosystems that are more definitively either terrestrial or aquatic, rather than some indeterminate mixture of the two” (12).
The várzea is one of the most direct engagements with the Tietê in its natural course in the city—one of the messier boundaries between water and land in the city—and this relationship is far from bucolic (See figure 3.4). Instead, the relationship between riverine communities and the river that exists alongside them is marked by pollution, degradation, and regularized flooding. The Tietê is a deeply polluted river, initially from industrial contamination but increasingly from household sewage. Due in part to its location in the floodplain of the Tietê and the region’s sub-tropical weather patterns, the várzea is also subject to extensive and regular flooding in December and January when rainfall levels are at the highest. This is a recurrent problem that occurs in the neighborhoods along the Tietê. An article on January 1, for instance, was entitled: “The neighborhood of Itaim Paulista returns to have its traditional end of year flood in São Paulo” (Gallo, 2016). The notion of a traditional end of year flood is a frighteningly subdued way to explain and justify a recurrent, deadly environmental hazard.

The várzea’s indeterminacy is a product of its riverine dynamics but also its broader institutional and political mechanics. Like much of São Paulo’s urban periphery, it is an area that has existed outside of the confines of state planning and often state authority (See figure 3.5). By no means strictly informal, the várzea exists—like much of São Paulo—at the edge of the formal and the informal. The várzea is an “anxious landscape” to use Picon’s (2000) phrasing (See also Gandy, 2014: 223) due to its complicated ecological and social dimensions and its existence outside the formal landscape of urbanization in São Paulo. It is a landscape built largely by hand, largely through processes of autoconstruction and consolidation and often without direct state involvement. Following Yiftachel (2009), we might see the landscape of the várzea as a “gray zone,” a place, like much of São Paulo, exists uneasily between the formal and the informal (See too Wigle, 2014; Roy, 2005). This legal ambiguity
places informal neighborhoods in positions of “permanent temporariness,” awaiting upgrading or removals that often never come (Yiftachel, 2009; See Wigle, 2014).

Many who reside in the várzea are living in situations of extreme vulnerability and live there not by choice but by necessity. Maria Zélia Souza Andrade, resident of the favela *chacara tres meninas*, gives voice to this in her short piece, *History of an Occupation*, written after the flooding of 2009 and 2010 that affected the neighborhood:

Every occupation happens due to necessity. A person or a group goes to live in a specific place and over time they form a vila, neighborhood, state and country. In the region of the várzea of the Tietê it was not different. It is worth remembering that the occupation of the region was initiated by the bandeirantes… [Mixed-race slavers and explorers who opened up the interior of Brazil’s interior in the 17th and 18th centuries using the Tietê as their path inland].

With the passing of years, people constructed their housing in the region due to the lack of alternatives. Today there are vilas and neighborhoods constructed by hand by the first residents who, with a lot difficulty, courage, and struggle, gained some improvements in infrastructure….

I am Maria Zélia Souza Andrade, resident of the region for 22 years. I was able to accompany the recent chapters of this history and I did not like the experience that I passed through and continue to pass through. I am not the only person who is in this process, but thousands of people who fight to have a little house to live with their families, but the state and municipal governments of São Paulo do not act in the service of this, but instead for other interests…. (in Coletivo Mapa Xilográfico, n.d.).

Zélia’s story is a familiar one throughout São Paulo, and within the várzea more broadly. It is a story of migration, identity, and informal urbanism, a story that characterizes much of São Paulo’s development. This interlocking of social and ecological vulnerability has combined to create a region defined by a patchwork of legality and illegality, formality and informality, a “watery landscape” (Mandelman, 2015) whose indeterminacy marks residents’ lives in profound, embodied ways.

*Jardim Pantanal*
Within the várzea’s broader landscape this research is most directly focused on the community of Jardim Pantanal, a nearly thirty-year-old occupation located in the floodplain of the Tietê (See Barboza, 2015). The community is located in the district of Jardim Helena, part of the broader administrative region of São Miguel (See figure 3.6). It is around thirty kilometers from the center of São Paulo, with a population of roughly 20,000 residents (Barboza, 2015: 22). With a nearby commuter train stop, it takes between one and two hours to get into the urban core where the bulk of jobs are located. As a broadly informal community, Jardim Pantanal is not recognized as an existing neighborhood by the city. As Barboza notes, “The construction of this region came out of the necessity of the residents to concretize it, in the practice and experience of the day to day, the area already imaginatively delimited as Jardim Pantanal…” (22).

Jardim Pantanal is located at the edge of the várzea’s landscape, at the most direct point of contact between water and land in the region. Jardim Pantanal’s watery nature can be demonstrated by the neighborhood’s name, which translates to Wetlands Garden. This is in itself suggestive of the complex fluvial dynamics of the region, and the underlying environmental realities for communities located in the Tietê’s floodplain. Very few residents have legal tenure and the threat of expulsion hangs over the community, even as it is a clearly consolidated community that goes back decades at this point. Nevertheless, it is a community that has endured decades of attempted removal and a broader lack of state investment. Its dynamic of land tenure are decidedly murky, and it exists somewhere between a favela and an irregular allotment, depending on the street (see next chapter for more on these differences).

This is largely due to the fact that much of Jardim Pantanal is located in an area of environmental protection. The eastern várzea was designated an area of environmental
protection in 1987 (formally referred to as the Tietê floodplain area of environmental protection [Área de Proteção Ambiental Várzea do Tietê]). This turned the floodplain into an area that was zoned as environmentally fragile and prevented occupation, but the designation was not regularized until 1998. At that point, much of the várzea had been occupied by a variety of informal, low-income neighborhoods. Indeed, occupation began in the region in the late 1980s and increased dramatically starting in 1995 and 1996 (interview with Marzeni, 2016). The description of the region supplied by the Movement for Urbanization and Legalization of Pantanal [MULP], a social movement active in the 1990s and 2000s, for instance, makes note of this:

The region began be developed in its current form in 1986. At that moment, the then governor of São Paulo, Orestes Quércia, reintegrated an occupied area in Itaim Paulista, also in the Eastern Zone [Zona Leste] of São Paulo, he brought the dozens of families from there to areas close to Pantanal. In one year, the area already had more than 3,000 families. The housing movements approved the wave and occupied the other areas on the margin of the river. Jardim Pantanal began to be occupied in 1989…In 1998, after an occupation initiated in 1986, the government declared that the area was an area of environmental protection (MULP, n.d.)

Throughout the 1990s and early 2000s, the várzea’s designation as an area of environmental protection would be used as a pretext for attempts to remove riverine neighborhoods. Operation Defense of Waters [Operação Defesa das Aguas] would be the most dramatic example of this, employing a kind of militaristic vocabulary to prevent occupation in the region (See Barboza, 2015). Indeed, the mayoral administrations of Jose Serra and Gilberto Kassab (2005-2013) were aggressively opposed to floodplain occupation, and a variety of projects were developed in these years. In 2007, for instance, a pamphlet titled “It’s a Crime!” was distributed to local children through their school. The pamphlet was part of an attempt to limit occupation in the region, and in effect told school children that their parents were criminals. Juxtaposing an image of police officers clad in military gear, the pamphlet’s text notes:
Two hundred and thirty men of the environmental guard patrol the banks in cars and motorcycles in order to prevent illegal constructions. Markets of construction materials and block and brick factories are being demolished…. those who build new homes are having their construction demolished – this has already happened. The locations were mapped and are being visited. These actions are permanent, in order to control the invasions, avoid the destruction of the environment, and not let the situation worsen.

As with efforts to clear communities out of the populated areas ringing the Guarapiranga reservoir in the southern zone of the city, operations like this showed limited success in removing and de-urbanizing these regions (See Santoro, Ferrara, and Whately, 2008). In addition to the logistical and financial costs associated with removing tens of thousands of people, the ambivalent nature of state practice in zones of environmental protection is also to blame. Indeed, even as residents in Jardim Pantanal were being told that their homes were in illegal areas, a variety of state-sponsored projects were being built in the region. These include local educational centers as well as the eastern campus for the University of São Paulo.

Nevertheless, removals (and the threat of removals) persist, and the underlying zoning designations for specific neighborhoods matter. For neighborhoods like Jardim Pantanal, their formal illegality has complicated attempts at consolidation even as residents have built lives over decades. Much of the surrounding region has consolidated in recent years, marking communities like Jardim Pantanal into outliers, marked by the endurance of dirt roads and incomplete infrastructural provisioning. The area of environmental protection prevents the implantation of infrastructure in the region, at least legally or formally. As a result, many of the communities in the area subsequently exist somewhere between the formal and the informal. They are legally not allowed to connect into the sewage network, for instance. As Fernanda, the director of the Tietê floodplain area of environmental protection, noted in a 2014 interview:
The lenience of the state, the inertia of the state, is so big, so big, that when we passed, who knows, x years after 87…we have all of this [area] occupied…And so what did they [the environmental secretary] do afterwards, they said, ‘ok, this is a floodplain, its vulnerable, I am not interested in having everyone there, we’re going to paint it green, or, you can’t do anything, and so you can’t provide infrastructure for these guys, they are there with nothing. Theoretically you couldn’t. Everything is resolved. Excuse me, people from environment, not everything is resolved. This is in 1998…. And so what did we do? When I saw we I mean the environmental system in 1998, we painted it all green. These guys [residents] continued and amplified these irregular areas, and so they’re in a marginality. We didn’t gain from the environmental or social perspective (personal interview, 2014).

Or, to put it into the language of activist Oswaldo:

And so you have a lot of people who are living in really precarious situations, due to, unfortunately, I saw unfortunately because it’s an area of environmental protection that was implemented after a lot of occupations. I mean, first you have an occupation and afterwards the area becomes an APA [Area of Environmental Protection]. On the other hand, you’re in an area of environmental protection, but there is also the necessity of housing. You have the question of the real estate side, which inflates prices, but that’s a historical process, right? You have the big businesses that in the past came, evicted people, and so there aren’t conditions and that whole history. Come to the periphery and occupy the banks, which is our reality (personal interview, 2014).

These tensions between environmental fragility and citywide inequality mark the neighborhood, and the effects on Jardim Pantanal’s capacity to consolidate can be demonstrated by photographs from the community itself (See Figures 3.7, 3.8, 3.9). The overlapping dynamics of informality and formality are visible, for instance, in the co-presence of electrical infrastructure with the lack of asphalt, for instance. The houses, too, indicate multiple generations of collectively or individually built housing, infrastructures of domesticity and collective life that gesture at changing articulations of auto-construction over two to three generations. Much of the infrastructure in areas like Jardim Pantanal is constructed collectively, an example of what Amin (2014) refers to as “lively infrastructure” or what Silver (2014) calls “incremental infrastructures.” In the case of Jardim Pantanal, infrastructural provisioning often occurs through collective multirôes, group implementations of infrastructure organized by residents. The construction of sewage
infrastructure, the implantation of roads, the building of houses: much of this is done by
hand and in collaboration, strengthening affective bonds to the landscape. This makes clear
that attempts to remove communities in the region are complicated not just by logistical and
economic dynamics but also affective and relational ties.

The continued illegality and ambiguity that characterizes many ‘gray zones’ like Jardim
Pantanal continues to mark them. It provokes a disjunct that is characteristic of much of the
urbanization process in Latin America: decades of consolidation have yielded communities
that are formal neighborhood in basically every sense except for the legal. They are illegal
communities that receive mail, that receive piped water, that feel the weight of repressive
police forces, that pay sewage bills, that possess some form of title, that display formal
design conventions. Jardim Pantanal’s development occurred in spite of the area’s
designation as undevelopable. As Fernanda, the director of the area of environmental
protection, noted:

Everything I’m telling you are contradictions. I say something and then take it back. And
it’s this, exactly this…and so how do you consolidate this area [Jardim Pantanal]? And
this has to do with the APA yes, because in in the 1980s the APA already existed, and
see how this area expanded and consolidated, because it has public structures, it has
light. We said that it couldn’t have anything, right? But it has everything. It has street
names, it has post offices, it has a city happening. And so there is a crisis there, some
contradictions, that are worth studying…but it’s hard. It’s extremely complex (Personal
interview, 2014).

Fernanda’s comment suggests the complexity of a neighborhood like Jardim Pantanal, where
overlapping threads of legality and illegality coexist within a framework in which the state is
unable—or, unwilling—to actively intervene in consistent ways. The result is a landscape
whose management suggests other logics: of state patronage, of localized political claims, of
the complex associations between residents associations and politicians. It is a landscape that
highlights what Pardue (2014) refers to as the tricky nature of fiscalização [management], and
materializes the abstract dynamics of water in the lives of residents faced to live with recurrent flooding.

Conclusion

On a trip to Jardim Pantanal in June 2015, I jotted notes of what I was seeing in an attempt to later comment on it. These notes would later take the form of a more narrative description of the trip and are designed to give an introduction to the community through my (particularly positioned) eyes. I use them here to conclude this chapter in the hopes that they give insight into my research practice and the community itself.

I get to Jardim Pantanal through a route that combines the metrô with the state commuter train system, an underfunded, slow, and often brutal means of public transit that residents of the urban periphery are forced to engage with on a daily basis. The trip from the center to Jardim Pantanal runs directly through the várzea, tying together the urban center and the urban periphery through the daily travels of urban residents who spend hours every day on this train. But while the center/periphery logic that defines São Paulo concentrates and exacerbates poverty and inequality, the landscape of the várzea offers a compelling glimpse into the multifaceted networks that compromise the city. The train ride, which in this case took roughly an hour, passes by a series of housing types, administrative buildings, and differing typologies of urban water. It passes by what are clearly favelas—many thin and linear, located in between highways and administrative buildings—but many are either rudimentary or vacated, sometimes located alongside what looks like social or public housing.

Rectified córregos [streams] slice through the landscape, offering brief pauses of lush greenery but also clearly choked by trash and detritus, and many streams are in process of rectification. This demonstrates a continued drive towards channelization and modernist urban water management. The train passes through USP Leste [The eastern campus of the University of São Paulo], a federal university campus located in the Eastern Zone [Zona Leste] that highlights the conflicting and often contradictory engagements with the várzeas on behalf of the state in the region. Designed as a means of bringing the country’s best university to an underserved part of the city, the university was closed for months due to faulty construction and has struggled to make inroads with students from surrounding neighborhoods.

State approaches to the várzea need to be understood as contradictory, at times encouraging human presence and at times attempting to clear territories. This is not necessarily a demonstration of a state approach to the várzea that privileges certain uses—especially when we remember that the municipal and state governments are vastly different entities—but more a demonstration of an inconsistent and often contradictory approach to urban environmental politics that emerges from a multitude of overlapping
and contested political dimensions. But the one constant is that precarious communities are the most at risk of relocation, resettlement, and environmental risk.

As the train passes, the landscape continues to shift, combining warehouses and industrial processes with the endless spread of self-built or auto-constructed homes. One to three story homes, many with a gated garage in front, are the predominant housing typology of São Paulo, stretching for miles in every direction with the spread of the city. Sometimes painted, often with the logo of the CORINTHIANS football club, these homes constitute where most of the city live, and vary in size and decoration. We pass by abandoned factories, a reminder of the fact that São Paulo is not just industrial but also post-industrial, but also a reminder that this rail track was once a commercial route, linking together the city’s past as a coffee producer with its more recent industrial past. As Brazilian geographer Milton Santos has noted, urban landscapes need to be understood as conversations between the past and the present, with the past weighing on the present in distinct ways, not the least of which is by historical decisions and implantations of infrastructure. We pass by soccer fields located alongside channelized córregos, a cruel version of São Paulo’s famed futebol de várzea, or river valley soccer.

Eventually I arrive in Jardim Helena, disembarking at the Jardim Helena – Vila Maria train stop. I leave the train and head into the neighborhood, where as always I’m greeted by the flurry of activity that surrounds the station. Men and women sell DVDs, sodas, and snacks, and I stop in for a cafezinho at one of the lanchonettes located a block of two from the station. From there I head east, before eventually heading north for about 10 blocks on Avenida Professor Alípio de Barros. The avenue features a central greenway with a bike path, and I’m reminded of the fact that the district of Jardim Helena has one of the highest rates of bicycle usage in the city. I pass by the usual markers of daily life in São Paulo as I walk: lanchonettes and restaurants, small stores, barbershops and butcher shops, houses, people, occasional stray dogs. Eventually I turn right on Rua Erva do Sereno and head towards Instituto Alana, a community space funded by a children’s advocacy organization. Eventually the asphalt disappears and I’m on a dirt road, but the landscape remains familiar: brick and cement houses with up to three stories, kids and families, a variety of small-scale stores and windows, the constant presence of people in the street. The end of asphalt though marks the beginnings of Jardim Pantanal and makes clear that this community is not legitimate in the eyes of the state, that infrastructure reflects political articulations. Eventually I reach my destination.
Figure 3.1: São Paulo, showing location of Jardim Pantanal and location of the Penha Dam. Praça da Sé marks the historic core of the city, and functions as a means of orienting the city’s broader spatiality.

Figure 3.2: Two versions of autoconstruction in Jardim Pantanal, 2014. Photograph by the author.
Figure 3.3: Aftermath of flooding in Itaim Paulista, February 2010. Photograph by Euclides Mendes. Reprinted with permission.

Figure 3.4: Protecting against flooding in the Várzea, 2014. Photograph by the author.
Figure 3.5: Jardim Pantanal and Tietê River, 2014. Photograph by the author.
Figure 3.6: Zoning map of São Miguel. Image courtesy Mayor’s office of São Paulo. Licensed under Creative Commons. Available at: http://gestaourbana.prefeitura.sp.gov.br/marco-regulatorio/zoneamento/arquivos/
Figure 3.7: Street in Jardim Pantanal, 2015. Photograph by the author.

Figure 3.8: Street Scene, Jardim Pantanal, 2014. Photograph by the author.
Figure 3.9. Scene from Jardim Pantanal, 2014. Photograph by the author.
Chapter 4: Situating São Paulo: Center, Periphery, and Contemporary Dynamics

Introduction

Founded in 1554 as São Paulo dos Campos de Piratininga, São Paulo grew from a tiny colonial outpost to a city of nearly eleven million residents in around a century and a half. This process of rapid growth yielded a complex, dynamic place that defies easy categorization. A product of coffee production that was converted into industrial growth, the city is currently a sprawling metropolis that bears the imprint of decades of immigration from Europe, the Middle East, and Asia. Today, the city has a population of around 11 million in a metropolitan area of nearly twenty million inhabitants, making it the largest in Latin America. It is a sprawling, massive metropolis, the economic heart of Latin America, a site of incredible wealth that is bisected by a brutal delineation between center and periphery. It is a city of immigrants and migrants, a place of opportunity and extreme hardship, a famous “city of walls” to use Teresa Caldeira’s terminology. It is the city where former president Luiz Inácio Lula da Silva (‘Lula’) first came to power as a union organizer, leading massive strikes of autoworkers in the late 1970s that hastened the end of the military dictatorship. It is a deeply queer city in a country that murders LGBTQ people with alarming frequency, a working-class city, a global city, a city of ostentatious wealth, a city of fortified enclaves and armored cars, a city with the highest rate of personal helicopter ownership in the world. It is a city of astounding cultural vitality and a center of global financial capitalism. The city accounts for over one fifth of Brazil’s economy, and concentrates nearly one tenth of the country’s population. A hub for both immigration and migration, nearly a quarter of its population was born outside the state (versus 1893, when 55% of the city’s population
was born outside of the country). It is a place of endless stimulation for an urban geographer (See Figure 4.1, 4.2, 4.3).

Like other Brazilian cities, São Paulo has long been understood as a particularly bifurcated place, a divided city that is often described as two cities (See, for instance, UN-Habitat, 2010). While this framing often ignores the interlinked dynamics of inequality and the more heterogeneous pattern of the contemporary city, it is also a useful shorthand for describing the city’s spatiality in a broad sense. Fundamentally, São Paulo is an unequal place. This divide is typically referred to through the terms center [centro] (or expanded center [centro expandido]) and periphery [periferia]. The centro expandido includes the historic urban core as well as the neighborhoods that ring it (such as Pinheiros, Jardim Europa, and Vila Mariana). The periphery, in contrast to the centro expandido, is a broad discursive marker for the communities that exist outside the formal real estate market, communities defined in part by their development outside of the contours of state involvement and investment (See figure 4.4). These neighborhoods sprawl outwards from the urban core, concentrating the bulk of the city’s residential population. The term periferia is somewhat loose, and its meanings can shift depending on who is talking, but it is typically used to articulate distance from the urban core, a lack of formal infrastructure and investment, and the concentration of low-income residents. In this sense it is a qualitative as well as quantitative descriptor. The World Bank, for instance, estimates that the average household income in the periphery is half the city’s average and the per capita household income is three times lower than in the central city (World Bank, 2012). Of the reportedly 890,000 precarious dwellings in the city in 2010, 85% were located in the urban periphery (World Bank, 2012). The division between a formal urban core and a broadly informal periphery marks the city, and location can have serious
implications for residents’ lives. Experiences of the place can be vastly different depending on where you are positioned geographically.

Focusing on the interlinked yet divergent experiences of center and periphery is subsequently an important way to both describe the city’s spatiality as well as make specific claims about its structural inequality. To understand and engage with São Paulo, it is important to understand that the city is in effect divided, but that this division is crisscrossed in myriad ways. In this chapter, I use this enduring divide between center and periphery to introduce the city. I focus on the inequality that is at the heart of it, which I argue is a necessary component of engaging with the city. Yet I also focus on the changing dynamics of center and periphery in São Paulo, which have yielded a more complex geography in recent decades (See Marques, 2016; Rolnik, 2015). Over two decades of economic growth and center-left governance—coupled with broader processes of central city decline, capital flight, and urban fortification—has yielded a more heterogeneous landscape. This has reconfigured but by no means eliminated the enduring inequality that is at the heart of the city. As such, my purpose in this introductory chapter is to examine the changing geographies of center and periphery in São Paulo as a way of elucidating the city more broadly. My intention is not to confirm articulations of São Paulo as a city divided into two, but rather to think about how that division is taken up politically in the city and what it reveals about the lived experience of inhabiting São Paulo more broadly.

I focus first on the historical development of the city’s landscape before considering contemporary articulations and spatialities of inequality that materialize in its landscape. I conclude the chapter though an analysis of contemporary dynamics of governance in the city, focusing specifically on the period from 2013 to the present. This timeframe largely coincides with the mayoral regime of Fernando Haddad and the attempted development of a
strategic plan for the city (See Pardue, 2015). This chapter is designed to give a broad introduction to São Paulo that will orient the remaining chapters.

Twentieth Century São Paulo: A story of Center and Periphery

Between the late 1800s and late 1900s, São Paulo grew from a frontier outpost to a booming zone of coffee and agricultural production before growing into a massive industrial metropolis in a metropolitan region of around twenty million people. The initial growth of the city was due to coffee production. Coffee was sent to the port of Santos first through fluvial transport and then through railroad travel. Investing profits from coffee production into nascent industry, the city grew from around 65,000 people in 1890 to over two million in 1950. Its growth was shaped first by immigration, specifically from Europe and Japan, and later by migration from the Brazilian northeast. Many of the city’s current residents are from the Brazilian northeast, whose continued albeit dramatically slowed out-migration from their home states dramatically reconfigured the social geography of Brazil in the twentieth century. While northeastern migrants are often discriminated against due to their skin color and accents, their presence in the city has called some to refer to São Paulo as the “capital of the Northeast.” This is in spite of the Paulista elites’ long-standing attempts to situate the city as specifically not Northeastern, as a place more European (and subsequently more white) than its surrounding nation (See Alberto, 2011; de Albuquerque, Jr., 2011; Weinstein, 2015). Indeed, São Paulo’s articulation of itself as a place apart, one marked not by bikinis and beach going but instead work, consumption, and purportedly European values remains a component of the city’s mythos. São Paulo highlights the diverse nature of Brazilian cities, which are often reduced to easy characterizations of favelas, beaches, kleptocracy, and violence. São Paulo has no beach; instead, as the saying goes, it has shopping malls.
In the years following the coffee boom in São Paulo, the city continued to expand but its growth was largely kept close to its original extent due to the topography of the city (See figure 4.5). Between the 1890s and around 1940, the city’s population grew but the city’s area did not change much; instead, the city densified along the Tamanduateí River and into the Tietê River’s floodplain (Caldeira, 2000: 215; Jorge, 2006; Kogan, 2013). In the years following the 1930s (see next chapter), the city began to expand past its original form and incorporate new territory as its industrial economy continued to expand. As São Paulo grew, the inequality at the heart of Brazilian society began to spatialize in the form of a dramatic disconnect between the city’s historic center and its expanding periphery, one that was made manifest by the “legal ambivalence” that characterized the state’s approach to the emerging periphery (Caldeira, 2000: 218). This juxtaposed the city’s broadly well-resourced and formalized core with its outlying neighborhoods that grew largely without state involvement.

While peripheralization is tied into broader structural dynamics of informality and uneven development, the peripheralization of Brazilian cities is both an active and passive process. As Raquel Rolnik notes, “[peripheral residents] are there as a result of policies that, instead of offering adequate housing, incentivized the occupation of the peripheries in exchange for votes and political support” (Uchinaka, 2009). These created patchwork settlements, where infrastructural provisioning was not universal. The periphery is structural, too, a product of global inequality and broader patterns of resource extraction and dependency (Cardoso and Faletto, 1979). For Brazilian urban critics and thinkers, the periphery results from the history of land inequality in the country. It is an expression of what Erminia Maricato (2015) refers to as “cities on the periphery of capitalism,” where low salaries combine with oligarchic and unequal land tenure regimes [latifundio] to push residents
into the territories that are effectively left over, the marginal spaces that exist outside of the formal property market.

For Holston (2008), peripheralization is a product of Brazil’s long-standing pattern of differentiated citizenship. This unequal model of citizenship gives certain rights to some and withholds them to many, and is rooted in the patterns of land ownership instituted by the Portuguese in the colonial era. For Holston, the withholding of property to most Brazilians had the effect of making legal land ownership the exception rather than the rule, “making illegality if not the norm than the predominant condition of settlement (2008: 113). This dates back to the Portuguese colonial era, in which the *seismaria* system was implanted. This system centralized land ownership in the Portuguese crown, and gave use rights to individuals only if they were willing to productively use the land. Due to the distance of the Portuguese crown from Brazil itself, this instituted a system of considerable confusion, in which claims to land were often impossible to properly sort out. When combined with the sheer size of the land grants given to specific individuals—many of whom never set foot in Brazil—this produced a tangle of ownership claims that were often mediated by fraud [*grillagem*] and violence. This allowed for Brazilian elites to use violence in the service of property, a practice that would mark not just the famous land disputes of the Brazilian backlands but also disputes over the right to the city in more recent Brazilian history. As Holston (2008) details, the lack of clarity over ownership claims is both a means through which favela residents are made illegal and a strategy for resisting expulsion and demanding citizenship rights. Caldeira echoes this, noting that urban legislation in the first part of the twentieth century effectively determined where the law was and was not applicable. She notes:

Because the boundaries of the legal and illegal are ill-defined, the executive has the de facto authority to give the final word on land disputes and to determine legality on a
case-by-case basis. The urban laws of the 1910s established a division of the city into four zones: central, urban, suburban, and rural. Most of the laws created during that period applied only to the central and urban zones, leaving the other areas (to which the poor were moving) unregulated (Caldeira, 2000: 218).

For Caldeira (2000: 218), much of the legal ambiguity that characterizes São Paulo can be demonstrated by the development of so-called “private streets,” where legal frameworks did not apply. This meant that for much of the urban periphery the construction of infrastructure and other urban services was not legally required.

These structural dynamics are matched by specific policies and localized techno-political formations that yielded an unaffordable urban core that was made increasingly inaccessible to the city’s poor over the course of the twentieth century. For Kovarick (2009; See also Holston, 2008), the development of a peripheral urbanization in São Paulo can be traced to the development of bus transportation and dynamics of rent freezing and expulsion that occurred in the 1930s and 1940s (See next chapter). Freezing rents had the paradoxical affect of stalling the construction of rental properties, effectively denying the capacity of low-income residents to settle in the urban core. This was accompanied by broader processes of elite development, demonstrated most notably by the development of Higienópolis (“Hygiene City”). As the central city became an increasingly elite space, and as the primary mode of occupation shifted from rent to ownership, land speculators seized the opportunity to extract income from low-income urban residents no longer able to afford housing in the center (See Holston, 1991). Arriving ahead of the state, lend developers sold plots of dubious legality, often relying on false titles and confusion over land tenure dynamics more broadly. Over the course of the twentieth century, this pattern that would form the foundation of São Paulo’s expanding peripheral landscape. According to Holston (2008), the term periferia probably came into usage in the 1940s but would become increasingly popular
from the 1960s onwards as it increasingly came to symbolize the suburban areas that concentrated the city’s poor.

The process of autoconstruction [autoconstrução] emerged from this historical imbroglio of inequality, differentiated citizenship, and uneven access to land. Autoconstruction is a process in which residents slowly build homes, primarily by hand and primarily on days off from work. Beginning as shacks, informal dwellings, and even tents, decades long processes of autoconstruction in São Paulo eventually yielded consolidated housing, as residents slowly added levels, ornamentation, and extra space. Through this process, peripheral neighborhoods in São Paulo expanded throughout the twentieth century, as residents spent their days off slowly building initially simple homes of wood and tin into multi-story homes of brick and ornament. Autoconstruction is for Holston tied into a set of future concerns: it represents both a reaction to the existing material constraints imposed by an unequal city, but it also representative of a gesturing to the future (See Caldeira, 2016).

Interestingly, Holston notes that the term emerged to differentiate those who bought land on which to build from those who merely occupied (as in the case of a favela). This distinction is more discursive than explanatory though, given the unclear dynamics of land ownership and the prevalence of clientelist political relationships throughout the city. Both autoconstructed neighborhoods and favelas are examples of a form of urban growth that are largely predicated on unclear land tenure and graft. As Holston (1991) notes, “urban peripheries in Brazil generally develop through cycles of seizure and legitimation in which usurpation initiates settlement and precipitates the legalization of land claims” (450-451).

Over the course of the twentieth century, São Paulo expanded dramatically, primarily in its peripheries. As the periphery grew it also consolidated and formalized. This occurred through what Silver (2014) refers to as “incremental infrastructures,” the slow, regular
petitioning for infrastructural provisioning as a form of state recognition. Over time, this process—what Bayat evocatively (2004) calls the “quiet encroachment of the ordinary”—made possible the consolidation of vast swatches of the purportedly irregular or informal periphery (See too Makhulu, 2015; Varley, 2013). The result is a patchwork landscape that threads between the informal and the formal, where poverty coexists with decades of economic growth and neighborhood consolidation. This can be demonstrated most specifically by the spatial typology that marks much of the peripheral city in São Paulo: the “horizontal popular allotment,” a type of high-density horizontal urban sprawl (See Figure 4.6). Horizontal popular allotments are the defining spatial form of São Paulo, which result in a high-density urban agglomeration without much vertical height, with much of the construction done by hand. Visually, miles of single and double-story houses, built largely in brick and cement, mark these neighborhoods. While identified with poverty and other forms of socio-spatial marginalization, these neighborhoods demonstrate a general degree of consolidation and formalization even as patchworks of legality and illegality differentiate residents and neighborhoods. As such, they are often differentiated from the more specific favelas, where residents typically hold no title. As Caldeira (2000) makes clear, favela residents are often stigmatized not just by the wealthy but also by other low-income residents, many of who live in communities that are themselves lacking in legal provisioning and coherent land tenure. On my first trip to Jardim Pantanal, for instance, I asked someone for directions and was told that I need to be really careful when I got there, a location about five blocks away. This articulates the sorts of micro-scale geographies that characterize the urban periphery.

If the horizontal popular allotment is the defining spatial form of the periphery, its corollary in the urban core is the fortified apartment building, the closed condominium
While the closed condominium can take on divergent forms, for the purposes of this dissertation I am referring to tall, multi-story apartment buildings, often ringed by ground-flood walls and often guarded by multiple doormen [porteiros] and security guards [seguranças]. These are the defining housing typology of São Paulo’s urban center. Gated high-rises began to be constructed in the early twentieth century and they were largely concentrated in the urban core where zoning codes combined to keep apartment buildings as largely elite spaces. They are now the primary form of construction in the city, marking the city’s landscape in highly visible ways. In their privatized, fortified anonymity, the closed condominium allows for residents to escape the chaotic nature of the Paulista landscape, to avoid the sorts of violences and inequality that mark it, In his introduction to Dunker’s 2014 psychoanalytical approach to the closed condominium, Vladimir Safatle notes that this form of building (and its associated life) has become “the hegemonic paradigm of life in the national imaginary.” But as he makes immediately clear, “the dreams of the closed condominium produce monsters” (10).

These monsters range from the intimate realities of ennui and isolation chronicled extensively by contemporary Brazilian film directors and artists to the realities of segregation that intimately mark the city. As Caldeira (2000) notes, the logic of the closed condominium is a logic of stratification and a push against solidarity. It uses walls to manage increasing proximity, and creates a landscape of overlapping segregations and isolation. It is a form of “eco-apartheid” (Cohen, 2016) that marks São Paulo’s bifurcated landscape. It is both an enduring marker of the center and periphery distinction in São Paulo but also a response to the changing geographies of inequality. Indeed, as Caldeira argues, the closed condominium is in many respects a response to changing spatialities of the city that have yielded much more intimate relationships between rich and poor than previous hierarchies of distance and
proximity. It is one more instantiation of the structural inequality built into the city’s landscape as the city developed throughout the twentieth century, but it makes clear that bifurcated analyses of center and periphery are inadequate to the task of addressing São Paulo’s contemporary form.

**Changing Geographies of Periferia and the Contemporary Geographies of São Paulo**

The closed condominium and the irregular allotment represent two poles of the city’s spatiality. But as the closed condominium has spread throughout the city and come to mark many of the city’s neighborhoods, it has made clear that the patterns of center and periphery that once marked the city have changed in recent decades. In the years following Brazilian democratization, São Paulo and other Brazilian cities underwent a process that yielded more democratic political possibilities. Paradoxically, these changes were coupled with a dramatic rise in insecurity. Detailed by Caldeira (2000), this process of disjunctive democracy yielded an increasingly fortified landscape and an increasingly scattered one. In lieu of a center and periphery distinction that had long marked the city, the 1980s and 1990s continued the creation of elite enclaves (in both the center and periphery) that were coupled with a continued process of central city population loss. While the decline of the city’s historic core did not necessarily alter the broader structural inequality in the city, it did introduce new spaces and new dynamics. Throughout the early 2000s, successive attempts to redevelop the core would be met with mixed success, although processes of gentrification have been increasing in the city in recent years (See Duran, 2015).

Since the early 2000s, São Paulo’s landscape has become increasingly heterogeneous. For nearly two decades of center-left governance, Brazil has undergone a transformation that has lifted millions out of poverty and dramatically reconfigured the economic landscape of the country. The result of this has been, in part, an increasing formalization and economic
vitality for residents of the periphery, who are increasingly tied into circuits of capital that were previously out of reach. This is a product of specific state attention—specifically, the two decades of worker’s party [PT] led rule at the federal level—and also broader macroeconomic trends. Important too have been the incremental politics of infrastructural demand and the urban reform movements of the 1980s and 1990s. This process of formalization has yielded an urban dynamic that pushes past broad definitions of center/periphery towards a more heterogeneous and networked intermeshing of poverty and wealth in the city (Rolnik, 2015: 265; See Also Caldeira, 2000). This has produced a plural understanding of periphery that both understands the fissures that exist between and within specific peripheral communities and the movement of wealth out of the urban core into satellite communities. As Kovarick (2000:43) notes: “Peripheries…in plural.” While vulnerability continues marks the urban periphery writ large, residents of peripheral neighborhoods have benefited from increased investment and income in the last two decades. As Rolnik (2015) argues, “The decades of progressive consolidation of popular territories – favelas, peripheral allotments and housing projects – do not allow us to speak any more about dual space, marked by the difference center/periphery” (265).

The differing typologies of the irregular allotment versus the closed condominium show that inequality has not disappeared but its geographies have changed. Spatial heterogeneity does not mean that the city’s inequality has dramatically improved. In the case of housing, the financialization of the real estate market has yielded a landscape where the costs of living have dramatically outpaced wages, for instance, yielding a city that is some metrics more inaccessible than in decades past (See, for instance, Boulos, 2015; Rolnik, 2015). Indeed, in 2010, roughly 11% of the total population of the city of São Paulo still lived in favelas (Rolnik, 2015: 277). Additionally, while economic growth has meant that
peripheral residents have increased their material comforts, this has not necessarily been reflected in the broader communities that they inhabit in the form of better schools, medical centers, or other markers of public investment. As such, inequality remains a marked (if not defining) feature of the urban landscape, and arguments about peripheral disinvestment are taken up regularly by activists, artists, and state representatives in the city. As the mayor of São Paulo Fernando Haddad noted in 2012, “Life improved from the front door to the inside of the house. Now, we need to improve life outside of the front door” (Bombig, 2015).

The case of security is here illustrative here. São Paulo has witnessed a dramatic reduction in violence in the last 10-15 years, but these reductions have not necessarily yielded an increased sense of security for peripheral residents. The formal decline in violence is certainly good news, and São Paulo is actually one of the safer major cities in Brazil at the moment, but this apparent safety ignores the complex ways in which violence has been consolidated in the urban periphery. As Willis (2015) notes in his analysis of policing in the periphery of São Paulo, a consensus on killing has taken place, one that trades sovereignty between organized crime (specifically the Primeiro Comando da Capital or PCC, one of the primary organized crime groups to emerge in the years following democratization in the 1980s) and the police. While this has reduced levels of violence more broadly in the city, it has done so through the consolidation of power in the hands of violent state and non-state actors (including the PCC and the police, as well as militias). The result is a precarious situation that is deeply insecure in a broad sense, even as rates of violence have declined per capita. Furthermore, residents of the urban periphery, specifically young black men, are murdered by the police at astonishing rates, and police too are killed with alarming frequency. Indeed, the periodic massacres that mark the urban periphery make clear that
safety in São Paulo is a relative term, one by no means shared by those deemed killable by police logics (who are almost exclusively poor, black, and young). For Alves (2013), São Paulo is a black necropolis, where “black bodies are exploited in low-paid jobs, segregated in favelas, incarcerated, beaten, killed, dismembered, disposed in trash cans, burned and discarded to later resurface as bones in what [he] name[s] macabre spatialities (324; See also Mbembe, 2003).

Alves makes clear that peripherality—and its racialized geography—both marks the city in a material sense but is also central to the discursive claims made on behalf of the city’s landscape and political dynamics. While definitions shift and mutate, the discourse of periphery and peripherality continues to mark the urban question in Brazil more broadly. As a stand-in for a broader category, the term has become a means of articulating a broad set of politics related to class, race, and geography and is increasingly marshaled by activists in search of affordable housing, against police brutality, and through demands for better public transportation. This has provided impetus for extensive cultural production (and investment), seen through the production of diverse styles including hip-hop, funk (and its ostentatious variant, funk ostentação), poetry, and marginal literature. Periferia is more than just a category; it is an identity and a deeply political utterance regularly marshaled by urban residents.

The changing geographies of center and periphery can be illustrated by changes in cultural production and peripheral visibility in recent decades. The capacity of the urban periphery to represent itself is itself a product of changing economic realities. Economic growth and expanded access to resources on behalf of urban residents have yielded a city that is increasingly accessible. Peripheral urban residents, long segregated from the center, are now increasingly visible in the urban core. For Caldeira, this new capacity of once
peripheralized residents to mark the center city—to imprint upon it, in her terminology—is a product of the dueling dynamics of democratization and fortification that have shaped Brazil’s transition to democracy. For her, new spatial practices—in particular a Paulista variant of graffiti referred to as pixação and the mobility of low-paid delivery drivers known as motoboys—is a result of the slow undermining of previous hierarchies that framed everyday practice” (2012: 389). The forms of (gendered) cultural production that she highlights play on the notion of peripherality and make claims on the city’s landscape more broadly. Caldeira considers these interventions forms of dissensus, claims to citizenship on the part of those previously marginalized. Yet the politics of these claims are complicated: in her analysis, motoboys and taggers lay claim to space but also re-enforce inequality, and these interventions lack more formal political claims to rights. Furthermore, the project of citizenship remains incomplete, given the continued realities of inequality, crime, and environmental injustice that plagues São Paulo’s peripheral residents. In a 2016 lecture at the AAG, for instance, Caldeira noted that economic growth in the periphery has presaged a move away from collectivist politics of consumption towards more individualist attempts at buying into consumer society. These transformations are as much gendered as they are classed, a product of increasing amounts of women in the workforce.

Caldeira’s project, then, calls attention to the changing modalities through which claims to belonging—or, perhaps more broadly, claims to visibility and presence—are articulated by peripheral residents. While the 1980s and 1990s saw the emergence of rights-oriented claims made through the vocabularies of organized social movements and the related technologies of auto-construction, which were given cultural vocabularies via politicized rap and hip-hop in the 1980s, contemporary peripheral cultural production takes on a different form. For Caldeira, the institutions that marked peripheral expression in the
1980s and 1990s were primarily neighborhood associations, trade unions, and Catholic base communities. These are, in her articulation, specifically political institutions, versus what she refers to as “mass demonstrations that are not directly political” (2012: 401). Here, she is referring to what could best be seen as specifically cultural or identity-based expressions, including the city’s pride parade (the biggest in the world, and one largely attended by working-class youth), the ubiquitous graffiti known as pixação, and other forms of cultural expression including music and street art (See Siwi, 2016).

For Caldeira, the shift from political to cultural forms of expression is representative of changing practices of signification, a breakdown in the formal vocabularies of peripheral cultural mobilization that speak to the changing nature of Brazilian democracy and the increasing refusal of peripheral urban residents to stay invisible or subservient. She notes that taggers, for instance, “have no intention of emphasizing dignity, citizenship, law, or rights, as was the case with urban social movements” (405). Instead, their forms of intervention are predicated on what Rancière might call dissensus, a fracturing of the formal partitioning of bodies and space, of sense and sense (2010: 139). While the divide between center and periphery may have once made the periphery invisible, it now functions to bring low-income residents in but often specifically as peripheral residents. As such, center and periphery distinctions remain marked socially even if their geographies are altered.

This can be seen through an analysis of the rolezinho phenomenon that occurred in 2013 and 2014 (See Vargas 2014). Organized via social media by young people in the urban periphery, rolezinhos [translated in Vargas (2014) as “cruises” or “little strolls”] brought hundreds of young, often dark-skinned teenagers to São Paulo’s shopping malls (referred to as shoppings). Shoppings, which began to emerge in Brazilian cities in the 1980s in response to the rise of violent crime, have functioned as de facto public spaces for those able to
 afford them, allowing for wealthier urban residents to drive, park their car under the
watchful eye of surveillance, and shop, eat, and socialize in controlled environments. The
sudden appearance of hundreds of young people who clearly did not belong due to their
class, age, and race caused a public outcry, and commentators fumed over the invasion of
shopping malls by “criminals” and “bandits.” Echoing a broader engagement with urban
space formulated by residents of the urban periphery, rolezinhos and their cultural
counterparts in the form of funk, hip hop, and poetry are suggestive of the ways in which
residents of the urban periphery have laid claim to the urban landscape and made extensive
claims on the city’s political and cultural life in recent decades (See, for instance, Caldeira
2000, 2012; Pardue 2007, 2010; Vargas, 14). Rolezinhos also laid claim to the landscapes of
fortification that mark the city, and the articulation of politics oriented around inclusion
specifically in a consumerist vein (See Rolnik, 2015). As such, they are ambiguous
articulations of politics, markers of an insurgent citizenship oriented around new
vocabularies of transgression that remain to be decoded.

Outside of the cultural sphere, we can see changing geographies of center and periphery
in terms of housing provisioning as another marker of the changing geography of the city.
Between 2009 and 2014, for instance, the federal government of Brazil allegedly delivered
3.5 million homes through the Minha Casa Minha Vida [My Home My Life] Program. A
program of state-funded housing development, MCMV subsidizes private construction firms
to develop public housing complexes. At the same time, the state of São Paulo claims to
have built around 30,000 housing units per year in the first decade of the 2000s (Bulkeley et
al, 2014). These programs have dramatically reconfigured the landscape of many Brazilian
centers, and in a fundamental sense put many Brazilians into homes. Yet the form in which
these homes were constructed, there location often deep in the urban periphery, and the lack
of an urban vision to cohere the projects has yielded a complex legacy that is by no means strictly positive (See Rolnik, 2015). Indeed, the quality of MCMV apartments located in the extreme periphery is a considerable problem for broader patterns of inequality and sustainability in the city. In São Paulo, this is especially marked due to the high rates of vacancy in the urban core, where hundreds of thousands of habitable apartments remain tied up in real estate speculation and vacancy. Furthermore, the expansion of financialization into the housing sphere and the justification of large-scale removals of low-income populations that was legitimized by the existence of subsidized housing renders the legacy of MCMV even more unclear (See Rolnik, 2015).

The changing dynamics of *periferia* and subsidized housing are just one example of the changing modes of life in São Paulo, another demonstration of the heterogeneous yet still deeply unequal geography of the city. Explaining the city in binary terms is no longer sufficient to explain the overlapping geographies of inclusion and exclusion that mark the city, and the city’s vitality requires fine-grained analysis that extends past dystopian readings of the city’s bifurcated landscape. São Paulo remains a brutally uneven place but the forms in which its inequality materializes continue to shift.

**Conclusion: São Paulo Going Forward**

In this introductory chapter, I have attempted to use the changing geographies of center and periphery to tell a story of São Paulo’s spatiality, to understand how its enduring inequality continues to mutate over time. These dynamics continue to shift, especially given ongoing political dynamics at the federal level and the impeachment of Dilma Rousseff in 2016. São Paulo has been governed since 2013 by Fernando Haddad, who is only the third worker’s party mayor to govern the city since the election of Luiza Erundina in 1989. Indicative at the time of his election of a tentative process of post-neoliberalism in much of
Latin America, Haddad is a left technocrat, an ally of both social movements and intellectuals who holds a PhD in philosophy from the University of São Paulo. After four tumultuous years in office, Haddad is a deeply unpopular mayor, seemingly reviled by both the rich and the poor. Indeed, on a visit to the favela of Paraísopolis in 2016, I was told by the president of the resident’s association that he was the worst mayor the city had ever had for residents of the periphery. This, of course, was a politically motivated statement, but one that makes clear how certain alliances frame the city’s political life. Haddad was soundly defeated in his reelection campaign in 2016 by João Doria, a millionaire and star of Brazil’s version of *the Apprentice*.

In spite of his electoral loss, Haddad’s mayoral administration existed alongside broader shifts in São Paulo’s landscape that have shown nascent moves away from fortification and auto-centricity towards better public transportation and transparency. While initially slow to pick up on the energy of the protests that marked urban Brazil in June 2013, Haddad nevertheless instituted some far-reaching changes to the city’s landscape. His central focus was on mobility and an attempt to move away from the city’s famed reliance on the private automobile. This took the form of a reworking of the city’s bus lines through the development of dedicated bus corridors and expanded funding, as well as the implantation of a network of (highly polemical and contested) bicycle lanes throughout the city. During his administration, the city constructed 506 kilometers of exclusive bus lanes and 400 km of bike lanes.

Crucial too to Haddad’s administration was the passage of the city’s strategic plan, which passed in 2014 after 114 public meetings and over a year of activity. The final passage of the Strategic Plan—which occurred while the city council was occupied by Haddad-allied housing movements—is a tentative step towards a more egalitarian and more democratic city.
(See Pardue, 2015). The PDE’s central mission is to alter the center and periphery dynamic through investment in the periphery and further densification of the center, and the proposal is based around an attempt to constrain private development through initiatives like the solidarity quota and the environmental quota. The former demands that buildings over a certain height must dedicate a certain percentage to subsidized housing while the latter calls for the incorporation of specific environmental functions into every new property. If followed and implemented, the strategic plan could yield a potentially more egalitarian city. Unfortunately, given the electoral dynamics of the city and the continuing political power of developers and other growth machine actors, it remains to be seen what of the plan will actually be implemented.

Yet even if ultimately the plano diretor will not generate the sorts of progressive changes it advocates, its passage calls attention to many ongoing dynamics in the city. Specifically, it calls attention to the renewed attention being paid to the city’s long-marginalized public life, as well as broader questions about sustainability and housing inequality that have become increasingly visible in recent years. Indeed, if one word can be used to describe São Paulo’s contemporary political life, it is the word occupation [ocupação], which seems to animate a variety of conflicting yet linked ongoing processes. Occupation coheres much of what is currently happening in the city, from the occupation of abandoned skyscrapers in the urban core by housing movements to the dramatic upsurge in urban interventionist art and practice throughout the city. Even the emergence of street carnival in São Paulo, which has grown explosively over the past decade, is a testament to a growing interest in city spaces and landscapes on behalf of urban residents. After decades of fortification, violence, and inequality, the time I spent in São Paulo from 2011 to 2016 were suggestive of a vital, inspiring landscape in which physical presence in the street was a central demand of many
activists, artists, and residents. This does not overshadow the violence and inequality that continues to mark the city, but it does make clear that there are many for whom São Paulo is the only place they can imagine living in. Take, for instance, Guerra’s 2015 manifesto, a symbol of what you might call a kind of contemporary urban boosterism:

We were prohibited from loving you, São Paulo.

Enough. Perhaps this atavistic relationship of hate fills our eyes with cataracts and we can not yet name this emergency, but we did, with deserved historical distance. We occupied the streets with food, with music, with art, with movies, with life in all its power. We saw in the ugly the beautiful, we stopped being afraid of the street, which appears as an axis that begins to coalesce around itself as a new identity of the Paulistano. We fought tooth and nail for a piece of land that until then was no more than a parking lot and called it a park [Parque Augusta]. We turned a scar caused by militarism into a space to teach new paulistanos to ride a bike. We occupied places that we had never seen and recovered the avenue from the hands of bankers. We will be tourists in the city we inhabit. We no longer accept this hatred, this permanent state of war, the need to beat out the other daily.

São Paulo is a city in the future: post-apocalyptic, radioactive, dry, where one day money and work will not be the only imperatives of social life. When the world trembles, all cities will be similar to ours. From chaos and ugliness will emerge a beauty that only we who reject your idea of beauty will see. We want the street, we deny your heroes, your monuments, your cars, your ways of life. It might take us decades, but we will do something beautiful with the debris that we inherited and we will make a city, not an abstraction called São Paulo. We will occupy every crevice, every crack, every hole of the gray city. Here ends this cycle of hatred and opens the possibility of a new beginning in the relationship with São Paulo (Guerra, 2015).

Or, to put the moment into the language of the state itself, we can highlight the city’s own promotional materials, which celebrate São Paulo’s gritty, imperfect landscape. In a video documenting the city’s current landscape and the recent changes, the narrator notes, “We’ve already been the land of drizzle, of building and of cars / Now we’re the land of reinvention…Nothing is perfect, nothing is resolved / Because here, man, this thing is alive.”

These forms of cultural occupation and resignification exist uneasily with the continued demands by surging housing movements for more public housing and a stronger
commitment to housing on behalf of the state. And the cultural politics of the city overlap uncomfortably with questions around gentrification, real estate development, and the increasing privatization of the urban landscape that has accompanied the ongoing surge in urban intervention and occupation. National politics are increasingly complex too. Budgetary shifts at the federal level pushed through by the Temer government have dramatically reduced the funding for subsidized housing, even as the Haddad administration released in July 2016 a comprehensive plan for managing housing in the city. The cultural politics of São Paulo’s remaking also coexist unhappily with the city’s enduring conservatism, its violent police culture, and the neighborhood associations who police street life in fear of crime and degeneracy. Important too are the broader dynamics of debt that structure many of the city’s projects and complicate funding priorities. Peripheral residents have argued throughout the recent administration that in lieu of important structural projects in the outlying neighborhoods, the mayor’s office has focused on visible, low-impact projects designed to serve central elites.

All of this is to suggest that the future of São Paulo remains to be written, and the present moment is one in which many categories and long-standing realities are being debated. Take, for instance, one of the defining images of the city, Tuca Vieira’s photography of the favela of Paraísopolis (figure 4.8). This famous image juxtaposes an elite housing complex with the favela next door, a favela that presumably provides the labor required to attend to the residents of the apartment building. Vieira’s image is a visual demonstration of stark inequality that has circulated globally, becoming in many respects the defining image of the city. Yet Vieira’s image also gestures at the complex geography that marks the city. Not just a representation of the city’s overall pattern of class-based segregation, Vieira’s image is also representative of the importance of perspective and
positionality in how the city is experienced. When juxtaposed with a different image of the same building (Figure 4.7, 4.9), for instance, one gets the sense that micro-scale geographies matter in the city. To reduce São Paulo to one story is to gloss over all the cracks in that narrative. The hope is that this dissertation will help to fill in some of those cracks.
Figure 4.1. São Paulo landscape: Centro, 2014. Photograph by the author.

Figure 4.2: São Paulo Landscape: Avenida Paulista closed to traffic, 2015. Photograph by the author
Figure 4.3: São Paulo Landscape: Home in Butantã, São Paulo, 2015. Photograph by the author.
Figure 4.4: Socio-Economic Profile, São Paulo. Green indicates higher economic capacity, orange indicates lower. Broad center/periphery distinctions can be discerned from the data. Jardim Pantanal is located in the far right corner (in the district of Jardim Helena). Image adapted from the Environmental Atlas of Sao Paulo. Available at: http://atlasambiental.prefeitura.sp.gov.br/pagina.php?id=25
Figure 4.5: 1897 Map of São Paulo. Image courtesy São Paulo Municipal Archive.

Figure 4.6: Horizontal Popular Allotments, Itaim Paulista. Photo courtesy Euclides Mendes.
Figure 4.7: Closed condominiums in the background of the Paraisópolis favela. Photograph copyleft Daniel Aldana Cohen. Reproduced with permission.

Figure 4.8: Tuca Vieira, A foto da favela de Paraisópolis. Reproduced with permission from the artist.
Figure 4.9: Paraisópolis. Photograph by the author.
Chapter 5: Becoming Impermeable: The Creation of São Paulo’s Hydrological Landscape

Introduction

In the summer of 2009 and 2010, communities on the extreme eastern edge of São Paulo were flooded for nearly forty days. In a 2011 online publication entitled *This is Not Normal* [Isso não é normal], one can watch nearly thirty minutes of footage of the neighborhoods under water, shot from an unmoving camera. Over the course of the video, which largely focuses on a submerged car and highlights the continuous and unceasing rainfall that often characterizes São Paulo’s rainy summer, one sees residents wading through the water on the way to work, men leaving and arriving by boat, and more scenes of banal daily life in the urban periphery of São Paulo. In its banality and distanced, almost automated gaze, the video is a document of a ritualized and regularized disaster, a slow-motion breakdown in an infrastructural system that stranded residents, damaged and destroyed houses, and exposed residents to heightened levels of toxicity for 47 days.

While it is correct to assert that this is not normal, at least by any normative standard of justice or a right to a healthy environment, the history of São Paulo shows that in fact flooding is a particularly normal component of the city’s life. While the flooding in 2009 and 2010 was perhaps the most dramatic instance of recent flooding in the city, flooding has marked the city since its inception (See Custódio, 2011; Jorge, 2006; Kogan, 2013). São Paulo is, in the words of a series of architects at the University of São Paulo, a “fluvial metropolis,” one that exists in a dynamic and politicized relationship with its primary river, the Tietê, and the hundreds of tributaries that flow into it. All residents experience flooding, but effects are differentiated due to class and residential geography. Floods’ effects range from serious inconvenience for the residents of wealthier central neighborhoods to the
possibility of total devastation for residents of the urban periphery, many of whom live in close proximity to the city’s waterways due to their disconnection from the city’s formal property market.

While the city and state have invested considerably in flood prevention infrastructure over the last five decades, the continued expansion and impermeabilization of the city, its location in a floodplain, and the changing dynamics of the city’s microclimate mean that flooding remains a considerable threat for low-income populations. Indeed, due to the city’s pollution and heat island effect, recent decades have seen a shift from a city defined by overcast skies and light drizzle to a city marked by high temperatures and intense rain events. From 1930 until the present, intense rainfall events have increased every year, furthering the flood dangers of the city’s humid, subtropical climate. The problem of flooding is increasing, prompting increasing concern about the city’s ability to withstand global climate change and the more localized effects of urban pollution and changing temperatures. As organizations like the World Bank as well as local favela resident associations make clear, the poor are most at risk of global climate change, and much of São Paulo’s urban periphery live in situations of considerable vulnerability. The municipal government estimates that over 800,000 domiciles in the city are located in areas of environmental risk. A 2011 study by the federation of industries in the state of São Paulo estimated that each month with above average rainfall cost industries $1.3 billion dollars (Matuck, 2011).

This chapter supplies a broad introduction to São Paulo’s hydrological landscape, a complement to the previous chapters’ broader introductions to the city’s social landscape. This chapter is designed to tell a story of São Paulo’s growth through its hydrological infrastructure, which overlaps with the city’s social environment in intimate ways. In a sense, I am following the model put forth by Bakker (2010), in order to understand what they call
the “techno-politics of urban water governance” (Location 2325 in Kindle version). I focus on dueling processes that yielded a profound impermeabilization of the city’s landscape: the overdevelopment of the central floodplains, and the marginalization and underdevelopment of peripheral floodplains. These dueling dynamics of floodplain governance yielded two versions of impermeability, one elite and one poor. Wealth-induced impermeability brought on by a desire to maximize developable land was matched by a broader lack of attention given to the urban periphery, where neighborhoods marked by auto-construction would modify the region’s underlying landscape in different but related ways. The result is a form of urban space that gives no room to water but is produced through distinct but interlinked processes. As the city has continued to grow, this continued impermeabilization of the city’s landscape has resulted in increased flood pressures as the city’s weather and climate patterns have shifted. Waterways that were once small streams have become larger rivers, buoyed by household sewage and the increased water usage that accompanies population growth. This has yielded a consistent problem of flooding that threatens to worsen as the city’s micro-climate becomes hotter and wetter. Through dueling processes of impermeabilization—both rich and poor—São Paulo’s landscape cannot accommodate the water that flows through it.

The Geography of Urban Flooding and the Perils of Impermeability

In 1945, geographer Gilbert White famously noted that, “Floods are ‘acts of god,’ but flood losses are largely acts of man.” This claim would provide one of the defining statements for the hazards school, a mid-century research program that focused on environmental risks and remains a potent form of contemporary scholarship in geography. White’s claim offers two important truths: first, to put his words into a more contemporary register, White suggests that floods are socio-natural processes, or that, “there is no such thing as a natural disaster” (Squires, 2006). This is due to the fact that flooding is intimately
related to broader dynamics of vulnerability and inequality that mark flood prone landscapes and render specific populations more at risk. As such, the effects of flooding are experienced in uneven ways. Second, White’s statement calls attention to the fact that flooding and flood losses are two distinct phenomena. Flooding is a normal component of fluvial processes. As such, in an anthropocentric sense, flooding only becomes a problem when it intersects with the human built landscape and broader dynamics of vulnerability that characterize cities and landscapes (See Mustafa, 2005; Cutter, 2006). Flooding, then, is a socio-natural process in two registers: First, the effects of flooding are differentiated by class, geography, and identity more broadly; And second, flooding (and its effects) are produced through engineering practice and other attempts at water management that overlap with historic patterns of settlement and land use. As such, the culpability for flood management is complex, tying together long-standing histories of water management and land use with political and social dynamics of specific landscapes. Flooding is a socio-natural process of assembly that involves human social organization alongside hydrological and climatic processes (See Orsi, 2004).

Flooding is an increasing problem for many cities, especially those in the global south. As the effects of climate change are becoming visible in places like Miami, Florida, and Jakarta, Indonesia, coastal flooding is already reconfiguring urban geographies on a global scale. In the wake of storm-induced flooding in New York City and New Orleans, coastal floods are enrolling billions of dollars of investment into flood-prevention infrastructures and landscape design. Coastal flooding, which typically results from storm surges but is increasingly a product of changing tide dynamics, presents complex challenges for cities due to the fact that it is altering long-standing patterns of settlement and occupancy. The
management of coastal flooding is leading to complicated questions about the politics of sea level retreat in a changing climate (Koslov, 2016).

As a city located seventy kilometers from the coast, São Paulo is affected not by coastal flooding but rather pluvial and riverine processes. This refers to flooding that occurs as a result of river overflow and heightened precipitation. Urban riverine or pluvial flooding occurs through the relationship between precipitation and impermeable land use. When rain falls in a forested landscape, the bulk of the rain that falls is either absorbed into the ground or returns to the atmosphere due to evapotranspiration. Modified or urbanized landscapes, on the other hand, drastically lower the absorption rates. The result is a dramatic increase in runoff, which yields increased flood possibility due to heightened flood peaks. Reduced permeability results in what Karvonen (2014) calls a “‘flashy’ hydrological regime, with higher peak flows in receiving waterbodies that increase flooding and bank erosion processes, threaten habitat for vertebrate and invertebrate populations, and lower baseflows during dry periods due to depleted groundwater volumes (11).” This makes clear that while flooding is a complex process, one that ties together the built environment with riverine processes, the historic production of an impermeable landscape is one of the central factors in contemporary urban flooding.

My intention here is not to simplify the complex hydrological dynamics that result in increasing flood activity, but to make clear that the problem of flooding is fundamentally a problem of finding space for water. As engineer Canholi (2005) notes, “…urban drainage is fundamentally a question of the ‘allocation of spaces’” (15). The impermeability of urban landscapes is dramatically related to the broader management of flooding in contemporary landscapes, and enrolls the broader management of the city’s landscape into its capacity to manage precipitation and flooding. As such, historic approaches to stormwater management
have largely focused on the capacity of urban drainage systems to remove water, and have involved technologies of rectification and channelization whose primary purpose is to speed the flow of water (See next chapter). The corollary to removal is retention, the capacity of the urban landscape to accommodate water in specific places in order to reduce damages and dangers of flooding. In recent years, a turn towards retention has been suggestive of an ongoing paradigm shift in stormwater management at a global level (See chapter 6).

Locating São Paulo

São Paulo is located in the drainage basin of the Tietê River, roughly 70 kilometers from the coast of the Atlantic Ocean on a plateau that is around 800 meters above sea level. It is located in a humid subtropical climate, with an annual rainfall rate of 1,441 mm per year that largely falls during the summer. Located at the point of contact between the Tietê River and two of its tributaries, the Pinheiros and the Tamanduatei (as well as the Aricanduva, located to the east of the city’s center), São Paulo grew in the space between rivers. Both the Pinheiros and the Tamanduatei flow into the Tietê, which then flows westward out of the city and into the interior of São Paulo state. Instead of flowing directly into the ocean, 22 kilometers away from its source near the town of Salesópolis, the Tietê instead winds westward, flowing through the city before eventually discharging into the Paraná River, 1,150 kilometers from its source. The water that flows through São Paulo and into the Tietê eventually enters the Atlantic Ocean via the Rio de la Plata in Argentina. São Paulo is located not at the end of the river’s course, but instead at its beginning.

As such, due to the city’s location in the headwaters of the Tietê, the flashiness of the river has historically led to flooding during high flow and insufficient water supply during extended periods of low flow. What this means, more broadly, is that São Paulo is crisscrossed by hundreds of rivers but that water scarcity is and has been a real problem
since the city’s founding (On the history of water management in São Paulo, see de Sant’Anna, 2007; Jacobi, Fracalanza & Silva-Sánchez, 2015; Jorge, 2006; Abers & Keck, 2014; Seabra, 1987; Ribeiro, 2011; Silva, 2012). This was exacerbated by the city’s explosive growth throughout the twentieth century. The Alto-Tietê basin, in which São Paulo is located, has an estimated water availability of around 200 m$^3$ per inhabitant per year, dramatically less than the international standard for water stress of 1,500 m$^3$ per inhabitant (Silva, 2012: 112; See also Porto, 2012; Ribeiro, 2011). The state of São Paulo’s water concern [The Basic Sanitation Company of the State of São Paulo, hereafter SABESP] estimates water availability in the region to be around 150,000 liters per residents per year, or around 150 m$^3$. This puts São Paulo on par with the famously dry Brazilian northeast, and puts residents of São Paulo, who make up ten percent of the total Brazilian population, at risk of absolute scarcity even under normal conditions.

In terms of drinking water (See chapter 8), the result is that like other places where water stress is chronic, a system of intensive infrastructural provisioning is necessary to manage and supply water. Water has to come from somewhere else. São Paulo’s water needs are subsequently met by three primary reservoir systems: the Cantareira, located to the north of the city, which provides for 45% of the city’s water needs, the Alto-Tietê, located to the east of the city, which provides 20.5%, and the Guarapiranga, located in the southern periphery, which provides 19% (See Figure 5.1). Each reservoir system is itself a system of smaller reservoirs, and the rest of the city’s water is provided by three smaller systems (Cotia, Rio Claro, and Rio Grande). Before being distributed to the population, water from these reservoirs is treated at eight treatment stations scattered throughout the region. Most dramatically, Guaraú, which treats the water from the Cantareira system, is responsible for supplying water to roughly nine million people.
São Paulo’s propensity towards scarcity occurred in spite of the fact that São Paulo’s history is intimately linked to the broader fluvial dynamics of the city, which provided the early transportation infrastructure for both its agricultural and industrial development.

Indeed, the early name of the city—São Paulo da Piratininga—is a reference to the Tupi-Guarani word for ‘dry fish,’ a reference to the fish left to die when floodwaters expanded out of the Tamanduatei’s river channel (See Kogan, 2013; Jorge, 2006). São Paulo’s early development was intimately linked to its status as a particularly watery city, a place crisscrossed by hundreds of small streams and rivers, many of which were flood prone. The city’s early growth occurred on the banks of the Tamanduatei. There, on the banks, where railways had been used to transport coffee from the city’s hinterland to the coast, industrialists began to locate factories and working-class neighborhoods in the second half of the nineteenth century. Throughout the late twentieth and early twenty-first century, the city would expand from the banks of the Tamanduatei in all directions, ultimately yielding a massive urban agglomeration that far exceeds its original spatial extent.

Early representations of the city make visible the fluvial landscapes that are now largely invisible, such as Benedito Calixto de Jesus’ 1892 watercolor, Flood in the Carmo Valley [Inundação da Várzea do Carmo] (Figure 5.2), painted in 1892. The painting depicts the flooded Carmo valley and highlights the lack of development along the river’s bank. By depicting São Paulo in the midst of floods, the image makes clear that flooding was both worthy of documentation but also regularized, and highlights a landscape that had yet to develop into the city’s floodplains (See Figure 5.3). This was a landscape that lived with flooding, in a sense, preserving space for rivers to exceed their banks. Like other historical studies of São Paulo’s fluvial landscape (See Jorge, 2004; Sant’Anna, 2007), Benedito’s image calls attention to the central presence of water within the city at its inception.
This is in spite of the contemporary invisibility of waterways in the city, most of which have been channelized and rectified and are often hidden from sight, or narrated more as conduits for sewage than pre-existing rivers (See next chapter). The result is that the fluvial topography of the city is often invisible to the contemporary eye, but is present in the urban fabric in unexpected ways. Take, for instance, the ladeiras [ladders] that mark the city: sharp, steep inclines that connect parts of the city that are at different altitudes. These ladeiras are landscape reminders of pre-existing ports that brought people and goods to the city, and they highlight the original river valleys that crisscrossed the city and are now largely buried beneath avenues. Or take the viadutos, bridges that crossed over the city’s streams and rivers. By the early twentieth century, these had come to be seen as icons that marked the Paulista landscape. Yet, in their present form, these viadutos cross over landscapes that are no longer obviously riverine, with the river channels often buried below ground and covered over by a freeway. I could also highlight the nominal subject of this dissertation—flooding—a hyper visible reminder of the fluvial processes that pre-existed the city’s development. For many environmentalist groups, flooding constitutes a form of revenge on the part of a mistreated underlying nature.

The fluvial underpinning of the city can be more expansive, overlapping with broader structures of class and location. São Paulo’s social geography is linked to its hydrological foundations, and evidence of underlying fluvial processes can be often heard by the sound of water coursing through buried stream channels. The city is marked by the persistence of its rivers even as they have been rendered out of sight. For the activists of Rivers and Roads [Rios e Ruas], for instance, finding the city’s waterways is a sensorial process, requiring a willingness to listen for the sounds of running water, the presence of unexpectedly lush vegetation, dips in the road, and gaps in the built environment (See Chapter 9). These
sensorial engagements allow you some access to the persistent landscape that predates the contemporary built environment, a landscape that—in the eyes of environmental critics—reappears when the rivers regularly flood. Environmental hazards mark the social landscape too, with the urban poor being disproportionately affected by watery dangers of flooding and proximity to pollution. Water in São Paulo is, in a sense, both visible and invisible, marking the urban landscape but often in unexpected or unclear ways.

**Engineering São Paulo**

This fluvial landscape slowly disappeared from view as the city expanded in the nineteenth and twentieth century. The city’s growth—facilitated by the explosive expansion of Brazilian industry in the twentieth century—was matched by a process in which the city “suffocated” its rivers, enrolling them into broader processes of flood prevention and electricity generation (See Custódio, 2011; Jorge; 2004). This occurred through a process of rectification, in which the city’s waterways were largely encased in concrete and given concrete beds. A product of flood prevention logics and a desire to increase river velocities for the purpose of sewage expulsion, the city’s rivers were subjected to command-and-control strategies of water management predicated on the large-scale engineering of urban stormwater throughout the twentieth century and into the twenty-first. For Phil Jones and Neil Macdonald, the water management strategies employed in the city are representative of what they refer to as “pre-modern” water management strategies, ones that stress repression rather than production in a Foucauldian sense. For Jones and Macdonald, water management systems have long functioned according to a logic of discipline that attempts to channel water out of the city through the central principle of rapid transit and one particular disciplinary apparatus: the pipe. This takes the form of an approach to surface water level management whose primary purpose is to ensure the rapid exit of water from the urban
landscape during rain events. As part of what Maria Kaika (2005) refers to as a “promethean project,” these strategies are designed to manage the flow of water through industrial scale construction projects and landscape modification (See, too, Gandy, 2014; Swyngedouw, 2004). By no means exclusive to São Paulo, “promethean” approaches to water management marked much of the global approach to stormwater throughout the twentieth century. In much of Latin America, the development of hydrological infrastructure would take on explicitly cultural ambitions linked to broader developmentalist projects, for instance, tied to efforts at nation building and modernization (See, for instance, Correa, 2016).

In a 2013 meeting, geographer and risk analyst Rodrigo gave voice to this, colorfully noting that, “the mayors of São Paulo thought they could cure cancer with concrete.” He was referring to the long history of large-scale engineering infrastructure in the management of water in the city, and the succession of mayors drawn from the worlds of engineering. More specifically, he was referring to the processes of rectification and channelization that have remade the city’s waterways throughout the twentieth century. Rectification, channelization, and other forms of bank stabilization measures essentially enlarge and straighten stream channels in order to increase the velocity of a storm flow (Riley, 1998: 162). Riley (1998) notes that this typically takes either the form of a culvert, in which a stream is entirely encased below ground, or an open-air, flat-bottomed channel with either horizontal or trapezoidal walls (Riley, 1998: 162). In all these cases, the purpose is to speed up the process of water flow in order to reduce the possibilities of flooding while limiting the surface area of the project due to the cost of land and materials. In São Paulo, much of the earlier hydraulic infrastructure was also oriented around sanitation concerns due to household sewage (Jorge, 2004). As the streams were slow-moving, low-volume channels, rectification would ideally move sewage out of the city faster (See Jorge, 2004).
Unsurprisingly, the environmental impacts of these projects are manifold, ranging from the loss of habitat on riverbanks to the increased sediment loads downstream. More broadly though, channelization poses complex challenges due to the inherent propensity of rivers to meander and jump channels, requiring constant maintenance and management of heightened sediment flows (See, for instance, McPhee’s classic 1987 *New Yorker* article on Louisiana’s Atchafalaya). Fixing the movement of rivers requires extensive processes of consistent maintenance that includes the dredging and clearing of river channels.

The first infrastructural intervention made into the city’s drainage infrastructure occurred in 1810. Exceptional rain events were noted as far back as 1569 and continue to reappear. The first rectification work on the Tamanduatei began in 1848, and by 1914, significant portions of the river that flowed through the city had been channelized. Over the course of the twentieth century, the Tietê, Pinheiros, and Tamanduatei would continue to be rectified, and this process would last until nearly the present. While flood prevention was a reason for early river rectification, concerns about sanitation played the primary role in early modifications made to the city’s waterways (Jorge, 2004).

This process of rectification was tied to a broader process in which the city moved closer to the city’s waterways and began to develop in the floodplains. While at first the city largely stayed away from the riverbanks due to concerns about flooding, people eventually began to move towards its rivers. The city’s early growth occurred along the Tamanduatei, which functioned as the early location both for residential and industrial population clustering. With time, the city expanded out of the Tamanduatei’s floodplain and would soon find itself hemmed in by the Tietê to the north. There, as São Paulo increasingly industrialized, the Tietê began to anchor working-class urbanism linked to railroad infrastructure. Before this, the Tietê had been a place of leisure as well as small-scale industry including fishing,
washing, and sand mining (See Jorge, 2004). Yet as the city developed and space became scarcer, it slowly overtook the river’s edges. Working class neighborhoods in the Tietê’s immediate floodplain like Bom Retiro and Lapa were essentially railroad towns, combining the functional landscapes of industrialization with the housing needs of workers. Given that these parts of the city had always been flood prone, we can see the development of a broader urban dynamics in which the costs associated with proximity to watery nature were placed on the city’s working class populations. In particular, the costs of regularized flooding were experienced most intimately by working-class communities located on the Tietê’s edge. As Jorge (2004) argues, low-income communities on riverbanks were dramatically affected by regularized flooding in the late 19th and early 20th century. As Kogan (2013) notes:

The occupation of floodplains was the product of social and natural processes – with environmental and economic origins – related to the industrialization process; a transformation shaped by the industrial capital to the landscape in order to maximize profits by reducing costs (for example, high land costs for working houses). At the same time, this became a domination tool, as the poor were segregated in special areas, paying for their own risks (59).

Within the emerging urban core, then, the floodplains of the Tietê were working-class spaces, the sites of some of São Paulo’s early and iconic neighborhoods. Over time though the function of the central várzeas would change as the rivers were increasingly integrated into the city’s emerging automobile infrastructure and its related processes of real estate speculation and development. While many of the early riverine neighborhoods would remain as iconic working-class bairros into the present, the expansion of the city outward would change the spatial form of the city in dramatic ways. Specifically, the creation of elite neighborhoods to the south of the city and the massive growth of the urban periphery would dramatically reconfigure the fluvial geography of São Paulo throughout the twentieth century.
Some of the most dramatic changes were initiated in the 1940s under the mayoral administration of Francisco Prestes Maia, whose first term lasted from 1938 until 1945. Under Prestes Maia’s plan for radial avenues in the city, developed with engineer Ulhôa Cintra, river floodplains and valleys were increasingly integrated into the city’s traffic infrastructure. This was an extension of the city’s ongoing patterns of settlement, in which railroad lines were placed in floodplains due to their level topography. Prestes Maia’s plan expanded on these nascent forms of floodplain infrastructure through the development of automobile infrastructure in river channels. Prestes Maia put roads in the river valleys for the same reason early industrialists located train lines there: they were flat. This allowed highway engineers to skirt the city’s topography and create a network of radial avenues that expanded out from the center.

Beyond strict functionality, this was a product that was predicated on a broader rationalizing and modernizing of the city’s landscape in line with contemporary ideas about nature and urbanism (See, for instance, Avila, 2014; Berman, 1988; Harvey, 2005). In parallel with other examples of high-modernist architecture and urban planning in the first half of the twentieth century, Prestes Maia’s plan constructed a radial network of highways that drew traffic out of the urban core into the expanding periphery. Specifically, by rationalizing the city’s floodplains, this project had the duel function of both rationalizing the city’s traffic infrastructure and clearing out evidently undesirable communities located in the city’s floodplains. In this, it mirrored other seemingly rational or modernist engagements with the city’s waterways that were circulating in the era, and its visual project is reminiscent of much of high modern(ist) urban planning associated with figures like Robert Moses and Le Corbusier. Like the design schemes of Moses and others, Prestes Maia’s plan would also play a profound role in the increasing peripheralization of poverty in the city. This was aided by
the dismantling of train technologies in favor of bus transportation, which allowed for a
move flexible process of peripheralization to emerge (See Holston, 2008) As a result, new
geographies of expansive, uncontrolled peripheral urbanization accompanied Prestes Maia’s
modernizing projects. This entailed a remaking of the urban landscape that valorized central
neighborhoods while laying the minimal infrastructure necessary for peripheralization.

In terms of water, Prestes Maia’s plan entailed the dramatic reconfiguration of the city’s
fluvial landscape. It deepened an approach to the city’s rivers that was predicated on their
burial and consolidation into a network of rationalized channels for sewage removal. The
first projects linked to the Avenues Plan effectively traded the city’s early rivers for its now
canonical freeways: Above the Saracura and Itororó rivers was placed the Nove de Julho and
23 de Maio avenues, and above the Sumaré was placed Avenida Pacaembu (See Júnior, 2011:
15). The rivers were buried beneath the avenues, encased in culverts [galerias], and often
covered with some form of landscaping. These early interventions would yield some of the
city’s more iconic roadways, and the pattern would persist throughout the twentieth century,
enrolling smaller tributaries into processes of channelization and rectification that marked
the city. Indeed, as Júnior (2011) notes, much of the city’s channelization of its waterways
occurred after the 1960s and intensified in the 1970s and 1980s. This had to, in part, with
changing budgetary regimes, in particular the shift from municipal to federal funding for
infrastructure projects. This meant that large sums of money could be generated from
federal infrastructure projects, which led to economic incentives towards channelization and
large-scale drainage infrastructure (Júnior, 2011). It meant too that channelization was by no
means a historic process linked to the failures of modernist planning and promethean water
management logics. Instead, channelization is a contemporary component of the city’s water
management regime. As Júnior (2011) makes clear, while the broader institutional structure
of the city’s water management changed in the 1960s and 1970s, very little changed in the way that drainage was managed at the municipal and state level. This was intimately tied to the broader densification of the city’s landscape; as the city densified and put pressure on the pre-existing floodplains, the rectification of the city’s waterways became increasingly urgent. According to a 1974 study predicted by the mayor’s office in conjunction with the municipal planning secretariat [Empresa Municipal de Urbanismo], only one of the 130 sub-basins in the city would have its rights to vegetation preserved. The rest—seen to be “not very pretty” (Júnior, 2011: 34)—were considered urgently in need of channelization in order to expand the capacity of the avenues. Throughout the 1970s and 1980s, massive engineering projects would be brought to bear on the city’s rivers, deepening and extending their channels. It was only in the 1990s that tentative changes in city’s hydraulic paradigm would begin to emerge. These would culminate in the development of new guidelines for stormwater management in the late 1990s that were linked to the creation of a state-level strategic plan.

**Hydrological Infrastructure, Land Acquisition and Emerging Geographies of Accumulation**

This rationalization of the city’s landscape was not just pragmatic but also linked to broader dynamics of capital accumulation and land acquisition. In particular, river channelization was tied into processes of real estate speculation and the valorization of previously floodprone land (See Seabra, 1987). Indeed, it is important to note that the broader channelization of the city’s waterways was a project of flood prevention and sanitation infrastructure but was also a means of rationalizing and incorporating new developable land into the real estate geography of the city (See Júnior, 2011; Kogan, 2013; Seabra, 1987). This entailed a dramatic shift in the value of the city’s várzeas, which had previously functioned as places for small-scale industry such as fishing and washing, but
were increasingly tied into the emerging real estate industry. Rationalizing urban waterways effectively created land where it previously did not exist. It generated new forms of accumulation through the creation of developable land.

This relationship between infrastructure and accumulation can be demonstrated most dramatically by the ambitious project to reverse the course of the Pinheiros River in the 1930s. This project would dramatically reconfigure the city’s social and ecological geography, and in doing so would incorporate vast new areas of the city’s landscape into development. Many of the city’s wealthy central neighborhoods were built on reclaimed land provided by the rectification and reversal of the river, and it is hard to overstate the importance of this process in the development of contemporary São Paulo.

The reversal of the Pinheiros’ course and its associated rectification began in the early 1920s, and was undertaken by the São Paulo Tramway, Light and Power Company (LIGHT), a Canadian engineering firm responsible for the production of energy and early transportation infrastructure in the city. The reversal of the Pinheiros was tied into a broader remaking of the city’s hydro-landscape, whose primary goal was the expansion of the city’s electrical capacity. As with other high-profile cases of what we might call early geo-engineering in the era of emerging engineering prowess, LIGHT effectively remade the city’s landscape, dramatically modifying the underlying hydrology of the region. Between 1925 and 1927, LIGHT reversed the direction of the Pinheiros using a series of dams that flushed water towards a series of newly-created reservoirs at the city’s southern edge. One of these new reservoirs, the Billings, was to be connected to the Henry Borden Dam. Perched on the edge of a precipitous drop from São Paulo’s elevated location towards the sea, the Henry Borden sent water down the **Serra do Mar** in the direction of the ocean in order to generate hydroelectrical energy (which it still generates). Ecologically, this change in the city’s water
landscape would produce new reservoirs at the urban edge and turn the Pinheiros from a slow-moving tributary of the Tietê into a modernized waterway that now drew water out of the Tietê and flowed in the other direction. It largely turned the Pinheiros into a flood overflow channel.

In exchange for constructing this massive engineering project, the firm was given the rights to develop the newly created land on the edge of the river, land that had previously been undevelopable due to its propensity to flood. Between 1925 and 1927, LIGHT was given rights to develop the land that had previously been declared floodprone in exchange for reversing and rectifying the Pinheiros, constructing the Billings reservoir, and appropriating the previously floodprone lands and selling them. Luckily for LIGHT, extensive flooding in 1929—indeed, the worst flood the city had seen at that point—meant that LIGHT was given expansive territorial control. According to Seabra (1987), Jorge (2006), and Kogan (2013), LIGHT provoked this flooding by purposefully opening the river’s floodgates at the Guarapiranga reservoir in order to extend the flood line. In effect, LIGHT manipulated floodplain estimates in order to increase their land holdings.

The result was an expansive process of urbanization that folded the city’s várzeas into the broader dynamics of real estate development and growth, facilitated by LIGHT’s land grab. This was a massive rearticulation of the city’s landscape. As de Mello Franco (2005) argues, LIGHT proposed that their preserving of nine square miles could accommodate roughly 500,000 people. Given the fact that the city’s population in 1920 was barely over 500,000 people, this suggests the depth of LIGHT’s ambitions and makes clear how expansive the changes to the city’s landscapes were. They doubled the city’s developable land, in a sense, demonstrating the intimate links between infrastructure and urbanism in
twentieth century urbanism. For Langenbuch (cited in Júnior, 2011: 29), this was the period in which São Paulo expanded past its geographically imposed limitations and boundaries.

Given the cost of the property in the wake of LIGHT’s intervention, which included both the land itself and the cost of the infrastructure that was constructed, only entities capable of moving large sums of capital were able to purchase this newly created land. As a result, the primary beneficiaries of the development were the city, who built highways and train lines along the river’s new course, and real estate developers. In the years following LIGHT’s reversal of the Pinheiros, development spread along the edges of the Pinheiros, particularly through the actions of the Companhia City or the City of São Paulo Improvements and Freehold Land Company Limited. An international development company that in 1911 owned 37% of the city’s territory, CITY purchased much of the newly reclaimed land in order to develop elite residential neighborhoods. Borrowing from garden city principles, Companhia City planned and constructed a series of elite neighborhoods, which would ultimately turn the areas surrounding the Pinheiros into the heart of financial São Paulo (See Fix 2001, 2007). These include many of the city’s foremost elite neighborhoods, such as Jardim Europa, Alto de Pinheiros, and Vila Olímpia, all of which were built on land that was previously flood prone. LIGHT’s infrastructural intervention yielded the city’s modern elite heart and continued the expansion of the city southward (Fix, 2007: 29; See also Rolnik, 1997; Seabra, 1988). As such, LIGHT’s reversal of the Pinheiros was not just an ambitious project in relation to water, but also to the development of new property relations and entirely new neighborhoods. For Fix, this is a clear demonstration of the relationship between “international financial capital, real estate, urban legislation, and infrastructural networks (2007: 29)” In her analysis, it is a case study in growth machine
politics, a tying together of developmentalist aspirations with new forms of capital accumulation.

The story of LIGHT is one example of the ways in which São Paulo’s growth was dramatically related to the city’s várzeas and floodplains. Many of the city’s wealthier neighborhoods are located within the floodplain of the Pinheiros River, and they are largely a product of LIGHT’s real estate deal in the 1920s. As the city continued to expand in the years after the reversal of the Pinheiros, these areas would become increasingly tied into networks of financial capitalism as anchors for the city’s growing financial services industry (See Fix, 2001). As such, rectification and reversal were productive processes, incorporating vast amounts of land into the city’s landscape and generating expansive development throughout the twentieth century.

From the perspective of stormwater management, the reversal of the Pinheiros was a highpoint of the techno-managerial approaches to water management detailed in the previous pages. In reversing the course of the Pinheiros, LIGHT turned a previously natural floodplain into an area of elite real estate. By encouraging a mode of urban development that turned the city’s várzeas into developable land, they inaugurated a pattern of urban expansion that would make the city increasingly flood prone in the years to come. In a sense, LIGHT deepened a model of urban development that would prove ecologically catastrophic to the city, a model that relied on large-scale infrastructural intervention to produce habitable land in what were previously floodplains. As Júnior (2011: 35) notes, “from the point of view of drainage, these interventions had the affect of expanding significantly the flood peaks in the principal rivers, since they increased the flow and the flow velocity of the upstream channels.” Or, as two DAEE engineers noted in an interview:
Manoel: You keep impermeabilizing. Before, rain falls, the soil absorbs it and, over the course of the year, the water drains into the channels, into the rivers.

Sergio: And the city keeps occupying these várzeas of the rivers, you know?

Nate: Exactly. São Paulo is a várzea, right?

Manoel: It’s a thing that we did wrong here – I don’t think it’s just here, it’s in the whole world – is occupy the várzeas, which is the larger river bed. When there are floods, occupy the várzea….

Nate: Right, exactly.

Manoel: you have to expand the canals to compensate for this loss of these várzeas, you know?

By developing the riverine spaces in the urban core, these projects had the ultimate effect of increasing impermeability in the city more broadly and furthering floodplain development.

As Custódio (2001: 159; Cited in Júnior, 2011: 35) notes, the rectification of the city’s rivers revealed the “fragility of the techno-scientific rationality that, in search for the maximum control of unpredictability…generates actions that are paralyzing for itself.” The result was a landscape that was perversely more flood prone as the city continued to spread in the years to come. Where floods had once been a part of regular riverine processes, the new realities of urban development meant that flooding took on increasingly costly dimensions.

The Left Behind

The development of the city’s várzeas into traffic conduits and the development of the urban center into an elite space laid the foundation for dramatic changes to the city’s spatial layout. By modifying the landscape in favor of circulation, São Paulo’s engineers put in place the system that would dramatically reconfigure the urban landscape in favor of a more pronounced center/periphery divide. In contrast to the urban core, where modernization yielded an impermeability brought on by formal real estate development—as in the
neighborhoods along the Pinheiros previously mentioned—in the urban periphery the opposite was the case. There, in the face of state neglect, residents built their own homes in often the cheapest ways possible, generating a form of impermeability borne not from real estate development but instead from poverty and autoconstruction. In lieu of the leafy, garden city communities in the floodplain of the Pinheiros, peripheral urbanization involved the extensive paving of formerly green spaces and the almost total absence of trees and other forms of greening. This produced a concrete landscape that marks the urban periphery’s landscape in specific ways. As de Mello Franco et al note:

The process of uncontrolled urbanization imposed an excessive impermeability of the urban surface, and especially the várzeas, formerly acting like spaces of hydrological regulation. The result is the chronic problem of floods that affect the entire population. The residents of devalued areas close to the waterways live with recurring risk (123).

As previous chapters have noted, peripheralization has characterized the city’s modern history. This is a process that is viscerally connected to water. Water is intimately related to broader patterns of inequality due to the long-standing processes through which low-income communities have located on the edges of streams and rivers due to their lack of connection to the formal (and largely unaffordable) housing market. This has generated a process of expansive peripheral urbanization that pushes further into areas that are broadly unsuitable for habitation (even if those designations are often unclear). This is a historical process as well as a contemporary one. As mentioned in the previous chapter, the period of Prestes Maia’s mayoral administration coexisted with a rent freeze in São Paulo, one that had the perverse effect of incentivizing new construction and stalling the construction of any rental properties. The subsequent pricing out of many middle and working-class populations was accompanied by the demolition of old houses and buildings to make room for new automobile infrastructure (Jorge, 2006: 200). Between 1940 and 1950, over 100 thousand families moved into their own homes in the auto-constructed periphery, often in favelas.
The development of the Pinheiros is a central component of this broader process of peripheralization. As the region surrounding the Pinheiros grew, so too did its periphery, driven by the expulsion of the poor from the center and the development of transportation corridors to carry new residents. This reconfigured a geography of class-based proximity to one of distance, as favelas and other low-income urban areas increasingly began to be located far from the urban center. There were many favelas and other forms of low-income urbanism along the Pinheiros throughout the twentieth century, and the presence of favelas along the edge of the river was a characteristic component of the region from the 1930s to the 1990s. The Córrego Agua Espraiada, for instance, was occupied by nearly 68 distinct favelas in the 1970s, after a highway construction project stalled, leaving the territory ripe for occupation. Over the course of the 1990s and early 2000s, all of these favelas would be removed, through a process that was not just funded by the state but also by the pooled resources of the financial centers located in the region (See Fix, 2001). Throughout the 1990s, more than 50,000 residents were removed from the region through a combination of buyouts, threat, and offers of subsidized housing. By the early 2000s, there would be no favelas left in the region, and a succession of public/private developments produced a landscape of elite consumption and financial services.

Many displaced residents headed further south into the regions that abut the Guarapiranga and Billings reservoirs (which provide both drinking water and electrical energy to the city). One of the more famous of these favelas—Jardim Edith—would subsequently implant itself at the edge of the reservoir with the new name of Jardim Edith 2, a testament both to the sense of humor of those forced to leave their homes but also the lack of a solution to the crisis of housing that affects the city. These moves would have drastic contrasts for many residents, moving them from an under resourced yet centrally
located neighborhood into a distant suburb. For Fix (2001: 134-135), this “sociospatial-environmental segregation” is a form of apartheid, one that exposes poor residents to heightened travel times, heightened health risks, and regularized flooding (See also Cohen, 2016). The cruelty of fraud marks these processes, too: Fix (2001) notes how displaced residents used their city payouts to buy territories that were both illegal due to their zoning as areas of environmental protection, but also deceptively dry due to the purchases being made in the dry season. As Ferrara (2013: 348) notes:

As a consequence of an insufficient politics of housing and of a process of unequal urbanization, the areas of the mananciais [springs, a reference to the reservoirs in the city’s southern zone] turned, and continue being, an alternative for access to land in a precarious and irregular form for the poor population in the southern parts of the city.

During a visit to the Billings reservoir in 2013, environmental guards made constant references to these processes of fraud and manipulation, alleging that many residents were either being lied to or were themselves criminals. Indeed, the sub prefect of the Capela de Socorro sub prefecture claimed that 80% of occupations were “opportunistic.” These sorts of moral discourses repeatedly intersect with the broader dynamics of housing in São Paulo.

Whatever the cause of central city dislocation, these social dynamics overlapped with the city’s hydro-landscape to produce a landscape of impermeability that marks the city’s periphery. In the case of flooding, the historic pricing out of poor populations—coupled with the more dramatic removals evidenced in the Agua Espraiada story—has yielded a landscape of expansive horizontality that gives almost no space to water. With houses largely built by hand with little input from the state into the process, low-cost urbanization has yielded a landscape of profound impermeability, one marked by a lack of tree cover, extensive paving of outdoor spaces, and a lack of public spaces throughout the urban periphery. This can be demonstrated visually (see figure 5.4) but also in the dynamics of state
discourse. In the Program for the Recuperation of the Várzea of the Alto-Tietê Basin

[Programa de Recuperacao das Várzeas da Bacia do Alto Tietê], for instance, the authors note:

There are municipal districts with a zero rate of green spaces, which signifies that there are large areas that are totally occupied and impermeabilized. The right rates of impermeability of the city, little studied, and a complex physical location, from the point of view of its geomorphological characteristics, with areas of hills, interfluvios and alluvial plains, create a situation that's is extremely unfavorable, especially during the annual summer rains that aggravate the problem of flooding (48).

These impermeable zones are largely concentrated in the urban periphery. Jacinto, de Almeida, and Goveia (2009) give voice to this in their 2009 estimate of São Paulo’s rate of impermeability. They note:

They [the findings] point to the highest impermeability in the central and eastern zones, accompanying the hydrographical basins of the Tietê River and its affluents on its southern bank, like the Tamanduatei and the Aricanduva. In fact, these are regions with frequent occurrences of flood events that cause innumerous problems for the Paulistana population and, due to this, are the recipients of countless investments in infrastructure to combat floods, like the contention reservoirs, the so-called ‘piscinões.’

The city of São Paulo’s rates of vegetal cover [Cobertura vegetal] highlight the disproportionate rates of vegetation cover within the city’s neighborhoods, and make clear that the eastern zone is the most lacking in tree cover in the city. Indeed, the sub prefectures that make up the bulk of the várzea are the lowest in the city. Itaim Paulista boasts the lowest rate of vegetation cover of anywhere in the city, for instance (See Buckeridge, 2015, for a more expansive engagement with these figures).

This making impermeable of the urban periphery is a product of the informality of the peripheral urban process, one exacerbated by funding realities and cultural (or perhaps economic) propensities towards cemented yards and the lack of tree cover in peripheral neighborhoods. The result, across much of the urban periphery, is a landscape that is broadly impermeable, requiring increasing effort on behalf of hydrological engineers to manage stormwater through infrastructural projects. By expelling low-income populations
from the center of São Paulo, the city in effect put more people in the way of flooding and at the same took away the fragile, permeable landscapes that could help in flood prevention.

**Conclusion**

As São Paulo developed, it impermeabilized. As this differentiated pattern of land use intersected with the city’s pre-existing climate and its riverine dynamics, this yielded a city that remains flood prone. São Paulo’s 20th century development yielded a deeply impermeable landscape, one that combines a process of urbanization with a hydrological paradigm that saw urban water primarily as a conduit for disease and a means towards generating hydroelectrical energy. Related to this was the degree to which São Paulo’s urban periphery grew with little state involvement, both institutional and financial. This resulted in a pattern of peripheral urbanization largely attuned towards affordability and simplicity, producing a landscape devoid of tree cover and permeable space. This is a landscape that, to put it bluntly, floods. Indeed, the lack of permeable space, the lack of porous, spongy pieces of the landscape has produced a floodprone city that degrades its local water sources and subjects populations to environmental burdens and pollutants. Yet, against the broad claims that circulate about the city’s disorganized urban growth, this chapter has attempted to highlight the specific processes that yielded an impermeable, flood prone landscape.

Increasing permeability in the city is by no means a simple fix to the problem of flooding. Indeed, urban flooding is a local project, one that ties together not just impermeable and permeable space, but the absorptive capacity of vegetation, the topographical dynamics of cities, and the dynamics of weather and climate. Nevertheless, efforts to increase permeability in the city have been developed over the years, including the system of linear parks detailed in the chapters to come as well as legislation like 2002’s Lei das “Piscinhas” [Law of “Little Pools.”] The law mandates that all new structures with
over 500 m² of impermeable space are required to develop reserves to collect stormwater. While a positive engagement with stormwater management and micro-drainage, the law possesses little incentive for enforcement. And the peripheral areas where permeability is a challenge are often left out of law both formally and informally.

This means that a similar situation will presumably mark attempts to include an Environmental Quota into the city’s ongoing attempts to rewrite its strategic plan. The Environmental Quota expands from the lei das “piscinhas” to put small-scale environmental requirements into all new properties. But as Nobre, Martin, and Lima (2015) note, the capacity or the willingness of the state to enforce these metrics is largely nonexistent, yielding a situation in which it is hard to imagine the law being adequately enforced. As with the rest of the city’s Strategic Plan, the inability to adequately ensure follow through is coupled with the immense political power of developers and growth machine actors. The result is a situation in which formal legislation is not enough to determine positive outcomes. As Abers and Keck (2014) argue, legislation is often not enough in Brazil; what is required are the sorts of “practical authorities” and political demands that ensure that legislation is properly implemented. In the urban sphere, this can be demonstrated by the dramatic juxtaposition between some of the most progressive urban legislation on the planet with the continued realities of inequality and underinvestment. This suggests the intractability of impermeability in São Paulo, and the difficulties in implanting green space in “complex location” (Nobre, Martin, and Lima, 2015).

Impermeability is by no means exclusive to São Paulo, nor is flooding. Cities like Lexington, Kentucky, and Chicago, Illinois have dealt with floods in recent years, despite their different climatic and land use regimes. This makes clear that urban flooding is a global problem with localized causes and effects. In the case of São Paulo, a land use dynamic that
overdevelops the city’s várzeas has been generated in part by a focus of large-scale infrastructure that has attempted to fix rivers in place. This approach paradoxically requires more infrastructural modification to deal with flooding. In the next chapter, I analyze the contemporary management of stormwater in São Paulo and consider the “politics and poetics” (Larkin, 2014) of stormwater infrastructure.
Figure 5.1: How does water provisioning in São Paulo work. This map shows both the system of water provisioning for the city as well as the reservoir levels in April 2015 (situação dos reservatórios em Abril). Image reproduced with permission from UOL Noticias. Available at: http://noticias.uol.com.br/infograficos/2014/02/14/veja-quais-sao-os-reservatorios-de-agua-da-grande-sp.htm
Figure 5.2: Benedito Calixto, Inundação da Várzea do Carmo, 1892. Image courtesy São Paulo Municipal Archive.

Figure 5.3: 1877 Map of São Paulo. Note the extensive, undeveloped floodplain on the right half of the image. Image courtesy São Paulo municipal archive.
Figure 5.4: Occupation on the edges of the Billings Reservoir. Photograph by Paulo Whitaker/Reuters. Reproduced with permission by The Guardian.
Chapter 6: Tracing the Politics and Poetics of Infrastructure: Contemporary Stormwater Management in São Paulo

Introduction

The processes detailed in the previous chapter yielded a landscape that I described as impermeable, one that was tied into a broader reliance on large-scale hydrological infrastructure that is increasingly necessary for the prevention of flooding. Indeed, impermeability and rectification are linked techno-political formations, producing a landscape that requires recurrent investment and intervention. This combination of impermeable land cover and a focus on large-scale infrastructural provisioning can be referred to using the terms developmentalist or “promethean” (Kaika, 2007). This approach to water, which sees rainwater as a threat to be removed, is intimately tied to the broader channelization and rectification of the city’s waterways, but also to the dynamics of real estate speculation and development. Indeed, as the previous chapter argued, infrastructural strategies for managing water generate increasing need for more infrastructural solutions. The past weighs on the present, in a sense, demanding increasing investment into the urban hydro-landscape in order to make up for previous interventions.

In this chapter, the second of two chapters designed to introduce the city’s fluvial landscape, I focus on the contemporary functioning of the city’s stormwater network. Borrowing from Larkin (2014), this chapter considers the “politics and poetics” of São Paulo’s infrastructural landscape. For Larkin, infrastructures are different from other technical objects due to the fact that their primary function is to enable the operation of other systems, a process that they undertake in the form of a network or a system. Given their functioning as a type of substrate that is itself relational, infrastructures are, for Larkin, “conceptually unruly” (329). By focusing on the material underpinning of contemporary life,
theorists and analysts of infrastructure can subsequently perform what Bowker and Starr (1999) referred to as an ‘infrastructural inversion,’ a way of “uneartning the world-making (if often ignored) histories of standardization and connection (Carse and Lewis, 2016: 3). Carse and Lewis (2016), for instance, analyze how changes to canal depth standards in places like the Panama Canal have far-reaching effects due to the ripple effect of standardization. Here, infrastructure takes two forms: first, in the material underpinning of global trade networks that are seen in places like the Panama Canal, landscapes that “reveal global infrastructure’s barnacled underside” (2); And, second, in the infrastructural work performed by standardization, which works to dramatically reconfigure social and natural ecosystems as diverse processes are brought into line with changing standardization and technical requirements (See Mutersbaugh, 2005).

For Larkin, a focus on infrastructure needs to also needs to take seriously the aesthetic and the poetic in analyses of infrastructural forms. As he notes:

…infrastructures also exist as forms separate from their purely technical functioning, and they need to be analyzed as concrete semiotic and aesthetic vehicles oriented to addressees. They emerge out of and store within them forms of desire and fantasy and can take on fetish-like aspects that sometimes can be wholly autonomous from their technical function. Focusing on the issue of form, or the poetics of infrastructure, allows us to understand how the political can be constituted through different means (329; See also Gastrow, 2016; Kaika and Swnygedouw, 2000).

Infrastructures—whether referring to the monumental dams that mark nation-building or the data centers that hold up the cloud—are designed objects that intervene into daily lives and landscapes. As such, their forms of presence matter, and the analysis of infrastructural systems can be strengthened by an interest in the aesthetics and poetics of infrastructural technologies and sites. Infrastructural systems toggle between visibility and invisibility, at times designed to be hidden from view and at times infused with nationalist or modernist aspirations. While early theorists of infrastructure focused on how infrastructural systems are
often rendered invisible by their banality and quiet functionality, scholars from the global south have focused on the specific visibility of infrastructural systems in cities outside of the global north (See Furlong, 2014). For urbanists working in the global south, urban infrastructure is a highly visible component of daily life.

Visibility, though, can take many forms, and the politics of representations are complex. This chapter subsequently focuses on the strategies through which infrastructural systems are made visible in São Paulo. Specifically, I consider how infrastructural systems have been framed as political interventions into the urban landscape by activists and artists active in the city. These are grassroots level engagements with infrastructural systems that foreground the uneven terrain on which infrastructural investments are made and the implications of those priorities. I focus on three components of the city’s hydro-social network in order to foreground the political dynamics of infrastructural provisioning and use: córregos [streams], piscinões [detention ponds], and barragens [dams]. I consider how activists have resisted technical framings of urban infrastructural systems and instead articulated distinctly political readings of the urban landscape (See Li, 2007; Swyngedouw, 2004). Theorizations of urban infrastructure have long focused on the purported invisibility of infrastructural systems, which are seen to be only made visible in moments of rupture or breakdown. This claim has been resisted by scholars of infrastructure writing from the global south, for whom struggles over infrastructure constitute a distinct component of political praxis and identity formation (See Furlong, 2014). Following McFarlane and Silver (2016), this chapter is then concerned with the mechanisms through which infrastructure is made visible as more than a technical component of the city’s landscape. I focused on the strategies employed by activists, artists, and designers to render infrastructure political, to bring urban circulatory systems into view in new, often creative ways. As such, I focus on
conflicts over the three specific infrastructural technologies previously mentioned, and considered the tactics through which these infrastructures are made legible as more-than-technical systems.

**Accommodating Stormwater in São Paulo**

When rain lands in São Paulo, it first hits a surface: this may be a rooftop, a concrete paving, an asphalted road, or green space. Some rainfall—the drops lucky enough to land in a relatively porous location, perhaps a park or one of the reserves that ring the northern edge of the city—will either recharge existing groundwater supplies through infiltration into the soil or eventually be absorbed back into the atmosphere through the process of evapotranspiration. Those that end up as groundwater may eventually be drawn to the surface through wells and used in industrial processes. Some raindrops will find themselves deposited directly into a piscinão, a detention pond that holds back water in the case of intense rain events. There, their entrance into a local waterway will be delayed. Some even luckier raindrops will find themselves deposited into a home cistern or rain barrel, constructed probably by local environmental activists in the wake of the 2014 drought or perhaps constructed by someone like Terezinha Silva, a housing movement activist (See Cohen, 2016). These raindrops will be collected in a barrel, before being used to wash floors or water gardens.

Most raindrops, however, will flow along an impermeable surface of some sort—a gutter, a sidewalk, a roadway—before eventually being deposited in a stream [córrego] that forms part of the Tietê’s watershed. The Tietê’s basin is divided into six sub-basins, which cumulatively drain an area of 5,775 km². This travel to the Tietê is aided by a series of infrastructural investments that intervene in the landscape, creating a complex hydro-scape of engineered nature that marks the city. These include dams, channelized and buried
streams, detention ponds, and other forms of hydrological engineering that merges the existing topography of the city with its engineered landscape. Once these raindrops eventually land in the Tietê, they begin their long journey west. Immediately past the city’s limits, these raindrops will flow through Pirapora do Bom Jesus, where they will mix with detergents and household sewage to generate a foam that often surges out of the river to cover the town’s colonial landscape. Passing through Pirapora do Bom Jesus, rainfall will continue to flow west, passing through an extensive network of hydroelectric dams and interacting with local pollutants before eventually arriving, relatively clean, at the Paraná River in the Brazilian interior.

In contrast to urban infrastructural systems like electricity and the delivery of drinking water, stormwater circulates in spite of the presence or absence of adequate water management infrastructure. As the writers of São Paulo’s Strategic Plan for Stormwater Management and Macro-Drainage note:

In comparison with other urban improvements, the drainage system has a particularity: stormwater drainage will occur independent of the existence of an adequate drainage system. The quality of this system is what will determine if the benefits or damages to the population will be greater or lesser (14).

Stormwater is a specifically unavoidable process in contemporary cities, a binding together of fluvial processes with the meteorological and infrastructural dynamics of the city. Water has to drain somewhere, whether or not the city is prepared to adequately manage it. It has nowhere else to go, in a sense. Yet urbanization compels a perverse process of heightened risk: the more cities pave their porous and permeable landscapes, the more flooding increases. In the case of São Paulo, long-standing flood dynamics have been exacerbated by the city’s expansive development.

Faced with the enduring persistence of flooding in the city, São Paulo’s municipal and state governments have attempted to cohere drainage infrastructure through the
development of legal frameworks and guidelines. These frameworks, referred to as non-structural components of the city’s hydro-infrastructure, provide guiding principles for the management of water in the city. The most recent is the 2012 Manual of drainage and stormwater management [Manual de Drenagem e Manejo de Águas Pluviais], an update from the initial version developed in 2008. The manual is part of a broad effort to systematize the city’s ability to manage stormwater. It involves the articulation of a citywide drainage strategy through the development of a comprehensive geospatial analysis of watersheds and drainage systems and the laying out of specific design and policy solutions.

At the municipal level, efforts to re-envision the city’s macrodrainage infrastructure have also involved the development of non-structural solutions designed to raise awareness of flood risk. In the case of São Paulo, non-structural solutions have entailed the development of new means of alerting populations about the dangers of flooding. The mayor’s office of São Paulo has developed a program designed to use social media to warn residents of the dangers of floods. These coexist with more low-tech approaches (See Figure 6.1). This project uses social media including twitter to alert populations to the threat of flooding and the potential for traffic delays as a result. Seemingly more a means of preventing traffic delays than a means of allowing low-income residents to escape property damages, the project nevertheless articulates a systematic attempt at managing the dangers of flooding and stormwater in the city. In an actor-network-theory vein, we might say that the project expands the network that manages water in the city to include the cellular towers and electricity networks necessary for smart phone usage, and enrolls active citizens into responding to the threat of flooding. In some respects, these projects are suggestive of an expansion out of the city’s infrastructural system to include not just social media but also
human bodies and other forms of overlapping social infrastructures (See Simone (2004) on ‘people as infrastructure’).

Structurally, the city’s capacity to manage stormwater largely rests on a series of hybrid infrastructures. Structural infrastructures are largely divided into two categories: microdrainage and macrodrainage. Microdrainage, which is typically oriented around flood events that have a ten percent chance of happening every year, refers to smaller-scale technologies including gutters, pavement, and smaller culverts. Macrodrainage, on the other hand, is oriented around a 100-year flood and consists of larger-scale technologies including larger culverts, canals, and reservoirs. These infrastructural conduits work to corral water and flush it out of the city, using the pre-existing river channels as conduits for the movement of stormwater. Stormwater management is subsequently a combination of hard infrastructure (dams, culverts, detention ponds) and the existing fluvial system of the city (rivers, streams, topography). Together they comprise the system of stormwater management in the city. As previously mentioned, the city’s approach to drainage and stormwater generally employs large-scale infrastructure, channeling stormwater through culverts and other forms of mechanized nature out of the city. In these ways, the dynamics of natural and engineered are fuzzy or hybrid, combining the pre-existing topographical patterns of the city with the engineering practice of state agencies. This is suggestive of the degree to which flood prevention is both mediated in and through technological or infrastructural fixes while it is also linked to the broader dynamics of the landscapes in which it is situated. While stormwater management has largely been oriented around the principles of rapid transit and efficient conveyance (Karvonen, 2013), the reality is that even the most seemingly large-scale water management regimes are bisected by the social and the ecological. Socio-technical systems are often “rendered technical,” (Li, 2007), but their day-to-day functioning highlights
the limits of the modernist dualism famously unpacked by Latour and other theorists interested in relational ontologies and the complex politics of socio-natural assemblages (See, for instance Braun and Whatmore, 2010). As examples of “hybrid nature,” (Schneider, 2011) these landscapes thread between the biophysical and the designed, the social and the historical, the functional and the poetic.

As a way to further analyze these dynamics of São Paulo’s hydrolandscape, in the remainder of this chapter I consider how and through what techniques São Paulo residents have called attention to the political nature of the city’s stormwater infrastructure. I focus on three components of the city’s drainage landscape: Córregos [Streams], Piscinões [Detention Ponds], and Barragens [Dams]. The purpose of this section is to both make clear how São Paulo’s drainage landscape operates in more detail, but also to give insight into the contested politics of these specific infrastructural technologies and the techniques through which they are made visible.

**Infrastructural Politics 1: Córregos [Streams]**

The term córrego translates to the English word stream, but in São Paulo the term is largely used to refer to modified streams that are integrated into the stormwater sewage network. These are often the channelized and rectified streams discussed in the previous chapter, but the term also includes the meandrous, yet-to-be channelized streams of the urban periphery. There, many córregos remain in their natural state. Due to the intersection of inequality and land use regulations, peripheral córregos are often flanked by extensive informal housing (See Figure 6.2). There, they function as environmental hazards as well as depressors of land value, allowing low-income residents to trade health and safety for a place to live. In the eyes of engineers, córregos are essential conduits for stormwater. They are necessary to the broader functioning of the storm sewer network, and the city is constantly
channelizing and rectifying existing córregos in the service of flood prevention. The labor demanded by córregos extends past their construction: indeed, they require constant maintenance and dredging due to erosion and sediment buildup. This is especially pronounced for córregos that were previously meandrous and subsequently suffer from low flow rates. In these canals, sediment quickly builds up and encourages flooding.

For environmental activists in the center, the continued channelization of the city’s córregos is an environmental crime, a means of obscuring the nature that pre-exists the city and its material infrastructures. On March 16, 2014, for instance, I participated in a walking tour with the river activist Rivers and Roads [Rios e Ruas]. At one point they were asked what the difference is between a córrego and a river [rio] and Luiz of the group responded sharply: “Rios e Ruas hates that word [córrego].” They offered, instead, the terms riacho and rio, words designed to remind residents that the urban landscape is foremost a natural landscape. Rios e Ruas has developed a multi-year project designed to highlight the purportedly invisible córregos that mark the city. Through walking tours, performance, and art practice, they call attention to the city’s hidden streams as reminders of the city’s pre-existing landscape and natural processes. Their ultimate goal is to highlight the visibility of rivers in the city and bring people back to the city’s public spaces and roads. As detailed in chapter 8, Rios e Ruas’ project uses the city’s córregos to tell broader stories about the loss of public space in the city and the need for a more sustained engagement with the city’s waterways.

Visual artists have also called attention to the dismal state of many of the city’s córregos. A corollary to the project of Rios e Rios can be found in the work of Eduardo Srur, a visual artist active primarily along the Pinheiros River. Srur’s projects have included the placement of large plastic bottles along the edge of the river, a calling attention to the dynamics of
pollution and personal responsibility in the management of the city’s rivers, as well as the creation of a labyrinth using recycle materials. Recently, though a partnership with the Clean Waters of the Pinheiros River Association [Associação Aguas Claras do Rio Pinheiros], Srur constructed a series of figures along the river designed to showcase alternative possibilities for the river. These included figures diving and preparing to swim in the river, figures in swim clothes mimicking what it might mean for the river to be swimmable. As swimming provides one of the central affective ways in which the city’s rivers are remembered and by extension critiqued for their present pollution, this project pulls on a long history of nostalgia for the past state of the city’s rivers. It is a reminder of the fluvial dynamics that have marked the city since its inception, even as its vocabulary was suggestive of recreationist approaches to nature and, perhaps, a specifically hetero-male gaze.

Srur’s project is similar to projects like Hector Zamora’s *Errante*, which involved the installation of hanging trees over the Tamanduatei. The Tamanduatei is the river that anchored São Paulo’s early industrial growth and continues to mark some of its more central neighborhoods. It is a completely channelized stream that runs through the heart of São Paulo. Zamora’s “absurd garden” subsequently juxtaposes the dismal state of the river with the possibility of organic life, prompting a site-specific response that enrolls longer histories of occupation and socio-natural marginalization. The idea of the project, part of a broader project entitled *Margin*, suggests both river margins but also what, in the words of curator Guilherme Wisnik, exists at the edge of progress. In this, the Tamanduatei River is used to make a broader point about the positioning of Brazil and Latin America at the margins of global capitalism, at the same time as it is used to call attention to the environmental effects of progress and the city’s historic growth.
Artists active in street art and graffiti scenes have also engaged directly with the hybrid nature of the city’s sewage network. One of the most visible examples is ongoing project of graffiti writer and street artist Zezão, whose work consists of tagging the city’s storm sewers and infrastructural waterways using a consistent tag that suggests a type of mechanized water (See Figure 6.3). Zezão tags degraded sites, including storm sewers (some of which are occasionally invisible to all who do not physically enter the sewers themselves). In its repetitive visuality and focus on specifically marginal sites, the project is suggestive of an environmental and social critique grounded in what is left behind by the city’s urban form. Like Errante, the project calls attention to the functional spaces of the city that are often rendered invisible. In his celebration of storm sewers and other sites of degraded fluvial nature, Zezão draws on the history of urban exploration that has become increasingly visible in geography in recent years (See Garrett, 2013; See also Mott & Roberts, 2014). By highlighting the city’s degraded and forgotten fluvial conduits, Zezão links social to ecological marginalization, putting an imprint on landscapes deemed to be purely infrastructural or functional.

Yet, for others, the symbolic politics of córregos are different. Largely channelized in the urban core, córregos are often undermanaged in the more distant periphery, left in more natural states. There, they are seen to harbor pests, disease, bad smells, and danger. As such, low-income populations often see river channelization as a crucial metric for state involvement in the region, and see unchannelized córregos as dangerous and as markers of underinvestment. The Córrego Itaim, for instance, has been a sticking point for activists in the region of Itaim Paulista for years, and I often saw political campaign signs calling for river channelization in the area. On October 28, 2014, I visited a tributary of the córrego Itaim, the córrego Manoel, with local activist and community leader Anderson (Figure 6.4).
He told me that people had died in this córrego—“morreram varias pessoas”—by falling into the banks while driving past. As such, he was advocating for the process of channelization, part of a broader campaign for a more expansive engagement with the local drainage infrastructure that was linked to his involvement with the Movement for the end of Floods, a small-scale social movement associated with local Catholic organizing. He referred to this as a projeto global, a global project, a call for a consistent, sustained involvement with the hydro-dynamics of the region. For Anderson, the lack of a broader response to flooding and stormwater dynamics in the periphery was a broader result of center/periphery dynamics. For him, projects in the center developed rapidly but in the periphery communities had to fight. In an earlier interview, he had described to me the nearly ten-year campaign to bring resources to the drainage network that cohered in the córrego Itaim. This culminated in a moment of direct action:

They put in a really pretty canalization in one of the blocks, there are three blocks. And one block was perfect in the way that we dreamed it would be. And the other two they said they were just going to put some grass on the edge of the river. And the community didn’t agree, said no, twenty years of fighting to arrive at this point? And so we said no to the secretary, and she told us that they were going to put asphalt down and that would be the end of the project. So we mobilized and said no: we’re not going to accept that. We’re going to park out cars all over the site and you guys won’t be able to put down asphalt. And we began to call the secretary, she told me she received around 500 calls yesterday. And yesterday, the company began to implant the pipes that were lacking and implant the canalization in the way that the community wanted. And so it was a victory (Personal interview, 2014).

This was a moment of demanding a specific mode of hydrological infrastructure that was both pragmatic but also specifically oriented around a set of demands for consistent and engaged investment, markers of modernization and investment. As Anderson noted in our visit to the site, “They wanted to plant grass and we asked, “are you serious?” Just because we’re poor doesn’t mean we’re stupid.” This quote speaks to the complex terrain of environmentalism and landscape design in São Paulo, as Anderson is presumably referring to
attempts to implant a linear park on the edge of the córrego. While the development of linear parks on the edge of córregos may be seen as an environmental improvement and a marker of a new environmental ethic in the city (see next chapter), legacies of underinvestment render their implementation in the urban periphery discursively and visually fraught.

Anderson’s approach to activism was predicated on direct action, and it used the physical presence of bodies to remind engineers and local state representatives that they were in a sense being audited (see McFarlane and Silver (2016) for their typology of making infrastructure visible, which includes both ‘spectacle’ and ‘auditing.’). But this moment was a product of much longer histories of sustained relationship building, often far from the more dramatic moments of road blocking and protest that mark political action in Brazil more broadly. In this sense, this brief story of the Córrego Manoel is suggestive of how small interventions can require sustained struggle, a testament to the broader politics of infrastructural landscapes or the “political life of small urban places” (Newman, 2014). Indeed, as the figures make clear, this is a tiny project, yet one with both life and death implications for nearby residents as well as implications for the broader functioning of the drainage network in the region. Stormwater infrastructure is relational: a change to one component of the network can cause effects downstream. Indeed, the construction of a dike in the community of Jardim Romano was often blamed for the increased floods in nearby communities, a testament to the difficulties in managing urban water. More broadly though, these sorts of small-scale engagements with infrastructures determine much of the political life of peripheral communities in São Paulo and beyond. As Silver (2014: 788) notes:

As marginalized urban dwellers confront multiple inequalities and difficulties in accessing resources, they often intervene in configurations of infrastructure in order to shift socio-environmental conditions and metabolisms of energy and other resource flows that
sustain urban life. Incremental infrastructures can thus be understood as in-the-making, undergoing constant adjustment and intervention, and in a permanent state of flux.”

While Silver is referring to the construction and development of infrastructural networks on behalf of peripheral communities, the argument can be extended to include the pressures exerted on state entities. Politics in the contemporary moment in peripheral locales is often seen in the slow, sustained, incremental application of pressure and accountability (See Bayat, 2004; Von Schnitzler, 2016). This takes the form of consistent pressure that is coupled with moments of direct action, but these are actions that often occur far from the centers of power and authority in the city. Instead, the targets are small-scale authorities, district supervisors and managers, sub-prefects and local decision makers. As such, visibility is often less about the highlighting of specific political responses and more about the reminder of specific communities who are often rendered invisible.

A different form of making visible was relayed to me through a visit to Itaim Paulista with activist Euclides in January 2016. We toured pieces of flood prevention infrastructure, including a dike implanted in the wake of 2009 and 2010 flooding, and focused on the state of córregos in the region. Weeks before the community had flooded when water overflowed the banks of many of the region’s streams. For him, much of the continued problem of flooding in the region is a product of the state’s lack of investment in the routine dynamics of maintenance, in particular of waterways. As such, he has filed a motion with the Ministerio Público alleging environmental crimes in the management of a degraded part of the district of Itaim Paulista. The motion takes issue with the Lagoa Itaim, a crater on the edge of the Tietê left by a sand mining operation in the 1970s (Figure 6.5). The lake that remains—which, it is worth noting, had evidently been slated for the construction of social housing—is a historical reminder of what Euclides refers to as an environmental crime, a case of private industry not adequately cleaning up the residues of their operation. The motion alleges that
in addition to the problem of flooding brought on by the excessive vegetation and lack of upkeep of the lake, it also brings dangers from mosquitos, rats, and fire in the summer. As such, Euclides’ motion asks for a civil action to look into the region, with the hoped for solution that the region will be dredged and that the córrego that drains into it—the Itaim—will be better managed. The state, in response, has argued that these areas would have limited effect on flooding in the region and that the state has actively engaged in adequate cleanup. The landscape itself would suggest otherwise though (See figure 6.6).

This broader argument can be summed up by an image produced by Euclides himself, designed to heighten the difference between the channelized and seemingly orderly Tietê and its peripheral counterpart (Figure 6.7). The image shows the Tietê of purportedly official propaganda: an orderly, evidently managed river channel, one that is suggestive of the promethean objectives of modernity. It is juxtaposed with the overgrown Tietê of the periphery, where accidental vegetation and the “unintentional landscape” of neglect predominates (Gandy, 2016). The image is suggestive in a lot of ways, in part because it inverts contemporary articulations of nature that see channelization and rectification as outdated technologies. As such, it makes clear the differing aesthetics of environmental management and landscape desire, and reiterates the fact that environmental initiatives in the urban periphery are made legible within pre-existing histories of underinvestment and marginalization. While environmentalists often see channelized córregos as an affront to environmental dynamics, many communities who deal with flooding blame the lack of consistent channelization for these problems. The image is also suggestive of the ways in which maintenance and repair are important component of the politics of infrastructure in contemporary cities, and also highlights the ways in which accidental or overgrown landscapes are engaged with by the communities who inhabit them (See Millington, 2015).
Often flooding in São Paulo is blamed on littering (see next chapter), but images like the ones Euclides deploys make clear that the responsibility for maintenance demands a more active state presence than what it is often given.

By appealing directly to the Public Ministry [Ministerio Publico], Euclides reflects much about the contemporary nature of political action and law in Brazil. Specifically, Euclides’s action reflects the increasingly judicial nature of governance in Brazil, in which the complex dynamics of legality in Brazil are managed through appeal to the Public Ministry. The Public Ministry is an independent branch of government whose purpose is to protect, “the rule of law, the democratic regime, and collective and individual rights” (Coslovsky, 2015: 1107-1108). Currently employing nearly 2,000 prosecutors in the state of São Paulo alone, the Public Ministry allows for prosecutors to bring what are affectively class action lawsuits against both private and public entities. In doing so, the public ministry allows citizens to bring lawsuits against private enterprises, other individuals, and the state, and has become one of the central means through politics operates in contemporary Brazil (See Coslovsky, 2015; Holston, 2007). Often a means of bypassing bureaucratic indifference, appeals to the Public Ministry are often used to halt construction projects or eviction orders, and can occasionally serve as a means of halting ongoing projects or plans. Often this is more about delaying inevitable decisions than gaining final solutions, as Public Ministry proceedings can often take years. In a context in which low-income citizens are often seen to lack political rights, appealing to the public ministry can work to complicate and slow down decisions, to “beat the master at his own game” (Holston, 1991: 722; Cited in Coslovsky, 2015). In a sense, appealing to the Public Ministry can use bureaucracy against itself, and is one of the means through which communities can make claims of the state. In the case of Euclides and Itaim Paulista, the purpose is to call attention to the environmental and social effects of an
infrastructural remnant, and to hold the state legally accountable. These gestures get through, and reveal the power that low-income communities can occasionally yield. While broad dynamics of inequality mark São Paulo in general, to see political conflicts in the urban periphery as strictly a story of an undemocratic state ignores the slow, everyday articulations of compromise and demand that generate specific political outcomes. Visibility is here about the slow, purposeful reminders of accountability and obligation, a willingness to engage with the parameters set by the state in order to ultimately subvert them.

**Infrastructural Politics 2: Piscinões [Detention ponds]**

A Piscinão is a large-scale detention pond that is designed to collect excess stormwater in periods of high rainfall. Piscinões hold back water during peak events, in order to control and lessen flooding. They are essentially large-scale short-term reservoirs, places where water can be briefly delayed from entering the sewer and river networks (See Figure 6.8). They slow the arrival of water into the streams and rivers that function as stormwater channels, and in doing so lessen the impact and possibilities of flooding. Hydrological engineers in São Paulo see them as a paradigmatic shift in flood management, a technological advance that moves past long-standing approaches to flood prevention to consider not just the removal of stormwater but also its partial accommodation in the landscape. As such, they are reflective of a new logic in stormwater management, at least in part: detention as opposed to rapid transit. The first Piscinão was built in 1998, and the city currently has 54 large-scale examples in the city (Franco & Coachman, 36). Currently, piscinões are capable of handling 10.8 million cubic meters of water, equivalent to 40 kilometers of the Tietê River. While some piscinões are buried—as in the famous retention pond below the Pacaembu soccer stadium—the bulk are located above ground. As a result, they are highly visible interventions
into the urban landscape even as they are typically located in peripheral locations and broadly inaccessible parts of the city.

Piscinões are seen by some as engineering marvels, but their size, limited functionality, and imposing presence make them unpopular in the city. Abascal (2015), for instance, refers to them somewhat hyperbolically as “carcasses of disaster” (16). Urbanists often see them as a means for engineering companies to make vast sums of money developing large-scale infrastructure in lieu of smaller-scale solutions. As Alejandra, a professor of urbanism and former director of the city’s environmental secretary, noted in a 2014 interview:

When the candidates take power they are quasi hostages of the [construction] enterprises and the enterprises want construction projects [frentes de obra]. They are not going to want to make linear parks. Right? Linear park, they don’t know how to make a linear park. They need a place to inject concrete and implant projects, a lot of iron, concrete. And so enterprises are in favor of highways, the railway system, tunnels…and piscinões. And principally, I don’t know if you understand the size of a piscinão, but a piscinão is practically a buried cathedral.

A buried cathedral is an interesting spatial metaphor, a gesture perhaps at the ways in which engineering practice is often infused with nationalist and imaginative import. More broadly though, the above comment is suggestive of the broader political economy of infrastructural interventions, which prioritizes the symbolic and monetary implications of implanting large-scale infrastructure over the often-invisible infrastructures of stormwater and sewage (See Mbembe, 2001). This is a point made by activist Marzeni, who noted in a 2015 interview, describing the differences between the visibility of local sewage networks and the connectors that tie together neighborhood or home level systems to treatment centers: “People know when the local network was executed because the sewage is collected and people are charged. The interceptor, no. Who knows when the interceptor or the trunk sewer were done? No one sees, its underground! (A Publica, 2015).” This is suggestive of the broadly
visual politics of infrastructure in contemporary cities (in the global south and beyond),
where construction is tied into broader political circuits of clientelism and appropriation.

For the architects and artists Franco and Coachman, the failure of the piscinão has to do with their specifically non-relational character, their functioning as effectively urban voids despite their linkage to a system of fluvial circulation. They note:

…we have determined that from an architectural, geographical, social and environmental point of view, they [piscinões] have not really functioned as a network. It seems ironic, because they have existed precisely to address the issue of water, which is primarily environmental. But, far from being part of the hydrographic network and functioning together with the natural cycle of the river basins where they are located, the piscinões were designed to solve the specific problem of floods, recreating the floodplains of the rivers that were lost with the conurbation and densification of the city. The point is that in this attempt, they were located in places outside the floodplain, spatially representing the appendices to the river, instead of enlargements in harmony with the urban space, in order to establish interactions between the fluvial infrastructures and the city (37).

This is a point made too by the MMBB architects, whose project watery voids attempts to rethink piscinões as part of a broader urbanist project. For them, the singular function of piscinões prevents them from being used in more creative ways, as public spaces for example. What they propose is a kind of relational infrastructure: piscinões that double as public spaces in communities that lack much open space. Their proposals are for multifunctional, modifiable landscapes, and in this they overlap with much contemporary work in landscape design and landscape urbanism calling for relational landscapes. They are provocations as much as coherent projects. When I discussed these sorts of modifiable piscinões with geologist Rodrigo, I was told that the pollutants in the water made it nearly impossible for these spaces to be used as public spaces when empty of water.

This highlights one of the central issues of piscinões, which is that they concentrate pollutants. As a result they can degrade their surrounding areas by bringing environmental burdens. As Juan Mascaró and Mário Yoshinaga (2014) argue, “From the point of view of many urbanists this [a piscinão] is not a good alternative, because it tends to degrade the area
that it occupies and leave the bottom muddy and dirty, problematizing the alternative use of the area, unless given special maintenance and treatment” (101). Or, to put it in the language of Ivan Valin:

The city is halfway through building 131 of these retention ponds, in Portuguese ‘piscinões’—literally ‘big swimming pools’—that will draw excess water from overflowing streams and detain it long enough to diminish the storm surge volumes arriving at locations downstream. Because of the uncontrolled growth however, the pools must be ‘extracted’ from the existing urban fabric: homes must be relocated, roads realigned, community assets replaced. For hydrological, but also for economic and practical reasons, the piscinões constructed or planned fall largely in the poor, peripheral areas of the metropolitan region. In effect, the issue of flooding (which is largely a problem of the center and of the formal sector) is being resolved in areas that stand to gain the least from that solution” (2009, unpaginated).

Valin makes clear that once again center and periphery dynamics matter for the development of infrastructure and urbanism in the city.

For hydrological engineers, on the other hand, piscinões range from being marvels of engineering practice to being a kind of necessary evil, a requirement for dealing with water in a city that is deeply impermeable and whose patterns of urban development are disorganized at best. Take, for instance, the following claim by the “inventor of the piscinão,” Aluíso Pardo Canholi:

While in more developed countries the emphasis in questions of urban drainage are concentrated on the aspects related to the quality of the collected water, finding practices linked to the control of floods in general to be very advanced, in Brazil the quantitative control of floods is still the principal objective of actions (2005: 17)

As a result:

The most adopted ‘innovative’ concepts for the readjustment or the increase of the hydraulic efficiency of the drainage systems have as objectives to stimulate the delay of discharges, in order to increase the concentration times and reduce the maximum outflows; weaken the peaks and reduce the flood volumes through retention in reservoirs; and contain, as much as possible, run-off in the precipitation region, in order to improve the conditions for infiltration…

This signifies a radical change in the philosophy of structural solutions in urban drainage, because earlier canalization projects were implanted that accelerated the discharge for the rapid removal of the rain peaks for nearby low water bodies. This ‘hygienicist’ vision was
adopted by those responsible for the drainage of stormwater. In the example of sanitary sewage, these projects encouraged the rapid removal of water that was draining from the locations where it originated, which caused the overloading of receptive streams, or, of macrodrainage. Currently, the ‘conservationist’ vision, which attempts to delay the discharges of rain flows close to their sources, constitutes the paradigm of modern urban drainage (16).

Canholi argues here that piscinões are suggestive of a new paradigm in urban stormwater management that attempts to delay the discharge of stormwater rather than removing it as rapidly as possible. This constitutes a fundamental change in the nature of stormwater management at the global scale.

Piscinões, though, only partially live up to this interpretation. Piscinões are, at their best, a kind of mimicry of natural systems in order to better manage urban stormwater. But at worst they are big pools that collect stormwater and its associated pollutants and hazards. They corral water rather than flush it out of the city, but they do so in a way that largely involves producing urban voids through large-scale infrastructural interventions. And rather than permanently hold back water from the storm-sewer network, they merely delay its arrival. This aids in flood prevention but does not help with water purification or depollution, for instance. In an ideal system, infiltration yields water purification. As water infiltrates soil, bacteria break down the pollutants and contaminants found in the water. This leads, with some obvious caveats, to the purifying of water as it makes its way towards underground aquifers. Yet in lieu of a strategy for managing urban stormwater that genuinely increases permeability or porosity in the city, piscinões are a continuation of a hydro-paradigm that can be considered through the language of “command-and-control” and single-use management. Water is merely delayed, not returned to the groundwater. Worse, piscinões are representative of an approach to infrastructure that generates profits for some while forcing others to live alongside contaminants and pollutants. In this sense, they are
examples of growth machine political formations that privilege the construction of large-scale infrastructure and enroll engineering expertise into circuits of global capital.

As such, the politics of visuality at work in piscinões are dynamic and difficult to interpret. Despite their mass, piscinões are largely hidden from view and rendered out-of-sight, and accessing them is extremely difficult. Piscinões are defined by their banality and their function as voids; they are, by design, hidden from view, infrastructural leftovers, purely utilitarian spaces that nevertheless impose themselves on the landscape. Like other examples of degraded infrastructures, they are often embarrassments to all but the engineers who constructed and designed them. They are designed not as monumental landscapes but instead as necessary pieces of functional infrastructure. In this context, they are landscape interventions that are often unseen, especially for residents of the urban core. Yet their mass marks the landscape, producing voids in the urban fabric.

In the realms of art practice and design, some efforts have been made to render them visible, to call attention to the specific politics and aesthetics of piscinões. One compelling example is Franco and Coachman’s catalog of São Paulo’s piscinões, which exists somewhere between a design project dedicated to celebrating hydrological engineering and a repository of useful data about water management (See Figure 6.9). Franco and Coachman’s catalog is a visual repository of that which is typically out of sight. In addition to plotting the location of every piscinão in the city, it gives details on them: their date of construction, their basin (as well as sub-basin and micro-basin), their cost, their capacity, and their functional typology. When possible, it even notes the frequency of their cleaning and volume of detritus removed from each piscinão. It diagrams every piscinão in the city.
The catalog is a reminder that monumental infrastructures are infused with meaning but it is unclear what the symbology of these landscape interventions is. In the prologue to the project, Isabel Martinés Abascal gives voice to this, asking:

The reservoirs integrate the unintended generosity of the engineering scale – a scale that relates to the American continent – and the mythic of water spaces. Water has always embodied a poetic dimension….How shall we unveil the potential of the water reservoirs in São Paulo according to this aquatic genealogy (16)?

As Abascal demonstrates, the iconography of the piscinão remains up for debate. Where bridges and monumental infrastructures gestured at the continued resonance of the modernist project throughout the twentieth century, degraded repositories for polluted water at the edges of São Paulo’s landscape lack this romance. Interpreting them is subsequently less intuitive. They are, in the words of Davis and Jensen (forthcoming), “an appendage to a landscape on life support, existing in a no-man’s land between river and highway, detested by local residents yet apparently essential to prevent flooding” (unpaginated). They are marginal landscapes that retain a monumental quality, even as that monumentality is obscured.

At a base level, then, piscinões symbolize the complex visuality of essential infrastructure, which is often rendered invisible despite being a central component of urban life. Like the Center for Land Use Interpretation or other engagements with the banal and functional urban landscape, there is something inherently compelling about attempting to catalog and highlight the mundane landscapes that make our lives possible (especially when they themselves are designed to be kept out of site). Franco and Coachman’s catalog of piscinões makes clear that there is poetry in the mundane, that the pouring of concrete is mediated by broader circuits of politics, aesthetics, and design convention. They make clear that monofunctional landscapes can never be just that. As Gandy (2006: 140) notes, “Networks of urban infrastructure do not simply create modern cities, they also create their
own distinctive spaces or landscapes within the fabric of the city.” Highlighting the banal calls attention the leftover landscapes that exist at the margins of the more “charismatic landscapes” (Patrick, 2014) that mark the cities we live in. By articulating the piscinão as an object worthy of philosophical and aesthetic consideration, Franco and Coachman call attention to the often undefined poetics and aesthetics of infrastructure in very real ways (Larkin, 2013).

By calling attention to piscinões, artists and designers have found ways to make visible the seemingly hidden pieces of hydrological infrastructure that lurk in São Paulo’s landscape. In doing so, they push back against the processes through which landscapes come to naturalize their own production. They raise real questions about infrastructural visibility and the “politics of concrete” (Gastrow, 2016: 4), and raise broader questions about the politics of cataloging and representing. Franco and Coachman’s catalog is undeniably an elite form of visibility, but it offers a corollary to some of the forms of political visibility detailed in the previous section and is suggestive of creative, compelling ways for designers and architects to intervene into the urban landscape.

**Infrastructural Politics 3: The Penha Dam**

As São Paulo’s rivers were channelized and rectified throughout the twentieth century, many were also dammed. A means of controlling the flow of water, the Tietê is dammed twice within the city, and eleven times overall. The dams to the east of the city, in the headwaters of the Tietê, were initially designed to modulate the flow of water entering into the city. They were soon incorporated into the broader demands for water as the city grew, and now make up part of the Alto-Tietê reservoir system (which supplies roughly 20% of the city’s potable water). Within the city itself, the city is marked by two dams: The Penha Dam, located at the eastern edge of the city; and the Movel Dam, near the western edge of
the city where the Tietê intersects with the Pinheiros River. Given this dissertation’s broader focus on the politics of water in the eastern periphery, I focus for the remainder of this chapter on the dynamics of the Penha Dam (Figure 6.10). The Penha Dam marks the point where the river returns to its meandrous state, and in a sense determines where the river becomes peripheral. To the east of the dam lies the Tietê Ecological Park, a sprawling linear park designed and built by Brazilian architect Ruy Ohtake. Further east lies São Paulo’s extreme eastern zone, home to a wide variety of informal neighborhoods and consolidated, working-class urbanisms that coexist uneasily with the complex dynamics of the Tietê River. For the purposes of this dissertation, the Penha Dam marks the start of São Paulo’s várzea.

As mentioned in previous chapters, flooding is a recurrent problem in the neighborhoods located in the Tietê’s Várzea due to their proximity to the river. Flooding in 2009 and 2010 was particularly marked, especially in the community of Jardim Pantanal. That summer, excessive rainfall provoked extensive flooding which persisted for over 40 days and subjected residents to extensive damages, losses, and health effects in the form of diseases like leptospirosis. Local leaders allege that fifteen people were killed in the floods (Barboza, 2015), and journalists focused on the water that remained in the neighborhoods that abut the Tietê for months. Residents protested extensively, demanding the state intervene more forcefully in the prevention of flooding and in the pumping of the floodwaters that remained (Barboza, 2015). The state was slow to respond, but eventually declared the region an area of public calamity, pumped out the remaining water, and developed a series of infrastructural interventions designed to curb flooding. Additionally, they bought out many residents who were affected by the flooding, and developed a resettlement program for them related to an ongoing project to build a linear park along the Tietê’s southern bank (See next chapter). In the five years since, only one project—a dike in
the neighborhood of Jardim Romano—has been built. In the meantime, the neighborhoods continue to flood regularly, even as the city faced a drought-induced water shortage in 2014 and 2015. Flooding in 2016 dramatically impacted the neighborhood as well.

Flooding ties together much of São Paulo’s social and ecological landscape, and overlaps viscerally with broader dynamics of vulnerability and inequality. Many communities that are located in flood-prone areas are there due to the lack of affordable housing in the city and their inability to pay formal rent. More immediately, the slow response by the state to the problem of flooding is a constant source of complaint for communities in the várzea. For many, the regularity of flooding is seen as another case of a politics that largely ignores peripheral residents. Indeed, residents in communities like Jardim Pantanal make constant reference to the election year visits of politicians to the urban periphery, politicians who then purportedly do not return once the elections are won.

But for many residents in the várzea, the state’s complicity in flooding extends past neglect to include criminal complicity. Specifically, residents argue that the flooding in 2009 and 2010 was criminal. Residents allege that São Paulo’s water authorities (specifically DAEE and EMAE, the Metropolitan Water and Energy Company [Empresa Metropolitana de Águas e Energia] are criminally responsible for the flooding. This claim largely rests on two accusations: First, that the state did not adequately dredge the Tietê in the years leading up to the flooding. This meant that, at the time of the 2009 and 2010 floods, the river was full of silt and sediment, complicating its capacity to transport water downstream and subsequently encouraging floods. Dredging [desassoreamento] is a crucial component of river management, especially for rivers like the Tietê that combine channelization with extensive processes of upstream erosion. Indeed, for the landscape designers of the Dredge collaborative, dredging and infill are the unseen shapers of the world, responsible for many
of the urban landscapes that we take for granted. In the case of São Paulo, the engineering firm responsible for much of the Tietê’s dredging—TIISA—claims that they clear 500 tons of trash per day, the equivalent to the amount of refuse generated per day by a city of 600,000 residents. Evidence does seem to confirm the claim that the river had not been adequately dredged in the lead up to the 2009 and 2010 floods, as discussions over contracts between the state and firms like TIISA were ongoing for much of that time frame (See Barboza, 2015). Dredging is largely outsourced to firms like TIISA, meaning that delays and contract disputes can slow what is an essential function.

Second, and more pointedly, many residents argue that the state purposefully kept the Penha dam closed during days of intense rainfall in 2009 and 2010. Residents interpreted this as an attempt to preserve the urban core at the expense of the periphery. This argument is made forcefully by housing activist Zélia in her short piece entitled *History of an Occupation*. She notes:

Unfortunately, for the state and municipal government, the residents of the region are miserable people who don’t deserve respect for their rights. At the end of 2009, in a planned way, they closed the floodgates of the Penha dam, flooding the region. Entire families were desperate, with nowhere to go with houses under water. Many were lodged in schools, others in houses of parents and friends. Entire families separated. In this moment, they [the state] took advantage of the desperation of people and sent representatives to register people. They began the registration of residents with fragile families, enough to allege that they were without homes. They offered in exchange for registration 2,000 reais, being 200 reais for the move and 1,800 reais for renting a different apartment. In this period, a lot of people lost their houses…which were demolished without the family having any kind of alternative.

One year later, on January 23, 2011\(^5\), without being able to accomplish all of their objectives, but with some regions still flooded since the year before, we were present for our big flood. Curiously, it was a Sunday, the day before a holiday, and public organs weren’t functioning. I’ve never seen anything so sad. Where there were streets surged canals with fish, rats, snakes, and insects. At this altitude we didn’t know what were floodwaters or sewage, because SABESP doesn’t treat the water in this region, despite charging us for the services. People walked in that contaminated water in order to not die by drowning and to recover some possessions.

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\(^5\) This appears to be a typo: the correct date should be 2010.
We did not have medical assistance (psychologists, gynecologists, cardiologists, dermatologists, etc). A lot of people got sick, they got leptospirosis and others died. But their opinions were negated by the authorities, who blocked them from divulging. A lot of people lost their houses with the false promise that they were going to apartments. Two years have already passed and no apartments have been built in the nine areas of social interest that were highlighted for this. The sub prefecture already warned us that if it rains again, at the end of 2011, there will be floods again (Coletivo Mapa Xilográfico, n.d).

The artists and activists of the Mapa Xilográfico collective, who developed a long-standing collaborative cartography project in the region, echoed this sentiment. For them, the floods were produced by the actions of the state of São Paulo who, “opted to close the flood gates of the Penha dam, protecting the flux of automobiles on the Tietê highway and flooding for days an entire neighborhood.” Similar arguments were made during interviews with local activists and residents. Artists, too, engaged with these discourses (as detailed in Chapter 9).

Giving voice to this argument, activist Ronaldo argued in the wake of the 2009 floods:

“Flood the marginal [the central highway that runs along the Tietê in the urban core] or kill people in Pantanal. They killed. And still they put the blame on the residents” (Uchinaka, 2010; See also Barboza, 2015 for a more extensive engagement with the flooding and the response by local activists).

These accusations are somewhat hard to verify, and the state itself denies them. In documents provided to me by the Floodplain Committee, a group of neighborhood associations in the várzea, DAEE alleges that the functioning of the dam’s floodgates have little influence over flooding in the region, and that the primary problem is the irregular occupation on the city’s floodplains. In a letter from DAEE dated February 8, 2006 in reference to earlier flooding, for instance, they note:

…it is important to reiterate that the bulk of the area in question was occupied in an illegal manner through the construction of modest homes, typically on precarious infill and inserted into the floodplain of the Tietê, or to put it another way, in its floodplain and as a result in an area of environmental protection…With this, much of the
floodplain suffered a mischaracterization, because these occupations begin to interfere in the free circulation of water, conflicting with its natural function, particularly in regards to the dampening of flood peaks.

For DAEE, this irregular occupation serves to interfere with the movement of water in the region, complicating the natural function of riverbanks to dampen and lower flood peaks. In this analysis, the day-to-day operation of the dam is less pertinent to the longer-term dynamics of land use and informal occupation that marks the region. In reference to the specificities of the 2009/2010 flooding, DAEE has denied that they purposefully flooded the várzea.

A report by journalist Fabiana Uchinaka suggests some truthfulness to the accusations though. In it, she quotes the engineer responsible for the dam, João Sérgio, who noted that the dam was closed for two crucial days in early December. Justifying it, he noted that, “If I hadn’t closed the dam here, it would have flooded the marginais [central highways] in São Paulo.” He claimed that the order came from EMAE. He noted too that the river had clearly not been dredged, a fact that both slowed down the path of water away from the city and gives less space for its retention in the river’s floodplain.

Drawing from accounts like these, residents subsequently used the technical functioning of a dam to call attention to themselves, to make their lives visible and demand their rights as citizens while their neighborhoods remained flooded for months. In response to the flooding in 2009 and 2010, activists responded forcefully, leading extensive protests and even developing an occupation of those displaced by the floods. Detailed by Barboza (2015), activists (largely affiliated with MULP, or the Movement for Legalization and Urbanization of Pantanal) protested by blocking streets and setting fire to furniture ruined by the floods. Residents traveled to the urban center to stage protests at the mayor’s office calling for the uninterrupted opening of the dam’s floodgates, for an equitable housing policy, and for the
immediate dredging of the Tietê River (Barboza, 2015: 40). In April of 2010, nearly 100 families occupied a piece of land under the banner of “Occupation – The flooded ones of Pantanal” [Ocupação – Alagados do Pantanal]. The occupation lasted for 34 days, but was ultimately removed. Over the preceding months and years, local activists would continue to raise the issue of flooding but slowly interest would fade as waters receded and residents returned to their homes. At their peak though, organizations like the Movement for Legalization and Urbanization of Pantanal featured a representative from every street in the neighborhood (interview with Marzeni, 2016). While MULP no longer maintains a formal presence in the neighborhood, it remains visible, notably in the ongoing cursinho [a preparatory course for students preparing to take exams] and in the development of the Communicators of the Várzea [Comunicadores da Várzea] project, which teaches photography and writing skills to students from the region.

In embracing direct action and occupation, activists from the várzea articulated a vernacular version of contemporary work in the social sciences on “sacrifice zones” (See Lerner, 2010). Regardless of the specific culpability for flooding, the linkages between ecology and engineering in the management of the várzea’s flood dynamics are direct. The broader marginalization of the urban periphery in favor of its center is a long-standing component of the city’s urban and hydrological pattern and marks it political and ecological dynamics in specific ways. In this sense, the politics of the Penha Dam extend past the specific questions of opened or closed flood gates to include the broader urban pattern that pushes low-income residents to the edge of the city in the search for housing. In 2013, for instance, a resident of Jardim Pantanal, asked for solidarity from the mass mobilizations that rocked Brazilian cities by noting, “We are the ones who built the city and make it work every day. But today we don’t have the right to use it: the turnstile stops us from using
transportation, evictions and floods take our houses.” In this interpretation, areas like Itaim Paulista and Jardim Pantanal function as piscinões, areas that can be flooded in order to preserve circulation in the urban core.

The politics of visibility in these responses are overt, clear demands voiced by residents often made invisible by geography and marginality. Of interest too is the form through which activists made their demands clear, specifically through the language of occupation. Occupation constitutes a distinct form of political action in São Paulo and beyond, and constitutes one of the primary forms through which politics are made legibility. The physicality and materiality of landscape occupations are direct interventions into the urban landscape, and they immediately call attention to the dynamics of land and legality that produce the city’s shape. By choosing to occupy, residents of Jardim Pantanal enacted forceful demands on the urban landscape that took seriously property ownership and the localized politics of the urban landscape. As Vasudeven (2015) argues, occupation is a way to “re-imagine the city as a space of refuge and gathering, protest and subversion” (318; see also Amin, 2014; Boulos, 2015). It is also a way to make direct demands about property and speculation through the physical imposition of bodies.

In the case of the várzea, the technical management of a dam allowed for the articulation of a set of political claims that extended past the management of water to include dynamics of scarcity, inequality, and marginalization. These were spatialized through claims to the urban landscape in the form of protest and occupation. These projects make clear that dikes and dams “are thick with politics” (Bijker, 2007), not the least of which due to the fact that

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6 This quote was included in Holston (2013) and attributed to an anonymous source. Due to my research in the region I recognized the speaker but opt to keep the quotation anonymous. The original video that supplied the quote (which was originally found at: http://saopaulo.mpl.org.br/2013/07/01/ato-contra-remocoes-na-zona-leste/) is no longer available.
they function as materializations of broader political realities and histories. The Penha Dam is no exception, functioning as a flash point for conflicts in the region and a specific intervention into the region’s ongoing socio-natural relationships that allowed for the voicing of broader political claims to be made. The issues raised by the Penha Dam move past sheer questions of culpability and competence to include the broader ways that material infrastructures can be made to matter within ongoing political dynamics. Decisions about stormwater management matter for the lives and deaths of peripheral urban residents, and seemingly technical matters around issues like dredging can result in waterlogged homes and displaced residents. Through direct action and continued pressure, residents of Jardim Pantanal refused to see flooding as anything resembling a natural disaster.

Conclusion

This chapter, the second of two chapters designed to introduce the city’s hydrological landscape, was written to do two things: First, to give a sense for São Paulo’s landscape in more detail, focusing on its system of stormwater management. I explained how stormwater is managed in the city and considered the contemporary approach to water management in the city. Second, it was designed to highlight how seemingly technical systems have been articulated as specifically political interventions by residents, activists, and artists. While scholars of infrastructure writing from the global south have complicated existing articulations of the purported invisibility of infrastructural systems, more work is to be done to understand how and through what forms infrastructures are made visible. I focused on three specific components of the city’s drainage network: córregos, piscinões, and dams. I argued that these technologies make clear that the management of stormwater is intimately connected to broader dynamics of inequality and socio-spatial marginalization in the city,
and that artists and artists have creatively called attention to the city’s infrastructural networks in creative and challenging ways.
Figure 6.1: Area subject to Flooding, Vila Madalena, São Paulo, 2016. Photograph by the author.
Figure 6.2: Córrego, Itaim Paulista, 2016. Photograph by the author.

Figure 6.3: Piece by Zezão, São Paulo, 2015. Photograph by the author.
Figure 6.4: Córrego Manoel under construction. Itaim Paulista, 2014.

Figure 6.5: Córrego Itaim and Lagoa Itaim. Photo Courtesy Euclides Mendes.
Figure 6.6: Blocked córrego, Itaim Paulista, 2016. Photograph by the author.

Figure 6.7: Tietê River of Propaganda / Tiete River of the Periphery. Image courtesy Euclides Mendes.
Figure 6.8: Jardim Romano Dike and Piscinão, 2016. Photograph by the author.
Figure 6.9: Piscinão Aricanduva V. Image from Franco and Coachman (2016). Reproduced with permission of the authors.
Figure 6.10: Penha Dam, looking east. Photo courtesy Euclides Mendes
Chapter 7: The Urban Political Ecology of Linear Parks and the Problem of Permeability: The Parque Várzeas do Tietê

Introduction

São Paulo is an impermeable city, one traversed by extensive hydrological engineering and intense inequality. As I argued in the previous chapters, this making impermeable of the landscape was a product of two different forms of interlinked urban policy: the extensive development of the city’s várzeas by the real estate industry and the abandonment of the várzeas in the urban periphery. This yielded an impermeable city in both a social and ecological sense, one which tied a broader marginalization of the urban periphery into a land use pattern that has exacerbated flooding, polluted local water sources, and resulted in problems of water scarcity. In the previous chapter, I considered the contemporary shape of flood prevention infrastructure in the city, and analyzed how the city’s environmental geography incorporated the topographical dimensions of the city with localized political struggles over resources and representation. I argued that the city’s management of flooding is suggestive of the intimate entanglements between the social, the ecological, and the aesthetic in how storm water is grappled with in contemporary cities.

If the previous chapter was concerned with the city’s ongoing approach to stormwater, this chapter considers a more speculative project, a gesturing at the future. Specifically, it focuses on the attempted implementation of linear parks in São Paulo. Linear parks are narrow stretches on the edge of rivers designed to curb flooding and provide environmental services to the city’s underserved population. In their usage of designed landscape to serve ecological functions, these projects are one of the few examples of the attempted implementation of green infrastructure in Brazilian cities. Green infrastructure, which focuses on the usage of natural processes to yield ecological benefits, is an increasingly
prevalent albeit contested mode of engaging with urban-environmental landscapes in the global north (See Braun, 2014; Finewood, 2016; Herzog, 2013). Green infrastructure attempts to work with natural processes to produce better ecological outcomes in cities. In contrast to long-standing paradigms of water management that have focused on the rapid expulsion of stormwater from the city, green infrastructural interventions attempt to accommodate stormwater through design. In doing so, they aid in water filtration, lessen the impacts of flooding, and encourage biodiversity.

I engage in this chapter with these somewhat lofty ambitious through an analysis of something far more prosaic: strips of green space on the edge of polluted rivers. While the figure of the linear park may have links to high-profile examples of green infrastructure and climate change adaptation, in particular the High Line and other attempts to deal with increased storms in cities like New Orleans and New York City, linear parks in São Paulo are significantly more small-scale. Yet as a result of São Paulo’s long-standing inequality and its materialization in the city’s hydro-landscape, efforts to implant even simple green spaces are fraught, requiring complex negotiations over land tenure, housing, and environmental functionality. As such, attempts to construct linear parks are windows into broader dynamics of governance and landscape management in the city. In a sense, linear parks are suggestive of an emergent paradigm shift in water governance in São Paulo, but they are also suggestive of the difficulties in modifying existing social and infrastructural paradigms and the broader difficulties of landscape modification in unequal urban places. This makes them unique spaces from which to analyze both the contemporary nature of landscape governance in São Paulo but also broader questions about the politics of landscape more broadly.

This chapter is focused on the Tietê River Valley Park [Parque Várzeas do Tietê]. The Parque Várzeas do Tietê [hereafter referred to as the PVT] is a linear park being constructed
by the state on the eastern edge of the city. Bridging a series of municipalities, the PVT is by far the most ambitious linear park currently under construction, ultimately destined to be the largest linear park in the world upon completion. Located in a region I have been referring to as the várzea, the project’s scale necessitates and implicitly justifies the considerable removal of low-income communities and a dramatic reconfiguring of the landscape of São Paulo. As a result, I critically analyze the project, both at the level of its discursive justification but also at the level of its attempted implementation. I take issue with three discourses that are used to justify its development: it will improve water quality though the reduction of sewage deposited into the river, it will take resident out of situations of risk, and it will improve the region’s problems with flooding. I argue that the project is largely predicated on discourses that disproportionately place the blame for environmental degradation on the urban poor, and that its implementation lacks transparency and a willingness to collaborate with local residents. Given the dynamics of housing in the city of São Paulo, this suggests that communities in the region are right to question and resist the project’s implementation.

More conceptually, I argue that the project ignores what an expansive engagement with green infrastructure could offer, a version of green infrastructure not as a design solution to stormwater management but instead as a broader way of engaging with cities in relational ways. I subsequently conclude by considering how relational engagements with the landscape of the várzea could produce more satisfying social and ecological futures for the region, ones based in a flexible understanding of socio-natural hybridity. I consider how an approach to landscape level management predicated on the existing histories of autoconstruction and making do—an ethic of repair, rather than new construction—may offer possibilities for engaging with both the social and ecological dynamics of complex landscapes.
The organization of this chapter is as follows. First, I briefly focus on linear parks created by the municipal government over the past decade. I discuss the difficulties of creating linear parks in the city, and the broader challenges of urban interventions that bring together different branches of São Paulo’s municipal and state government. São Paulo’s linear parks showcase the enduring difficulties of attempting to merge the social and the natural in the urban policy process due to specific constellations and configurations of governance. Second, I focus on the attempted construction of the PVT, paying attention to the specific discourses that are used to justify the project’s implementation. I conclude by calling for a more fluid engagement with landscape borders in the management of the várzea.

**Linear Parks in historical and geographical contexts**

For the purposes of this chapter, linear parks are defined as narrow stretches of green space located on the edges of rivers. They are simple pieces of urban infrastructure, designed to improve water quality and ease the impact of flooding through the preservation of riverbanks. While the figure of the linear park has become an increasingly visible component within contemporary urban design practice, specifically in the form of remade pieces of outdated urban infrastructure in projects like the High Line, in this chapter I am mainly concerned with small-scale attempts to preserve riverbanks through the provisioning of green space. These sorts of projects are by no means new, but have taken on increasing significance in recent years as the economic functions of urban landscapes have shifted. For Travassos (2010), the history of linear parks can be best demonstrated by considering them in light of American Greenways, a term defined by Charles Lille in 1990. Frederick Law Olmsted’s emerald necklace is an obvious historical precedent, too, especially given Olmsted’s brilliant capacity to make his own landscape interventions appear natural rather
than designed (See Spirn, 1995). Olmsted’s emerald necklace initially emerged out of a concern about flooding and drainage, and subsequently was able to fuse green space provisioning with the demands of a modified landscape. As such, it provides an early articulation of the role of linear parks within contemporary engagements with green infrastructure and landscape-level water governance. Linear parks dot the American landscape, especially as formerly industrial waterways are increasingly converted into sites of leisure and recreation.

Architecturally, the figure of the Linear Park has become a visible symbol of contemporary urban design, most notably in the context of Manhattan’s High Line Park. There, it functions as a means of incorporating post-industrial accidental landscapes into the broader functioning of a real estate oriented, neoliberal process of governance (See Patrick, 2013; Millington, 2015). Other versions of linear parks continue to emerge in the wake of the High Line, including London’s proposed Garden Bridge, Mexico City’s proposed Avenida Chapultepec, and a variety of small-scale green spaces on previously functional infrastructural sites. São Paulo, too, boasts its own version of a high-profile urban linear park, the strange elevated highway turned informal public space known as the Minhocão (See Millington, forthcoming). As designed spaces that are often used to replace existing transportation or hydrological infrastructures, linear parks mark the shift of cities from managerialism to entrepreneurialism (Harvey, 1980). They show how urban economies have, in part, moved away from production-oriented logics towards becoming predicated on real estate speculation and the financialization of housing (See Rolnik, 2015). By highlighting the temporal disjunctiveness of outdated infrastructure, they highlight how cities have changed in a broadly neoliberal era. They are, in a sense, remnants of past urban landscapes, traces of previous productive regimes.
In São Paulo, linear parks are generally more limited, although they too demonstrate the changing function of riverbanks over time. The project to develop linear parks in the city was formally inaugurated in São Paulo in 2002 as part of the Water Course and Valley Floor Environmental Recovery Program, a set of guidelines included in the city’s first strategic plan. This emerged from the national requirements that all cities over a certain size develop strategic plans, part of the statute of the city developed in 1996. Since then, the municipality of São Paulo has built 17 linear parks, largely concentrated in the city’s eastern zone and on the urban edge more broadly (Silva-Sánchez & Jacobi, 2014). Given their limited acreage and broader lack of funding, as well as the presence of highways along the edges of many of the streams discussed in previous chapters, linear parks in São Paulo are often discussed more in symbolic than practical terms. They are articulated as a corrective to long-standing binaries made between river and city in São Paulo. René of the environmental secretary in the sub prefecture of Butantã made this point directly:

The city of São Paulo was formed incorporating the córregos into the sanitation system…And so what happens? This perspective brought a concept, right?, for the population. That the córrego is a space for defecation, right? This is the reason why people talk so much about this thing here, that people throw trash in the córregos, but where did the population learn that? From the state’s own practice. From the moment that the state took the sewage that was to be treated and put it into the córrego, then they are telling everyone that the córrego is a space for trash….And so what is necessary when you talk about a linear park? You want to clean the córrego and everything else. It’s a revision of the concept for the population. The population has to have a new vision for this córrego, you know? (Interview with René, 2015).

Linear parks have been seen as a potentially new intervention that combines the provisioning of green space with concerns over water quality and environmental degradation more broadly (See, for instance, Jacobi et al, 2015). As René noted later in the interview, they are an “instrument of urban and environmental requalification.” For him, the linear park was designed as a corrective to a long-standing approach to the management of córregos in the city, which have long been seen primarily as an appendage to the city’s sewage infrastructure.
The scholarly literature focused on linear parks in São Paulo makes a similar point. For Jacobi et al (2015):

The Linear Park, as an urban-environmental intervention, if adequately implemented, could signify a real transformation in the urban landscape, promoting the requalification of public spaces, the recuperation of water quality and integrating the córregos into the city as a socio-environmental system that provides important ecosystemic services (74).

In this reference to ecosystemic functions, Jacobi et al discursively link linear parks into broader contemporary theorizations of urban ecology and landscape urbanist approaches within planning and design. In these articulations, linear parks are a relational intervention, a way to resignify the functionality of córregos within the city.

More specifically, the functionality of linear parks is based around three particular capacities: First, linear parks use landscape to both generate water quality improvements through the purported (albeit questionable) limiting of raw sewage deposited into the river; Second, they curb flood losses through the removal of occupation from river floodplains and the restoration of riverbanks into partial flood regulators; And third, they generate some increased permeability and vegetation in the city through the preservation of riverbanks. This preservation of the riverbanks is often linked to the removal of informal communities from the edges of rivers. The plan for the management of macro-drainage in the city, for instance, makes this point: “The creation of linear parks for use as areas for leisure and contemplation” can, “in addition to slowing down discharge and improving the quality of water, impede the irregular occupation of riverine areas.” Linear parks, then, are more than just green spaces: they are mechanisms for specific environmental possibilities and landscape ordering. For Sun, an employee of the environmental secretary who had been involved in the implementation of linear parks projects, linear parks are a specifically 21st form of park. In opposition to what he called romantic parks, linear parks are more intimately linked to urbanization and their environmental functions are much more evident. For him, linear
parks—along with their environmental functions in the form of drainage, retention of rainwater, and habitat development—are suggestive of a cultural change, a change in perception, in relation to water.

Accompanied with a move away from stream rectification, the development of linear parks can be tied to a broader shift in water management away from the principle of rapid transit—that is, piped removal of storm water—to what may be seen as the principle of retention or absorption: permeability, in short. This is a vision that, in recent years, attempts not to strictly expel water from urban landscapes but accommodate it through increasing urban permeability and porosity, as in green infrastructural interventions. Linear parks take many forms and involve many different political and economic dynamics. Nevertheless, they reflect emerging discourses focused on the use of natural systems to mitigate flooding, improve water quality, and provide environmental and green space benefits to urban residents. In places as diverse as Lexington, Kentucky, and Philadelphia, Pennsylvania, the usage of green space to absorb stormwater has become an increasingly visible component of the urban landscape, spatialized most specifically in design elements like bioswales, rain gardens, and retention ponds. These sorts of low-impact stormwater management are seen in many respects as win-win: cheaper than large-scale hydrological infrastructure, green infrastructure can provide green space and ideally serve to order the complex edges between watery and terrestrial landscapes (See Finewood, 2016). Most importantly, they filter stormwater, help to recharge groundwater supplies, and ideally lessen the severity of flooding.

In the case of Brazil, green infrastructure remains largely underimplemented, suggesting that efforts to see specifically green infrastructures as emblematic of changing modes of governance may be premature in global south contexts (See Herzog, 2013). Efforts to create
green infrastructural systems in the city are often piecemeal or products of either community or private efforts. These initiatives range from small-scale community projects to unearth buried streams or create rain gardens to broader programs initiated by NGOs to implement artificial wetlands along the city’s rivers. As such, while green infrastructure has some presence in São Paulo, it is largely sidelined by a continued approach to stormwater management that relies on large-scale infrastructural development and ongoing processes of repair and maintenance made to previous infrastructural interventions. As the broader unfolding of a crisis of water scarcity made clear throughout 2014, transposition and interlinking of watersheds remains more politically viable than a politics of reuse, stormwater retention, and smaller-scale sewage treatment (See Chapter 8).

As such, the implantation of linear parks in São Paulo have been significantly more small-scale, functioning as windows into localized politics more than broader dynamics of global governance. While their implementation has been multifaceted, the majority have been located in the urban periphery where land values are cheaper. Some have been successful, but many show signs of underinvestment and a lack of prolonged funding for maintenance. Take, for instance, Parque Linear Rio Verde (Figure 7.1), which is located in the neighborhood of Itaquera. Lacking a more holistic engagement with the dynamics of sewage in the region, the park includes a green space but neglects the sorts of landscaping and design elements that make parks more accessible. It is, in the words of activist priest Father Ticão, a park, “for the poor,” one designed with little consideration of its users (personal interview, 2014). It supplies limited green space for organized sports and preserves a stretch of the Córrego Verde. But the stream is still deeply polluted, and it is kept behind a fence so as to avoid contamination or bodily proximity. This demonstrates the disconnect between landscape-level interventions and the broader, relational nature of water
management. It also highlights the difficulty in getting different state entities to collaborate. Central to the necessary functioning of linear parks is a relationship between differing state entities (water, environment, housing), but the capacity to collaborate is often complicated by party affiliations and a lack of broader sectorial cooperation. Indeed, the lack of sectorial cooperation within São Paulo’s water management is a broader complaint of many activists in the sector (See, for instance, Barros, 2014; Porto, 2014; Silva, 2014).

This can be demonstrated by the attempted construction of the Água Podre linear park in the region of Burantã (Figure 7.2). The project began in 2006 when the neighborhood rewrote its strategic plan. That process yielded 21 linear park proposals which were eventually whittled down to 10 priority sites. One of these was Água Podre, whose funding largely comes from environmental compensation financing. Despite being sanctioned, the project remains unbuilt ten years after its initial announcement. At a meeting in August 2015 between residents and state representatives, plans were discussed and updates were given, and delays were largely blamed on funding dynamics and the inability to coordinate between differing state entities. Despite some initial enthusiasm on behalf of the neighborhood representatives, nothing has happened in the year since the meeting.

The stalled construction is an example of the ways in which budgetary limitations and bureaucratic indifference yielded slow-to-implement projects. For René, the central dynamic of the project’s delay is its location in the broadly defined urban periphery, specifically in the sub prefecture of Butantã:

It’s really a question of priorities. We live in a city where some areas are abandoned. You know? Just to give you an idea, I am in favor of the implantation of the Parque do Jóquei, here. Yesterday there was a meeting…I’m one of the people who fought for the

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7 Exceptions include some interesting ongoing efforts to develop linear parks that would encompass entire watersheds, often situated within a broader move towards macro-scale governance regions and concepts like the macro-metropolis. These are all largely in development at this point though.

8 A park in the wealthy neighborhood of Morumbi.
implantation of the Parque do Jóquei, but for me the lesson is clear: the Parque do Jóquei is in an area that...why was it a priority? In one year the discussion began and its already being implanted...it’s the location of it, the insertion into the territory, right? It has, thus, the relations with which it becomes a priority. And so the state is spending 30 million [reais] to implant the park. And the Parque Agua Podre, which with 5 [million reais] you can finish and execute everything, is there [ie. Not implemented]. So its really a question, for me its clear, it’s a question that the state has priorities and so us, in this movement, the periphery has to put a lot of pressure to get the things and its not the same thing as some parks located in wealthy neighborhoods of the city. You already have a state that facilitates the implantation. It’s all a question of power. And so the question is difficult. Bringing policy to the periphery is really complicated.

René’s comment highlights the broad terrains of inequality that characterize the implementation of environmental projects within São Paulo. While bureaucratic complications are certainly a factor in the failure to implement specific projects, bureaucratic dynamics are often bypassed in situations of urgency. As such, bureaucratic delay is more often an example of priorities than capacities. As a result, in the case of linear parks, many projects remain more dream than reality, and funding dynamics suggest that they will increasingly fade from sight. The city is now overburdened with the costs of maintaining the parks built by previous administrations.

**The Parque Várzeas do Tietê**

The Parque Várzeas do Tietê or Tietê River Valley Park is the proposed exception to the generally small-scale, underfunded linear parks previously mentioned. While other linear parks in the city are municipal, the PVT is a state project, one under the institutional control of the Department of Water and Electrical Energy [DAEE]. As such, its budgetary dynamics are entirely unrelated to the city budget. Developed in 2010, the project boasts a much more robust budget than other park projects, with funding from the Interamerican Development Bank amounting to nearly two hundred and fifty million dollars. The project will, upon completion, be the largest linear park in the world, connecting the center of São Paulo to the source of the Tietê, found in the town of Salesópolis. Its discursive framing makes clear that
the project is not a small-scale intervention but instead a massive rearticulation of the relationship between river and city in São Paulo.

The park creates a green edge along the Tietê, a border. Upon completion, the park will stretch for 75 kilometers, creating a green corridor that extends far out of São Paulo (See Figure 7.3). The central idea for the project is that in addition to its capacity to serve as a flood regulator, it will bring a series of benefits to marginalized populations in the region and preserve the river’s original course. These benefits will include 33 leisure centers [nucleos de lazer], a 230 km bike lane, 77 soccer fields, and 75 km of uninterrupted green space. This scale makes clear that while previous linear parks were largely piecemeal, small-scale interventions into the city’s hydrolandscape, the PVT is on an entirely different scale. It is, in a sense, a green infrastructural project infused with the logics and aesthetics of modernism. Indeed, when I interviewed the project’s director, Marta, she repeatedly described the project to me in terms of its relation to other spatial units in the city, telling me, “I love these comparisons…because they’re the only way that people will grasp the size of this thing.” As such, the project was compared in hectares to soccer fields and São Paulo’s famous Parque Ibirapuera, two specifically Paulistano landmarks. For Marta, the project is fundamentally a project of hydrological infrastructure. As she told me, “its an infrastructure project despite its really big social component.”

The purpose of the project is multi-faceted, even as the primary function of the project is to serve as a flood regulator. As DAEE notes on the project’s website:

The principal objective of the program is to recuperate and protect the function of the river’s várzeas, in addition to functioning as a regulator of floods, saving lives and people’s property. At the same time, the Tietê Floodplain Park contemplates a gigantic leisure area for the population.

This does not necessarily mean that the project is an attempt to prevent flooding for communities in the region. Aspects of it gesture at this, in terms of a focus on permeability
and a relationship to the related dynamics of dredging, but the project’s broader aim is, in a sense, to keep the várzea floodable but alter the affects of those processes. The PVT is specifically designed to use the river’s historic landscape to dampen flood peaks, whose dynamics have shifted given the intensity of occupation in the region and the issues of impermeability that have accompanied those processes. Lemes, writing in the Management Plan for the Tietê Floodplain Area of Environmental Protection [Plano de Manejo: Area de Proteção Ambiental, Várzea do Rio Tietê] notes that the velocity of flood peaks have increased dramatically in the last three decades due to the lowering of the absorptive capacity of the landscape, and that further deepening of the Tietê’s channel is no longer physically possible. As a result, the only way to prevent flooding in the urban core is evidently to remake the landscape of the várzea on a massive scale.

As such, the PVT attempts to clear the riverbanks of the Tietê in order to return them to their historic function as flood regulators and areas for water retention. In lieu of projects like channelization and the development of dikes—whose function is to prevent floods from reaching specific locations—the purpose of the PVT is the opposite. It is to dissuade occupation in floodable areas, to allow for floodplains to fulfill their historic ecological function (within certain constraints). It is an acknowledgement of a hydrological paradigm that has reached its limit. Central to this is the removal of low-income populations on the river’s edge and the usage of design elements to try to dissuade future occupation. Knowing that the occupation of unused and vacant land is a constant process, the project uses demarcated park space to bring a sense of planned order to what are affectively marginal landscapes in order to hopefully impede further occupation. The purpose of this intentional ordering of the landscape into a space of leisure and environmental benefit is meant to impede attempts to claim it for housing. The PVT then is a process of ordering that folds in
the landscape as a specifically infrastructural actor. When I previously mentioned linear parks as a paradigmatic shift in water management, this is what I was referring to: flood prevention through accommodation of floodwaters rather than attempts to modify the movement and flow of urban stormwater. This is a direct case of what Carse (2012) refers to as “infrastructure as nature”: the management of natural landscapes in a way that allows them to deliver services and facilitate economic activity (540).

As Marta, the manager of the project, noted in an interview, the purpose of the project is to:

Recuperate the capacity to capture rain on the margins, reestablish the function of the margin for the absorption of rainwater, maintain the maximum dam outflow, recuperate the margins of the stretch affected by irregular occupation, protect the natural environment, promote sustainable use…and guarantee in the relocation of vulnerable families dignified housing for the population (Marta, personal interview 2014).

This will take the form of an extensive green space threaded through the city’s eastern floodplain. The project will extend on the already existing Tietê Ecological Park, a green space designed by Ruy Ohtake and completed in the 1980s. The PVT expands on the original plan, and Ohtake is once again the architect responsible for the project’s initial design. The park spaces proposed for the project use much of Ohtake’s classic architectural styling, which consists in part of colorful engagements with formal geometric shapes. As with other Brazilian architects, Ohtake makes extensive use of large-scale abstract shapes in his landscape design, leaving his designed spaces to often feel under designed or spare.

The purported reason for the PVT’s development was the dramatic flooding that occurred in the várzea in 2009 and 2010 (discussed in the previous chapters). While flooding is regularized in the region, its intensity shifts by the year. The PVT is subsequently an attempt to reorient this complex fluvial landscape in the service of flood prevention and
environmental remediation, to develop a more permanent solution to flood management in the region. As Marta noted, flooding in 2009 was the:

…worst flood that we have confronted here: what happened? Look, the river filled up…and it had nowhere to spread its water. It spread into the houses, or the houses occupied where it needed to spread. And so this project here, it creates a physical barrier, which is a park lane, a bike lane, to secure, to maintain the distance from the river.

The project is discursively articulated as a corrective to both a lack of investment and the problem of flooding itself. As such, the project proposes an extensive green swathe that will both give space to the river to expand during periods of high flow, as well as provide residents with access to free leisure. The project proposes the implementation of a series of leisure centers or parks, linked together by an extensive bike lane and green stretch that will give the river space to flood and impede informal and irregular occupation in the region. Indeed, the bike lane is a central component of the project’s development, a marking off of where neighborhood ends and park begins. Like concrete spikes designed to prevent the homeless from sleeping on benches, it is an attempt to use landscape to modify behavior.

Nearly ten years in, the project has little to show for it beyond a series of designs, an 11 kilometer bike lane, and one completed park space that is only nominally connected to the project. The three primary nucleos for the project that have been planned—Itaim Biacica, Vila Any, and Jardim Helena—are all in development, with Itaim Biacica being the only one to show evidence of construction. While project employees made clear to me that the project was progressing, fiscal and political crises in Brazil suggest that the project may remain unrealized in the years to come, a product of the complexity of intervening into the “gray zone” (Yiftachel, 2009) of the várzea. In addition to the broader logistical and financial costs of resettling populations deemed at risk, the underlying dynamics of land ownership complicate project plans. This stretches already limited funding.
The project too has suffered from a lack of buy-in from residents and local civil society representatives. Many activists have made demands on DAEE since the project’s initial announcement. Since the project’s inauguration, resident associations and activists linked together through loose networks of solidarity have questioned the project, and during my informal visits with PVT employees they expressed serious fatigue with neighborhood leaders and activists. While areas like the várzea do not necessarily retain the active social movement presence that existed in the 1980s and during the broader period of democratization, they nevertheless include considerable local political activity and representation that takes a variety of forms. This includes organizations like the Várzea Committee [Comitê da Várzea], the Movement for the Urbanization and Legalization of Pantanal [MULP], Organized Cultural Action Afro East [ACALEO], and others. Additionally, the region boasts a considerable presence of electoral parties affiliated with the political left, most notably the Worker’s Party [PT] and the Party of Socialism and Liberty [PSOL], a contemporary left political party. 2015 even saw the arrival of a parliamentary front designed to address challenges in the community of Jardim Pantanal but it is unclear what the current status of that effort is.

In the remainder of this chapter, I do two things. First, I engage with the project on the discursive level, to consider how it is being articulated and how it is being justified. I take issue with three discourses that animate the project: that it will improve water quality through the reduction of sewage deposited into the river, that it will take residents out of risk, and that it will improve the region’s problem of flooding. While to some degree largely focused on the discourses at the heart of the project, I use the idea of risk to move from the project’s discursive articulation to consider its actual implementation. I argue that the form in which the project is being implemented is deeply lacking in transparency, placing
vulnerable urban residents in situations of liminality that complicates any efforts to see the project as a potentially beneficiary investment in the region. In a sense, my broader argument is that the proposed benefits of the project in the form of flood prevention are not matched by its claims about water quality and precariousness. As such, rather than inaugurate a new era in water management it continues a mono-functional approach to water management that largely sees the city’s rivers as vehicles for flood prevention. In doing so, the project uses a gloss of environmental benefits to aid in what is more broadly a project of large-scale hydraulic engineering.

More conceptually, I argue that a prevailing logic of differentiation—between the watery and terrestrial portions of the project—limits the possibility for more relational approach to water management that would balance social and ecological goals in the region. For Mathur and da Cunha (2014), contemporary engagements with (urban) water are predicated on the “regime of the line,” one that “separates, calibrates, and contains water to a flow and to flood” (11). “Why is it,” they ask, “that despite waters everywhere precipitating, seeping, soaking air, soil and vegetation, collecting in interstices, pores, terraces, cisterns, and aquifers, evaporating, transpiring, and sublimating, we see water somewhere, confined within or behind lines and generally colored blue in maps?” (13; See, too, Mandelman, 2015). As such, I consider the PVT as a case of aesthetic ordering, one predicated on a binary view of landscape that attempts to use formal design to manage the inherent relationality of urban water processes. I further argue that without a sustained rethinking of the edges and borders that purportedly mark the landscapes many inhabit, projects like the PVT continue an approach to water management and landscape governance that is specifically mono-functional. The three discourses that I highlight are products of a binary view of water and land in the region, a socio-ecological distinction that has real implications for residents in the
region. I conclude by calling for a politics of porosity—an “ethic of permeability,” to reference Mandelman (2015)—that is both social and ecological, that takes seriously the histories of making do that are present in the city’s landscape.

Landscaping 1: Sewage

In addition to their aesthetic and recreational functions, linear parks are commonly seen as a means of preventing the depositing of raw sewage into riverways. As Marta noted:

Immediate benefit: reduce the depositing of sewage directly into the river, because if you remove these families, we’re talking about 8,000 families, we’re talking about close to 40,000 people. Thirty thousand people, forty thousand people. And so if you take this sewage directly out of the river, 40,000 people, to give you an idea, do you know the city Aparecida do Norte? Aparecida is where there is a cathedral, a religious city of the saint of Brazil. It’s the size of the city. Its these people that we have to remove (Personal interview, 2014).

Marta is referring to the fact that many residents of informal or irregular neighborhoods are often not hooked into formal sewage networks. Images of untreated sewage pouring from self-built pipes in the urban periphery are a common visual accompaniment of a broader discourse around sewage and water pollution in the city. This suggests that the poor disproportionately pollute due to their lack of connection to the sewage network, and there is a lot of truth to this statement. Constructing sewage networks in floodplains is expensive and requires technological sophistication that is often missing (Swyngedouw, 2004: 59). Additionally, the formal illegality of many low-income communities prevents the construction of sewage infrastructure. SABESP is legally prevented from putting in sewage networks in irregular areas or areas deemed as areas of environmental protection. This results in a paradoxical situation in which communities blamed for pollution are prevented from having sewage infrastructure constructed due to their illegality. This is most pronounced in the regions surrounding the Guarapiranga reservoir in the southern zone of the city, where nearly a million people live in close proximity to one of the city’s primary
drinking water reservoirs. During participatory hearings about the city’s strategic plan in 2013 and 2014, residents often spoke about the discrepancy of purported environmental zoning in communities that had been in place for multiple decades. While these legal designations are often unclear to residents themselves—many of whom presumably possess what they assume to be a legal title to their home—they matter at the level of formal state practice.

Saying that the poor pollute is a true statement, but it is also limited. Indeed, everyone pollutes in São Paulo. As political ecologists have argued for decades, blaming the poor for environmental degradation remains an easy and often too simplistic explanation for environmental problems (See Blaikie and Brookfield, 1987). While it is true that favela communities along the Tietê and other waterways in the city do deposit sewage directly into the river, the notion that they are to blame for the river’s pollution ignores the broad structural failings of sewage treatment in the city, a failing that is in fact shared by all residents of the city. Additionally, it ignores the broad inequality built into the city’s housing landscape more generally, and the degree to which peripheral residents have long campaigned for sewage infrastructure in their communities. A study found that 88% of informal residents in São Paulo would pay for sewage if implemented (Leite and Velasco, 2015). Granted, this is a hypothetical argument, but it gestures at the discursive politics of sewage provisioning in low-income communities. Those blamed for pollution are often the most affected by low water quality. Indeed, the broader logic that compels urban residents to occupy areas of marginal value mean that those who are blamed for putting sewage in the city’s riverways are those who most have to bear the burden of inadequate sewage collection in the form of smell and disease. As such, the notion that poor residents are to blame for
pollution ignores the ways that poor residents are specifically at risk due to water pollution, and especially to diseases like leptospirosis.

Residents of the Eastern Zone [Zona Leste] have been active in movements to depollute the river, organizing protests in 2009 in particular. But, unlike the broadly depolitized calls for water cleanups organized by more elite actors, the calls to remove pollution that emerge from the urban periphery often invert the scripts of culpability, calling attention to the broader state failure to provide adequate sewage. Take, for instance, a 2009 editorial by Wagner Novais in the journal *Voice of the Community* [*Voz da Comunidade*], who notes:

> We should do our part, ‘our homework’....But, we also should question and demand why, in the middle of the 21st century, mayors of riverine cities continue to deposit tons of untreated sewage in their waters. Why does the state...not manage, not charge and permit the punishment of these offenders? Did you know that there are still industries in the Eastern Zone that in the ‘quiet of night’ open their polluted taps in the direction of the river?”

Comments like this are representative of differing modalities of environmental thought as articulated by residents and representatives of the urban periphery (See, for instance, Jacobi, 2000). Indeed, the idea that residents of the periphery lack an environmental sense is complicated by the actions of social movements who are able to link their demands to a clean environment with their desire to not be forced to leave their homes. Organizations like the Movement in Defense of the Favela Resident [Movimento em defesa do Favelado] are important, as they connect issues of housing inequity to concerns about climate change and environmental degradation more broadly. While collaborations between environmentalist and housing movements in São Paulo remain underdeveloped, there are glimmers that nevertheless suggest future collaborative directions (See Cohen, 2016).

More immediately though, it is worth noting that the bulk of São Paulo’s sewage—from both rich and poor—is not treated. This includes sewage from both formal and informal sources. As was articulated by a 2015 investigative report from *A Pública*, the continued
pollution of the Tietê is a broader failure of the state’s capacity to manage sewage collection and not the depositing of sewage into rivers by the urban poor. The authors note, in reference to their study of seven distinct neighborhoods, “the expulsion of untreated sewage comes as much from barracos [shacks] as it does from mansions.” They demonstrate this through two specific case studies, but these can be backed up by broader work on the geography of sewage collection in the city.

Using data from SABESP, the Instituto Trata Brasil alleges that the city of São Paulo currently treats roughly 52% of its sewage. The environmental regulatory agency CETESB, on the other hand, puts sewage collection at around 75% in the city itself, which reduces to around 50% total treatment when expanded out to include the entirety of the Alto-Tietê basin (which, again, houses almost the entirety of the metropolitan region of São Paulo’s population). These numbers, the number of residents served by sewage networks divided by population figures, are alarming, but they may also be lower than they should be. Many residents of poor communities claim that while they are paying for sewage treatment, their water is not actually being treated. In the case of Jardim Romano, where the PVT will be located, the treatment station in the neighborhood functions at levels vastly lower than expected. Indeed, in their investigative reporting, the reporters of A Publica put red dye into sewage pipes, and watched as the dye was directly deposited directly into the river, completely bypassing the sewage treatment plant located 7 kilometers away. Even the SABESP-run website for the treatment center itself admits that the station is underperforming, treating a little over half of what was estimated for the location. More broadly, the treatment centers in the city are in general only capable of treating 18 m$^3$ per second while the metropolitan region itself consumes roughly 79 m$^3$ of water per second. This makes clear that even much of the sewage that is being formally collected is not being
treated. For critics of the state’s management of water (see chapter 7), this is a product of the state’s partial privatization of its water governance. This has yielded a situation in which the state actively expands water availability while underinvesting in water treatment and sewage infrastructure.

This suggests that sewage, and the supposed culpability of the poor in polluting São Paulo’s riverways, is not necessarily an easy justification for environmental interventions into the city’s waterways. Water pollution in São Paulo is a state-level failure, one that ties together the entirety of the city’s hydrological infrastructure, its social dynamics of housing provisioning, and its for-profit model of water provisioning and sewage collection. While the image of sewage seeping from self-built pipes in favelas is a compelling and often convincing visual representation of the dynamics of pollution in places like São Paulo, it ignores the invisible, unseen ways in which pollution is a product of the city as a whole. Furthermore, it ignores, once again, the unseen dynamics of repair and maintenance that are of essential utility for thinking through longer-term environmental futures (See Thrift, 2005). Sewage treatment plants operating only at partial capacity are a dramatic indictment of an approach to water management that is not adequately investing resources in sewage treatment. As such, sewage is a relational failing, one solved not by the clearing out of favela communities but instead by a broader reconfiguring of the city and state sewage networks and a more consistent investment in sewage infrastructure throughout the city. As Luiz of the NGO Rios e Ruas mentioned in an 2014 presentation, anyone who talks about revitalizing the Tietê and starts there, rather than in the myriad córregos that flow into it, is either a “liar or is ignorant.” Water quality in São Paulo begins with the hundreds of tributaries that crisscross the city, but often water quality initiatives privilege high-profile interventions into the city’s primary rivers. The PVT is, in a sense, no exception.
This argument extends past sewage to include solid waste, which is often blamed not just for water quality but also flooding. A discourse intimately related to the politics of sewage, claims about the unregulated tossing of garbage into the rivers circulates extensively in the city. Its primary function is to connect the depositing of trash into riverways with increased flood events, and often functions informally as a way to once again make low-income Brazilians into social and ecological villains. This comes up repeatedly when projects focused on the Tietê are discussed, and largely functions as a way to both explain the recurrent problem of flooding as well as provide specific justification for projects. Take, for instance, Alceu Segamarchi Junior’s comments on the dynamics of dredging in the Tietê, in the 2013 issue of Engineering [Engenharia] magazine. He notes that much of the problem with the river is its low volume of water:

The Tietê is a river with extremely low declivity, with 1.5 cm per km of declivity in the metropolitan region of São Paulo. And this is practically nothing. Additionally, it’s a sedimentary river, due to the characteristics of the basin. And, moreover, there was an uncontrolled urbanization. And so desilting is a project – it’s a continuous service….It is something that can not stop. You can do more or less, depending on the rainfall for the year—but you will always have to take out sediment and trash. And trash, unfortunately, is a constant in the river, which functions as a big drain (43).

This discourse on trash in the rivers is a constant in environmentalist and engineering discourse, one that largely functions as a way of calling attention to the perceived lack of environmental consciousness on the part of (typically poor) Brazilians. Yet, like the broader discourse on sewage, it sidesteps the structural dynamics of waste collection in order to concentrate on the purported failings of individuals to put trash in the right places. The notion that individual behavior is responsible for water pollution ignores the structural failings of São Paulo’s state government in ensuring adequate trash pickup.

Furthermore, in the case of flooding, it is not entirely clear that the depositing of trash into the river is a primary culprit in flooding. Costa et al, for instance, estimate that only 5%
of the sediment found in the river can be identified as specific items like tires; the rest is sediment generated by erosion. This point is made by geologist Álvaro Rodrigues dos Santos, who argues that, “Urban trash really obstructs, but it is far from being the villain of floods. Of the volume that arrives in the Tietê, only 5% is trash, 95% is sandy sediments that come from erosive processes, provoked by the advance of the city into a region every time more mountainous, with excavation every time more extensive, exposing the soil to erosion.” For Rodigues, by blaming trash, “the authorities put the responsibility on the shoulders of the population…Trash provokes localized floods. In terms of the general process of flooding it doesn’t have any influence” (See also Vier, 2010). This suggests again that it was the failure to engage in routine practices of maintenance—rather than the supposed depositing of trash into the rivers—that yields effects in the form of flooding and water pollution. It is ultimately a question of sediment, not trash. As dos Santos himself notes:

The populations buys that it is trash thrown in the street that causes floods. Trash only obstructs, but, close to other things, the problem it causes is practically paltry because its more punctual, a blocked drainpipe, for example. Society criminalizes the person who litters, but not the supermarket owner with an asphalted supermarket. There is a culture of impermeability.

Will limiting the amount of raw sewage deposited into the Tietê from communities like Jardim Pantanal help to lower water pollution in the region? Yes. But as a justification for a landscape project that threatens to remove nearly 8,000 family it disproportionately relies on the traumatic dislocation of vulnerable populations in order to respond to a problem that folds in the entire city. Removing low-income populations from the Tietê’s banks will presumably lower water pollution levels, but without a stronger commitment to affordable housing and curbing inequality it is a small intervention into what is a citywide problem. As
with other dynamics of the PVT, it is an example of a landscape solution whose primary logic is that of the border instead of the relation.

**Landscaping 2: Assigning Risk and the Dynamics of Transparency**

In addition to the purported environmental benefits of this project, the developers of the PVT also celebrate the project’s social dimensions, in particular its ability to remove citizens of the várzea from situations of risk. In my interview with Marta, for instance, I was shown videos of a happy elderly Paulista who could barely contain her excitement about the new apartment complex she would eventually be moved into. Risk reduction and an improved standard of living are some of the primary ways in which removals of low-income communities are justified. Risk is both an important ethical as well as practical dimension within contemporary slum governance in São Paulo, serving as the means through which removals are legally justified. Furthermore, risk, as Austin Zeiderman (2016) makes clear, is an increasingly central component of contemporary urban governance. This is especially marked in Latin America, where histories of violence and dislocation have created a perverse situation in which vulnerability is one of the central forms through which claims to citizenship are articulated (Zeiderman, 2016). Indeed, in Bogotá, where Zeiderman’s work is located, it is precisely the capacity to claim to be at risk that justifies state involvement, as entry into state resettlement programs is determined only through resident’s capacities to claim to be at risk of environmental or geological vulnerability. As a result, “The right to housing is thus a privilege bestowed on members of a collectivity whose entitlements are grounded not only in shared membership within a political community but also in their common condition of vulnerability. In the endangered city, this is often how the poor must define and execute their citizenship claims” (102).
In São Paulo, this relationship between risk and citizenship is less direct, as there exists no state project of relocation on par with Bogotá’s. Nevertheless, risk is important to how social housing and favela governance are conducted. If communities are declared at risk, it gives residents access to specific funding sources that allegedly cover the costs of resettlement. But riskiness is a somewhat ambiguous concept, one that lacks real definition and whose application is often mixed. In a city where over 29,000 families are seen to be living in high levels of risk according to the mayor’s office, how do you begin to prioritize particular locations over others? This is especially true in the context of municipal and state fragmentation and the collaborative requirements necessary for favela upgrading, population relocation, and environmental cleanup. As Rodrigo, a geographer with the department of environmental risk told me repeatedly during a series of interviews in 2014, São Paulo lacks a broad preventative strategy of risk management, relying instead on responsive approaches. This suggests that the definitions of riskiness are often not particularly well-defined, even as the dynamics of living in risky places is extremely fraught. In the case of the PVT, decisions about removals and the location of the demarcation line [linha de remoção] was based on hydrological data and in particular the 25-year flood line (See Figure 7.4 – the dashed blue line indicates the 25 year flood line, the yellow is the eventual location for the park boundary). The relationship between the line of removal and the 25-year flood line was never made clear to me, which suggested that removals were more improvisational decisions.

The ambiguity of risk extends past its definition to include its application, in particular the fact that communities deemed at risk will be relocated to newly built housing projects as part of this project. Due to the fact that the project functions according to a logic of differentiation between the space of the river and the space of habitation, the project calls for removals of communities determined to be too close to the river itself. The initial
estimates for the project called for the relocation of eight thousand families, or roughly 40,000 people. These removals are largely seen as necessary to preserve the river’s floodplain, improve the lives of local communities through resettlement in housing projects, improve water quality, and implant green space in a region that is lacking. As Marta noted:

Because who leaves will have housing with resources. It might be smaller, but you’re [not] in the edge of the river. It has sewage, it has internet, light, everything. And who stays has a park in front of them. And those who leave also have a park they can visit (personal interview, 2014).

Resettlement is perhaps a necessary effect of extracting infrastructure out of São Paulo’s deeply impermeable landscape, and it is true that flood plains are risky and subject residents to indignities as well as disease and property damage. Not all residents are opposed to resettlement, and many housing movements are specifically oriented around putting members into public housing projects. The Movement in Defense of the Favelado [Movimento em Defesa do Favelado] (MDF), for instance, links climate change to the vulnerability of low-income residents in the city, and argues that residents in areas of risk should have access to dignified habitation in locations close to where they already live. Many in Jardim Pantanal agree. As a researcher I often saw activists attempting to persuade residents that they should not allow the state to buy them out, even though many seemed eager to be relocated. For activists, this eagerness was a product of a naïve faith in the terms being offered to them, and activists constantly pushed residents to ask for higher buyouts and to negotiate better offers. In any case, staying put was by no means the primary desire of many residents.

But for many residents, it is probable that removal at the hands of the state will actually increase the riskiness of daily life. Specifically, the idea that the state will take residents out of risk privileges one form of risk—flooding or other environmental dynamics—for the broader everyday riskiness that accompanies processes of removal and resettlement (See, for
instance, Perry, 2013). Despite the celebratory housing victories that were shown to me a visiting researcher, which promised well-built, well-located housing that many residents actually want, low-income Brazilians have many reasons to doubt the benefits of state-promoted relocation, ranging from the inadequacy of the financial compensation to the timeframes and geographies of federally subsidized housing projects built to house the displaced. In lieu of comprehensive, democratic housing and resettlement projects, resettlement often puts residents in increasingly precarious situations. The risks associated with removal are multifaceted, but they often have to do with time frames of projects. Often, clearances will occur before alternative housing has been built, which forces residents to live on short-term housing subsidies of around R$400 [about 100$] a month. These are not designed to be permanent subsidies, but often end up being semi-permanent when construction lags.

Beyond the possibility of being forced to live on rental subsidies, even successful removals can be fraught. The construction of public housing complexes is notoriously low quality. Indeed, in an investigative reporting detailing the removals of communities in the várzea in the wake of 2009 and 2010 flooding, Pacheco (2012) found that many residents were dissatisfied with the housing units that had been built. More broadly though, the locations of these projects are often far from the urban core, increasing travel times and further marginalizing peripheral residents into distant locations like Cidade Tiradentes. Security also matters. While nowhere in the urban periphery is specifically safe, relocation can often lead to deeper questions of security and safety for displaced residents. Furthermore, removals and the associated delays can often cause banal issues that have profound effects, such as questions of where to store possessions during periods of movement. For low-income residents, these sorts of seemingly minor delays can add up in profound ways.
As such, for residents and activists who engaged with the project, the most worrisome dimension of it had to do with its calls for extensive removals as part of its construction. Rather than being opposed to removals entirely, many residents were frustrated by the vagueness and lack of transparency on behalf of DAEE. Many of the activists who I spoke with were not necessarily opposed to all removals, but wanted a politics of housing that was serious, in a sense. As Vagner put it, they wanted a process that was “more humane.” This was a point made repeatedly by activists, both in print and in person. Activists often made reference to the residents who were initially removed in the wake of floods in 2009 and 2010 when the state government bought out many residents whose homes had been damaged by flooding (See Figure 7.5). The majority are still awaiting their subsidized housing, surviving on a monthly stipend of 300 or 400 reais a month, roughly a hundred dollars. This is a point made by DAEE themselves, who noted in a 2015 progress report on the project’s implementation:

Of the 7,115 families [determined to require removal], 2,661 families were removed due to the floods in the summer of 2009/2010, with 240 being sent to buildings built by CDHU [] [in 2010], 203 to buildings under the responsibility of SEHAB [] [in 2012 and 2013] and 2,118 continuing to receive housing support, whose costs are divided equally between GESP/SH – CDHU e PMSP/SEHAB.

This means that of the 2,661 families removed from their homes in 2009 and 2010, only around 450 were actually given the housing promised (which, it is worth noting, is located at considerably distance from the already peripheral location of Jardim Pantanal). Important, too, is the way that these communities were removed: during a situation of risk and unease, with little alternative. As Zélia noted in 2011, “many lost their houses under the false promise that they were going to apartments” (Coletivo Mapa Xilográfico, n.d).

This is a constant within the management of relocation in São Paulo: removals occur before state-subsidized construction has been built, leaving many to suffer through
protracted periods of waiting while they receive minimal rent subsidies. This suggests that the approach to housing provisioning and relocation in São Paulo is often at odds with the populations who are being served. As Rolnik notes,

> Its always like this, remove first and construct who knows when, who knows where. Or give a check. What can you buy with 5,000 reais? A shack above a córrego. It's a repetition of a historic error. Its very common that the residents of these communities have come from other removals (Quoted in Uchinaka, 2009: unpaginated).

In the case of Jardim Pantanal the lack of legal tenure for most residents meant that most received a monthly housing subsidy of 300R$ and the promise of resettlement in a state housing complex. This has produced a situation in which many previously removed residents have returned to the area, continuing a cycle of informality and environmental degradation that characterizes the area and complicating the state’s supposed plans to improve the region. As activist Anderson noted in 2014, in response to the question of risk.

> Look what the government does. They take you out of risk and put you in worse risk. Because this is what happens. They are going to take these people and put them in an apartment that is far, far, far away. These people will sell for 20 thousand [reais, currently five thousand dollars]. Twenty thousand lets you buy what? And so they’ll buy a shack in the river. And will they have a right [to be resettled] again? No, because they’re already registered (personal interview, 2014).

Worse still is the degree to which rent subsidies generated their own forms of expulsion. In lieu of actual housing, the distribution of rent subsidies had the perverse effect of encouraging speculation and raising local rents. As Marzeni noted in a 2015 interview, this was especially pronounced in places like Jardim Pantanal as nearby residents knew about the continued subsidies and would subsequently attempt to charge displaced residents more.

> Residents were not and are not opposed to removal in all cases. But many were rightly opposed to removals that were conducted piecemeal and without an adequate plan. While scholars of peripheral urbanization often highlight the cases of resistance against state projects in the form of dramatic refusals to leave (See, for instance, Perry, 2013), what I
witnessed in the várzea were significantly more bureaucratized engagements, borne out of long histories of marginalization that provoked more conciliatory positionings on the behalf of residents (See Barboza, 2015, for an account of more overt processes of occupation on behalf of várzea residents in the wake of the 2009/2010 floods). These sorts of approaches are suggestive of the ways that conflicts over housing are often provoked by the details and the lack of consistent follow through on behalf of the state, rather than the threat of removal as such. While many residents were clear that they did not intend to be moved, many residents of the region understood the dynamics of risk and resettlement, understood that they were living in areas of environmental protection. Many wanted to leave, in short.

Indeed, following Ghertner’s (2015) framing of slumdwellers’ embodied understandings of themselves as out of place, we might say that peripheral São Paulo residents had come to find environmental arguments convincing, to find themselves convinced of their insuitability to live in the Tietê’s floodplain. As a result, it was clear that many residents were excited about the possibilities of subsidized housing and the chance to move out of the region. For many housing movement activists, such as the radical Movement of Homeless Workers [Movimento dos Trabalhadores Sem Teto] (MTST), the goal is to ultimately be placed into subsidized, state-built housing. Activists, then, rarely articulated politics of wholesale resistance. Instead, they asked repeatedly for timeframes, for information, for details on the projects, and for conversation. These requests were rarely met.

Instead I witnessed a definitive lack of transparency, a withholding of information that was at odds with the project’s ultimate goals and predicated on an often dismissive sense for residents borne from their assumed desperation. This was at times hard for me to make sense of, given the knowledge of the difficulties associated with removals. Indeed, at no point in this research project was I met with anyone who celebrated the removal of low-
income populations for its own right, no one who seemed poised to benefit from these processes of dispossession. Instead, what I was witness to were a series of justifications: of riskiness, of improved situations (“less bad,” Wagner of DAEE told me in a 2016 interview), of environmental improvements. These were used to determine the necessity of removals but they were often divorced from actual engagement with residents and their representatives. I consistently witnessed a disconnect between the lives of those affected and those making decisions, a disconnect I was given access to as a visiting researcher seen as distinct from the community members who were perceived as a hindrance to project implementation. The maps and visualizations that gave structure to the PVT were not matched by an intimate understanding of the lives of those affected by the project. Indeed, the seemingly haphazard ways in which flood lines and removal lines were imposed onto maps of the region was striking (See figure 7.6). In Figure 7.6, for instance, the historic flood line runs along the edge of the built landscape but the line of removal takes an entirely different route. This suggests other logics at work in the decisions over removals and evictions. This was in spite of the fact that employees of DAEE understood the effects of these project and the logistical and ethnical difficulties of moving populations. As Celso noted when discussing the proposed removals of nearly 5,000 families in the municipality of Guarulhos: “It’ll be a little delayed, and maybe it won’t even be us that does it. And part of it we might not even be able to do.” When I asked further, he noted:

[It’s] difficult, complicated…It will be very expensive, it will be traumatic, and it won’t be an easy job to do in one phase. Maybe the project will have to be restudied, reformulated, replanned or suddenly the possibility some financing form the government will appear and we’ll be able to do it one pass…. So: do it and close it, or do it and keep having to redo it because occupation is constant. You pass by today and there is no shack and tomorrow there is one.

Yet at no point did this discourse extend past the general, and the removal plans were gestured at only vaguely. The discursive articulation of populations deemed at risk, deemed
precarious, rendered them abstract entities to be moved by a state whose interests remained obscure to me. But what was very clear throughout this process was that without a sustained engagement with housing and removals and without an intimate relationship with the communities whose lives were being slated for drastic changes, there was little incentive for local residents to buy into the project.

This is a point made by the limited academic work on the development of the PVT. Pereira (2012:6), for instance, notes that:

In spite of the affirmation that areas for relocation are still to be identified, in the actual stages of the project they are precisely defined. But we do not have mention of the effective initiation of the projects nor of the communication to the hundreds of families that will be removed. In all the forums that we participated in, including the offices and meetings with sectors of civil society, the central complaint was not just the fact of removal, but how, when, and where the relocation would occur.

I witnessed these moments too in my own research practice. On October 18, 2014, I took a walking tour in Jardim Pantantal, organized largely by the Communicators of the Várzea [Comunicadores da Varzea] and Free Earth [Terra Livre]. Our purpose of the walk was to chart the purported line that demarcated eventual removals in the region, part of a broader solidarity-building effort on behalf of the resident-activists. As we walked, we used a couple of maps, one that the local activists were using and another that was in the hands of some students at the university of São Paulo. The origins of both maps were somewhat unclear. Like much of the documentation that makes its way into the hands of activists, these seemed to have been surreptitiously downloaded from the computers of DAEE during a meeting. At one point, we reached a moment where the maps diverged (figure 7.7), where one showed a line going straight, and one veered, performing a kind of detour before eventually meeting back up with the line that we were on. This was met with some surprise, and it was unclear which map was the most up to date or which was the most accurate. Given that this line
determines who will be forced to leave a long-standing community, this sort of ambivalence had and has potentially very real consequences for specific people.

The week before, I’d met with Elissa, a biologist who worked with the PVT. During the interview we discussed the relationship between plans and local dynamics, and it became clear that delineating boundaries of the park was only the start of what would become a long negotiation with residents, housing movements, property owners, and environmental legislation. I asked about the satellite images that were providing the visual foundation for the project, and was told that they were presumably from 2008. The Várzea is a dynamic socio-ecological space, one consistently remade by residents who set up shop, pushed out by the housing prices in the formal city. As such, six years is a lifetime, resulting in a static image that no longer corresponds to the reality at hand but nevertheless determines specific policy interventions. As such, my conversation with Elissa suggested a kind of piecemeal, improvisational nature to state projects in the region, an idea that these lines or boundaries were fluid and open to contestation. But this was not necessarily how the project was seen by local activists, who understood the project to be fixed, coherent, stable. I asked one of my research participants, a resident of Jardim Pantanal named Vagner, about this, and he told me that the project had never changed, this line had marked the demarcation point since the beginning of the project. Repeatedly, residents saw the state as acting in consistent ways, even as my own experience was one of improvisational work, part of the broader marshaling of “practical authority” that Keck and Abers (2014) detail.

This moment of cartographic anxiety was thus suggestive of the broader lack of transparency in the implementation of the PVT, a sticking point that consistently circulated in the communities of the várzea during 2014 and 2015. The sense that the state knew what they were doing permeated discussions, even as the state’s own practice seemed to suggest
otherwise. For many residents, then, the development of this project was not designed to
develop park space in the region but instead to clear out low-income populations. Whatever
the truth to these accusations, they are suggestive of the failure to adequately collaborate
with the communities being served. They suggest a failure to incorporate communities into
projects whose entire function is evidently to serve them. If risk is one of the defining
discourses through which this project is being articulated, a sustained engagement with the
dynamics of it make clear that residents have little incentive to cooperate with the state
government at the moment. Without a transparent policy of engagement that takes seriously
the multilayered dynamics of risk that accompany resettlement, projects like the PVT will
yield risker situations for residents.

**Landscaping 3: Flooding and The Making Legible of the Landscape**

Finally, then, we need to consider the category and possibility that the PVT is most
dramatically oriented around: flooding. In articulating the project, DAEE and designers
make clear that the project will have an impact on flooding. As the project’s website declares:
“The principal objective of the program is to recuperate and protect the function of the
river’s várzeas, in addition to functioning as a regulator of floods, saving lives as well as
people’s property.” In order to do this, the project involves the renaturalization of the river’s
banks through the attempted removal of communities deemed to be located too close to the
river’s edge. In the promotional videos for the project produced by DAEE, the contact
zones between habitation and green space is paved over by a metaphorical green space, one
that mirrors the eventual implantation of the park. The project’s architectural renderings are
similar: barriers between the social and the purportedly ecological, they demonstrate the
central importance of the project’s combined bike lane and road way to divide park from
housing (See Figure 7.8). While these designs are based in historical data on flood extents,
they are nevertheless products of bifurcated imaginaries that segment the social and the ecological. They are projects that use designed landscapes to obscure the dynamic relationality of riverine landscapes. Worse still, they already show signs of breakdown, suggesting that the project’s goals will be flawed from the start.

With reference to Gilbert White, there is a difference between attempting to change the path of flooding and finding ways to lessen the impact of floods. The PVT is, in a sense, not a strategy for curbing flooding, at least for residents of the várzea. It is instead about returning the region to its historical capacity as a regulator and to prevent downstream flooding. The project is a means of lowering the costs associated with flooding through the changing of the region’s landscape. By clearing the Tietê’s banks of the occupations that ring them, the PVT is attempting to give space to water. This is a means of putting landscape to work in the reduction of the costs associated with flooding by incorporating the riverbanks into a regime of flood prevention. This is a paradigmatic shift that is designed to accommodate floodwaters while removing the populations that are affectively in the way, to render flooding less costly. It is, to quote Ashley Carse, a direct case of nature “as infrastructure.” More broadly though, the PVT offers little in the form of flood prevention for communities located at the edge of the river, who seem not to be the primary beneficiaries of the project. Instead, the project’s broader purpose is focused on the restoration of the riverbanks in order to lessen flooding downstream in the urban core. It continues a logic of peripheral sacrifice in order to augment the drainage capacity of the river. Allowing the periphery to flood in order to save the urban core continues the long-standing patterns that have marked the city.

In this sense, my argument in this chapter is that the PVT is less about flood prevention and more about the development of an ordered landscape whose boundaries and slippages
are less fuzzy. As such, I argue that the PVT in this regard is not just a project of flood prevention but is instead a broader project of ordering, of the incorporation of a specifically unruly landscape into a regime of water management and visual legibility. What differentiates the project from longer histories of becoming legible to the state (See Scott, 1988) is the increasing role played by a green aesthetic in the development of the project. In this vein, the project has been critiqued as a kind of “green washing.” But my argument is that the PVT goes past green washing through its incorporation of landscape as infrastructure within a contemporary governance strategy. For Bruce Braun (2014), contemporary regimes of governance are oriented around an increasingly infrastructural role played by non-human nature. As he notes, “Not only is biopolitics today ‘infrastructural’: the ‘environment’—in the sense of nonhuman nature—is itself increasingly understood and treated as infrastructure” (58). For Braun, this new role of nature within contemporary governance—in which one does not work against nature but instead with it (59)—is suggestive of a deepening of biopolitical logics that move past the strictly human, as part of the paradoxical rediscovery of the “‘naturalness’ of nature within the Anthropocene” (60). As he notes:

  …governing through the naturalness of nature at the scale of the city must be understood as a particular mode of government, one that may be less of a departure from already existing modes than an extension of a particular apparatus in which molding life is replaced by modulating natural processes, now extended to include the nonhuman world itself (60, emphasis in the original).

Braun’s argument asks how the governance of landscape raises new possibilities for governing in “a particular historical moment, one in which society and nature come to be seen as a single integrated system” (60). Alongside thinkers interested in the complex politics of non-human actors as well as political theorists interested in politics as distributive, Braun gestures at the role played by landscape in the articulation of specific political formations, to ask how politics is operationalized through engagements with the landscape.
In the case of the PVT, it is nature—in an ordered, modernist vocabulary—that becomes the means through which that disorder can be rendered legible and manageable to state practice. As a result, specific interventions into the urban landscape are often predicated on commonsensical, often quickly made aesthetic judgments about landscape disorder. These are of course tied into longer histories of informal urbanism being designated as specifically *out of place* but they are given environmental glosses in a contemporary moment in which the environment has come to function as a necessary component of urban governance more broadly. As a result, many critics of the project highlight the fact that it involves the development of automobile infrastructure as a component of it, resulting in criticisms that that the project is in fact about urban development and not green space development.

São Paulo’s várzea is a complex, dynamic landscape. Yet in lieu of working with this complexity or finding ways to incorporate it into state practice, plans to implement the PVT have instead attempted to manage the region through the purposeful simplification of its many features into one specific binary engagement with the landscape and the river that runs through it. As Fernanda of the APA Várzeas do Tietê noted, “What is the PVT? It’s a linear dike. It’s a great ‘wall of china,’ a rampart of China, and it will be possible to look at it from a satellite and know that it is a type of polder” (personal interview, 2014). She was referring to the project’s reliance on a border between the park spaces and the areas zoned for habitation, which are designed to be divided by a roadway for bicycle and automobile traffic. During my research process, I was struck by the degree to which the siting of lines and the development of zones of removal often seemed to match commonsensical determinations of where habitation should and should not be. These often seemed to be based on quick visual judgments of the landscape. The plans developed for the projects referenced flood dynamics
but seemed to rely more on commonsensical determinations of the landscape than detailed engagements with flooding. Conversations with project developers and employees suggested a flexible yet rigid approach to the landscape, a commitment to binaries between land and water that nevertheless seemed based on unclear data. While communities fretted about the removals that would form accompany these projects, the actual practice of those I spoke with suggested an improvisational, flexible approach to the landscape that was predicated on a fixed imaginary.

Borrowing from Ghertner (2015), I argue that the project’s ambitions to curb flooding extend not strictly from engineering logics but instead aesthetic ones. This involves an ordering of the landscape that occurred from afar, away from the tangled socio-natural relationships that characterize the várzea. The primary technologies for the development of the PVT were satellite images and other forms of aerial photography, technologies that largely stress boundaries and fixed processes. As a result, the PVT largely functions according to a fixed logic that determines where is floodable and where is habitable, but the technical authorities used to create these designations largely move from the fixed landscape of photography to the relational landscape of the várzea itself. The result is a binary approach to the landscape that attempts to order a complex socio-ecological space. This creates a response to flooding that cleaves the social landscape of housing—which is articulated as impermeable and environmentally degraded—from the natural landscape of flooding. Rather than attempt to develop a landscape whose flood dynamics preserve the social and ecological health of the region, the PVT in a sense does neither.

**Conclusion: In defense of relational landscapes**

In this chapter, I have considered the Párque Várzeas do Tietê and have attempted to take seriously both its discursive justification and its attempted implementation. I first
contextualized the project within the broader attempts to develop linear parks in São Paulo, attempts that I argued have been met with limited success due to the dynamics of sectorial conflict and a limited commitment the urban periphery. Next, I considered the PVT in more detail. I argued that the project unjustifiably blames low-income residents for problems of water pollution and threatens to put low-income residents into situations of heightened rather than lessened risk. I critiqued what I saw as a lack of transparency in the implementation of the project. I argued that the project rests on a set of assumptions that are deeply problematic, and disproportionately affect low-income residents of the várzea for what are essentially citywide problems. Ultimately, I suspect that these issues matter for the project’s ambitions. The lack of a consistent and transparent policy process in the várzea has generated a project that is delayed and possibly at risk of failure. As political and economic crises continue to mark Brazil’s contemporary moment, it grows increasingly possible that this project will not be implemented in full. Perhaps the project will join the ranks of other derailed Brazilian megaprojects, another set of skeletal remnants of developmentalist aspirations gone awry.

My argument in this chapter’s conclusion is that an engagement with the processual and small-scale urban development would yield more credible and more just solutions to the ecological and social dynamics of the region. Here, an ethic of repair and maintenance, one that is perhaps more in line with articulations of “tactical urbanism” than large-scale landscape reconfiguring offers possibilities for moving forward. This is increasingly important as the dynamics of flooding in the várzea continue while the state stalls in developing crucial flood prevention infrastructure. Indeed, in March 2016 flooding returned dramatically to the communities of the várzea, damaging property and livelihoods again. Water surged not out of the Tietê but instead out of the local córregos that crisscross the
region, provoking property damage and losses more broadly. As Claudia, whose parents live in Jardim Pantanal, noted:

Once again I come here to ask that everyone prays for these families that find themselves in this situation in São Paulo…my parents, like all the residents, are suffering due to this flood that in addition to taking material goods, also took the dignity and the dreams that were constructed with a lot of force by these residents. Unfortunately this is the reality of Jd. Pantanal, Eastern Zone of São Paulo. All the roads turned into rivers (in Fernandes, 2016).

This quote, compiled by the activists involved with the Journal of the Várzea project, is entitled, “Meanwhile…in the neighborhoods in the várzea of the Tietê,” a demonstration of the invisibility of places like Jardim Pantanal in the broader social understanding of the city as well as the sense of regularity that is characteristic of flooding in the region. In addition to their compiling of experiences, the journal released a series of five demands developed by local leaders. These demands were: 1. The Acceleration of the construction of the Polder [a piece of flood prevention infrastructure similar to a dike] in Vila Itaim, 2. The immediate cleanup of the córregos that discharge into the Tietê in the region, 3. The guarantee of permanent doctors in the region, especially at periods of high rain, 4. The guarantee of immediate attention to families affected by the floods, and 5. Transparency in the processes in which families are registered for services and in partnership with local community organizations.

Nowhere in these demands is a desire for more green space mentioned. Instead, these demands ask for the state to fulfill its promises to the region in the form of continued infrastructural provisioning and maintenance. That these demands need articulating is a demonstration of a failure of politics in the region, and a distinct failure to collaborate and work with the social movements already active in the várzea. While participatory processes can be limited in their capacity to yield better outcomes, in the case of the várzea the degree to which the region is suffering through a badly articulated case of state planning that seems
to broadly sidestep resident concerns is cause for considerable skepticism. Indeed, residents who have been forced to engage with regularized flooding are already adept at managing it, and yet the solutions for the region lack any real consistent engagement with the everyday practices of accommodation and survival that mark the area. In lieu of a sustained approach to managing water in the region, large-scale projects are given systematic gloss and official seal, in spite of the sheer complexity of the region’s property relations and ecological dynamics. As a result, these projects are, I argue, vacant at their core, suggesting aesthetic glosses designed to sweep away the deep inequalities that continue to produce the social environment of communities like the várzea. It is worth taking seriously Koslov’s (2016) insistence that retreat from climate change need not be seen as only a capitulation to climate change, but it is also important that retreat and resettlement are democratically managed and that resident concerns are actually taken seriously.

Oswaldo, for instance, gives voice to this:

I think the government has to create more serious policies, you know? They have to actually think about the local community, the environment of that community. And there are mechanisms for that. Its not impossible to do…impossible is to know if Mars has water or not, if you can live there or not. But its still not impossible, you know? People are already researching. And so, requalify this region? The people can stay, you can, instead of planting, instead of cementing the yards: grass, ecological sidewalks, ecological pavement, everything sustainable, a project of environmental education, create a partnership with the university of São Paulo, create the incubator, hire people who live in the community...there’s so much you can do, you know? And it would be an example for society, for Brazil, for the world, and the government prefers...And so, sometimes, I don’t understand these things, you know? I don’t get it. You have things that can change lives, right?

These are complex solutions that do not necessarily fit in with existing governmental institutions, a demonstration of Oswaldo’s longstanding connections to activism in the region. But they gesture at the possibilities afforded by thinking through the relational ways in which landscape and water coexist in places like São Paulo. Here, there is overlap between the contemporary engagements with water being articulated by landscape architects and
designers and the sorts of commonsensical solutions to flooding suggested by the flexible, creative approach to home construction demonstrated by the very actions that occupied these areas in the first place. Sarah Whatmore (2013), for instance, has focused on the collaborative possibilities afforded by the expansion of flood policies to include the localized knowledges of people who consistently live with flooding. Contemporary work in landscape design has attempted to incorporate new theorizations of water and relational landscapes in their framings of landscape projects too. Brett Milligan’s notion of *Landscape Migration* (2015), for instance, is based on a foundational ontology of movement, one that requires designers to engage with constantly shifting and modifying landscapes. In a similar vein, Mathur and da Cunha’s work on fluvial landscapes attempts to escape binaries of water and land in favor of more relational entanglements that are constantly moving and shifting (See Mathur and da Cunha, 2014). Doreen Massey engaged with these processes in her thoughts on moving landscapes in *For Space*.

There are ideas that emerge from complex theorizations of ontology, but they are in certain respects intuitive and familiar to the broader ways in which urban landscapes shift over time. In Brazil, processes like autoconstruction are suggestive of innovative, flexible approaches to the urban landscape that can and should be prioritized in the development of specific urban and ecological futures. Brazilian urban dynamics are suggestive of the ways in which landscapes can be made legible through the everyday practices of making do, of building homes and lives in inhospitable locales. These can be matched by a flexibility or a willingness to take seriously people’s claims to tenure and fixity, to use people’s rights to their landscapes as a starting point rather than secondary matters. Prioritizing housing is essential, and it is worth wondering what an approach to water management that began from the perspective that all claims to tenure were legitimate would look like.
Here, the importance of maintenance and repair of infrastructural networks is crucial, and indeed many of the problems mentioned earlier are the product of a lack of attention paid to the systems (both social and ecological) already in place. Building homes over time is costly and generative of social and cultural ties. As professor of architecture Alexandre Dejaicov noted, “Every brick has a story” (personal interview, 2015). Removing people is logistically complex and expensive, and ignores the affective ties that urban residents have to place. In lieu of large-scale hydro projects, solutions could take the form of smaller-scale engagements with local housing movements and the development of localized, collectively governed cooperatives for developing solutions. In many respects these political infrastructures already exist; the task is to find better ways of employing them in the service of cities that are porous, both socially and ecologically. It is to embrace collaborative solutions with residents, rather than against them. In lieu of the view from above, this a view of the messy, relational networks that cohere in places like the várzea. Autoconstruction is a form of local knowledge that involves intimate understandings of topographical and social space in these regions. There is no reason for these forms of expertise to be underutilized in the development of flood prevention projects and urban consolidation in the region.

Linear parks, with their combining of hydrological infrastructure with the implementation of green space should be one means of developing these sorts of relationships. For Sun, for instance, this is one of their primary functions. Instead they appear to have become a vector for further marginalization, for the development of projects that serve only to displace residents already displaced from the formal city. As René of the environmental secretary noted in a 2014 interview:

And so, I think this, that you have you have to make more of an investment, a bigger investment in the periphery, which isn’t just bringing projects. I also don’t think its just a question of projects. It’s a question of bringing the population to discuss its problems and policies to resolve and humanize too. The linear park could be one.
Beyond just involving citizens in the process of developing the region—a necessary starting point—René makes clear that it is crucially important to involve citizens in the broader development of projects through long-term relationship building. These sorts of collaborative, messy relationships are suggestive of the possibility of developing solutions that move past binaries of occupation/nature in order to develop more expansive possibilities for living with water. While certainly problematic at moments, design solutions to urban water in places like New Orleans are suggestive of new ontologies of fluvial urbanism that could offer inspiration for planning in the várzea. Libeskind-Llovet’s project for the region, designed as part of the Renova São Paulo course, puts these insights to work in the várzea, calling for targeted permeability, innovative design, and the densification of housing. This project though cannot be implemented due to the existing zoning regulations in the region.

A focus on the new, or the possible, in lieu of the existing, yields unfortunate outcomes for low-income communities in the urban periphery. Instead of removing populations from their homes in the service of resettlement and landscape ordering, the state could find ways to incentivize collective infrastructural management and flood prevention. Relational landscapes are messy and often disordered; without a willingness to engage with those messy dynamics, projects like the PVT rest on a fundamental ontology of borders that is not matched by the existing dynamics of the region. There are no perfect solutions in the várzea, a region with a complex social and environmental geography. But there are means of generating expertise and involvement that can yield potentially less harmful outcomes.
Figure 7.1: Parque Linear Rio Verde. Photograph by the author.

Figure 7.2: Córrego Agua Podre. Photograph by the author.
Figure 7.3: The proposed extent of the Parque Várzeas do Tietê. Available at: http://www.daee.sp.gov.br/index.php?option=com_content&view=article&id=370:parque-varzeas-do-tiete-o-maior-parque-linear-do-mundo

Figure 7.4: Determining Flood Risk. The dashed blue line indicates the 25 year flood line, the yellow the eventual placement of the park’s edge (boundary road or bike lane). Photograph by the author.
Figure 7.5: Demolished homes in the wake of 2009/2010 flooding in Jardim Pantanal. Photo by Pëtria Chaves. Available at: https://www.flickr.com/photos/cbnsp/4535104511/, This image was not altered in any way.

Figure 7.6: Cartographic Anxiety in Jardim Pantanal, 2014. Photograph by the author.
Figure 7.7: Plan for Jardim Helena Leisure Center. Photograph by the author.
Figure 7.8 Design for the Parque Várzeas do Tiete. Available at:
Chapter 8: Producing water scarcity in São Paulo: The 2014 Water Crisis and the Binding Politics of Infrastructure

Introduction

In the second half of 2014, the signs of an impending water crisis began to emerge in São Paulo, Brazil, as drought combined with political intransigence to result in the city’s reservoirs being reduced to single digit percentages. While at the state level the situation continued to be downplayed, and would be throughout 2014 and 2015, journalists, activists, and neighborhood residents increasingly began to call attention to the crisis as it made itself visible in the form of water shortages and diminishing reservoir levels. Visualizations of the crisis produced by civil society included extensive coverage of the reservoirs themselves, a heightened interest in the meteorological dynamics of the region, pedagogical initiatives around environmental education produced by NGOs and the state, and a wide variety of explanatory texts that blamed the situation on factors ranging from the privatization of the state’s water supply concern to deforestation in the Amazon (See, for instance, Bonduki, 2014; Brasil Wire, 2015; Brito, 2014; Lute Pela Água, 2015; Scapio, 2014; Whately & Lerer, 2015). Additionally, despite a continued claim by São Paulo’s governor that rationing was explicitly not happening, many residents began to find themselves without water at seemingly regularized hours and were increasingly vocal about these shortages.

Yet it was not until the fourteenth of January 2015, more than a year after attention began to be paid to the city’s declining reservoirs, that state governor Geraldo Alckmin would admit that water had, in fact, been limited. In reality, rationing had been inaugurated earlier in the year in response to federal pressure, nearly a year before its official acknowledgement by the governor. But in a testament to the specificities and slippages of discourse, the governor was clear that what was happening was in fact not a formal process
of rationing but instead a merely technical solution: the lowering of water pressure, primarily at night, to prevent leaks (through which close to 30% of São Paulo’s water is lost).

According to the agency responsible for water management in the state—the public/private Basic Sanitation Company of the State of São Paulo (SABESP)—this was strictly a routine practice used to prevent water losses from leakages, and would not prevent residents from having legitimate access to piped water. According to SABESP, pressure lowering would only prevent access to water in extreme cases. This was due to the assumed universality of a particular technological fix in the Brazilian hydro-social cycle: the caixa-d’água, a type of small-scale reservoir (See Figure 8.1). Often perched on the roofs of auto-constructed homes in the urban periphery or hidden within apartment buildings, caixas-d'água are a particularly local and particularly visible part of São Paulo’s water infrastructure. They store water from the taps and hold it, a way of guarding against periodic water shortfalls. Assuming that all urban residents had caixas-d'água installed, SABESP argued that this solution was morally adequate as all urban residents should have up to 24 hours of water stored on site.

‘But while this technocratic discourse enabled the state to sidestep claims of rationing, it became increasingly clear that whatever rationing was being called, many urban residents were going without water. Throughout 2014 and 2015, water shortages were felt throughout the city, and there was a geography to these shortages. Specifically, it was in the urban periphery where water scarcity was most pronounced. This was due to the fact that pressure shutoffs, mediated by the broader geography and infrastructural dynamics of the city, were not universal. Instead, due to the infrastructural and topographical dynamics of inequality and poverty, low-income communities were both further from treatment centers and with significantly more precarious connections. Furthermore, caixas-d'água are not a universal technology, and many residents did not and do not have them. What this meant was that in
lieu of a rationing that punished the city equally, São Paulo’s version of rationing instead punished the poorest and most precarious, in keeping with the broader politics of São Paulo’s infrastructural provisioning and geography more generally.

In this chapter, I focus on the 2014 water crisis, and the response to it by São Paulo’s state government. Following Brazilian critics of the city’s hydro-politics, I argue that the response to the crisis on the part of SABESP has largely deepened a technocratic and black-boxed approach to water management that has ignored significant calls for transparency. While it is clear that this moment is, in the words of Whately & Lerer (2015), an “opportunity,” its ongoing management threatens to deepen and sediment approaches to water oriented around large-scale infrastructural provisioning and the uneven provisioning of water based on class and geography. As conversations about restructuring the tariff and fee structures as a response to the crisis continue, there is the possibility that the events of this year will lead not to an opening up of the state’s water management. Instead, they threaten to consolidate a hydraulic paradigm that deepens inequality and ecological degradation while avoiding the sorts of small-scale, adaptive solutions that deserve consideration going forward.

Conceptually, this article takes up a series of questions raised by contemporary theorizations with infrastructure as a means of reconceptualizing urban geographies and politics (See Anand, 2011; Amin, 2014; Braun, 2005; Carse, 2012; Furlong, 2014; Graham & McFarlane, 2014; Larkin, 2013; Meehan, 2014; Ranganathan, 2014; Silver, 2014; Simone, 2004). In effect, my argument in this chapter is that by embracing the seemingly most humane and most logical solution of pressure reductions in lieu of whole-scale rationing, the state in effect made a decision to most dramatically impact the urban periphery at the expense of the urban core. This was a decision that in some respects was based in the
infrastructural histories that are present in the city’s hydro-social cycle. As Bakker (2010) details, “inequitable access is often literally hardwired into water supply networks. Scarcity, in other words, is mediated by human action; it is socially constructed but nevertheless very real (Loc 2368 in Kindle version; See also Barnes, 2014; Swyngedouw, 2004). Since inequality is wired into São Paulo’s hydrological infrastructure through the related land use patterns and urbanization dynamics that characterize the city, the solutions embraced by the state government in managing the crisis could only sediment those inequalities and deepen their instantiation in residents’ daily lives. This is not to suggest that São Paulo’s infrastructure overrides its politics. It is, instead, following Winner (1980) an argument about the specifically political dynamics of infrastructural provisioning and socio-technical systems. Infrastructural politics are about naturalization, in a sense; they do not determine outcomes, but they do shape the possibilities of action that are available. By governing the crisis in a way that preserved the broader strategy through which water was provided to urban residents, SABESP insured that the broader patterns of inequality and marginalization would be unaltered.

I begin this chapter by explaining the system of water provisioning and management in São Paulo. I focus on the structure of Brazilian water provisioning as it is practiced in São Paulo and analyze the lead up to the current crisis. I consider how the drought was responded to at the state level and within broader circuits of discourse. I consider then how São Paulo’s state government responded to the crisis of scarcity that affected the city in 2014 and 2015. Finally, I consider these responses in light of theoretical engagements with the role of infrastructure within urban governance. I conclude by arguing that while cracks are emerging in the city’s hydraulic management strategy, the solutions proposed by the state nevertheless demand a continuation of a strategy of large-scale infrastructural provisioning in
lieu of small-scale, ecological solutions. These projects entail a continuation of the broader logic of water management in the city, which suggests that the crisis will repeat itself in years to come.

**Producing Water for São Paulo**

Located at the point of contact between the Tietê River and two of its tributaries, the Pinheiros and the Tamanduatei (as well as the Aricanduva, located to the east of the city’s center), São Paulo grew in the space between rivers.\(^9\) Both the Pinheiros and the Tamanduatei flow into the Tietê, which then flows westward out of the city and into the interior of São Paulo state. São Paulo is located not at the end of the river’s course, but instead at its beginning. As such, due to the city’s location in the headwaters of the Tietê, the historical flashiness of the river has historically led to flooding during high flow and insufficient water supply during extended periods of low flow. What this means, more broadly, is that São Paulo is crisscrossed by hundreds of rivers but that water scarcity is and has been a real problem since the city’s founding (On the history of water management in São Paulo, see de Sant’Anna, 2007; Jacobi, Fracalanza & Silva-Sánchez, 2015; Jorge, 2006; Abers & Keck, 2014; Seabra, 1987; Ribeiro, 2011; Silva, 2012). The Alto-Tietê basin, in which São Paulo is located, has an estimated water availability of around 200 m\(^3\) per inhabitant per year, dramatically less than the international standard for water stress of 1,500 m\(^3\) per inhabitant (Silva, 2012: 112; See also Porto, 2012; Ribeiro, 2011). SABESP themselves estimate water availability in the region to be at around 150,000 liters per residents per year, or around 150 m\(^3\). This puts São Paulo on par with the famously dry

\(^9\) This paragraph is reproduced from an earlier section of this dissertation. As a component of what is designed to function as a standalone chapter, I opted to include the text as it was originally written rather than delete it for the sake of avoiding redundancy.
Northeast, and puts residents of São Paulo, who make up ten percent of the total Brazilian population, at risk of absolute scarcity even under normal conditions.

The result is that, like other places where water stress is chronic, a system of intensive infrastructural provisioning is necessary to manage and supply water. Water, in a sense, has to come from somewhere else. São Paulo’s water needs are subsequently met by three primary reservoir systems: the Cantareira, located to the north of the city, which provides for 45% of the city’s water needs, the Alto-Tietê, located to the east of the city, which provides 20.5%, and the Guarapiranga, located in the southern periphery, which provides 19%. Each reservoir system is itself a system of smaller reservoirs, and the rest of the city’s water is provided by three smaller systems (Cotia, Rio Claro, and Rio Grande). Before being distributed to the population, water from these reservoirs is treated at eight treatment stations scattered throughout the region. Most dramatically, Guaraú, which treats the water from the Cantareira system, is responsible for supplying water to roughly nine million people.

Water in São Paulo is managed by SABESP, a public/private water concern formed in 1973. A product of decentralization and partial neoliberalization or privatization, SABESP was created in 1973 and semi-privatized in 1994. It is currently a publically traded entity in which the state owns slightly more than 50 percent. SABESP manages the provisioning of water and the collection and treatment of sewage for 33 of the 39 municipalities that make up the metropolitan region of São Paulo, and provides bulk water to the other municipalities (some of which supplement this water with local reserves). Currently, the bulk of São Paulo’s residents received piped water, and water availability per capita in the years leading up the drought was over 300 LCD. Yet, as Swyngedouw (2004) makes clear, per capita water availability does not always mean that water is being delivered in egalitarian ways (See also
Bakker, 2010; Rodina, 2016). Local topographies and land use dynamics yield uneven systems of water provisioning and water access, meaning that many in the urban periphery suffer from inconsistent water supply. Additionally, water stress extends past sheer provisioning to include overlapping problems of pollution, inconsistent service, and stress on the city’s reservoirs due to occupation and ongoing deforestation. This yields an uneven geography of hazards that disproportionately affects peripheral urban residents. Important too is the fact that changes to the city’s microclimate have resulted in higher temperatures and more frequent intense rain events, leading to increased flooding in recent years. These overlapping threads suggest that water security in São Paulo is tenuous, complicated by the broader dynamics of inequality that mark the city.

Narrating the 2014 Water Crisis

In 2014 and 2015, these existing dynamics of water management would become further stretched as the city came to the edge of a water crisis that pushed reservoir levels into the single digits. According to SABESP, the formation of a zone of high atmospheric pressure blocked the arrival of weather fronts from the Amazon and the Southern Atlantic and South Pole, altering the region’s climatic dynamics. The result was that in the region that supplies water to the Cantareira reservoir, only 444 mm of rain fell between October 2013 and February 2014, much less than the average yearly rainfall of 995 mm (SABESP, 2015). Indeed, throughout 2014 rainfall would bypass the city, prompting increasing concerns about the city’s capacity to consistently provide water to urban residents. At the end of January 2015, the primary reservoir in the city, the Cantareira, was operating at 5% percent capacity, and the city was teetering on the edge of a full-scale water crisis. Plans circulated about the possible evacuation of much of the city and resident began to complain vocally about recurrent water shortages. Luckily for residents of the city (and their elected officials),
rain fell at levels high above the average in 2015 and 2016, allowing the state government to claim, somewhat dubiously, that the crisis was officially over in March 2016.

Explanations for the severity of the crisis ranged from the climatic to the political. For SABESP, the drought in 2014 was an exceptional event without precedent, the worst drought the state had seen since it began tracking weather data in 1930 (SABESP, 2015). For SABESP, then, the dangerously low levels of water in the reservoirs were largely articulated as a freak weather phenomenon, one which could not have been prepared for. Indeed, throughout 2014, the state government would claim repeatedly that the drought was an unprecedented event. This discourse of a specifically severe drought would at times be mapped on to a broader discourse around the water crisis that largely placed the blame on a broadly undifferentiated but expansive urbanization process, spatialized most dramatically by the figure of the sprawling urban periphery. Due to long-standing inequality in São Paulo, the urban poor have long been denied housing in the center of the city, and as a result many have occupied or settled areas kept out of the private housing market, most notably along streams, rivers, and reservoirs. This long-standing dynamic to São Paulo has resulted in a situation where the urban poor are often blamed for environmental degradation and water pollution, due primarily to a purported lack of sewage collection in favelas.

This can be seen in a long form investigative report in the Folha de São Paulo in September 2014. The reporting, part of a broader series on national water woes, discursively situated water scarcity within broader patterns of disorganized occupation, cattle raising, and deforestation. While the authors are right to focus on irregular urban patterns that compel the city’s crisis, their alarmist tone, titled “TOO MANY PEOPLE: The biggest city in Brazil comes to the limit,” was exactly the sort of depoliticizing, Malthusian narrative critiqued by contemporary Brazilian critics (Milanez, 2014; Whittaker, 2014). Of particular interest for
this chapter is the fact that the reporting opened with a series of vignettes from the occupation Nova Palestina [New Palestine], an encampment in the southern zone of the city organized by the Movement of Homeless Workers [MTST]. The occupation is located near to the city’s reservoirs, in the region primarily referred to as the mananciais. While negotiations between housing movements and environmental ambitions are often fraught, the discursive strategy to begin with a poor people’s occupation in lieu of any number of alternative explanations for the crisis is telling. In response to a claim by the MTST about the demands to occupy in the context of limited housing availability, for instance, the authors respond by noting that, “The problem is that the entire population, and not just the group led by the MTST, needs water, every day more water” (de Almeida, 2014). This implies that low-income groups are specifically to blame for water degradation.

In response to these overlapping discourses of climatic severity and undifferentiated water stress, critics of the state’s management of the crisis would place the blame not on the urban and agricultural dynamics of São Paulo, but instead on the broader management of water by SABESP. These critics alleged that the city had been seen to be at risk of scarcity for years, and that SABESP had not adequately prepared for a year with unexpectedly low rainfall. Critics called attention to the fact that since 2003, when SABESP’s concession to the Cantareira was extended, the reservoir has been shown to be at risk. Furthermore, acknowledgments of impending water scarcity were matched by state-level concern. In 2004, for instance, the department of water and electrical energy (DAEE) requested that SABESP begin to search for alternatives to the
Cantareira system as they reapproved their ten-year concession to the reservoir. This was due to droughts in 2003 and 2004 that nearly led to rationing. For DAEE, the response from SABESP that came in 2006, “did not adequately respond to the wishes expressed” (Brandt & Leite, 2014), and DAEE requested that the state government intervene by searching for alternatives. The state would ultimately complete this request in 2013, in a document titled the Strategic Plan for Water Resources in the Paulista Macrometropolis [Plano Diretor de Recursos Hídricos para a Macrometrópole Paulista]. The study found that 79 municipalities of the 180 watered by the Cantareira system would be at risk of water shortage in the case of a drought that was as bad as the worst in recorded history (1951 through 1956) (Brandt & Leite, 2014).

In response to these accusations, SABESP has continued to state that they adequately responded to the earlier warnings and were prepared but that the drought of 2013 was worse than any that had been predicted or could have been prepared for. Indeed, in a meeting on July 22, 2015, SABESP president Jerson Kelman noted that SABESP was prepared for an 84-year drought but not a 300+ year one, a direct reference to the previously mentioned strategic plan. In response to the criticisms that have been cast on SABESP, they responded by claiming that they had invested 1.2 billion reais in improvements to the system between 2008 and 2013, including 11 large projects that were completed by 2014. They also noted that water losses from pipes had been reduced from 29.8% in 2007 to 25.4% in 2013 (Brandt & Leite, 2014; See also Serapião, 2014).

Like the broader travels of state and federal money in Brazil, it can be somewhat hard to verify the numbers provided by entities like SABESP. For instance, the data on losses from water leakages is controversial, with the Regulating Agency for Sanitation and Energy of the State of São Paulo (ARSESP) arguing in 2014 that SABESP actually lost over 32% of its
water to leaks and not 25.4% as was reported by SABESP (Domingos, 2014; See also Serapião, 2014). Other estimates place the figure closer to 37% (Lobel, 2015a). SABESP disputes these numbers, but verification is largely beyond the reach of this paper. The same situation applies for sewage collection and treatment, which is also managed by SABESP and also underperforming. While the state claims that around 70% of sewage in the city is treated, others argue that the city treats only 52 percent of its sewage (See Afiune & Mota, 2015).

While the actual figures may fluctuate depending on the metrics used to monitor them, the best-case scenario is that somewhere between 50 and 70% of the metropolitan region’s sewage is treated and that roughly 30% of water is lost from pipes. Both of these factors have been used by critics to argue that SABESP has failed in its mission to provide water to the state of São Paulo. As Whately of the Socio-Environmental Institute put it:

The Socio-environmental institute put on a lot of pressure in that era [in 2003 and 2014] and accompanied the concession given to the [Cantareira] system. But from then to now, little was done to better use available water. On the contrary, consumption increased, and with that the money made by SABESP, the big residential consumers (apartment buildings) continued with collective hydrometers, the provisioning in poorer regions suffered continuous interruptions, and the rivers stayed polluted and sewage remained untreated (Whately, 2014).

In this comment, Whately suggests a broader critique of SABESP, which is that its partial privatization has worked to generate an approach to water management that aggressively encourages expanded supply while not adequately reinvesting in treatment.

This critique of privatization was made repeatedly in 2014 and 2015, voiced by a series of critics active in water politics. One of the most eloquent is Marzeni, a nearly thirty-year veteran of SABESP who was laid off (along with 600 others) in 2014, allegedly due to his increasingly visible critiques of the agency (See Afiune & Mota, 2015). For Marzeni and other critics of SABESP, the technical and institutional failures of SABESP are a product of
the entity’s status as a public/private entity. Indeed, as Marzeni noted in a meeting of the collective *Lute Pela Agua* [Fight for Water] that I attended in June 2014, SABESP’s private logic compels investments in distribution and collection, because that generates profit whereas treatment does not. This is a sentiment echoed by many critics of SABESP’s partial privatization, who cite it as a central factor in the state’s ongoing water crisis.

This critique is given considerable heft by engagements with the *Projeto Tietê*, which since 1992 has funded the depollution of the Tietê River at a total cost of at least 3.6 billion dollars (Afiune & Mota, 2015). While there have been some successes to the project, the Tietê remains deeply polluted and the considerable monetary investment has largely failed to improve the river’s water quality. For critics of SABESP’s privatization, the failure of efforts to clean up the *Tietê* suggests that SABESP has pursued an approach to management that degrades existing water sources and underinvests in treatment while extending service. This unsustainable model of water provisioning is what, for many, is implicated by the ongoing water crisis.

Geographers from the state of Campinas made a similar argument in 2014, alleging that SABESP had not invested 37% of what was slated for water infrastructure between 2008 and 2013 (Pasti et al., 2014). They note:

In the case of the current hydric crisis, understanding this is essential: what is in crisis the provisioning of water ‘planned’ (disastrously) by the state governments. The hydric crisis is due to the failures in the organization of this system of provisioning, which we knew—us, and the governments—have been in collapse for more than ten years. Blaming the lack of rain is a typical escape (already utilized in 2001 to justify the rationing of electrical energy), which is only possible thanks to the immense media silence in respect to the responsibilities of the governor reelected by our state, Geraldo Alckmin (PSDB), and to the institution responsible for the provisioning of water in the state, SABESP.

It is important to highlight that SABESP, created in 1973 to unite the water and sewage companies of the state of São Paulo, is a private company since 1994 that is currently listed on the MN&F Bovespa and the New York stock exchange. In 2012, SABESP alerted its investors, through an annual report, of the risks of water shortages and
compromises in provisioning water to the population. This did not unfold, however, in information from the state to the population or in precautionary actions, suggesting that the company is more interested in its financial results gained for their shareholders than to their acting with the population.

These arguments can be bolstered by the fact that, between 2004 and 2013 the consumption of water in the 33 municipalities of São Paulo state managed by SABESP expanded 26% while the treatment of sewage only expanded by 9% (de Almeida, 2014).

This critique of SABESP’s privatization is broadly shared by a wide subset of left-learning groups and social movements, who have taken this crisis as an indictment of the perils of Brazil’s particular brand of privatization (See, for instance, Lute Pela Agua, 2015). Given its profit-generating dynamics, critics allege that the entity did not adequately invest in sewage treatment or safeguarding of the reservoir, but instead used its resources to encourage more demand and subsequently more profit [lucro]. For critics, this privatized logics compels a continuation of a hydraulic paradigm that Whately refers to as “big works, big networks, and big treatment stations” [grandes obras, grandes redes e grandes estações de tratamento]” (Afiune & Mota, 2015). In these articulations, the ongoing management of the hydric crisis—one that was, in effect, produced by SABESP’s privatized logic—is encouraging further consolidation of the state’s hydraulic paradigm. These critiques are augmented by SABESP’s current efforts to raise water prices, which are being compared to monthly cellular phone bills (de Araujo, 2015). That calls for higher pricing are occurring at the same time as price reductions are given to consumers who use less water suggests a kind of schizophrenic neoliberalism.

While these critiques are persuasive, they also open up a series of logistical questions in relation to alternatives (See, again, Bakker, 2010 on the limitations of framing water supply only through binaries of public and private). Furthermore, critics of the Projeto Tietê ignore
the successes that have occurred in regards to the river. Indeed, Serva (2015) claims that the project has dramatically reduced pollution levels in the river, a point matched by observations of the river produced by the environmental NGO SOS Atlantic Forest [SOS Mata Atlantica]. A clear denunciation of privatization subsequently ignores some of the multifaceted ways in which water is being managed in São Paulo even as the broader contours of the critique ring true.

These critiques, though, make very clear that blaming scarcity on nature alone—or, as often happened, on the patron saint of water, São Pedro, who was raining in the wrong places—only tells part of the story. While commentators have focused on disorganized urban patterns and broader patterns of deforestation, critics of SABESP’s management of the crisis articulate an explicitly political response that is localized in the state’s management of water. Scarcity, as many have argued, is a political failure, one that results from the way water is managed and used (See Barnes, 2014; Mehta, 2011; Swyngedouw, 2004). Activists, as such, have effectively and critically constructed a political-ecological critique of the city’s hydric crisis, a critique that includes both calls for re-statization of the water concern to an ambivalent interest in small-scale, stateless solutions. While it is clear that there are no easy answers to how to manage water in a city like São Paulo, these critiques of SABESP’s privatization make clear that in many ways SABESP did not adequately prepare for a serious drought in the years leading up to the crisis and as such deserve at least some of the blame for its severity.

Responding to the Crisis

As rain continued to bypass São Paulo in 2013 and 2014, SABESP began to take a series of emergency measures to protect against the threat of scarcity and rationing. They reacted primarily in four ways. First, SABESP offered a reduction in cost for those who
diminished their water consumption. Between February and November 2014, consumers
who lowered their water usage by twenty percent were given a thirty percent reduction in
their bills. In November this bonus was amplified to include those who reduced their
consumption between fifteen and twenty percent. Water saving tips and suggestions also
began to appear throughout the city during these months.

On the structural side, SABESP employed three short-term strategies. First, they
tapped water from what is referred to as the dead volume within the Cantareira system, the
water that exists below the pumps and was previously ignored when reservoir levels were
tallied. SABESP would add this volume twice in 2014, on May 15 and October 24. By taking
water from the Cantareira system that was previously not considered water, at least
statistically, the dead volume had the effect of conjuring water where there was none
previously and raising water levels in the reservoirs from one day to the next. At the same
time, the quality of the water in the dead volume was roundly questioned. Second, the state
began to move water between the reservoirs, specifically from the Guarapiranga into the
Cantareira at largely unknown levels. Finally, and perhaps most polemically, SABESP
employed what they referred to as the reduction of water pressure. By lowering the pressure
in the pipes, primarily at night, SABESP argued that less water would be lost to leaks, while
residents would not be forced to go without water. This suite of actions meant that, in the
words of Alckmin, “nobody went without water” (G1, 2015). Even as residents were clearly
articulating their water shortages, the up for reelection Alckmin continued to maintain that
rationing was not happening. He noted, as late as November 2014, after he had been
reelected, “There is no risk [of rationing] (G1a, 2015).

Increasing levels of water-borne diseases in 2014 and 2015—what one researcher referred to as a
‘hyperepidemic’ of diarrhea—suggest that the dead volume and the pressure reductions have led to water
pollution and contamination (See Martín, 2015c).
Finally, in early 2015 after months of denials, the state governor of São Paulo would admit that there was in fact an ongoing rationing: “Rationing [**racionamento**] already exists,” he noted on January 14, 2015: “When the federal water agency says you need to reduce withdrawals from 33 to 17 [cubic meters of water per second] from the Cantareira [reservoir system], it’s obvious that there is hydrological restraint.” This was the first mention of rationing by the state governor, and he would very quickly backpedal days later.

Yet, in some sense, Alckmin did not need to backpedal, since he was not necessarily lying when he consistently denied the existence of rationing. There was no formal rationing in São Paulo. There was, instead, hydrological restraint. This term is a case study both in the particularities and evasiveness of state discourses but also in what Li (2007) refers to as the “rendering technical” of political solutions. Hydrological restraint is not rationing, at least in the formal sense; as such, it enabled SABESP to avoid being characterized as having put São Paulo under a system of enforced rationing. More broadly though, it worked to obscure the localized political dynamics at work in how the crisis was managed by rendering them into a managerial, depoliticized response, one necessitated by the technical and infrastructural limits of SABESP.

For SABESP, in lieu of a formalized rationing, the more humane means of reducing water usage was through the lowering of water pressure primarily at night when residents were allegedly sleeping. This strategy was designed to eliminate the need for a formalized rationing in the city and meant that the state was merely employing a routine strategy to reduce water losses from leaking pipes. Using the assumption that most residences had caixas-d’água installed in their homes, this meant that residents should be able to withstand pressure reductions without losing access to water. The logic was broadly articulated as a technological requirement to preserve the city’s reservoirs from collapse, and an
environmental alternative to formal rationing that prevented the sorts of problems associated with citywide rationing and cutbacks. Specifically, SABESP argued that a formal rationing would leave pipes depressurized for long periods of time, increasing the threat of contamination.

Jerson Kelman, the new president of SABESP, gave a more detailed explanation of this informal rationing in a January 2015 editorial (Kelman, 2015). In it, he laid out the broader dynamics of the state’s response to the hydric crisis, by asking, “Is SABESP rationing water?” His answer, perhaps not surprisingly, was no, or better yet, not really. He credits the drops in water consumption that were reported throughout the year not to rationing but to the sacrifices made by civil society. Kelman notes that, “the bulk of the population already reacted by lowering consumption, before being subjected to a restriction (2015).” This “change in behavior” was motivated by the “knowledge of the necessity of confronting the worst drought in history, at times motivated by the desire to take advantage of the fee bonus.” Here, he is referring to the price reductions that were offered in exchange for lowered consumption.

He goes on to note that there are cases in which the change occurred not by choice but due to the forced lowering of pressure, but he reiterates that this was “necessary to diminish the leaks in underground pipes: it is a preventative measure designed to avoid a worse problem, which would be the exhaustion of the underground water that supplies the big reservoirs.” Anticipating the critiques that would be made about the persistence of leaky pipes, which amount to nearly 30% of the water that travels through São Paulo’s hydrological network, Kelman calls attention to the herculean work that would be required to repair leaks in all of São Paulo. Specifically, he notes that there are 64,000 kilometers of underground pipes in the city, which would take incredible resources to fix. In a meeting on
July 22, Kelman would make a similar point, noting that SABESP has actually been on par with the speed through which Tokyo reduced its losses due to leaks.

He notes that alternative of a “pure and simple” rationing runs the risk of contamination in the water pipes when they are shut off, which would require a more rigorous monitoring of water quality on the part of SABESP. In exceptional cases (affecting much less than 1% of the population), he clarifies, some residents lost access to water for days, a product of the lack of a caixa-d'água that, in his analysis, affects both the rich and poor. He notes that these localized cases will be managed by the distributing of caixas-d'água to residents, and concludes by asking:

Can you describe this situation as a rationing? It depends. For those who belong in the minority that, at this point, do not have water, the answer is certainly positive. But, the term “rationing” is used, in general, when you force collective consumption through the total interruption of service for some hours of the day or when you impose individual quotas on consumption. That is not what SABESP has done, but could be forced to do, if it continues to not rain in the right places and in the necessary quantities.

There are a variety of points that could be made about this document. It is a spectacularly rich text, one that offers a series of possibilities for analysis. The first is on the level of the purely factual. First, it is worth noting that there is some controversy about SABESP’s claim that it was only lowering water pressure and not engaging in wholesale water cutoffs. Marzeni Pereira makes this claim in a 2015 interview:

The justification for the water shortages has been the reduction of pressure in the network. This is false. It is not possible to reduce the pressure in a house that is at a thirty-meter elevation difference in relation to another, and have both of them receive water. In addition, not all the tubes in the capital of São Paulo are controlled by pressure reduction valves (VRP). What they [SABESP] are doing is turning off the water. They are already rationing, really, because there isn’t water. If they hadn’t, the water would have already run out. A question to be asked is the following: The pressure in the tubes is being reduced from what to what? They don’t say because it isn’t true (Afiune & Mota, 2015).

Further evidence for these claims, as Cohen (2016) demonstrates, can be found in an event in February 2015 in which SABESP employees were allegedly interviewed using a hidden
camera while they were cutting off water to entire neighborhoods. These sorts of accusations are impossible to verify, but they do cast doubt on the mechanics through which scarcity was supposedly managed by SABESP. If the arguments of critics like Pereira are taken seriously, a wholesale rationing was in fact in place, one that was directly oriented around specific neighborhoods and not adequately communicated to the population of the city.

Yet even if the city was not engaging in any formal rationing and were in fact strictly reducing water pressure, Kelman's claim that only 1% of the population suffered from water shortages is extremely low. A poll from October 20, 2014 found that in fact 60% of São Paulo residents had gone without water at some point in the thirty days before the study. While the data does not break down into class or geography, it does distinguish between apartamentos [apartments] and casas [houses]. Given the broader urbanization processes in São Paulo, it is reasonable to approximate that apartments are representative of wealthier residents whereas casas are a stand-in for middle or lower income residents (with exceptions, of course). The poll found that 67% of houses had gone without water, whereas only 26% of apartment dwellers had. This suggests a broad pattern of class-based rationing created by a particular configuration of infrastructure and politics. Additionally, in July 2015, SABESP reported that they had received a 62.5 percent increase in complaints about water shortages between the first half of 2014 and the first half of 2015 (Nunes, 2015).

Geographic data was supplied by polling done in April 2015, which found that 35% of city residents had suffered water cuts on five or more days per month, while 14% had experienced water scarcity for up to 4 days per month (Geraque and Lobel, 2015). Most importantly, the polling found a distinctly classed nature to the cuts, with 42% of residents earning up to two minimum salaries experiencing water cuts in comparison to 19% for residents with incomes above 10 minimum salaries. Geographically, the study found that
residents in the north and the east were affected most dramatically, a result of the intense pressure on the Cantareira reservoir. This was matched by the Water Alliance [Aliança Pela Água]’s project, Tá Faltando Água, which used crowd-sourced mapping technologies to create maps of water shortages in the region. While crowd-sourced data can hard to interpret, their cartographic project articulates a clear center/periphery distinction in terms of who was experiencing water shortages.

This quantitative data was matched by journalistic and qualitative encounters with scarcity in the city. I encountered water scarcity repeatedly as a researcher in the eastern periphery of São Paulo in 2014 and 2015. At meetings with the Movement for the end of Floods that I attended in the Fall of 2014 in the neighborhood of Itaim Paulista, for instance, participants offered extensive commentary on the water shortages that were by then common. At a meeting in October 2014, nearly all the residents noted that they did not have water at night. Members also made reference to the quality of the water, and a series of jokes were made about the fact that they were no longer serving milk at schools because the milk was coming out of the tap. Saron, a resident of Itaim Paulista, discussed his experiences with scarcity with me in a 2016 interview, telling me:

We went without water... still do. I live next to a SABESP caixa d’água. Now its better but then, it was 3:00 in the afternoon. Now [In February 2016] when it gets to seven, eight at night it runs out. And returns around 5:00 (AM)... two or three in the afternoon? If you turned the faucet there wasn’t any water (Personal interview, 2016).

Journalists in the city encountered similar stories throughout 2014 and 2015 (See Cesare, 2014; Martím, 2015a, 2015b; Estadão Conteúdo, 2014; Rigby, 2015a, 2015b; Romero, 2015; Souza, 2015). In February 2015, for instance, Rafael Italiani discussed water shortages of up to six days in the Santa Etelvina housing project in the Cidade Tiradentes neighborhood. For residents of the eastern periphery who often live with flooding, scarcity took on a particularly perverse dimension. This was articulated perhaps most forcefully by Anderson, a
community activist from the neighborhood of Itaim Paulista, who noted in 2014, “we’re up to our necks in water with none to drink” (personal interview, 2014).

This data makes clear that scarcity was broadly experienced in the city and that scarcity had a geography. The lowering of pressure, which was largely unannounced, combined with the uneven geography of caixas-d’água resulted in a kind of arbitrary, unpredictable, and structurally unequal rationing of water that most dramatically affected the urban periphery. Reporters Krepp and Brenha, for instance, noted in a March 2014 report that of the eight neighborhoods where water shortages were being vocalized, five were localized in the northern and southern urban peripheries. Additionally, evidence for the unequal dynamics of water shutoffs can be seen in the fact that the urban periphery lowered their water usage between January and June 2014 at a rate of nearly double the wealthier urban core (Leite, 2014). This is suggestive that there was more to the lowered consumption than strictly voluntary reductions in the service of a lower bill. As Carlos Thadeu de Oliveira of the Brazilian Institute for the Defense of the Consumer noted:

The balance shows that poorer and more remote neighborhoods economized more. It is in these regions that we see more complaints about water shortages. I don’t believe that the rich are less sensitive to the crisis. I think this must be a consequence of the rationing that is being done in some regions (Leite, 2014).

The article goes on to quote a resident of Limão, who notes that water stopped being available in his house after 8 PM starting in February. He notes, “In my case, I didn’t have a choice. Since there isn’t any water when I get home from the university, I stopped showering at night.”

This broad geographical dynamics of the crisis suggests that while Kelman may have been right that only a minority were affected by water scarcity, he both downplayed the numbers of affected and their geographical and class positioning within the city. Kelman was right that not everyone went without water for multiple days, but he ignores the classed
(and raced) dynamics of who constitutes this particular minority. This makes clear that while the lowering of water pressure may have allowed the city to sidestep formal rationing, it did not prevent many from going without water in 2014 and 2015. This is suggestive of the dramatic lack of transparency in the management of the water crisis and the broader inequality into which water scarcity was inserted.

The Infrastructures of Crisis

In the remainder of this paper I argue that this perhaps not surprising outcome was the product of two specific agglomerations of technology and politics. The first was the broader hydrological infrastructure of the city, which meant that those furthest from the treatment stations or highest up were specifically inconvenienced by pressure reductions (See Cohen, 2016). With lowered water pressure, locations far from treatment received the lowest quantities of water. This meant that residents with precarious connections were most affected by the change in water supply. The second is the caixa-d’água, which was supposedly the technological fix that enabled pressure reductions to not limit residents’ access to water. Even SABESP itself, in response to a report on a building that had gone 11 days without water in January 2015, were quoted as saying that they, “reiterate the importance that residents count on the caixa d’água” (Souza, 2015). But while caixas are found within most apartment buildings and are a visible component of the peripheral landscape, they remain a technology that can be out of reach for many. As such, those who cannot afford caixas were unable to hoard water for the necessary periods in which pressure was reduced and did not make it to their neighborhoods, buildings, or homes. Furthermore, while the state government was supposed to distribute caixas-de-ague to low-income residents, very few were actually distributed (See Lobel, 2015c).
Yet both caixas and precarious water hookups are part of a system of water provisioning that is a material instantiation of inequality. As such, my argument in this paper is that by choosing the most logical and the most sensible means of managing water, SABESP were in some respects making the illogical logical. And in doing so, they made the decision to leave the periphery at the mercy of water shutoffs. São Paulo’s fluvial infrastructure is a deeply unequal system, one that links together housing inequality, financialized housing provisioning that yields favelas and irregular allotments, and uneven access to water and sewage into what Ioris (2012) refers to as “multiple scarcities.” In the form of water provisioning, this is made manifest by often-precarious access to water on the part of the urban periphery, a reality that predates the water crisis. This can be materialized in the insecurity of many peripheral water hookups, which lack the consistency of their central counterpoints, but it also can be more expansively understood through a broader consideration of infrastructure. In particular, the fact that many low-income neighborhoods have had to fight for water access through political mobilization or through illegally hooking up to the system suggests the sort of inequality that is built into the system. At its most direct, this takes the form of lowered water pressure in higher areas, or heightened chances of contamination for neighborhoods located near polluted córregos, or, even, in the fact that residents of the urban periphery are at considerable risk of flooding. These inequalities are stitched into São Paulo’s landscape in dramatic ways, and implicate infrastructural dynamics within the broader socio-ecological landscape of the city.

As such, choosing the most logical or simplest possibility afforded by the system is to embrace the inequality that is a structural component of the system itself. By rendering the crisis technical, to return to Li’s phrasing, the fundamental inequality of the system generated an unequal response that most dramatically affected the urban periphery. This is a
rendering technical that is subsequently direct; it places those whose access to water was made most limited as a necessary byproduct of a technological solution that was mandated by the environmental dynamics of piped water.

This is not to say that SABESP acted incorrectly or illegally in their management of the city’s water. That may be true, and in fact probably is, as testimonies like that of Pereira suggest. But the limited data made available by SABESP prevents me from making this sort of argument. Instead, I am interested in the politics of infrastructure as they make themselves visible through the managing of the crisis. Infrastructure is crucial to the functioning of urban political life as well as the lived experiences of urban residents, and the provisioning and management of infrastructure is deeply political (See Amin, 2014; Benjamin, 2008; Holston, 2008; Ranganathan, 2014; Silver, 2014; Swyngedouw, 2014). As Bakker (2010) argues, inequality is written into infrastructural networks themselves. In São Paulo’s case, the idea that a solution to the crisis would not severely impact the urban poor was almost determined from the start, given the overlapping linkages between residential inequality, fluvial geographies, and hydrological infrastructure that mark the city. In a sense, this is a case in which, following Winner (1980), of an artifact that has politics. As he notes:

These are instances in which the very process of technical development is so thoroughly biased in a particular direction that it regularly produces results counted as wonderful breakthroughs by some social interests and crushing setbacks by others. In such cases it is neither correct nor insightful to say, ‘Someone intended to do somebody else harm.’ Rather, one must say that the technological deck has been stacked long in advance to favor certain social interests, and some people were bound to receive a better hand than others (126).

Pressure reductions were in some sense the only solution that made sense if one operated within the logic of the city’s hydro-social system more generally. This does not mean that SABESP should not be blamed for the inequitable distribution of water scarcity in 2014 and 2015; instead, it suggests the ways in which technical systems and political
dynamics are constantly interrelated and tied together. By choosing the response that made most sense, the inherent inequality and irrationality of São Paulo’s urban form was rendered normal. The immediate result was that poor communities were deprived of water. This matters both for understanding the relationships between infrastructure, technological expertise, and urbanism, but also for engaging more clearly with the ongoing effects of the water crisis on the future dynamics of water governance in São Paulo.

**Conclusions (Embracing the Long-Term)**

In this chapter, I have analyzed the response of the state to an ongoing and still unfolding water crisis. By focusing on the discourses of state response in regards to rationing, I argued that the state embraced a strategy that exposed most dramatically the urban periphery to a rationing that was largely unannounced and unequally experienced. Through an engagement with the broader politics of infrastructure, I have argued that by choosing a strategy to manage the crisis that embraced the logic of São Paulo’s deeply unequal system of infrastructural provisioning, the state in effect made a decision to most dramatically impact residents of the urban periphery at the expense of the urban core. This was not necessarily a conscious, purposeful decision, but instead a result of a broader logic to the state and city’s infrastructural dynamics. The techno-political management of São Paulo’s water produced a response to the crisis that exacerbated and continues to exacerbate inequality. That little in the way of substantive change appears to be occurring, despite pressure from both the state and civil society, suggests that a crisis-prone approach to water management will persist in São Paulo unless serious pressure can be imposed.

This can be seen in the longer-term solutions currently being employed by the state. In addition to the short-term solutions detailed above, SABESP is currently constructing a series of projects that are designed to supplement its water supply system through the
transposing of water from other hydrographic basins. These long-term solutions, which move past the short-term management of the crisis through rationing and the exploitation of the dead volume, focus on new sources of potable water and linkages between existing reservoir systems. While discursively open to the possibility of encourage reuse, improving sanitary capacity, and aggressively working against water losses due to leaks, SABESP has largely moved to govern the crisis through the extension of the current reservoir system to include further water sheds. In particular, current plans—which, it should be noted, are showing considerable delays—involve the expansion of the Alto-Tietê and Cantareira systems to include additional rivers and water sources. At the same time, SABESP has halved their investment in spending on sewage treatment, suggesting that efforts to embrace reuse will continue to stall (Lobel, 2015b).

SABESP’s ongoing plans to develop new sources of water while ignoring sewage collection suggest a deepening of a hydraulic paradigm that is fundamentally prone to crisis. The response to the ongoing crisis suggests that the paradigm of water management in São Paulo—of “big works, big networks, and big treatment stations” to return to Whately’s phrasing, will persist (Afiune & Mota, 2015). As critics like Pereira call for state-run cistern systems and organizations like the Water Alliance call for greater transparency in water management, the ongoing continuation of the state’s approach to the crisis suggests that little will change in the years to come as long as the state-level governance remains unchanged. Indeed, in October 2015, the state government of São Paulo put much of the data about water provisioning under seal for the next fifteen years, suggesting that gains in transparency as a result of the crisis will be extremely short-lived (G1b, 2015). While the crisis has evidently resolved itself for the moment, the degree to which a changing climate in
both a local and global sense is causing changing water patterns in the city suggests that São Paulo’s water woes are only beginning.
Figure 8.1: A Caixa d’Agua. Jardim Romano. 2014. Photograph by the author.
Chapter 9: Re-Imagining São Paulo’s Rivers: Alternative Cartographies of Environmentalism in the City

Introduction

This chapter is concerned with how São Paulo’s water crisis has been made visible by artists and activists. In conversations with the other chapters in this dissertation that have focused on attempts to remake the city’s relationship to its watery landscape, it focuses specifically on performances that are designed to call attention to the degradation of the city’s fluvial landscape and the problem of flooding. In the last decade, São Paulo has witnessed an explosion of art and activist practice designed to intervene in the city’s landscape and call attention to histories of fortification and degradation. These forms of “tactical urbanism” range from celebrations of neighborhood squares [praças] to more radical engagements with the urban landscape (Lydon and García, 205; See Woodward, 2016). Water plays a central role in these projects, and the groups and projects I highlight in this chapter are all specifically focused on watery landscapes and urban rivers. I focus on a series of engagements, but concentrate most specifically on three ongoing projects: The collective Rios e Ruas [Rivers and Roads], who conduct walking tours of the city’s buried streams; Coletivo Mapa Xilográfico [The Etched Map Collective], a group of radical urban interventionists interested in urban ethnography and the political economy of real estate speculation in the city; and a performance entitled The City of Invisible Rivers [A Cidade dos Rios Invisíveis], a memorialization of flooding that occurred in the peripheral neighborhood of Jardim Romano in 2009 and 2010.

These projects reveal the degree to which São Paulo’s water crisis is being engaged with by civil society actors, many of whose projects began before the 2014-2015 crisis of water scarcity. They make clear that creative, flexible approaches to urban water are being
developed in São Paulo, and reflect the broader discourse around water that is ongoing in the city. Alongside the more formal response to the water crisis that emerged from civil society in 2014 and 2015, represented by organizations like the Water Alliance and the Collective for Water Struggle [Coletivo de Luta pela Água], these projects demonstrate creative, provocative engagements with water in the city that reflect political-ecological critiques of the city’s water management regime. They make clear that people are interested in issues related to water in São Paulo. Further, they highlight how the water crisis is being narrated by activists and artists working across divides of center and periphery, and function as a demonstration of the capacity of performative practice to flesh out more technocratic discourses of water supply and flood prevention infrastructure.

These are projects that, in different ways, use water to articulate a broader critique that folds in differing dynamics of the city’s hydro-social landscape. I subsequently consider how these projects are using water to articulate differing critiques of the city’s urban political ecology. These engagements with water are often incongruous, often inconsistent. But as projects that are ways of responding to a broadly technocratic approach to urban water that has long held sway in São Paulo, they reflect new ways of engaging with water in the city. They are representative of how urban water can intersect with other politics and other ways of knowing. They articulate urban political ecologies of water that suggest one more way of engaging with the city’s degraded waterways that extends past the engineering paradigms that have determined water over the past century. While art practice and the technical management of urban waterways demand distinct knowledges and represent widely different scales, there is insight to be gained from art-based engagements’ willingness to consider water in multiple forms. As São Paulo confronts a multi-faceted water crisis that threatens to
get worse in the years to come, these sorts of projects offer insight into new relationships with water that could help to generate more expansive solutions to ongoing crises.

**Rios e Ruas: Performing Cidadania [Citizenship] and Environmentalism in São Paulo**

Formed in May 2010 by the geographer Luiz de Campos, Jr., and the environmentalist Jose Bueno, Rios e Ruas has since become a visible actor within the city’s environmentalist movement, especially as the city confronted water scarcity in 2014. Sometimes referred to as the “stream-hunters,” Rios e Ruas map and lead tours of the cities buried and often forgotten streams and rivers. The creation myth of Rios e Ruas involves a cup of coffee and a provocation: nowhere in São Paulo is more than 200 meters from a stream or river. This would become a challenge in the years to come, first enrolling friends and later expanding into a broader community project. Dedicated to visually and discursively calling attention to the city’s rivers, the duo lead expeditions, coordinate art exhibits, and give talks. But the central focus of the project has been a long-standing commitment to public space practice and tactile engagement with the city’s rivers through walking tours of buried streams. They lead walking tours along the city’s rivers, designed to both call attention to the hidden streams whose fluvial dynamics mark the landscape. They immerse themselves into the city’s landscape and develop alternative cartographies of its landscape (See Figure 9.1).

In May 2014, I participated in an event organized by Rios e Ruas, a walking tour along the largely buried and channelized Corujas River. This was one of a series of walks I took with Rios e Ruas over the course of 2014. We began our walk in the upscale but still purportedly bohemian neighborhood of Vila Madalena, specifically at the top of São Paulo’s Espigão. This is São Paulo’s hydrological dividing line, determining what rainfall will be deposited directly into the Tietê and which will first flow into the Pinheiros before eventually
discharging into the Tietê. As such, it was a compelling place to begin a walk dedicated to following the path of rainwater in the city.

Announcing their project to a crowd of around 75 people, Luiz and Bueno told us that the mission of Rios e Ruas is not just to discover and remember the city’s buried streams, it is also to be present in a city that is largely known for its walls, its violence, and its car culture. Bueno makes this clear in his introduction, noting that much of the point of the walk is exactly that: to walk and be a pedestrian in the street. We are all wearing blue t-shirts given to us by the organizers of the expedition, and Bueno comments that people in the street are going to gawk at this river of blue snaking through the city (See Figure 9.2). We’re mirroring the course of the buried rivers, in a sense, reasserting the presence of both buried streams but also car-encased urban residents. He refers to this as a kind of transgression of the logic of contemporary São Paulo, a crossing of barriers.

As we walk, Bueno is enthralled with the tactility of urban waters and urban life more generally, asking us to be silent, to listen to the streams flowing behind us, and repeatedly telling us to touch and feel the water that flows from buried nascentes, to feel the change in temperature. There is a rituality to this procession: a tactile, affective engagement with what is a deeply contaminated and obscured urban nature. As is customary with Rios e Ruas events, we’re told how to find buried streams by using our senses, to feel the lower temperatures, to note where trees grow, to observe where there are gaps in buildings, where dips in the road indicate a fluvial landscape that predates the urban form that exists above it and is intertwined with it. Bueno asks us to create a relationship of love and reconnection with “this invisible reality;” “the nature that is deeper than the city.” He is talking about buried streams but also about urban life, and there is something compelling, something
motivational in his pronouncements. Rios e Ruas is an educational project but one that takes on a kind of religious ritual.

After telling us about our river of blue shirts, Bueno tells us that we are following the Corujas River, one of the hundreds of buried streams and creeks that exist underneath the city. As discussed in previous chapters, São Paulo’s buried streams are representative of nearly a century of river management that has relied on channelization and rectification, resulting in an fluvial dynamic that is bound by concrete and piping. As such, the streams and rivers are buried underground, mixed together with sewage, and largely forgotten except for the moments when they reappear, in the form of floods, bad smells, and toxicity. We begin our walk at the nascente or source of the Corujas River, a trickle of water flowing out of a pipe alongside a staircase that connects two roads at different elevations. We’re told again to touch the water, to feel its cleanliness, but of course not to drink it. Much of Rios e Ruas project consists of celebrating these sorts of daily, unexpected engagements with urban rivers, and Bueno and Luiz highlight the many people who use this water daily to wash cars, to bathe, or to irrigate gardens. These sorts of DIY knowledges are central to the Rios e Ruas mission, and they celebrate localized knowledges, including older urban residents who remember free flowing streams that existed before the onset of urbanization. São Paulo is a new city, with much of its development occurring only in the second half of the twentieth century. Urban landscapes obscure their creation though, and come to seem fixed, ahistorical, always there. Anticipating this, Bueno asks us to deconstruct what has been constructed, in order to see what has been here for millions of years.

We are still at the start of the Corujas, in an area of antifeatros, cabaceiros, nascentes, all words to describe São Paulo’s location in a region of headwaters. We begin to follow the stream, stopping in about 100 feet to see where the water seeps out from a pipe and is
deposited almost immediately into a storm drain. The water flows down a smooth wall face, and the organizers joke that São Paulo doesn’t just have streams but it also has waterfalls. We watch the clean water flow from the pipe and get immediately deposited into a nearby storm drain. This is the last place you see these rivers, Bueno notes: “We’re happy when we find these streams, and then saddened to see them immediately go underground,” he tells us. “It doesn’t make us angry, just sad.”

We continue to follow the Corujas, through the leafy, upscale neighborhood of Vila Madalena. We’re told that the córrego or stream below us has been cleaned recently enough to allow us to think about a trip through the sewer at one point, and we’re told that the cleanliness of the streams was a product of a state project called Córrego Limpo [Clean Streams]. Began in 2007, Córrego Limpo is an ongoing project to clean córregos in the city and regulate sewage collection. While successful in many respects, the broad dynamics of sewage collection in São Paulo remain hostile to water quality in the city. With 39 municipalities within the greater metropolitan region of São Paulo, and a byzantine institutional matrix that fuses together river basin committees, state-led sewage treatment and water management, with city-led management of particular waterways, managing water in São Paulo is a herculean endeavor. With a record drought in 2013 and 2014, resulting in a dramatic lack of water, water management began to take on a more apocalyptic and disconcerting dimension as the nightly news counted down the levels of the local reservoirs.

We arrive at the Corujas Linear Park, a recently built park that highlights an opened up Corujas River and features extensive street art (See Figure 9.3). The project and related stream daylighting was designed and organized by Acupuntura Urbana, a private urbanist consulting firm. At the park we undergo a type of citizen water science, noting that the water quality has recently declined, a point clearly made by its lack of transparency. A friend of the
organization tells about water quality rankings, and reminds everyone that to truly clean the rivers you need to think at the scale of the basin or watershed. He tells us about the important effects of oxigenization, which cleans rivers but is prevented by channelization.

I chat with Luiz briefly about the project, and ask him if they do projects outside of the centro. He says that yes, they do, and that their goal is to walk every stream in the city. I ask him if the project changes when they leave the centro and he tells me ‘of course: every stream is different.’” Every stream needs to be researched in their particularities, and everyone is different. More specifically though, he talks with me about the bike trip they took to the Zona Norte, and tells me in the trip there to the Cantareira they never had one bit of elevation since they were traveling through the river valleys. He tells me about hiring local kids to bike with them, and explains that the context for those sorts of trips have to be different. You can’t just show up with a bunch of gringos, he tells me. I ask him if the relationship to rivers is different in the periphery, and he tells me that its different but the same in that no one knows that the riverways are actually rivers. They’re just sewage, and need to be paved over. He tells me that this changes when people learn that they are actually rivers, prompting my question about environmental education which he disagrees with.

We continue to follow the stream, passing through the upscale, low-density neighborhoods of Pinheiros before arriving at Praça Vitor Civita, a sustainability-themed park located in the neighborhood of Pinheiros and named after Vitor Civita, the head of a São Paulo-based publishing company. Opened in 2009, part of a broader urban revivitization project in the area, the park is centered around sustainability and features graceful wooden stages and a variety of environmental projects, including gardens and art installations. Developed during the mayoral administration of Serra-Kassab, who presided over a massive redevelopment of the region, the park is beautiful but stinks, reflecting the dominant
condition of the Pinheiros River. Here, at the edges of one of the wealthiest areas of financial capitalism in Latin America, home to Brazil’s largest television network and a variety of multinational firms, no one can avoid the river pollution that permeates the city. A product of industrial waste, untreated sewage, and clandestine housing, the Pinheiros is a slow-moving sewer. I take some solace in this fact, the river’s revenge for a city that has too long prioritized the accumulation of wealth over the fair distribution of urban amenities. At Praça Vitor Civita, Rios e Ruas have developed a series of impressive exhibits that include an imaginary vision of future fluvial landscapes in São Paulo and a broad overview of their projects (See Figure 9.4). The trip concludes here.

My description of a walking tour with Rios e Ruas highlights their broader purpose, a means of embracing the city’s degraded waterways through a romantic vision of nature and small-scale community building. Through a specifically apolitical approach, based on a vision of water that shares blame, Rios e Ruas offer a sentimental yet compelling way of seeing the city’s river in new ways. Indeed, in many of the events I attended, Luiz and Bueno would often refer to our collective culpability in environmental degradation. In addition to these walking tours, they have developed audio tours of the city’s rivers, organized races that follow the path of buried streams, and engaged in digital mapping exercises that visualize the city’s often forgotten rivers. Rios e Ruas make alternative cartographies of the city, and use the city’s hidden streams as a way to celebrate the simple act of being in the street in a city long plagued by violence and auto-centric planning. For Rios e Ruas, the city’s rivers are a kind of metaphor for a broader urban process that is both socially and ecologically unsustainable, and their project combines concerns about public space with environmental goals. In keeping with this dissertation’s focus on new modes of engaging with the Tietê, Rios e Ruas are, in a sense, at the forefront, pushing a tactile, embodied engagement with the
city’s rivers that offers the possibility of an environmental ethic grounded in everyday practice and embodied encounter. In this, they are another example of new relationships between water and city being articulated in São Paulo, and offer an inspiring vision of community environmental engagement. In doing so, Rios e Ruas are anchors in a broader project of environmental activism in the city. With other artists and activists, their project calls attention to the dynamics of pollution in the city and shares affinities with established environmental NGOs and artists in the city.

One example is the street artists Mundano. During the water crisis that affected the city in 2014 and 2015 (and beyond), graffiti writer Mundano pilloried the city’s response to the drought through site-specific engagements with the city’s declining reservoirs. In his images produced during the crisis, some of which insert cactus-shaped water spigots into the city’s declining reservoirs, the artist references Brazil’s sertão, the arid backlands characterized by drought and desiccated landscapes (See Figure 9.5). In doing so, he ties his critique of the city’s mishandled water crisis to longer watery histories that mark the nation as a whole. His tag on a car that only became visible when the reservoir lost the bulk of its water—which read, ‘welcome to the Cantareira Desert’—became one of the defining images of the hydric crisis, an easy representation of a system of water management gone awry.

**Linking Social and Ecological Degradation: Mapa Xilográfico and the Infrastructures of Inequality**

A similar, if more critical engagement with the city’s rivers can be seen in the Mapa Xilográfico project, whose name refers to earlier tree etchings made by the group. Mapa Xilográfico is a group of radical urban interventionists who developed a community mapping exercise and archive project in 2005. Using the rivers of São Paulo as a central axis through which to examine questions of politics and encounter, the Mapa Xilográfico along
with their related carnival group, the “fluvial block of dead fish,” navigate through the city, collaborating and conversing with residents. Their project is a multifaceted engagement with the urban landscape that draws in critiques of real estate speculation with environmental critique. Through documentary films that focus on everyday urban experiences, the collective has produced an informal urban ethnography that is complemented by more critical interventions into the dynamics of real estate and the development of fortified housing enclaves.

As such, Mapa Xilográfico use the city’s rivers as part of an expansive project of urban ethnography, cartography, and intervention. In their project O Barco [The Boat], the collective engages most directly with rivers in the city. The project was developed in 2011 in the community of Jardim Pantanal, which was intimately affected by the 2009 and 2010 flooding. Through a collaborative relationship with residents, the Mapa Xilográfico project created a documentary about the community that forms part of a broader alternative cartography of the city. In 2015, they developed a site-specific performance piece in the neighborhood of Jardim Pantanal, developing a samba that celebrated the community’s history of resistance to removal (Figure 9.6, 9.7, 9.8, 9.9). As a participant in this performance, I paraded through the streets as the performers sang songs that tied together the inequity of pollution with the realities of marginalization that characterize many neighborhoods in the floodplain of the Tietê. Though an affective engagement with pollution that saw nearby residents not as polluters but rather as residents forced to live in a toxic environment, Mapa Xilográfico’s project sidesteps questions of culpability to focus instead on the project urban political ecology of the city. Later, in a collaboration with local activists and social movement participants, the performers participated in a Sarau [open-mic] that included poetry, music, and other forms of performance. As a form of cultural
production linked to hip-hop and the marginal literature, saraus are currently an extremely visible component of the city’s cultural scene.

In their project in the historic neighborhood of Bixiga, located in the urban center, Mapa Xilográfico called attention the contemporary invisibility of the rivers that flow through it.

As Gabriel Fernandes argues in one of the project’s descriptions:

Saracura, Itororó, Bixiga/Japurá: three rivers that seem to flow between the visibility and the invisibility.

Despite being channelized, covered, hidden and massacred under the asphalt of the heart of the biggest Latin-American metropolis, these three toponyms are recurrent when we speak about the history of Bixiga in the history of São Paulo, its urbanization and development. They are visible rivers not just in academic texts and journalistic materials but also in the memories and the buried practices of the urban everyday. Evoked by researchers as well as their neighbors, celebrated by older residents of the neighborhood as well as artists and activists, the rivers gain a new life, despite their death under the city’s rivers. Without a doubt the advance of the metropolis turned them invisible, but the memory, the political action and – principally – art in its various manifestations has revealed and commemorated them.

As with their project in Jardim Pantanal, the group led a series of procession-excavations along the buried streams, in collaboration again with the Fluvial Block of Dead Fish. This project was part of a broader performative practice related to the city’s waterways, including a theatrical funeral procession for the Cantareira Reservoir’s Dead Volume [Volume Morto] and some more critical engagements with urban development and eviction.

Mapa Xilográfico use the city’s rivers in metaphorical ways, to tell broader stories about the urban landscape and those who inhabit it. They use the rivers to articulate a critique of São Paulo’s broader inequality and its co-constitutive environmental degradation, folding in critiques of real estate speculation with concerns about environmental degradation. They create alternative cartographies, conceptual or affective mappings of the city that tells stories using the rivers. Straddling at times incongruous positions, these projects are more pedagogical or provocative than policy ready. But they suggest the
intimate, embodied ways that rivers figure into the collective life of cities like São Paulo. In doing so, the project gestures at the complex politics of occupation and intervention that are currently marking the city of São Paulo.

**The City of Invisible Rivers: Memory and Identity in Jardim Romano**

If São Paulo’s rivers are known for their visibility, flooding is a particularly dramatic way in which rivers re-emerge. For environmentalist groups, floods are the revenge of rivers confined to channels and storm sewers. Yet for those who live in the floodplains of the rivers, most of whom are, in the words of activist Wagner, not there by choice, the reality is more direct. The flooding in 2009 and 2010 along the Tietê led to a declaration of calamity and to considerable hardship in the form of ruined property and health issues. Residents protested extensively, demanding the state intervene more forcefully and demanding a more humane engagement with the process of removals that took place at the time (See Barboza, 2015). State interventions into flooding remain stalled and underfunded, and the return of flooding to the region in 2016 exposed residents of peripheral neighborhoods to material damages and toxicity. Flooding is a regularized problem in São Paulo, but one whose effects are felt most dramatically by residents of the urban periphery.

The 2009 and 2010 floods were incorporated into the powerful play and longer-term performance called the City of Invisible Rivers. Described as a, “Itinerant spectacle on Line #12 of the CPTM in the direction of Jardim Romano and its flooded memories,” the play is an homage to the floods that occurred in Jardim Romano in 2009 and 2010. Organized by the Coletivo Estopô Balaio and written by director João Junior, the play is designed to call attention to the history of flooding in Jardim Romano while also commenting on the broader disconnect between the central city and its far flung peripheries. As one of the actresses in the play, Carol, noted after the play completed, the idea for the project emerged
when the director, employed in an Educational Center [CEU] in the neighborhood, began to hear fantastical stories told by children about the neighborhood’s history of flooding. Kids told stories about fish hidden in their apartments and roads that became rivers, a testament to the presence of the fantastical in the everyday. As the program for the play itself notes:

The children were the first to get in touch with the artists of Estopó Balaio through a ludic and fabulous elaboration of their experience. Fish jumped in the streets, the river-road, the moon reflected in the street, the fish who hid in the closet, alongside other images, composed the imaginative panel of the young memory of Jardim Romano. From them came the smiles and the jokes, from their parents the pain, the disgust, and the sadness.

For the performer Carol, a northeasterner from the Brazilian state of Rio Grande do Norte, flooding in Jardim Romano presented a complicated politics of drought and excess. For the entirety of São Paulo’s existence, migrants from the northeast have fled drought in search of work in the southeast, in cities like São Paulo, Rio de Janeiro, and Brasilia. In Jardim Romano, a neighborhood that, like most of São Paulo’s periphery, is populated by many first or second-generation migrants from the northeast (in particular Rio Grande do Norte, where the director and most of the performers are also from), this was a productive relationship. This tension between drought and excess, which called attention both to the creative possibilities afforded by a river-road but also the very real hardships faced by residents who reside in the várzea lay the foundation for A Cidade dos Rios Invisíveis.

The play began in the Brás train station, one of the central switching points where the commuter train system intersects with the metro\textsuperscript{11}. This is a moment of translation between the formal and the informal, from the well-maintained, extremely fast trains of the metro system to the slow, unpredictable commuter trains that primarily serve the urban periphery. We board the train, a group of around 30, with matching earphones. Passengers are curious.

\textsuperscript{11} I participated in the play twice in 2015, yet for the sake of narrative coherence I refer to my experience in the singular.
but not exceptionally so, and put up with the actors and visitors. On our headphones is a creative and unusual narrative, inspired primarily by Italo Calvino’s canonical *Invisible Cities*. The narrative tells a story of São Paulo’s periphery, but is told fantastically, a story of old gods and new gods and puns. It is interspersed with fragments of interviews conducted with neighborhood residents, who discuss their experiences living in the urban periphery. We’re shown nascent favelas from the window of the train, and the actors play with the audience’s role as spectators and visitors, playing post-its on the window that call attention to the visuality of seeing from the train. The script is playing with visibility and disappearance, a tying together of the idea of invisible rivers with invisible lives, a critique of the ways in which the urban periphery is marginalized, rendered invisible. We’re told the train divides the city: on one side, commerce, regularity, economy; on the other, residences and homes, informality, ephemerality.

We leave the train and are taken outside of the station, where the three actors greet us and welcome us to Jardim Romano. We hold out our hands, our maps for the day, and invited into the “Roman Empire,” a play on the neighborhood’s name. The actors lead us, dancing and singing, into the neighborhood, a low-rise, largely auto-constructed neighborhood, typical of much of the Eastern Zone of São Paulo. Suddenly six members of our group reveal themselves to also be part of the play. These actors, young residents of the region, will be with us the rest of the way, leading us through the neighborhood and inviting us in (See Figure 9.10). We’re given a safety message, but informed, dramatically, that, “if you call for help, no one will come!” a reference to the minimal state response to the 2009 and 2010 flooding.

The street we are on, Rua Adôbe, has been painted with images drawn from the children’s memories of the flooding. Fish swim on the asphalt, frogs dangle on windows,
and water pours from non-existent drains (See Figure 9.11). We’re taken into the first installation of the project, the Casa Molhada or Wet House. Here, in a house that was not damaged by the flooding due to its proximity to the metro and distance from the river, we’re offered food—a fried river fish (decidedly not from the nearby Tietê) inside a tapioca, a type of Brazilian crepe specific to the northeast and a reference to the neighborhood’s history of in-migration from the state of Rio Grande do Norte—and led inside. Inside the house has been converted into a permanent installation, a site of memory designed to call attention to the floods. The room has been marked as water damaged, with mold drawn on walls and a sense of artificial dampness. In the living room we find a memorial to the floods themselves, with newspaper clippings hanging from the ceiling and ephemera related to them. The actress who led us in tells us about having to save her children during the flooding, and we are led to an upstairs room where a permanent installation calls attention to children lost in the flooding.

We’re led back outside, where Dunstin MC, a local rapper, serenades us from the porch of a nearby building, with a story of the difficulties faced by residents of the extreme edge of the zona leste. “Facts of the Extreme East” [Fatos do extremo leste], a reference to the neighborhood’s distance from the urban core, is the chorus. We move forward, and are drawn in further into the narrow neighborhood. From here the play takes many routes. We stop and listen to an interview with Jacira, a resident of Jardim Romano, who has also baked us a cake. We’re told to be quiet by a neighborhood resident, prompting a whispered session of the play that calls attention to some of the dynamics of insider/outsider that are being played with during the performance. At one point two young teenagers aggressively ride their motorcycles through the parade before pulling u-turns and speeding off. Is this part of the play, a commentary on youthful aggression and the fear of young men from the
periphery? Or is this something more insidious, a policing of boundaries between insider and outsider designed to make clear that there are other layers of governance that circulate in peripheral regions of São Paulo? It is not clear and no response is given by the performers.

The audience is regularly folded into the performance. At one point I’m asked to discuss my first time seeing the ocean, and one of the actors—Juãu Nin—tells me about a time that he was buried in sand on the beach near Natal. The story is fantastical, an embodied celebration of the tactility and joy of water, in direct contrast to the state of the river that threads through Jardim Romano. Throughout the play the dynamics of northeastern migration are being engaged with, as the actors articulate their own experiences of dislocation within the broader dynamics of migration from the northeast to the southeast that characterizes contemporary Brazil and its cities. When we hear Jacira tell us her story, the recording echoes her statement: I am proud to be a northeasterner, she tells us, and the crowd sings along. This is confirmed by the publication associated with the project, in which Ana Carolina Marinho [Carol] writes, “I am a northeasterner but I only realized this in São Paulo.” This is a reference to the processes of racial differentiation that have long characterized São Paulo’s claims to a specifically whitened variant of Brazilian identity.

We’re led through alleys, where we meet a poet named Rata who serenades us with poems that call attention to her black womanhood, and an alleyway is lined with speakers that broadcast the stories of local residents. The local actors tell us stories of what they did during the flooding, and one tells us a tale of rescuing local pets to the constantly repeated chorus of “the house is flooding, the house is flooding” (See Figure 9.12). These stories are reproduced in the play’s publication. We stop at a house, where the actress Kika tells us a story about the inspector coming to the house of her grandmother to tell her that it will be demolished in the wake of the flooding. The actress calls attention to the ties to place that
are strong here, with her grandmother refusing to leave, before asking us repeatedly “this is just?” with increasing tension. Her repeated question is filmed by one of the other actors, who continues to provoke her into further anguish.

We finally emerge at the Tietê itself, where we’re asked to imagine what hope means to us, and we walk through the neighborhood where we hear the play’s finale. Each actor speaks to the river. One notes, “I understand now. You had to invade my house so I could be there today telling your story,” while another—Carol—notes that, “Sometimes, because of the heat, I want to dive in you—the same heat that drove me from the northeast.” The play concludes here, perched on the edge of the polluted Tietê as the sun sets, a bucolic scene that is nevertheless infused with the pollution that marks the region (See Figure 9.13). The play has taken around three hours and covered over thirty kilometers. I walk back to the train and head back into the center.

In the years since the play was first performed, it has reappeared periodically, and has received extensive state support. The version I saw was funded by the São Paulo secretary of culture. In 2016, a documentary about the theater group premiered at the Festival of Latin American cinema. In addition to the play itself, the broader production associated with it has yielded a series of more regularized events, including a monthly sarau [open-mic] that includes cabaret, a new years eve drag performance, and a series of consistent provocations around themes of identity, gender, belonging, and peripherality. Employing a variety of types of cultural production and support for local actors and performers, the project connects to broader themes of center and periphery as they relate to the ongoing ways through which the urban periphery has articulated itself. Of course, the presence of outsiders—defined broadly—makes clear that this is not strictly a matter of the periphery asserting itself but a more complex politics of representation, appropriation, and solidarity. Yet unlike
contemporary engagements with the periphery that stress peripheral cultural production as a kind of voice of the voiceless narrative (as with Caldeira, 2014), The City of Invisible Rivers paints a complex portrayal of daily life, environmental hazards, and the dynamics of identity within the urban periphery. It is a deeply queer performance, one that continues to move past environmental narratives to instead engage more dramatically with questions of gender and sexuality. As such, the play—and its linked projects—is dense, folding in a series of themes that are central to São Paulo’s broader artistic and cultural production in the contemporary moment. In its connection to *saraus*, for instance, the play is suggestive of exactly these sorts of questions of periphery and center, a point given considerable attention in the project’s literature. The racialized and gendered identities of the performers figures prominently into the narrative and its associated cultural production, and the project raises broader questions about presence, about visibility in the street, about gender, about public life. These take on different forms than in the works of Rios e Ruas, for instance, whose project aims to bring public life back to spaces of elite public life in São Paulo.

In its overlapping significance, the play calls attention to a series of themes that are essential to contemporary São Paulo: its buried rivers and their presence in the lives of peripheral residents, its ties to the northeast, its inequality and center/periphery dynamics, and the increasing state funding for art related to the periphery. While there is a politics to bringing non-residents into the periphery to see it, a point made clear over and over again as the main actors facetiously thanked us for taking the time to come “so far,” the periphery is currently a currency in trade (see Pardue, 2010). Taking control of its representations has been a project of the urban periphery that has picked up speed over the last two decades, and groups like Estopô Balaio are intersecting with those currents in interesting ways. While obviously conscious to those facts, and interested in the dynamics of visibility and invisibility
and clearly dedicated to collaboration, there remains a tension between the ways in which the actors are representing the community and how the representatives themselves are being asked to involve themselves. Is visibility enough, or do the kinds of visibilities matter?

Environmentally, the project paints a more ambivalent picture. The invisible rivers referenced in the play’s title are perhaps a reference to the hidden streams called attention to by other activist groups, but they could also be references to the emergence of invisible rivers in the light of flooding: “the roads were rivers that reflected the moon at night” (Júnior, 9). There is little in the way of specifically environmentalist critique in the project. The project is instead more ambivalent, suggestive of the lived experience of making a life at the edges of urban degradation, in the once wastelands of the city that have become sites of long-standing habitation and affect even as they remain broadly articulated through the lens of lack and marginalization. There is a complex politics of memory and commemoration that threads through the performance, linking questions of environmental degradation with the demands of making life in a place that is deemed by many to be not fit for habitation. Here, the environment is not something to be understood, but rather a broader metaphorical current within the lives of the performers and audience members.

**Conclusion: Making environmental degradation Legible**

The projects highlighted in the previous pages are not engineering projects. They are pedagogical, in a sense, provocations that connect the city’s degraded rivers to broader threads of inequality, marginalization, and urban fortification that characterize the city. Yet through their attempts to think through water in ways that are multi-functional and embodied, they are suggestive of new engagements with urban water being articulated on the more formal design level. They demonstrate an ongoing paradigm shift in the city, one that is currently attempting to rewrite the city’s longer history of water management. Like the
activists currently attempting to unpack what is commonly referred to as the black box of water provisioning in São Paulo, groups like Rios e Ruas and Mapa Xilográfico call attention to the intimate linkages between water, inequality, and urban history in profound ways. The City of Invisible Rivers has little to say about the management of flooding in the várzea of the Tietê, but its broader affective engagement with the city’s rivers is suggestive of how relationships to urban water can tell broader, more compelling stories about the city. Water is, as feminist urban political ecologists have noted, intimately connected to the broader daily life of urban residents (See Doshi, 2016; TrueLove, 2011). These projects—and the networks of solidarity that sometimes but not always emerge from them—are suggestive of the affective ways in which water can work to articulate other stories. In a moment in which Brazilian water management faces a series of profound crises, these are important interventions into the techno-politics of water management. They make clear that water management extends past the political ecologies of privatization and investment to include broader questions of identity, collectivity, and presence.

In doing so, these projects gesture at the making of collectivities, of new articulations of common interest in a moment in which commonality is being ripped apart through neoliberal politics of austerity, what Lauren Berlant (2016: 394) refers to as, “the glitch of this moment.” She notes, with specific attention paid to infrastructure:

What remains for our pedagogy of unlearning is to build affective infrastructures that admit the work of desire as the work of an aspirational ambivalence. What remains is the potential we have to common infrastructures that absorb the blows of our aggressive need for the world to accommodate us and our resistance to adaptation and that, at the same time, hold out the prospect of a world worth attaching to that’s something other than an old hope’s bitter echo. A failed episode is not evidence that the project was in error. By definition, the common forms of life are always going through a phase, as infrastructures will (414).

All these performative projects—Rios e Ruas’ sentimental engagement with the landscape, Juniors’ queer peripherality in the City of Invisible Rivers, Mapa Xilográfico’s solidarity
across neighborhood boundaries—suggest the creation of new collectivities that extend past normative articulations of who belongs where and with whom. They are fundamentally ambivalent gestures, unwilling to make distinct claims but grounded, I argue, in a spirit of collective experimentation and the broader posing of possibilities. The City of Invisible Rivers project is especially expansive, a now multi-year investment in the area that has yielded diverse forms of cultural production and sustained research. These sorts of relationships make clear that the social lives of infrastructure alluded throughout this dissertation are mediated not just by the political economies of resource provisioning, but also the broader affective ties that bind us to the networks and assemblages that surround us. Berlant’s use of the word infrastructure is here especially pertinent, an understanding of the ties and relations that sustain people and things in moments of disassembly.

These projects call attention to a provocation made by Buser (2016), in which he asked: “To what extent can fixing a sewer be a care practice?” This question, for Buser, was a way of engaging with the technical dimensions of water management in more intimate ways, but it raises a series of questions that extend from the local to the planetary. These projects are not offering solutions to the planetary dynamics of climate change, but they are gesturing at the sorts of solidarities that may generate better futures. In an era in which the language of dystopia feels increasingly present, these gestures matter.
Figure 9.1: Rios e Ruas, 2014. Photograph by the author.

Figure 9.2: Rios e Ruas. Vila Madalena, São Paulo, May 2014. Photograph by the author.
Figure 9.3: Corujas Linear Park. Photograph by the author.

Figure 9.4: Exhibition by Rios e Ruas, May 2014. Photograph by the author.
Figure 9.5: Mundano, Sertão Paulistano, 2015. Reproduced with permission from the artist.
Figure 9.6: Mapa Xilográfico and The Fluvial Block of Dead Fish in Jardim Pantanal 1, 2015. Photograph by the author.

Figure 9.7: Mapa Xilográfico and The Fluvial Block of Dead Fish in Jardim Pantanal 2, 2015. Photograph by the author.
Figure 9.8: Mapa Xilográfico and The Fluvial Block of Dead Fish in Jardim Pantanal 3, 2015. Photograph by the author.

Figure 9.9: Mapa Xilográfico and The Fluvial Block of Dead Fish in Jardim Pantanal 4, 2015. Photograph by the author.
Figure 9.10: The City of Invisible Rivers, Jardim Romano, 2014. Photograph by the author.

Figure 9.11: Where is the River? Jardim Romano, 2014. Photograph by the author.
Figure 9.12: The City of Invisible Rivers, Jardim Romano, 2014. 2. Photograph by the author.

Figure 9.13: The City of Invisible Rivers, Jardim Romano, 2014. 3. Photograph by the author.
Chapter 10: Conclusion - Towards Porous Cities?

In São Paulo, there is both too much water and too little. Flooding and water scarcity characterize residents’ everyday engagements with water, and typify the hydrological challenges that complicate urban water management in a contemporary megacity. As was expressed to me over the course of nearly two years of research in the city, São Paulo’s water management is at a point of crisis. This extends past the most immediate reality of scarcity to include systemic water pollution and recurrent flooding. These manifestations of crisis are products of land use patterns, historical approaches to stormwater management, and the dynamics of weather and climate in the region. For close to a century, hydrological engineers and urban planners have managed São Paulo’s water by encasing the nearly 300 rivers that flow through it in concrete and burying them beneath avenues. This modernizing logic posits urban water as problematic, and funnels it to dams outside of the city where it is used for hydroelectric power (Custódio, 2012; Jorge, 2001; Junior, 2012). The result is an approach to water management that exacerbates flooding and encourages overuse. Flooding and scarcity are what geographers and social scientists refer to as “socio-natural” disasters due to their tying together of social and natural causes, and they are infrastructural failings that disproportionately affect the urban poor. As a result of São Paulo’s urban heat island and the broad dimensions of global climate change, it is predicted that extreme rainfall events will only increase in the years to come, amplifying the perils of flooding for the city’s most vulnerable residents (Nobre et al, 2010). At the same time, scarcity remains a serious threat for the city.

In this dissertation, I have considered the past, present, and future of this ongoing water crisis in São Paulo. My initial interest in this project was to think through how visions of the city developed in the global north were complicated by the dynamics of daily life in places
like São Paulo. But at this project continued, it changed. Where I had initially arrived in São Paulo to study flooding and its effects, I found myself in the midst of one of the most intense droughts the city had ever seen. As residents worried if they would have enough water to drink in the days to come, flooding seemed a remote concern. Yet when flooding returned in the midst of scarcity, it was clear that the city’s ongoing crisis was of a deeper sort: an indictment of an entire approach to managing water that was reaching a breaking point. The coexistence of flooding with scarcity, the complicated relationship between poverty, informality, and water degradation, and the response of the state government to the crisis of scarcity revealed the fragility of the city’s water management regime. This project then became more expansive, an attempt to engage critically with multiple aspects of an ongoing, broadly defined water crisis.

“Crisis,” is, of course, a loaded word, one too often infused with apocalyptic worry or diagnoses from afar. If there is a central argument in this dissertation, it is that attention needs to be paid to the everyday moments of breakdown, the constant dynamics of repair and maintenance that are often bypassed in favor of new, more expansive (and more expensive) projects. This takes seriously Barnes’ (2014) call for “a [water] politics anchored not in an alarmist narrative of global crisis and potential wars, but in the everyday practices of managing canals, opening dams, dredging channels, turning on faucets, operating pumps, and irrigating fields.” Throughout this dissertation, I have attempted to focus on moments of breakdown, not of the catastrophic sort but instead the mundane. As Erik Swyngedouw famously argued in 1996, to trace the water that flows from the drain is to trace the flows of power that materialize in cities. The management of stormwater implies a similar process: as rain flows through the urban landscape it drags along with it the metaphorical sediments of unequal cities, the fluvial reminders of an urbanization process that that weighs too heavily
on millions of residents in São Paulo and beyond. These politics often happen in moments that are largely out of sight, in the negotiations over dredging contracts, in the decisions to keep flood gates closed, in the broader lack of attention paid to the maintenance needs of hydrological infrastructure. This is where crisis happens.

Solving São Paulo’s water crisis will not be easy. The city is inserted in a fluvial landscape that renders any solution difficult, and the sheer size of the city makes water provisioning into a herculean task. The informality that characterizes much of the city complicates efforts to implant sewage networks and there are real difficulties in managing habitation in flood prone landscapes. The histories of land use that congeal in the city’s contemporary landscape are themselves knotty, demanding specific forms of infrastructural continuity that complicate efforts to rethink the city’s landscape. Any efforts to remake the city’s relationship to water will by necessity be incremental, small modifications to the landscape made in the context of inequality, budgetary constraints, and enduring confusion over land tenure and ownership. These sorts of incremental politics and modifications are resolutely not glamorous and they lack the conclusions suggested by a project like the Parque Várzeas do Tietê.

With those considerations in mind, I conclude this dissertation with a series of suggestions.

First, it bears repeating that the crisis of water management is fundamentally a housing crisis. The lack of affordable housing in the city doesn’t just generate a peripheral urbanism that degrades water but it also complicates efforts to implement necessary hydrological infrastructure. Without a clearer politics of housing, these sorts of water issues are unsolvable. And without stronger collaboration between the environmental and housing secretaries in the city, a solution will be hard to find. Residents are rightly skeptical of what they see as illegitimate plans for resettlement; until those plans can be developed not as an
afterthought but as a central element of these projects, the water crisis will continue. São Paulo needs a radical reconfiguring of its available housing and an expansive process of infrastructural provisioning and tenure legalization for peripheral communities in areas of environmental protection.

Second, as this dissertation has labored to point out, water management in São Paulo requires more extensive engagement with the everyday dynamics of maintenance and repair. Water networks are relational: they are linked not just to the circuits of housing and land use mentioned previously, but to the management of solid waste, the dredging of canals and streams, the maintenance of infrastructures. These happen in the context of the broader structural realities of funding and privatization, but they are also more mundane processes. Without a more consistent engagement with everyday dynamics of repair and maintenance, the management of water will remain fraught. While seemingly a banal suggestion, a focus on everyday maintenance is also a call for more attention to be paid to localized water sources and for more resources to be put towards water reuse. As I argued in Chapter eight, São Paulo’s water management continues to focus on expansive projects designed to increase water supply. Seemingly driven largely by concerns about profit, these projects further the environmental impacts of large-scale hydrological infrastructure and continue the degradation of local waterways.

Third, better collaboration between state entities is essential to the creation of solutions to the water crisis. Without a willingness to see housing, water, and infrastructure as linked entities, solutions to the city’s water problems will remain siloed. Commentators and water professionals in São Paulo continuously call for integrated water management, but the enduring divisions between specific state secretaries complicates these efforts. This is most pronounced in projects that are attempting to develop linear parks or improve water quality,
where budgetary constraints intersect with different institutional cultures to stall the development of projects.

Finally, ignoring communities affected by water crisis in the development of solutions to ongoing water crises is both perverse and counterproductive. As Ferrara (2013) and others make clear, low-income communities have already found solutions to water crises through collective infrastructural experimentation and the development of small-scale solutions. Funding these processes through collaborative engagements with communities at risk is essential. These projects already exist but their shift as priorities and institutional capacities move depending on funding priorities and electoral dynamics. Finding ways to engage more consistently with the everyday realities of water management demands a commitment to working with local residents who already intervene into the city’s hydro-landscape through their everyday practice. These knowledges and practices already exist; the challenge is to put them to use in the service of a consistent, long-term approach to managing both water and urbanism in the city. As long as water management remains black-boxed, it is hard to envision a solution to water management going forward.

Expanding out from the specificities of São Paulo, this project makes three suggestions for urban geographers going forward:

First, this project echoes recent calls for more research into the urban edge, the “frontier,” or what Ananya Roy recently referred to as “city’s end” (See Figure 10.1). In a specifically Brazilian vein, this project calls for a critical geography that starts from the piscinão, the várzea, and the periferia. Whether referring to the foreclosed landscapes of Chicago’s southern periphery or the dense landscapes of São Paulo’s várzea, there is significant space for more work that investigates the complex dynamics of property, ecology, and design in the ambiguous landscapes of the urban fringe. Understood both
metaphorically but also materially, the urban edge functions as a means of linking disparate cities across binaries of north and south, but also calls attention to the mundane politics of landscape management in landscapes that are often made to feel invisible. Focusing on the dynamics of property and speculation at the urban edge enables a focus on the mundane politics of profit accumulation that are often hidden from sight (See Akers, 2015; Blomley, 2004; Desai and Loftus, 2013). Rather than suggest that cities end at their edges (See Angelo & Wachsmuth, 2015), an interest in the edges of the city calls attention to interstitial landscapes and dramatic processes of urban metabolism and change. The urban edge too can often overlap with what Gandy (2016) calls “unintentional landscapes,” the ecologies that are often created at the edge of state involvement (See Brownlow, 2006). As I note in a previous article, “That landscapes of social want are often met by ecologies of abundance is an irony of contemporary urban decline, but one whose politics need further scrutiny” (in Millington, 2015: 2334). Here, a stronger relationship between geography and the design disciplines is needed, but so too is a broader willingness to consider the banal and mundane geographies of urban life.

Second, and related, is a call for more research into the dynamics of housing provisioning, especially in cities of the global south. In this, I echo recent work that has called for more textured studies of ongoing processes of displacement and contestation (See Ghertner, 2015), but also call for a more sustained engagement with the mechanics of developing affordable housing in contemporary cities. São Paulo’s ecological concerns are intimately connected to its structural inability to adequately house its residents. A sustained approach to housing would take seriously both the articulations of housing demands being voiced by social movement actors but also the dynamics of state-level (in)efficiency as they intersect with broader questions of neoliberal urban governance and legislative possibility
(Madden and Marcuse, 2016; Rolnik, 2015). As Raquel Rolnik makes clear, we are currently living in the midst of global housing crisis, and geographers and social scientists are well-positioned to consider alternative arrangements and give legal support to residents resisting eviction.

Finally, this project calls for continued research into the political and social dynamics of infrastructure in contemporary cities. While the “infrastructural turn” has become firmly entrenched within academic urban geography, there is still more work to be done. The Situated Urban Political Ecology lab’s ongoing research program into “heterogeneous infrastructural configurations” is one point of entry, and functions as a way of highlighting the diversity of infrastructural arrangements in cities across the global south. Infrastructure remains an essential point of entry for broader concerns about citizenship and belonging, and the politics of making infrastructure visible remain important components of activist practice in cities (See McFarlane and Silver, 2016). Geography engagements with urban design and the disciplines of (landscape) architecture remain underdeveloped, but more collaborative work around infrastructural landscapes would offer possibilities for collaboration that could yield outcomes. But a focus on infrastructure needs also to consider the funding and financing of large-scale infrastructural projects and the broad political economy of engineering expertise across national boundaries. The travels of infrastructural ideas and the political economy of engineering concerns are interlinked, reconfiguring urban landscapes in profound ways. This project has largely focused on the small-scale implications of urban infrastructure, but there is more work needed on the global political economy of infrastructural provisioning across national boundaries.

To take seriously cities as assemblages is to take seriously their heterogeneity and their particularity. This dissertation was one attempt at representing and visualizing the city of São
Paulo and constitutes one interpretation of its landscape and historical production. By focusing on ongoing responses to the city’s water crisis, my hope is that this dissertation echoes and contributes to ongoing efforts to remake and reimagine the city’s management of water more broadly. This dissertation was written with inspiration from the countless critics, activists, and artists who shaped its ideas. Throughout the water crisis of 2014, I participated in many events that showcased the commitment to water management and urbanism that was circulating in the city, ranging from the theatrical performances of Rivers and Roads to the policy-focused work of the Water Alliance. The Water Alliance’s ongoing efforts to develop a municipal law of water security echoes many of the suggestions I have made, and calls for greater transparency and greater collaboration between state entities. Ongoing attempts to place water concerns into municipal elections through projects like #votepeagua (#voteforwater) are reminders that residents are concerned about water even as the state has declared the water crisis officially over. As climate change starts to rewrite the cities we live in, there is inspiration to be taken from the capacity of people to intervene into the landscapes that form the backdrops to our collective lives.
Figure 10.1: City’s End, Jardim Romano, 2014. Photograph by the author.
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Vita

EDUCATION

2010  MS in Geography, University of Wisconsin-Madison

2006  BA in History, University of Virginia
      Minor: Urban Studies

CURRENT POSITION

2016- Post-doctoral Researcher, African Centre for Cities, University of Cape Town
        Project title: “Turning livelihoods to rubbish? Assessing the impacts of formalization and technologization of waste management on the urban poor.”

AWARDS AND PROFESSIONAL HONORS

2016  AAG Latin American Specialty Group Graduate Student Paper Award ($200)

2015  Fulbright-Hays Doctoral Dissertation Research Abroad Fellowship ($33,984)
      Graduate Student Incentive Program award for 2014-2015, University of Kentucky ($1,519)
      Spring & Fall Tuition Scholarship, University of Kentucky ($5,692)

2014  Graduate Student Incentive Program award for 2013-14, University of Kentucky ($720)
      Fall Semester Tuition Scholarship, University of Kentucky ($2,846)

2013  Fulbright U.S. Student Award for 2013-2014 to Brazil ($19,200)
      2013 Kathryn Davis Fellowship for Peace to attend Middlebury College for language training in Portuguese ($8,029)
      AAG Urban Geography Specialty Group Graduate Student Fellowship (PhD) ($600)
      Dissertation Enhancement Award, University of Kentucky ($3,000)
      São Paulo Symposium Financial Support, University of Chicago ($350)
      Graduate School Travel Funding Award, University of Kentucky ($447)

2012  Foreign Language & Area Studies Summer Fellowship, University of Wisconsin ($7,500)
      Department of Geography Travel Funding Award, University of Kentucky ($180)
      Graduate School Student Travel Funding Award, University of Kentucky ($400)

2011  Department of Geography Barnhardt-Withington Award, University of Kentucky ($2,340)
      Latin American Studies Travel Grant, University of Kentucky ($850)
AAG Urban Geography Specialty Group Graduate Student Paper Award ($200)
Graduate School Student Travel Funding Award, University of Kentucky ($400)

2010 Middlebury College Financial Assistance for language training in Portuguese ($4,610)
Vernacular Architecture Forum Presenter’s Fellowship Award ($500)
Department of Geography Trewatha Graduate Research Award, University of Wisconsin ($400)

PUBLICATIONS

Refereed Articles


Refereed Book Chapters


Online Publications


Book Reviews


TEACHING EXPERIENCE

Instructor

2015 Geography of Brazil (Spring), University of Kentucky Department of Geography
Introduction to Human Geography (Online, summer), University of Kentucky Department of Geography

Graduate Teaching Assistant

2011-13 Community 101 (Fall 2011, Spring 2012, Fall 2012, Spring 2013), University of Kentucky College of Arts and Sciences

2011 Lands and Peoples of the Non-Western World (Spring), University of Kentucky Department of Geography

2010 American Cities (Fall), University of Kentucky College of Arts & Sciences and Department of Geography

2009-10 Environmental Conservation (Fall 2009, Spring 2010), University of Wisconsin Department of Geography

2008-09 Introduction to Human Geography (Fall 2008, Spring 2009), University of Wisconsin Department of Geography

Assessment of Student Work

2014- Essay Scorer, Council for Aid to Education
2013- AP Human Geography Reader, Educational Testing Services, Cincinnati, OH

RESEARCH EXPERIENCE

2013 Research Assistant, “Hunertown,” sponsored by the Kentucky Oral History Commission and the University of Kentucky, in association with the Louie B. Nunn Center for Oral History (Primary Investigator: Dr. Richard Schein, University of Kentucky).

2012 Research Assistant, Summer 2012 “Social Justice/Faith Groups, Urban Homelessness and Spaces of Praxis: Lexington’s Catholic Action Center” (Primary Investigator: Dr. Sandra Zupan, University of Kentucky).

2010 Research Assistant, Summer Field School in Vernacular Architectural History (Primary Organizer: Dr. Anna Andrzejewski, University of Wisconsin-Madison).

CONFERENCE PARTICIPATION

Conference Organizing

2010-2014 Organizer, Dimensions of Political Ecology Conference, Lexington, Kentucky

2012-13 Conference Chair, Dimensions of Political Ecology Conference (February 28 – March 3, 2013) & President, University of Kentucky Political Ecology Working Group
Paper Presentations


Urban Nature and the Cultural Landscape: Milwaukee’s North Avenue Dam.
University of Wisconsin Buildings-Landscapes-Cultures Program Student
Symposium, May 7, Milwaukee, Wisconsin.

‘Wild, Wild Midwest’: Landscape, Vision, and Nature in Detroit, MI.
Association of American Geographers Annual Meeting, April 14-18,
Washington, DC.

‘Wild, Wild Midwest’: Landscape, Vision, and Nature in Detroit, MI.
University of Wisconsin-Madison, 9th Annual Graduate Student Symposium,
April 8-9, Madison, Wisconsin.

‘Wild, Wild Midwest’: Landscape, Vision, and Nature in Detroit, MI. Midwest
Interdisciplinary Graduate Conference, February 12-13, Milwaukee,
Wisconsin.

2009
Envisioning Detroit: Detroit’s Michigan Central Station and the Politics of
Representation, Minnesota Chapter of the Society of Architectural Historians
Fourth Annual Student Symposium, September 26, Saint Paul, Minnesota.

Organized Sessions & Panels

2015
“Infrastructural Visions and the Politics of Urban Design: Creating and
Managing Urban Landscapes in the Era of Climate Change.” Dimensions of
Political Ecology Conference, February 26-28, Lexington, Kentucky (with
Kenny Stancil)

2013
“Urban Design, Climate Resignation, and the Politics of Sustainability:
Accommodating Climate Change in Cities.” Dimensions of Political Ecology
Conference, February 28-March 3, Lexington, Kentucky

“Political Ecology: Pasts, Presents, and Futures.” Dimensions of Political
Ecology Conference, February 28-March 3, Lexington, Kentucky

Selected Participant, International Journal of Urban and Regional Research ‘Author
Meets Critics’ Seminar, January-May: http://www.ijurr.org/authors-meet-
critics-2013/

2012
“Environmental History & Historical Political Ecology I & II” Dimensions

“Industrial Ecologies,” Dimensions of Political Ecology Conference, April
“Racialized Landscapes: Embodiment, Mutable Natures, and Environmental Politics I & II” Dimensions of Political Ecology Conference, April 13-15, Lexington, Kentucky (with Sarah Watson)

2011 “Representing and Imagining the City I, II, and III,” Association of American Geographers Annual Meeting, April 12-17, Seattle, Washington (with Jason Nu)

LANGUAGE TRAINING & NON-DEGREE EDUCATIONAL ENRICHMENT

2013 Middlebury College, School of Portuguese
Six-Week Portuguese Immersion Program

2012 Pontifical Catholic University of São Paulo & Tulane University
Summer Course in Portuguese Language and Brazilian Studies, São Paulo

2011 Middlebury College, School of Portuguese
Six-Week Portuguese Immersion Program

2007 University of Washington Extension
Online Coursework in Geographic Information Systems

UNIVERSITY AND DEPARTMENTAL SERVICE

2015 Graduate Student Representative to Graduate Program Committee, University of Kentucky Department of Geography

2010-11 Graduate Student Representative to Graduate Program Committee, University of Kentucky Department of Geography

2009-10 Graduate Student Representative to Faculty/Staff Meetings, University of Wisconsin-Madison Department of Geography

2009 Coordinator, Theoretical, Human, and Urban Geography Scholarship Discussion Group, Department of Geography, University of Wisconsin-Madison, Spring semester.

PEER-REVIEW ACTIVITY


PROFESSIONAL MEMBERSHIPS

Association of American Geographers
University of Kentucky Political Ecology Working Group
University of Wisconsin Center for Culture, History and Environment (2009-2010)