

## PART VII

## Spaces of circulation

*Andrew E.G. Jonas and Kevin Ward*

This section examines an important yet often overlooked theme in the analysis of urban politics, namely, how cities and the spaces within them are interconnected through circulatory systems and flows. In recent years, concepts of mobility and flow have injected new life into critical thinking about the city and, indeed, space more generally. Urban scholars, such as Manuel Castells (2000) and Doreen Massey (1991), amongst others, have argued that seemingly ‘urban’ social and political processes are always constituted through socio-spatial relationships, flows and networks which can extend far beyond the boundaries of the city. Such relational thinking about the city aims to challenge the viewpoint that the underlying conditions shaping urban social formations and politics are to be found exclusively inside the city itself (Amin and Thrift 2002).

Relational approaches to the urban open up exciting new opportunities to examine urban politics from the vantage point of wider circulations and flows. Such connections and flows involve not just the different circuits of capital operating through the built environment as described, for example, by David Harvey (1985); they can also refer to flows of material goods and resources, nature, transport, policies, ideas and political discourses. The analysis of such spaces of circulation, in turn, requires a different way of thinking about the underlying social configuration of different spaces of urban politics; namely, it puts causal priority on exposing and explaining the spatial movements, flows and networks that stretch far beyond urban political territory and often at a global scale. At the same time, however, it is also important not to ignore how such ostensibly ‘global’ circulations operate within and around particular urban places.

These six chapters explore a series of issues related to the spatial politics and counter-politics of circulation. They include analyses and discussions of different sorts of circulatory systems such as those associated with climate change, urban experiments, the e-economy, water management, transportation and social justice movements. Each chapter highlights the importance of seeing cities not as spatial containers of politics but rather as spaces of flows, negotiations, experimentations and contestations, which cut across and actively disrupt received notions of the ‘urban’ as having fixed jurisdictional limits. Collectively, chapters throw into critical perspective the limitations of seeing urban politics as always contained, negotiated and defined within formal political boundaries and fixed territories.

The chapter by Kevin Fox Gotham and Clare Cannon develops the concept of ‘circulating risks’ in order to illuminate the ways in which the growing extension, intensification and

speeding up of social and economic activities contributes to spatialization of urban politics and climate change risks. It begins by describing the spatial and temporal components of climate change, and delineates the ways in which cross-border flows of capital and finance and increasing global connectivity expose cities to risk and vulnerability. It then highlights the centrality of relations of domination and subordination in the production of climate change risk, exposing their linkages to gender and social inequality. The authors proceed to describe the global circulation of climate change risk reduction measures – adaptation and mitigation – and discuss their impacts on cities and on the construction of spaces of urban policies. In doing so, they stress the importance of viewing cities as constituted by flows, circulations and cross-scale interactions.

Markus Hesse argues in his chapter that the digital economy is a catalyst for the circulation of people, goods and information, both material and virtual, affecting both urban and non-urban realms. He uses the empirical case of *Amazon.com* to discuss the digital arrangement of production, labour, distribution, advertising, purchasing or consumption as a means of creating particular spaces of politics. What once started as mail-order retail for books about twenty years ago can now be understood as an all-encompassing platform for performing a variety of socio-economic practices. Thanks to the peculiarities of disruptive innovation, and backed by venture capital and an aggressive market strategy, the ‘system’ has taken an almost totalitarian turn.

Hesse considers the implications of the e-economy for urban place, space and territory. These are manifold: first, the compartmentalized organization of value chains, physical distribution and labour relations accelerates the fragmentation of space-time-relations; second, the associated ‘logics of dislocation’ (Barnes 1996) help to create spaces of both agglomeration and peripherality, where contemporary notions of urban and rural are becoming further blurred; third, the abstract system’s imperative not only steers the orchestration of the firm’s networks, but also performs as a powerful agent of policy-making. Against this background, the chapter also explores the spaces of urban politics that are produced and reproduced by *Amazon.com*.

The next chapter is co-authored by James Evans, Harriet Bulkeley, Yuliya Voytenko, Kes McCormick and Steven Curtis. It examines the production and circulation of urban experiments through urban living laboratories (ULLs), a mode of governing that is rapidly growing in popularity as cities attempt to learn how to become more sustainable under conditions of economic, social and environmental uncertainty. ULLs can be buildings, neighbourhoods or districts within cities that are designated to host a multitude of social and technical experiments to inform urban policy, planning and, in particular, politics. ULLs require us to rethink how we approach urban politics as they reconfigure traditional processes of governing urban development in terms of approach, participation and scale. The promise of ULLs lies in their potential to transform top-down planning and development into local innovation processes that open up spaces for citizen-centric and place-based urban politics. In this way they are being championed as a new approach to solve long-running urban issues and transform under-developed urban areas into hubs of the new economy. Current evidence suggests that while participation is rather narrow they play a key role in providing legitimacy for alternatives, which in turn is driving their circulation as approach to urban governance.

In her chapter, Julie Cidell examines the Chicago Area Waterways System as a complex assemblage of water, infrastructure, fish, sewage and ships. A system of canals connects the Chicago River to the Great Lakes and Mississippi River watersheds, making it possible for water and its contents to traverse the subcontinental divide. The properties and capacities of fish, water, sewage and other elements of this assemblage have produced unexpected effects as

1 elements interact with and act upon each other, illustrating the concept of distributed agency  
2 and making the attempted reassembly of this network fraught with difficulty.

3 A proposed 'ecological separation' plan to reduce the threat of the invasive species of Asian  
4 carp in the Chicago region would separate the non-human ecologies of the two watersheds  
5 while keeping their human ecologies connected, thus keeping the region safe for capital in addi-  
6 tion to keeping the region's ecology safe from outside invasion. Considering the carp, Lake  
7 Michigan and the Chicago and Des Plaines Rivers as components in an assemblage offers a way  
8 to understand how the various properties and capacities of water have shaped and continue to  
9 shape the city of Chicago and the region around it and why this particular environmental  
10 problem is so intractable. Using this example, Cidell's chapter considers how the spaces of urban  
11 politics regarding water incorporate not only its consumption, but also its role as a medium for  
12 other kinds of circulations – wastes, freight, capital and biophysical life – and therefore the pol-  
13 itics of deciding what should flow and what should be blocked.

14 With the rapid global diffusion of Uber and similar transportation network companies  
15 (TNCs), as well as global fascination with self-driving cars, tech mobility is likely going to be  
16 making greater claims on urban spaces around the world. Jason Henderson suggests the utility  
17 of examining tech mobility with greater critical scrutiny and especially its implications for the  
18 urban politics of mobility, i.e. political debates over what urban transportation modes are priori-  
19 tized, and who decides which modes are important.

20 After describing some of the key characteristics of tech mobility, Henderson draws on a pol-  
21 itics of mobility framework to consider how tech mobility is an irreducibly political project  
22 promoting progressive visions of urban liveability such as reduced car ownership, whilst also  
23 aligning decidedly with a neoliberal politics of privatization and deregulation. Tech mobility  
24 may have far-reaching consequences in shaping urban geographies of the future – not by trans-  
25 forming cities, but, rather, by intensifying and solidifying contemporary inequities and uneven  
26 geographies.

27 Struggles for social justice and recognition of difference often begin and coalesce in cities.  
28 The final chapter in this section – written by Helga Leitner and Sam Nowak – examines the  
29 making of multi-racial (counter-)publics engaged in urban social justice struggles, and their  
30 attempts to create egalitarian political spaces to enact a potentially radical democratic politics.  
31 Informed by the political philosophies of Nancy Fraser and Jacques Rancière, the authors  
32 examine the worker centre movement – a swell of grassroots organizations that have emerged  
33 during the past twenty-five years to provide services to, advocate on behalf of and empower  
34 immigrants and people of colour. These organizations have also waged successful multi-racial  
35 social justice campaigns, which this chapter examines in the context of Los Angeles.

36 Leitner and Nowak highlight four dimensions of the making of multi-racial publics through  
37 the Los Angeles worker centre movement as follows: (1) the enactment of egalitarian forms of  
38 governance and experimentation with new ways of organizing; (2) a sustained commitment to  
39 learning from each other and negotiating across racial and other lines of difference; (3) publiciz-  
40 ing existing injustices and making demands on the state to rectify these; and (4) multiple spatiali-  
41 ties in the making of these multi-racial counter-publics. The chapter reveals how an especially  
42 critical role was played by spaces of withdrawal (safe physical space of the worker centres) along  
43 with spaces of circulation (mobilities of people and ideas and networks of connectivity amongst  
44 worker centers). These different spaces shape – even as they are shaped by – the construction of  
45 multi-racial publics and egalitarian demands within the wider arena of urban politics.  
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## CIRCULATING RISKS

Coastal cities and the spectre of climate  
change risk*Kevin Fox Gotham and Clare Cannon***Introduction**

Climate change is an urgent problem for coastal regions already facing the challenges of urbanization, overcrowding, subsidence and nutrient loading. Global mean temperatures are on the rise, ice sheets and glaciers are rapidly melting, and sea levels are rising (Nicholls *et al.* 2007; for an overview, see Moser *et al.* 2012). Scientists expect sea-level rise to exacerbate existing risks such as coastal flooding, coastal land loss, rising water tables and drainage problems, and salinization of coastal environments (Blum and Roberts 2009; Gonzalez and Tornqvist 2006; IPCC 2014; Karl 2009; National Academy of Sciences 2003: 4; Stern 2007; USGCRP 2013). Apart from climate change, predicted land loss combined with increasing population growth in coastal areas could endanger regional economies, threaten sources of fresh water, and alter land cover patterns and ecosystem services (e.g. provisioning services such as food and water; regulating services such as flood and disease control; and cultural services such as spiritual, recreational and cultural benefits) (Millennium Ecosystem Assessment 2005). “The scope, severity, and pace of future climate change impacts are difficult to predict”, according to the White House Council on Environmental Quality (2010: 6), but “coastal areas will need to prepare for rising sea levels and increased flooding.” Adding to the challenge of responding to these impacts, climate-related changes will likely exacerbate the impacts of other non-climatic risks and stressors such as pervasive inequality, jurisdictional fragmentation, fiscal strains, ageing infrastructure, habitat destruction and pollution (IPCC 2014).

We have two arguments in this chapter. First, we argue that cross-scale circulations – of energy, people, policies and financing – are major sources and drivers of climate change risk and vulnerability in coastal cities. Second, we suggest that the increasing extension, intensification and velocity of social activities surrounding climate change risks express the proliferation of spaces in and through which the politics of the ‘urban’ are constructed and contested. Globally, 1.2 billion people (23 per cent of the world’s population) live within 100 km of the coast, and 50 per cent are likely to do so by 2030 (UNESCO 2009). Around the world, coastal cities like Dhaka (Bangladesh), Jakarta (Indonesia), Manila (Philippines), Kolkata (India), Phnom Penh (Cambodia), Ho Chi Minh city (Vietnam), Shanghai (China), Bangkok (Thailand), Hong Kong (China), Kuala Lumpur (Malaysia) and Singapore, among others, are at risk not just because of rising sea levels but urban population growth (Hallegatte and Corfee-Morlot 2011; Nicholls and Cazenave 2010; O’Brien and Leichenko 2000).

It is tempting to argue that coastal cities face different levels of risk and vulnerability due to their geographical location, exposure to storms and susceptibility to sea-level rise. Yet risk, exposure and vulnerability are not the same thing. Risk is a general category that scholars define as the combination of people's *exposure* to a hazard and their social *vulnerability* (i.e. their capacity to anticipate, respond to and recover from damage) (for an overview, see Tierney 2014). The concept of vulnerability has become particularly important within natural hazard and disaster research (Cutter 2003; Pelling 2012) and researchers have used it as an analytical lens to explain how social context including policies, corporate investment patterns and socio-legal regulations shape risk. Researchers often describe vulnerability as having three components: exposure to a hazard, susceptibility to harm and adaptive capacity. This differentiated conceptualization usefully illustrates the relationship between human action and risk (i.e. certain policy and institutional actions can potentially alter exposure and/or vulnerability to a hazard) and reveals the socially and political constructed nature of risk definitions, risk assessments and risk analyses.

By cross-scale 'circulations' we mean influences, connections and interactions among institutions, government agencies and networks to facilitate the movement of information, people and resources across borders. We explain cross-scale circulations in terms of the extension, intensification and acceleration of government actions, interchanges between public and private actors, socio-economic activities, and flows and networks of investment and finance. 'Flows' refer to the movement of commodities, money, people and information across space and time, while 'networks' refer to patterned interactions among agents, organizations and activities. In this sense, cross-scale circulations involve increased interregional interconnectedness, a widening reach of networks of social activity, and the possibility that local events and actions (by individuals, corporations and governments) can have far-reaching and long-lasting consequences for urban politics.

As we argue, cities are not just backdrops or platforms against which cross-scale circulations unfold, but are central to the ways in which people and organizations interact to construct and produce climate change risks. Just as circulations are sources and drivers of climate change risks, climate change risk governance policies – e.g. mitigation and adaptation strategies – are both in motion and simultaneously fixed, or embedded in place. Changes in the extension, intensification and speed of circulations – e.g. in/out-migration of people, financial (dis)investment in cities, etc. – combined with changes in how people use and manage resources in cities are central to understanding the impacts and consequences of climate change risk. Our approach to examining climate change risks focuses attention on the intersection of gender and inequality and the ways in which they appear and reappear in matters of urban politics. In arguing that gender matters for understanding climate change risks, we make the case that the concept of circulations has implications for the gendering of urban policies.

### Spatiality, temporality and climate change risk

Scholars have used the terms mobilities, interactions, exchange and re/de-territorialization to describe and understand the movement of commodities, money, capital and people across socio-spatial boundaries and jurisdictions (Brenner 1999; Sassen 2001). Moreover, using concepts such as time-space distanciation, time-space compression, glocalization, and other temporal and spatial metaphors, researchers have re-conceptualized notions of capital circulation and commodity exchange to provide insight into the changing geographies of trade, finance, retail, distribution and consumption (Giddens 2000; Harvey 1989; Wellman 2002). While much of the literature on forms of exchange and circulation has focused on the growing intensity, extension and increased velocity of flows of capital under conditions of globalization, there has been a turn

1 more recently to consider forms of circulation that cut across cities and actively disrupt notions  
2 of ‘the urban’ as having fixed jurisdictional boundaries and delimited spatial borders. Against  
3 views of cities as containers of social action and relationships, recent critical interrogations by  
4 Scott and Storper (2015) draw attention to the importance of studying the “circulation space of  
5 the city” that is represented by infrastructures and arterial connections that facilitate intra-urban  
6 flows of people, goods and information. “There are many urban processes for which neither  
7 formal administrative boundaries nor the functional regions of cities would be the relevant scale  
8 for comparison”, according to Robinson (2011: 14). Instead, processes that exceed a city’s phys-  
9 ical extent – circulations, mobilities and flows – offer rich potential for empirical analysis and  
10 theorization to challenge extant scholarship and provide novel and original insights into the  
11 nature of urban politics.

12 Spatially, the concept of circulation attends to the specific flows and mobilities at work in  
13 drawing people, ideas, activities into proximity and close relationships. If we apply this thinking  
14 to climate change risk, then we can analyse climate change risks as products of the sharply  
15 increased connectivity between places and accelerated and condensed modes of human inter-  
16 action in today’s globalized world. According to the Intergovernmental Panel on Climate  
17 Change (IPCC 2014), climate change risks to coastal cities include sea-level rise which could  
18 lead to loss of land and communities; increased frequency and destructiveness of storms which  
19 could undermine infrastructure systems, property and livelihoods through flooding; warming of  
20 glaciers which could reduce fresh water supplies and availability; changes in winter and summer  
21 energy demand which could lead to brownouts; and changes in the incidence of vector-borne  
22 diseases (for an overview, see Hunt and Watkiss 2011). Importantly, climate change risks are not  
23 objective forces that exist in an a priori fashion. Rather, climate change risks “coalesce with  
24 other stresses” including water scarcity, institutional and jurisdictional fragmentation, fiscal  
25 strains and ageing infrastructure, limited revenue streams for public-sector risk reduction action,  
26 and inflexible patterns of land-use (UNISDR 2004). Obviously, the severity of these different  
27 types of stress vary across cultural, political and socio-economic contexts (UN-Habitat 2003).

28 Viewing climate change in terms of circulation suggests that climate change impacts have  
29 spatial and temporal components that reflect and reinforce global-local relations and cross-scale  
30 interactions. Climate change is a de-spatialized, global phenomenon and, simultaneously, a spa-  
31 tialized, urban problem. On the one hand, climate change impacts appear to be remote, distant  
32 and extra-local phenomena in which global climate change processes – e.g. greenhouse gas  
33 (GHG) emissions, atmospheric conditions, global disruption, extreme events and international  
34 negotiations – unfold and develop albeit in an unpredictable and geographically uneven fashion.  
35 On the other hand, climate change impacts vary geographically with local consequences that  
36 reflect different local histories and geographies and have different implications for local eco-  
37 nomies and communities. Understanding the urban nature of climate change requires that we  
38 examine not only how climate change is framed and contested within cities, according to  
39 Bulkeley (2013: 4), but also how the politics of reducing the risks of climate change has come  
40 to be so closely connected to the imagination of urban futures.

41 Temporally, climate change has both short- and long-term traumatic components. Changes  
42 in the incidence and intensity of extreme weather events – storms and floods – take place in the  
43 context of long-term and chronic traumatic processes such as sea-level rise, ocean acidification  
44 and rising temperatures (Bulkeley 2013; Millennium Ecosystem Assessment 2005). At the same  
45 time, the short- and long-term traumatic components of global climate change are producing a  
46 complex geography in which the differential impacts of climate change are being superimposed  
47 on dissimilar vulnerabilities. To add further complexity to the picture, climate change is  
48 occurring in a rapidly changing world marked by ongoing processes of economic globalization,

large-scale human migration, coastal urbanization, subsidence and nutrient loading (O'Brien and Leichenko 2000). Government policies, socio-legal regulations and other human behaviours and actions that drive climate change have enduring global consequences with local impacts that are often unevenly distributed across environments and societies (Bagstad *et al.* 2007). In short, viewing climate change risk in terms of circulations suggests that climate impacts do not happen *to* cities per se (in a top-down fashion) but are fundamentally shaped and transformed *through* urban processes.

### Gender and inequality in the city

The concept of circulating risks draws our attention to the impact of unequal power relations in shaping patterns of social mobility and access to social, political and economic resources. Researchers have documented that the impacts of global climate change will not be equally distributed around the world, and “many of the countries least responsible for the rise in greenhouse gases will be most likely to feel its impacts in changes in weather, sea levels, human health costs, and economic hardships” (Nagel *et al.* 2009: 17). One important predicted outcome of climate change is an accelerated circulation of people out of poorer regions and countries into more developed, less impacted areas, an environmental migration that has the potential to strain the resources and social fabrics of receiving societies and exacerbate tensions in sending communities. Variations in individual, community and national vulnerability to the impacts of climate change *across* cities are only part of the structure of inequality in global climate change. As the 2014 IPCC report notes, there is an unequal distribution of impacts and vulnerabilities to climate change *within* cities especially those associated with intense social class, race and ethnic, gender and age stratifications. Moreover, disadvantaged individuals and their communities – due to the socio-economic status, geography, racial and ethnic health disparities and lack of access to care – are likely to face greater susceptibility to such storms and floods associated with climate change (Nath and Behera 2011).

Women are one such disadvantaged group the IPCC (2014) notes as being particularly susceptible to increased risks associated with climate change. Gender is a mode of social stratification that affects the distribution of resources, wealth, power, as well as the extension of rights and entitlements (Dankelman 2010; Denton 2002; United Nations 1999). Women are by no means a homogenous group of persons; they experience risk differently in part due to the intersection of their social location (e.g. along axes of race, class, nationality, age, ability, etc.) (see Arora-Jonsson 2011; Khosla and Masaud 2010). Generally, theories of gender inequality elaborate on connections between women’s political-economic power and environmental exploitation, gendered-based differences in the interpretation and perception of environment problems and concerns, and gender discrimination as a driver of socio-environmental vulnerability (e.g. Agarwal 1995; d’Eaubonne 1974; Gaard 2011; Mies 1999; Mies and Shiva 1993; Rocheleau *et al.* 1996; Ruether 1993; Warren 1990). The relative poverty of women in cities creates greater barriers in the face of environmental degradation, since women tend to experience poorer nutrition, limited health care and, in the case of divorced and widowed women, fewer sources of social support (see Mies and Shiva 1993).

Variants of feminist political ecology focus on the uneven distribution of access to and control over resources within the social, political and economic context. This approach, with a particular emphasis on family and community health, argues that gender is a critical variable in people’s ability to sustain livelihoods and communities’ ability to develop sustainably (Rocheleau *et al.* 1996). An overarching goal, then, is to explain local experiences of inequality within global environmental and economic change. More generally, feminist political ecology seeks to



1 analyse the context in which gender interacts with class, race, culture and national identity to  
2 distribute hazard risks within the larger social-ecological environment (Rocheleau *et al.* 1996:  
3 5). With increases in frequency and magnitude of climate-related catastrophes (such as hurri-  
4 canes, typhoons, earthquakes, desertification, etc.), women experience exacerbated hardships  
5 and threats to their livelihoods and those of their families (Dankelman 2010; Davidson and  
6 Freudenburg 1996; Denton 2002; McCright 2010; Nelson *et al.* 2002; Terry 2009). Further-  
7 more, women tend to face disproportionately higher obstacles to participate in decision-making,  
8 to articulate and communicate collective needs, and to access external resources to cope with  
9 climate change risks.

10 Scholars have identified three major mechanisms that increase women's already vulnerable  
11 social position in the wake of climate change, and which have implications for the urban as a  
12 space of politics. First, women are the largest group of farmers in the world and yet have very  
13 few, if any, rights to the land they cultivate. They also tend to have little control over the  
14 resources necessary for survival (Rocheleau *et al.* 1996). Along with increased disasters that  
15 threaten the lives and livelihoods of women, climate change brings increased desertification of  
16 land thus making rural agriculture livelihoods unsustainable. This reality, in part, drives rural to  
17 urban migration (see Dankelman 2010). Increased urbanization in turn drives climate change  
18 with its use of non-renewable energy, inadequate basic services and infrastructure, and urban  
19 sprawl (Khosla and Masaud 2010). Generating a feedback loop, greater climate change increases  
20 risks women face and their socio-environmental vulnerability. Scholars then must theorize and  
21 empirically examine the gendered nature of environmental rights and responsibilities. Here  
22 women have greater responsibility over the health of families and communities but more often  
23 than not do not have access to the rights over property and land use and resource decisions that  
24 would provide them an equal opportunity to address their responsibilities (Rocheleau *et al.*  
25 1996).

26 Second, women's knowledge of environmental management and conservation typically are  
27 not included or valued in policy discussions or by policy-makers as well as those in positions of  
28 power to enact widespread policies (Dankelman 2010; Denton 2002; Nelson *et al.* 2002). As  
29 stewards of the land in their agricultural capacity, women have garnered intimate knowledge of  
30 ecosystems and their unique and diverse functions, yet this valuable knowledge is not included  
31 in policy discussions because the knowledge is deemed as non-quantitative, unscientific and  
32 unreliable (Mies and Shiva 1993). Oppositions to incorporating traditional ecological know-  
33 ledge into policy discussions are embedded in the social and political realities of cities and  
34 regions, and are designed to reproduce a particular social order and rely on definitions of the  
35 'environment' that are tailored to the ruling interests. The right to social protection, the defini-  
36 tion of social justice and, in a broader sense, the definition of citizenship, are defined accordingly  
37 (Dankelman 2010; Rocheleau *et al.* 1996).

38 Third, women themselves are often not included in policy discussions at key levels of global  
39 society (e.g. United Nations, national governments, local magistrates, etc.). The exclusion of  
40 women in these conversations continues not only the power asymmetry that produces and sup-  
41 ports patriarchal society, which creates social inequality, but also misses key perspectives women  
42 may contribute to discussions for the mitigation and adaptation of climate change's most peril-  
43 ous effects (Dankelman 2010; Terry 2009). Feminist scholars approach these issues by analysing  
44 gendered environmental politics and grassroots activism in which women's roles in struggles  
45 over natural resources and the environment redraw lines of identity and the nature of environ-  
46 mental problems (Rocheleau *et al.* 1996: 4).

47 As greater numbers of people move to urban areas, particularly to coastal cities, more and  
48 more have to confront risks caused by sea-level rise, greenhouse gas emissions and climate

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catastrophes, all consequences of global climate change (Khlosa and Masaud 2010). This circulation of ever-greater risks exacerbates women's already disadvantaged position due to power asymmetries and resulting social inequalities. Women, in this context, are not solely victims but often enact their own mitigation and adaptive strategies at the local and regional levels through their agricultural practices and urban organizing strategies (Arora-Jonsson 2011; Terry 2009). They are agents of change and, although not always, can have an ameliorating effect on global climate change (McKinney 2014). Moreover, although women as a class of persons experience social disadvantage due to patriarchal cultural and structural norms, they can exercise their own agency in both their local communities and when able, nationally (see McKinney 2014; Mies and Shiva 1993; Rocheleau *et al.* 1996; Terry 2009). In highlighting the centrality of women's social vulnerability to climate change risks, it is important to note there is nothing inherently vulnerable or virtuous, for that matter, in women's social location (Aron-Jonsson 2011). As a large percentage of those affected by climate change, and as a class of people who are often responsible for children and elders, it is important not only to research the ways gender inequality play out but also necessary to include women in decision-making and governance roles as coastal cities, particularly, and all regions, generally, debate and implement mitigation and adaptation tactics and strategies.

### Climate change mitigation and adaptation

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The concept of circulating risks draws attention to two paradoxical features of the relationship among urban politics and climate change risks. On the one hand, cross-scale circulations can enhance urban adaptive capacity through processes of coordination, inter- and intra-government collaboration, social learning, knowledge sharing and integration, trust building and conflict resolution (Folke *et al.* 2005). On the other hand, cross-scale circulations can limit capacity for social-ecological renewal, and reinforce patterns and processes of vulnerability and unsustainable development. Different cross-scale circulations can perpetuate social-ecological inequality, generate and exacerbate group struggles and antagonisms, and impede conflict resolution. The challenge is to identify and explain how and under what conditions increases in the extension, intensification and acceleration of cross-scale circulations can enhance risks for some cities rather than others, and lead to different individual, community and national capacity to respond to climate change causes and consequences.

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Over the last decade, governments and non-government organizations have relied upon, and developed, new multi-level institutional arrangements to encourage cross-scale circulations among government agencies, private firms and non-profit organizations in order to maximize the effectiveness of climate change countermeasures. Scientists, researchers and policy-makers have developed several climate change risk governance strategies – mitigation and adaptation – to manage changes in urban water resources, agriculture, infrastructure and settlement issues, human health, tourism, transport, and energy usage and production. Climate change *adaptation* involves developing ways to protect people and places by reducing their vulnerability to climate impacts. For example, to protect against sea-level rise and increased flooding, communities might build seawalls or relocate buildings to higher ground. For coastal systems, adaptation can mean identifying, preparing and funding the construction of coastal wetlands restoration projects in order to reduce risks associated with hurricane storm surge, sea-level rise and land subsidence (Day *et al.* 2007; Turner and Boyer 1997). Coastal restoration techniques include marsh creation and restoration, shoreline protection, hydrologic restoration, use of dredged material, terracing, sediment trapping, vegetative planting, barrier island restoration, bank stabilization and wetland mitigation banking, among other techniques (Allison and Meselhe 2010). Climate

1 change *mitigation* involves attempts to slow the process of global climate change, usually by  
2 lowering the level of greenhouse gases in the atmosphere. Mitigation can also mean using new  
3 green technologies and renewable energies, making older equipment more energy efficient, or  
4 changing management practices or consumer behaviour.

5 Policy models of climate change risk governance include provision of low-carbon infrastruc-  
6 tures, services and goods; tax incentives, deductions and exemptions to encourage corporations  
7 to curb GHG emissions and adopt green technology; adoption of new land-use planning, codes,  
8 standards and zoning; and education campaigns directed at diverse audiences (Adger *et al.* 2003;  
9 Field 2012; Hallegatte 2009; Pachauri *et al.* 2014; Smit and Wandel 2006; Smith 2013). Many  
10 cities have developed sophisticated policy approaches based on measuring and monitoring  
11 GHGs, setting targets and developing action plans. The extent and specific type of climate  
12 change adaptation and mitigation have been constrained and enabled by cross-scale interactions,  
13 institutional capacity between cities and levels of the state, policy coordination, information  
14 sharing, availability of financing and the legacy of past public-private investments in the built  
15 environment. Importantly, human response to climate change risks cannot be confined to juris-  
16 dictionally defined city spaces or left to the actions of the state. Rather, climate adaptation and  
17 mitigation is governed and realized through the interrelations between global, national and local  
18 actors across state/non-state boundaries.

19 Effective climate change governance implies a historically unprecedented level of global  
20 cooperation among different levels of government and also among governments and non-  
21 governmental organizations. International organizations such as World Business Council for  
22 Sustainable Development, World Resources Institute, IPCC, Carbon Disclosure Project,  
23 United Nations Environment Program and the International Council for Local Environmental  
24 Initiatives have worked to create workable rules, timetables, exchanges, credits and subsidies  
25 through extensive policy experimentation and debate. Through their cross-scale communica-  
26 tion and information sharing efforts, these organizations have expanded our understanding of  
27 the impact of land use and land changes on GHG emissions, effects of patterns of property and  
28 resource control on climate change risks, and identified the drivers and barriers for international  
29 climate change policy (for an overview, see Dunlap and Brulle 2015). Today, these organiza-  
30 tions are engaged in extensive cross-border collaborations using communication and informa-  
31 tion technologies that make spatial and temporal barriers obsolete and political borders irrelevant.  
32 As a result, climate change risk reduction measures are global in terms of the reach of the net-  
33 works of knowledge production associated with their formulation; ubiquitous in terms of their  
34 relevance and implementation; regionally differentiated in terms of the political cultures and  
35 modes of policy-making that shape them; and often deeply localized in terms of their politics  
36 and statutory content (IPCC 2014).

37 Circulations of environmental culture and cultural meanings systems are also important in  
38 shaping urban political responses to mitigate or adapt to global climate change. Social, cultural  
39 and political efforts by international organizations to encourage consumers to ‘go green’ represent  
40 concerted attempts to circulate information about the benefits, obstacles and feasibility of creating  
41 more sustainable consumption habits and lifestyle choices in a consumer society. International  
42 climate change organizations operate as transfer agents and carriers of policy information. The  
43 process of information transfer is both territorializing and de-territorializing as international  
44 organizations circulate progressive global models that are often adopted by local actors. Meyer  
45 *et al.* (1997) describe the emergence of the “world environmental regime” composed of environ-  
46 mental international non-governmental organizations (EINGOs) and other civil society groups  
47 that promote the universal adoption of environmental policies, programmes and standards.  
48 EINGOs diffuse norms, environmental cultures and policy models related to consumer-advocacy,

eco-friendly consumption and green sustainability. Broadly, the rise and global spread of EINGOs offer opportunities to re-conceptualize cities as produced in relation to processes circulating across geographical scales while recognizing that cities provide the basing points for those wider processes.

### Conclusion

Scientists and researchers predict that climate change will have a range of impacts in cities, from sea-level rise to increased destructiveness of extreme events (storms, heatwaves, droughts and flooding). However, predicting the specific impact that will occur in particular cities is fraught with scientific complexity, uncertainty and political conflict. The landscape of risk in a city is therefore not merely a matter of which assets and populations happen to be located in vulnerable sites. Rather, climate change risks are produced through the interaction between environmental and social processes so that the risks that poorer areas face have been historically and systematically produced through different circulations of people, capital and finance. In short, it is the effect of climate change combined with a range of other political and socio-economic processes operating across different infrastructural systems that produce urban climate change risks. While studies of future climate change impacts have focused on predicted levels of population growth and economic development, it is important to recognize that urban risk and vulnerability to climate change is affected by temporal and spatial dimensions of circulation through the underlying historical, political and economic dynamics of cities.

Whilst identifying risks is important, our examination suggests that we need to rethink the urban as a space of politics around climate change. In the realm of climate change politics, recent years have witnessed a movement from *municipal voluntarism* – a focus on the voluntary activities of government authorities as a means of enhancing capacity to address climate change – to *strategic urbanism* in which cities integrate climate change mitigation and adaptation measures with conventional socio-economic development strategies. Municipal authorities in New York, Tokyo and London, among other places, now partner with businesses, universities and civil society actors to engage in ‘experimental’ interventions often targeted at creating low-carbon urban infrastructures. Policy-makers around the world now are now considering a variety of new financing mechanisms and institutional structures – carbon taxes, carbon markets, carbon trading schemes, alternative energy development, and technologies (e.g. smart grids) – to reduce the risks of GHG emissions. While these new financing mechanisms and structures draw attention to the global context in which climate change operates, they are also designed to highlight the social construction of other scales, such as the ‘urban’ and the ‘regional’, as a means of drawing investment into urban political space and thereby reducing the negative risk consequences of climate change impacts. As this chapter demonstrates, global environmental concerns associated with climate change help to redefine the urban as a distinctive space for new political interventions and struggles surrounding risk and vulnerability to climate change impacts.

We believe that the concept of circulating risks can be a useful heuristic device to help scholars theorize and analyse the impacts and consequences of increased global connectivity on the production of climate change risks. Different forms and types of circulations – population growth and movement of people to coastal cities, globalization of financing, movement of capital and commodities across borders – are closely related to the production of climate change risk. Our heuristic device also draws attention to how climate change mitigation and adaptation strategies are characterized by a range of power relations associated with their adoption and execution, from top-down imposition by bureaucratic organizations to enthusiastic public

1 acceptance or deep animosity and grassroots resistance. Moreover, our concept highlights the  
 2 centrality of relations of domination and subordination in cross-border circulations in which  
 3 power and inequality structure how and where resources are deployed to address and combat  
 4 climate change risks. The recent and ongoing upsurge in economic, political and ecological  
 5 globalization allow for more powerful and wealthier cities and nations to external portions of  
 6 their climate change risk to less-powerful cities and poorer nations. In addition, the environ-  
 7 mental and public health consequences of rising sea-levels, urban heat islands, and flood-related  
 8 and heat-related diseases (e.g. malaria) disproportionately affect the poor cities and nations and  
 9 vulnerable populations in all nations. Through our analysis of climate change risks, we have  
 10 stressed the importance of viewing cities not as a passive medium and or receptacle of risk and  
 11 vulnerability but as spaces of flows in which climate change risks are circulating and cutting  
 12 across cities, a conceptualization that disrupts notions of the urban as having fixed jurisdictional  
 13 boundaries.

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