Chapter 9

The Urbanization of Nature: Great Promises, Impasse, and New Beginnings

Maria Kaika and Erik Swyngedouw

> Viewing the city as a process of continuous, but contested, socio-ecological change … unlocks new arenas for thinking and acting on the city. The tensions, conflicts and forces that flow with this process through the body, the city, the region and the globe show the cracks in the lines, the meshes in the net, the spaces and plateaus of resistance and of power.
>
> (Swyngedouw and Kaika 2000: 567)

The quotation above is taken from our contribution to the first edition of this *Companion*. Our chapter was then the sole one to address the broad relationship between nature and the city. In this *New Companion*, however, there are several entries that cover different aspects of this relationship. While ten years ago we were struggling to find references to theoretical and empirical contributions to substantiate our claims, the past decade has witnessed an explosion of exciting research and innovative ideas on nature and cities, some of which have redrawn the boundaries of urban theory and practice (for reviews, see Keil 2003; Keil 2005; Braun 2005). This intense scholarly attention to urban socio-ecological processes was set against remarkable changes not only in the environmental, but also the political-economic and socio-cultural conditions of cities. Whilst the environmental "wedge" was evolving into a possible leverage for forcing a more egalitarian urban living (Castree 2008), the neo-liberal urban "revolution" took ecological problems away from this politicized agenda, and promoted sustainable urban ecologies as a matter of individual consumer choice and market logic (Krueger and Gibbs 2007).

A comprehensive review of the astonishing academic and political developments of the last decade and of the insightful approaches to understanding the socio-

ecological processes that shape urbanization, presents a challenge that lies beyond the scope of this chapter. We shall not return to historical analysis either, as we undertook this in our previous contribution (Swyngedouw and Kaika 2000). Instead, we wish to focus here on the paradoxical situation that, despite the extraordinary wealth of urban socio-ecological research, and the increasing attention paid to urban environmental problems on the part of policy-makers, experts, civil society organizations, and the like, the urban ecological conundrum has in fact become more intractable than ever. Over the last decade, we have witnessed Hurricane Katrina ransacking New Orleans, increasing carbon dioxide levels aggravating the threat of global warming, lack of access to basic resources (water, food, land, medicine) persisting as the number one cause of premature mortality in the megacities of the global south, and recurring quasi-epidemics (HIV, SARS, Avian and Mexican Flu) reshaping global and local geographies of uneven urban development. While some cities – mainly in the global north – have begun to clean up their act, others – notably in China, Africa, and India (where most of the toxic stuff has decamped) – have become festering sores of rapidly deteriorating socio-ecological conditions.

Set within the nexus of a growing awareness of the complexity of urban environments on the one hand, and a deterioration of urban socio-ecological conditions on the other, the aim of this chapter is twofold. First, to contend that urban socio-ecological research, having made great strides in retheorizing the city as a contested socio-natural process, contributed to pushing the urban environmental agenda onto the public stage. Second, to ask why, after a decade of intense scholarly and public attention to urban environmental concerns, relatively little has been achieved with respect to altering precarious socio-ecological conditions in both the cities of the global north and those of the global south.

We shall focus on four key perspectives that galvanized urban socio-ecological research over the past decade: urban metabolisms; the neo-liberalization of urban environments; urban socio-ecological movements; and urban environmental imaginaries and discursive formations. We shall examine how each one of these perspectives has revolutionized urban theory and practice, and also how each has contributed in part to the political-ecological deadlock we are currently in. In the conclusion, we shall chart some of the intellectual pathways that might help to deal with this impasse, and insist, with renewed conviction, that renaturing urban theory is vital for urban analysis and urban politics as well as urban activism.

Urban Metabolism Redux

In his pioneering work *Nature's Metropolis,* William Cronon provides a brilliant historical-geographical analysis of how an intense socio-natural metabolic process transformed Chicago into a global metropolis (Cronon 1991). The term *metabolism* was originally used in a similar context by Karl Marx, when, back in the nineteenth century, he lifted it from scientific discourse to describe the process through which labor and capital produce and transform socio-natural landscapes: "man, through his own actions, mediates, regulates, and controls the *metabolism* between himself and nature" (Marx 1981 [1867]: 283, our italics). More recent approaches viewed the urbanization of nature as a process of continuous deterritorialization and reterritorialization of metabolic circulatory flows, organized through social and physical

conduits or networks of "metabolic vehicles" (Virilio 1986). These processes are infused by relations of power and sustained by particular imaginaries of what Nature is or should be.[1] Under capitalism, the commodity relation and the flow of money suture these socio-ecological processes and turn the city into a metabolic socio-environmental process that stretches from the immediate environment to the remotest corners of the globe (Heynen *et al.* 2006).

Through this conceptual lens, urbanization is viewed as a process of geographically arranged socio-environmental metabolisms that fuse the social with the physical, producing a "cyborg" city (Swyngedouw 2006; Gandy 2005; Haraway 1991) with distinct physical forms and incongruous socio-ecological consequences. Recent monographs have substantiated, both empirically and theoretically, how cities and their human and non-human inhabitants across the globe are linked through networks and flows of technology, and social relations of power for the circulation and disposal of water, energy, fat, chemicals, viruses, e-waste (Pellow 2007), household waste (Njeru 2006), redundant ships (Hillier 2009; Buerk 2006), ducts, pipes, cables, and channels (Graham and Marvin 2001). Gandy's *Concrete and Clay* narrates New York's urbanization process as a political-ecological construct (Gandy 2002), Kaika's *City of Flows* (Kaika 2005) considers the cultural, socioeconomic and political relations through which urban socio-natural flows are cast and recast during modernity, Swyngedouw's *Social Power and the Urbanization of Water* (Swyngedouw 2004) excavates the relationship between cities and nature through the lens of water, Desfor and Keil examine the socio-ecological productions that shape Los Angeles and Toronto (Desfor and Keil 2004). Bakker (2003) follows the flow of water through the privatization politics of England and Wales. Davis excavates the peculiar ecologies of cities that should not be where they are (Davis 2002). Friedberg's majestic study demonstrates how green beans link African cities to Paris and London (Freidberg 2004). Klinenberg (2002) shows that heat can be a matter of life or death in Chicago, while Brechin (1996) narrates how San Francisco's elites rummaged through nature in search of earthly gain and power. Burrowing into the metabolic process of less visible, yet powerfully important socio-natural actants, Ali and Keil (2008) map how the SARS epidemic challenged global networks of urban governance, Bulkeley and Betsill (2005) search for the urban roots of carbon dioxide, Robbins (2007) reconstructs the networks of pollution and toxic waste that sustain the "green" suburban lawn, and Castro links water rights to citizenship in Mexico City (Castro 2006). Other, less dialectical, standpoints claim a greater sensitivity to non-human "actants," and critique and complement the above perspectives (Wolch *et al.* 2002; Hinchcliffe 1999), adding further insights into what is now a rapidly expanding body of thought.

The scholars cited above have resolutely debunked the myth that the city is where nature stops and convincingly argued that the urban process has to be theorized, understood, and managed as a socio-natural process. By doing so, they contributed to delegitimizing dominant twentieth-century perspectives on the city that ignored nature (mainly practiced in urban sociology), without falling into the trap of nature fetishism or ecological determinism. Moreover, by transcending the binary division between nature and society the urban metabolism perspective has shown that socio-ecological processes are intensely political, and confirmed that urban theory without nature cannot be but incomplete.

However, this body of thought has paid relatively little attention to the political opportunities such a perspective could bring, or to imagining radically different urban socio-ecological assemblages. Thus, although we may now be able to trace, chart, follow, and narrate the multiple socio-ecological lines that shape the urban process both locally and globally, precious little has been said about how to produce alternative, more equitable and enabling, urban socio-ecological assemblages. "What is required," Mark Whitehead argues (2005: 280), "is a political methodology of urban nature," that becomes an imperative since, as noted in the introduction, the development of a problematic of "urban natures" coincides with the consolidation of the neo-liberal onslaught that engulfed the urban condition globally, albeit in highly diversified forms.

(Neo-)Liberalizing Urban Environments

The greatest of collectively produced socio-natural *oeuvres*, the city, has always been the playground and battlefield of what David Harvey terms "accumulation by dispossession" (Harvey 2003: 137). However, the recent politics of neo-liberalization extended dispossession and marketization from public spaces, parks, and collective environments to a new array of socio-natural objects – water, air, techno-natural infrastructures, carbon dioxide, and the genetic code, amongst others – have now also entered the sphere of commodified quasi-objects and have become subjected to unchecked carousels of capitalist speculation.

This radical political-ecological reordering was facilitated by the institution of a new urban policy framework, which inserted the environmental question into urban policies via the logic of ecological modernization, and through the rhetoric of "sustainability." Despite the fact that the pioneering academic argument about "sustainable development" often incorporates the social – alongside the environment and the economy – as an integral part of the sustainable development "triad" (see Whitehead 2007), the current practice of "sustainable development" more often than not sidelines issues of justice and equality (Baker 2007; Keil 2007) through a new policy framework that promotes market-led, technocratic approaches to "greening" capitalism (Gibbs 2000; Mol and Spaargaren 2000; Heynen, *et al.* 2007). The global bet for finding a technological fix to save to planet assembles complex, market-led, and probably unworkable "protocols" (like Kyoto) or nurtures new sinks for green capital investment.

As cities produce 80 percent of the world's greenhouse emissions (Bulkeley and Betsill 2005), greening capitalism becomes pretty much an urban question. Eco-cities are perhaps the most exemplary showcase of green capital investment. Abu Dhabi's Masdar City is portrayed as the first fully sustainable city and claims to be setting Abu Dhabi on a course to a post-carbon capitalist urbanization, albeit one that is now in jeopardy as the urban-financial crisis wreaks havoc in this erstwhile capitalist paradise. Dongtan, outside Shanghai, was conceived in 2005 as China's showcase for environmentally friendly eco-urbanization. A project of global scale and importance, designed by Arup, visualized through wonderful images (Dongtan had 150,000 Google hits in January 2010), commissioned by the Shanghai Industrial Investment Company (SIIC), supported by then British Prime Ministers Tony Blair, and later Gordon Brown, promoted by both the Chinese President Hu Jintao

and the city's Communist Party boss Chen Liangyu, Dongtan became the iconic lovechild of those who imagined the possibility of a new urbanity based on a new socio-ecological deal, sustained by market-based technological fixes. Yet the project has been stalled, while the first steps towards its materialization proved highly controversial. In April 2008 Chen Liangyu was sentenced to 18 years in prison over fraudulent land deals, while the SIIC's planning permissions have lapsed, along with the dream for a model global eco-city. Still, the project did confirm Shanghai's roaring success as a world city, and propelled it high on the list of cities where a new type of "sustainable" city–nature assemblages is imagined and possibly turned into real geographies.

As "sustainable development" evolves into a market logic that opens up new avenues for capital accumulation (Castree 2008; Himley 2008), the environmental question has become one that mobilizes diverse political energies. Indeed, the urban environmental question contributed to the formation of a highly selective "pluralisa-tion" of the state, whereby non-elected officials, experts, and private actors are being incorporated into the governance, delivery, and financing of sustainable cities (Swyn-gedouw 2009). Recent research has criticized these new forms of governance for excessively empowering business elites, for negating issues of democracy and accountability, and for "naturalizing the political" (Swyngedouw 2009). A consider-able body of academic literature has also detailed how the new assemblages of money–materialities–governance for managing resources across the urban world redraw the socio-spatial choreographies of the flows of water, waste, food, etc., rearticulate patterns of control and access along class, gender, and ethnic lines, and reconfigure maps of entitlement and exclusion. At the other end of the spectrum, however, these same assemblages of capital–natures–cities–people have also given birth to all manner of struggles and contestation (Prudham 2004; Loftus 2006; Bakker 2000; Castro and Heller 2009; Olivera and Lewis 2004), ushering in a variety of tactics of resistance, rebellion, and imaginings of alternative urban socio-environmental practices. This is what we shall turn to next.

Urban Socio-Ecological Movements and the Struggles for Justice

In their book, *From the Ground Up*, Cole and Foster (2000) argue that involvement in an environmental justice movement can improve the lives of disadvantaged com-munities, as it can enhance their consciousness of patterns of injustice, and increase their "self-confidence," "capacity" and "expertise" (p. 153). The ways in which people across the world form or join movements of environmental justice and equal-ity are indicative of the growing inclusion of urban environmental affairs in social struggles. These movements translate grievances into "repertoires of action," form collective identities, and influence "mechanisms" of injustice. The successful struggle of the Cochabamba people in Bolivia against Water International and the privatiza-tion of the city's water utility became an emblem of how social movements can successfully resist the neo-liberalization of urban natures (Olivera and Lewis 2004).

However, intellectual engagement with socio-environmental justice struggles remains limited. Although we now have ample evidence on how the physical envi-ronment of place (e.g. factories, air quality, toxic sites) influences the day-to-day inequalities that communities are faced with (Sze 2006), little is known about how

these place-specific physical environments can act as facilitators for – or barriers to – collective action (Leitner *et al.* 2008). For Nicholls (2009: 80), people's "sense of place" influences their "normative evaluations of what battles are worth fighting for, what battles are best left to others, who to cooperate with, and who to dispute." Therefore, socio-ecological movements cannot be understood outside their embedding in particular socio-spatial contexts. In order to understand their geographies, we need to focus on place as contested, scaled, in flux, and relational (Swyngedouw and Heynen 2003; Massey 2007).

Scale is indeed as important as place to the dynamics of social environmental movements. As these movements are embedded within a shifting political terrain, power relations are continually reworked within and between different political scales. This is exemplified through the growing, albeit still limited, interconnectedness of place-based urban socio-ecological movements and the internationalization of environmental politics (Carruthers 2008; Faber 2005; Pellow 2007). Yet, many of these urban socio-ecological movements remain locally based and inward-looking, preventing socio-environmental injustices to universalize from "Not in My Backyard" to "Not in Anyone's Backyard." Following Routledge (2007), we need to ask difficult questions about why most urban socio-ecological movements are primarily reactive rather than proactive; why their code word of choice is "resistance" (resistance to ecological degradation, to declining socio-ecological amenities, to privatization of common "resources"); why this "resistance" rarely translates into a demand for transformation and for producing equitable socio-ecological urban conditions; and why the imaginary of possible alternative urban natures is still impotent.

Urban Socio-Ecological Imaginaries: Discourses of Urban Natures

Despite the importance of the materiality of the urbanization of nature, neither urban environmental interventions nor the material practices of (in)justice and (in)equality can be understood without referring to the discursive practices that accompany and support them. Despite – or perhaps because of – the fact that social studies of science have convincingly rejected the possibility of fixing our knowledge about entities perceived as "natural" (Haraway 1992; Latour 1993), a variety of interpretations and representations of what "Nature" really is have been advanced, each of which aims to co-shape how to think about, and act on "Nature." For example, the representation of Nature as vulnerable, victim, or derailed, and therefore in need of saving or protecting, is based on "a political semiotics of representation" where "the represented is reduced to the permanent status of the recipient of action, never to be a co-actor in an articulated practice" (Haraway 1992: 313). This view of Nature has recently informed policies of environmental reconstruction that aim to revert Nature to its presumed pristine state, by dynamiting dams (US, France), or by producing new "pristine" urban natures in the form of urban rivers (Seoul) or public beaches (Paris). At the other end of the spectrum, Giddens' (1994) claim that we have reached "The End of Nature" paves the road for an entirely different way of engaging with nature, one that questions the notion of a lost and originally pristine nature (that needs to be recaptured), recognizes the irredeemable

socialization of nature, and urges us to mobilize the courage to deploy new and different socio-ecological assemblages.

These imagined, scripted, and symbolically charged "Natures" are always necessarily inadequate, always leave a gap in the understanding and interpretation of the natures that are there materially, and which are complex, chaotic, often unpredictable, contingent, historically and geographically variable, and risky. Morton (2007), for example, argues convincingly that the proliferation of such conflicting meanings of Nature and associated policy derivatives, such as "sustainability," have turned Nature into an empty signifier. There is not, he insists, such a thing as a singular "Nature" around which an urban environmental policy or an environmentally sensitive intervention can be constructed and performed. Rather, there is a multitude of urban natures and a multitude of existing, possible, or practical socionatural relations. "Nature" is a tapestry, a *montage* of meanings, held together with quilting points (*points de capiton*), like the upholstery of a Chesterfield sofa (see Swyngedouw 2010a).

However, despite general academic consensus on the impossibility of "fixing" the meaning of Nature, a growing global awareness of an "environmental crisis" that poses a possibly catastrophic threat to civilization as we know it, has led to an emergence of a global consensus over Nature as radically out-of-synch, singular, under threat, and in need of saving. This consensus has transformed, yet again, the signifying chains that attempt to provide a new "content" for Nature (Žižek 1989; 2008). Urging for techno-managerial and governance realignments that can save the planet, the discursive framing of Nature as singular has enormous implications for inequality and injustice in the city, as it annuls the properly political moment, ruptures hopes for environmental justice, whether in the form of procedural justice (through the removal of real debate and dissensus over what stands for equality) or the justice of capabilities (through disavowing more radical potential pathways to building a more socially and environmentally just society beyond the current status quo) (Swyngedouw 2010b).

Zimmerman contends that "in stressful periods, people are too willing to surrender to leaders promising to end humanity's alienation from nature" (Zimmerman 1993: 7). Indeed, while clouded in a rhetoric of immanent catastrophe and the need for radical change, technical fixes to environmental problems are currently highlighted as solutions, making sure that nothing really changes, contributing to what has been defined as a post-political urban condition (Žižek 1992/2002; Swyngedouw 2009, 2010b). Is this not the underlying message of, for example, former US vice-president Al Gore's missionary account of pending environmental catastrophe in *An Inconvenient Truth* (Gore 2007) or of the fourth report of the United Nation's Intergovernmental Panel on Climate Change (IPCC) on the human consequences of global climate change (IPCC 2009)? Both these narratives, in their very different representational ways (popular/populist on the one hand, "scientific" on the other), urge radical changes in the techno-organizational management of the socio-natural environment in order to assure that the world as we know it stays fundamentally the same (Žižek 2008). This sentiment is also shared by Frederic Jameson when he claims that "it is easier to imagine the end of the world than it is to imagine the end of capitalism" (Jameson 2003: 76), and leads Badiou (2008) to conclude that "ecology is the new opium for the masses."

Policiticizing Urban Environments: New Beginnings

Caught between the urge to retrofit urban socio-natures with "sustainable" technologies and "good" governance practices and the desire to "protect" a nature under threat, the controversies over urbanizing nature stand for a political inability to rearrange the socio-ecological coordinates of everyday life, and to produce radically new, and more equitable, urban socio-natural configurations. Whilst considering the extraordinary leaps that urban socio-ecological research has taken, we recognize that the urban ecological quandary remains as (if not more) acute than before. Although we now know a great deal more about the materiality and governance of the contested urbanization of nature, we are still faced with an extraordinary intellectual and practical challenge. We have traced the socio-ecological flows and power relations through which the urban becomes constituted, we have excavated how class tactics of dispossession and neo-liberalization reframed both nature and the urban environmental question, we have charted the multitude of socio-environmental movements that come together around (un)just urban sustainabilities, and we have dissected the discourses on Nature in whose name the above are undertaken.

Still, the ecological mess is more real than ever and has to be taken seriously, but this would require a radical conceptual and political reframing. Attempts to mainstream the ecological problem have been marked so far by three distinct but interrelated processes. First, the ecological turn of capital and the marketization of "ecological" or "sustainable" products, which nevertheless carry dubious environmental credentials (e.g. clean hybrid car technologies using resources mined through environmentally disastrous processes in China and elsewhere). Second, the nurturing of particular discourses and policies as a panacea for environmental protection, notably "sustainability," environmental cost recovery, and the "polluter pays" principle. Third, the financialization/privatization of the environmental commons as thepreferred mechanism to avoid the "tragedy of the commons." Carbon dioxide, forests, water, and other resources, human and non-human genetic codes, and perhaps most importantly, the privatization of the greatest of all common ecologies, the urban process, are key examples.

Revisiting the meaning and politics of a common urban environment becomes imperative today, as we have entered a unique historical moment. For the first time, human–non-human interactions produce socio-ecological conditions that are inimical to the continuation of human and other life forms, and the urban environmental catastrophe is not one to come, it is already here. We are already living in it, particularly in the mega-cities of the global south. Henri Lefebvre's clarion call for a politics articulated around "the right to the city" has now become an urgent call for "the right to urban environments," and to the urban "commmonwealth" (see Hardt and Negri 2009).

Although the full ecological consequences of human socio-ecological labor remain partly unknown, the dominant scenario today is one of interventions articulated around the structural necessity to grow, to accumulate for accumulation's sake. Yet, this process has spiraled out of control with socio-ecological contradictions that are now plain to see. However, capitalism cannot and will not stand for an unconditional demand for a transformation to a different, egalitarian, socio-ecological order,

despite the call to arms from a variety of elites, ranging from Prince Charles's dire warning that we have only have eighteen months left to do something to Al Gore's apocalyptic film *An Inconvenient Truth*.

The inability or incapacity to manage the (urban) commons of socio-ecological assemblages, not even in the elite's own interest, is an extraordinary situation. The point, here, is not to fall into the urge to save nature – which does not exist anyway as a stable marker or reference (Swyngedouw 2010a) – or to retrofit socio-ecological conditions (Kaika 2009) to an assumedly more benign earlier historical condition (which is of course an inherently reactionary demand) – but to call for an egalitarian and democratic production of socio-ecological commons. We contend that this would require recasting city/nature as a decidedly political project, and insist that recentering the political is a necessary condition for tackling questions of urban environmental justice and creating different socio-ecological urban assemblages, to recapture the urban as socio-ecological commons, as a collective and democratically produced *oeuvre*. But we also contend that recentering the political is not enough in itself. We also need to reassert the materialities of the natures we work with, respect the idiosyncrasies and particular acting of parts of nature, not all of which is or can be fully understood. We also need to engage head on with the condition that, despite intense struggle and despite growing understanding, preciously little real change takes place. Whether we depict nature as a thing "out there" to be saved, or as a frontier to be conquered or ignored, it becomes imperative to ask questions about what visions of Nature and what urban socio-environmental relations we wish to inhabit. What quilting points can be mobilized? How can new political urban socio-ecological narratives be stitched together? What issues and whose voices are being silenced and who or what has the right to speak and to be heard?

Politically engaging urban ecological research and practice are about changing the frame through which things and conditions are perceived, transforming the conditions of impossibility, not simply to possible but to necessary ones. Imagining, again, urban environmental utopias that go beyond a neo-liberal framework is imperative. We should dare to try again, to think anew, even if we have to fail again.

Note

1   When we use Nature (capitalized) it generally refers to a specific discursively constructed singular meaning or understanding of the natural world and what it is. The word nature (uncapitalized) refers to the sum total of the heterogeneous, diverse, and often whimsical things that comprise the physical environments of the world.

References

Ali, S. H., and Keil, R. (2008) *Networked Disease: Emerging Infections in the Global City*. Malden, MA: Blackwell.

Badiou, A. (2008) Live Badiou – Interview with Alain Badiou, Paris, December 2007. In *Alain Badiou – Live Theory*, ed., O. Feltham. London: Continuum: 136–9.

Baker, S. (2007) Sustainable development as symbolic commitment: Declaratory politics and the seductive appeal of ecological modernisation in the European Union. *Environmental Politics* 16: 297–317.

Bakker, K. J. (2000) Privatizing water: producing scarcity: the Yorkshire drought of 1995. *Economic Geography* 76 (1): 4–27.

Bakker, K. J. (2003) *An Uncooperative Commodity: Privatizing Water in England and Wales*. New York and Oxford: Oxford University Press.

Braun, B. (2005) Environmental issues: writing a more-than-human urban geography. *Progress in Human Geography* 29 (5): 635–50.

Brechin, G. (1996) Conserving the race: natural aristocracies. eugenics, and the US conservation movement. *Antipode* 28 (3): 229–45.

Buerk, R. (2006) *Breaking Ships: How Supertankers and Cargo Ships Are Dismantled on the Beaches of Bangladesh*. New York: Chamberlain Books.

Bulkeley, H., and Betsill, M. (2005) *Cities and Climate Change: Urban Sustainability and Global Environmental Governance*. London: Routledge.

Carruthers, D. V. (2008) The globalization of environmental justice: Lessons from the US–Mexico border. *Society and Natural Resources* 21: 556–8.

Castree, N. (2008) Neoliberalising nature: the logics of deregulation and reregulation. *Environment and Planning A* 40: 131–52.

Castro, J. E. (2006) *Water, Power and Citizenship: Social Struggle in the Basin of Mexico*. Basingstoke: Palgrave Macmillan, in association with St Antony's College, Oxford.

Castro, J. E., and Heller, L. (eds.) (2009) *Water and Sanitation Services: Public Policy and Management*. London and Sterling, VA: Earthscan.

Cole, L. W., and Foster, S. R. (2000) *From the Ground Up: Environmental Racism and the Rise of the Environmental Justice Movement*. New York: New York University Press.

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

Davis, M. (2002) *Dead Cities*. New York: The New Press.

Desfor, G., and Keil, R. (2004) *Nature and the City: Making Environmental Policy in Toronto and Los Angeles*. Tucson: University of Arizona Press.

Faber, D. (2005) Building a transnational environmental justice movement: obstacles and opportunities in the age of globalization. In *Coalitions Across Borders: Transnational Protest and the Neoliberal Order*, ed. J. Bandy and J. Smith. Oxford: Roman and Littlefield, 43–70.

Freidberg, S. (2004) *French Beans and Food Scares: Culture and Commerce in an Anxious Age*. New York and Oxford: Oxford University Press.

Gandy, M. (2002) *Concrete and Clay: Reworking Nature in New York City*. Cambridge, MA: MIT Press.

Gandy, M. (2005) Cyborg urbanization: complexity and monstrosity in the contemporary city. *International Journal of Urban and Regional Research* 29 (1): 26 –49.

Gibbs, D. (2000) Ecological modernisation, regional economic development and regional development agencies. *Geoforum* 31: 9–19.

Giddens, A. (1994) *Beyond Left and Right: The Future of Radical Politics*. Cambridge: Polity Press.

Gore, A. (2007) *An Inconvenient Truth: The Planetary Emergency of Global Warming and What We Can Do About It*. London: Bloomsbury.

Graham, S., and Marvin, S. (2001) *Splintering Urbanism*. London: Routledge.

Haraway, D. (1991) *Simians, Cyborgs and Women – The Reinvention of Nature*. London: Free Association Books.

Haraway, D. (1992) The promises of monsters: a regenerative politics for inappropriate/d others. In *Cultural Studies*, ed. L. Grossberg, G. Nelson, and P. Treichler. London: Routledge, 295–337.

Hardt, M., and Negri, T. (2009) *Commonwealth*. Cambridge MA: Harvard University Press.

Harvey, D. (2003) *The New Imperialism*. Oxford: Oxford University Press.

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

Heynen, N., McCarthy, J., Prudham, S., and Robbins, P. (eds.) (2007) *Neoliberal Environments: False Promises and Unnatural Consequences*. London: Routledge.

Hillier, J. (2009) Assemblages of justice: the "ghost ships" of Graythorp. *International Journal of Urban and Regional Research* 33 (3): 640–61.

Himley, M. (2008) Geographies of environmental governance: The nexus of nature and neoliberalism. *Geography Compass* 2: 433–51.

Hinchcliffe, S. (1999) Cities and natures: intimate strangers. In *Unsettling Cities: Movement/Settlement*, ed. J. Allen, D. Massey, and M. Pryke. London: Routledge, 141–85.

IPCC (2009) *Climate Change 2007: Impacts, Adaptation and Vulnerability*. Working Contribution to the Fourth Assessment Report of the IPCC. Cambridge: Cambridge University Press.

Jameson, F. (2003) Future city. *New Left Review* 21: 65–79.

Kaika, M. (2005) *City of Flows: Nature, Modernity and the City*. New York: Routledge.

Kaika, M. (2009) Landscapes of energy: hydropower from techno-natures to retro-natures. *Harvard New Geographies* 2: 103–10.

Keil, R. (2003) Urban political ecology. *Urban Geography* 24: 723–38.

Keil, R. (2005) Progress report – Urban political ecology. *Urban Geography* 26: 640–51.

Keil, R. (2007) Sustaining modernity, modernizing nature: The environmental crisis and the survival of capitalism. In *The Sustainable Development Paradox: Urban Political Ecology in the United States and Europe*, ed. R. Krueger and D. Gibbs. London: Guildford Press, 41–65.

Klinenberg, E. (2002) *Heat Wave: A Social Autopsy of Disaster in Chicago*. Chicago and London: University of Chicago Press.

Krueger, R., and Gibbs, D. (eds.) (2007) *The Sustainable Development Paradox: Urban Political Economy in the United States and Europe*. New York: Guilford Press.

Latour, B. (1993) *We Have Never Been Modern*. New York and London: Harvester Wheatsheaf.

Leitner, H., Sheppard, E., and Sziarto, K. M. (2008) The spatialities of contentious politics. *Transactions of the Institute of British Geographers* 33: 157–72.

Loftus, A. (2006) The metabolic process of capital accumulation in Durban's waterscape. In *In the Nature of Cities: Urban Political Ecology and the Politics of Urban Metabolism*, ed. N. Heynen, M. Kaika, and E. Swyngedouw. London: Routledge, 173–90.

Marx, K. (1981 [1867]) *Capital: A Critique of Political Economy*, vol. 1. London: Penguin.

Massey, D. B. (2007) *World City*. Cambridge, Polity Press.

Mol, A. P. J., and Spaargaren, G. (2000) Ecological modernisation theory in debate: a review. *Environmental Politics* 9: 17–49.

Morton, T. (2007) *Ecology Without Nature: Rethinking Environmental Aesthetics*. Cambridge, MA and London: Harvard University Press.

Nicholls, W. J. (2009) Place, networks, space: theorising the geographies of social movements. *Transactions of the Institute of British Geographers* 34: 78–93.

Njeru, J. (2006) The urban political ecology of plastic bag waste problem in Nairobi, Kenya. *Geoforum* 37: 1046–58.

Olivera, O., and Lewis, T. (2004) *Cochabamba: Water War in Bolivia*. Cambridge, MA: South End Press.

Pellow, D. (2007) *Resisting Global Toxics: Transnational Movements for Environmental Justice*. London: MIT Press.

Prudham, S. (2004) Poisoning the well: neo-liberalism and the contamination of municipal water in Walkerton, Ontario. *Geoforum* 35 3: 343–359.

Robbins, P. (2007) *Lawn People: How Grasses, Weeds, and Chemicals Make Us Who We Are*. Philadelphia, PA: Temple University Press.

Routledge, P. (2007) Transnational political movement. In *The Sage Handbook of Political Geography*, ed. M. Low, K. R. Cox, and J. Robinson. London: Sage, 335–49.

Swyngedouw, E. (2004) *Social Power and the Urbanization of Water: Flows of Power*. Oxford: Oxford University Press.

Swyngedouw, E. (2006) Circulations and metabolisms: (hybrid) natures and (cyborg) cities. *Science as Culture* 15 (2): 105–21.

Swyngedouw, E. (2009) The antinomies of the post-political city. in search of a democratic politics of environmental production. *International Journal of Urban and Regional Research* 33 (3): 601–20.

Swyngedouw, E. (2010a) Trouble with nature: ecology as the new opium for the people. In *Conceptual Challenges for Planning Theory*, ed. J. Hillier and P. Healey. Farnham: Ashgate, 299–320.

Swyngedouw, E. (2010b) Apocalypse forever? Post-political populism and the specter of climate change. *Theorie, Culture, Society* 27 (2–3): 213–32.

Swyngedouw, E., and Heynen, N. (2003) Urban political ecology: justice and the politics of scale. *Antipode* 34 4: 898–918.

Swyngedouw, E., and Kaika, M. (2000) The environment of the city or … the urbanisation of nature. In *A Companion to the City*, ed. G. Bridge and S. Watson. Oxford: Blackwell, 567–80.

Sze, J. (2006) *Noxious New York: The Racial Politics of Urban Health and Environmental Justice*. Cambridge, MA: MIT Press.

Virilio, P. (1986) *Speed and Politics: An Essay on Dromology*. New York: Semiotext(e).

Whitehead, M. (2005) Between the marvellous and the mundane: everyday life in the socialist city and the politics of the environment. *Environment and Planning D: Society and Space* 22 (6): 273–94.

Whitehead, M. (2007) *Spaces of Sustainability: Geographical Perspectives on the Sustainable Society*. London: Routledge.

Wolch, J., Pincetl, S., and Pulido, L. (2002) Urban nature and the nature of urbanism. In *From Chicago to LA: Making Sense of Urban Theory*, ed. M. J. Deer. Thousand Oaks, CA: Sage, 367–402.

Zimmerman, M. E. (1993) *Environmental Philosophy: From Animal Rights to Radical Ecology*. Englewood Cliffs, NJ: Prentice Hall.

Žižek, S. (1989) *The Sublime Object of Ideology*. London: Verso.

Žižek, S. (1992/2002). *Looking Awry: An Introduction to Jacques Lacan through Popular Culture*. Cambridge, MA: MIT Press.

Žižek, S. (2008) *In Defense of Lost Causes*. Verso, London.