

Cities, social cohesion and the environment:

towards a future research agenda

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Abstract

We shall argue in this paper that the problematic of social cohesion is also one of socio-ecological cohesion whereby the urbanization of nature and its socio-environmentally enabling and disabling conditions are key processes. By viewing the contradictions of the urbanization process as intrinsically socio-ecological ones, the terrain of social cohesion is shifted both epistemologically and politically. The paper critically examines three contemporary schools of thought that consider in different ways the relationship between cities, social cohesion and the environment. First, we shall examine critically the notion of urban sustainability. The paper will then move on to consider two approaches that emphasize issues of (in)equality and (in)justice in the urban environment, those of environmental justice and urban political ecology. The final part of the paper pinpoints four areas of research that urban researchers must examine if we are to understand more fully - and act more politically on - the nexus between cities, social cohesion and the environment.

Keywords: environmental justice; urban political ecology; sustainability; social cohesion; urban metabolism.

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Introduction

The question of how cities can accommodate the environment or how more cohesive socio-environmental urban environments can be planned, built and managed has challenged academics, activists and policymakers alike for centuries. From the mid 19th century onwards, the concern for many was with utilizing the environment as a tool to improve living conditions in the city. Engineers sought to bring clean water, air, light and sanitation into the houses of most urban dwellers in the global North and by doing so, contribute to the production of healthy and socially more just living in a cohesive city (Kaika and Swyngedouw, 2000). Planners, architects and urban designers, meanwhile, drew upon the ideas of Frederick Law Olmsted, Le Corbusier and Frank Lloyd Wright, among others, who emphasized the need for the integration of 'nature' in the city, a gesture that would restore social harmony and achieve 'wholesome' living (see Fishman, 1982). Fast forward to today and the rhetoric of sustainability and sustainable cities is all around us, being discussed in town halls, environmental activist meetings, public demonstrations, the day to day conversations of citizens and, of course, at the various governmental, academic and activist conferences. Although there are different emphases in the sustainability discourses to its antecedents, the emphasis remains on how

to align cities and city-living with the constraints, possibilities and possible limits of the earth's physical environment.

While it would not be uncontroversial to argue that there are fundamental links between cities and the environment, the relationship between urban change, the environment and social cohesion – as this paper will intend to show – may be more contentious. What, you may ask, has social cohesion, the theme of this special issue, got to do with the environment? If we take social cohesion to incorporate issues of social (in)justice and (in)equality, we can begin to see that the environment, just as the other 'arenas' examined in this special issue, is wrapped up in fundamentally uneven, unequal and often downright unfair social relations. As this paper will show, not only is there a distinctive lack of social cohesiveness in societal relations with the urban environment in terms of access to healthy environments and environmental decision-making structures, for instance, but socio-environmental inequalities are also a fundamental part of the urbanization process. If the tension between the 'apparently opposite aspirations of belonging and differentiation' galvanizes the urban cohesion debate (see introductory paper), socio-environmental processes are inextricably related in this dialectical dynamic. From this perspective the nexus between social cohesion, the environment and cities is a vitally important issue. More importantly perhaps, as the introductory paper to this special issue explores, 'social cohesion' should be thought of

as a political *problématique* in which the ecological concern is an integral part. We shall focus here on the dialectic between socio-ecological transformation as a necessary process that undergirds urbanization on the one hand and the socio-ecological condition of cities on the other. In other words, the problematic of social cohesion for us is one of socio-ecological cohesion whereby the urbanization of nature and its socio-environmentally enabling and disabling conditions are key processes. Rather than considering the role of nature in the city, we are concerned with considering how the urbanization of nature shapes socio-ecological relations. By doing so, the terrain of social cohesion is shifted both epistemologically and politically from considering the domains of nature and the city as separate, yet intertwined, to viewing the contradictions of the urbanization process as intrinsically socio-ecological ones.

This paper, therefore, will critically examine three contemporary schools of thought that consider in different ways the relationship between cities, social cohesion and the environment. It will be necessarily selective in scope and although the paper's empirical focus will be on European towns and cities, it will place emphasis on how European cities are connected to ideas, activist networks and global production networks that stretch beyond the city and the continent. The paper will begin by examining the notion of urban sustainability, arguing that despite its popularity it is inherently flawed through its technocracism and disavowal of

questions of social (in)equality and (in)justice. The paper will then move on to consider two more sophisticated approaches that emphasize issues of (in)equality and (in)justice in the urban environment, those of environmental justice and urban political ecology. The final part of the paper pinpoints four areas of research that urban researchers must examine if we are to understand more fully - and act more politically on - the nexus between cities, social cohesion and the environment.

Urban sustainability and beyond

Since the late 20th century, the notions of sustainability and urban sustainability have become increasingly hegemonic in European cities. So much so that if a policymaker was to talk about the environment and the city, he or she would almost certainly use the phrase sustainability or a variation of it. Its mainstreaming has been marked by a number of emblematic moments such as the publication of accounts that showed that the socio-ecological 'footprint' of cities was indeed truly global (Girardet, 1992, 1999, World Commission for Environment and Development, 1987) and a number of 'global' meetings such as the 1992 Rio Earth Summit and the recent 2009 United Nations Climate Change conference in Copenhagen. Much lip-service has been paid to the United Nation's World Commission for Environment and Development (1987) report *Our Common Future*

(widely known as the Brundtland Report). Three core messages are often repeated by urban policymakers and practitioners throughout the world: first, its belief that we should “adopt life-styles within the planet’s ecological means” (ibid, p.9); second, its definition of sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (ibid, p.5), and perhaps most importantly, the necessity to make economic development, social justice and the environment – the three pillars of sustainability – work together rather than in opposition.

The Brundtland Report, of course, feeds into the wider ideas around urban sustainability which point to the current unsustainability of cities and the urgent need to retrofit or re-organize them such that a more ‘sustainable’ form of urbanization can be produced. Cities, it is widely highlighted, produce untold amounts of toxic pollution and greenhouse gases, they consume non-renewable fossil fuels such as oil and gas in vast quantities, and they burn and dump much of their waste (Blowers and Pain, 1999). Such assessments are also associated with the post-socialist cities of Central and Eastern Europe who have suffered not only from severe environmental problems associated with hyper-industrialization, socialist urbanization and the political restrictions on environmental movements during the state-socialist era but also from insufficient post-socialist environmental protection legislation (see, for instance, Varga, *et al.*, 2002; Pavlínek and

Pickles, 2000; Whitehead, 2005, 2007). Added to the view that cities are seen as being unsustainable, urbanization across Europe and beyond is increasingly viewed as having an often unrepentant damaging effect on ecologies elsewhere. In the quest to “make the unsustainable sustainable” (Whitehead, 2007, p.13), a whole series of urban blueprints and best practice guides and models – from Malmö’s ‘sustainable’ waterfront development to Freiburg’s use of green technologies – have been mobilized and commodified (cf. Whitehead, 2007; Farr, 2008; Hopkins, 2008), while a range of industries have developed in monitoring sustainability indicators, ‘fixing’ unsustainable technologies and retrofitting urban infrastructure, and marketing and selling ‘sustainable’ products from food to computers, bags to energy (Astleithner *et al*, 2004). In short, there is a lot of money to be made in making things sustainable through tactics and strategies of ecological modernization.

Although it does pay more attention to the extra-local impacts of the (un)sustainable city, the sustainability argument and practices are sutured by a fantasy of socio-ecological cohesion which can be achieved by means of the mobilization of a combination of ecologically sensitive technologies, good managerial governance principles, appropriate institutionalized modes of stakeholder-based participatory negotiations, changing consumer cultures and individual habits. These technological fixes are supported by, and supporting, hegemonically accepted growth-oriented neo-liberal market

mechanisms as the idealized delivery mechanism. There is an unending stream of literatures that regurgitate this argument *ad infinitum* (Da Cunha et al., 2005). Although emphases and orientations vary, they are ultimately concerned with what can be done within an urban socio-ecological order that is considered given. The techno-managerial discourses and practices that infuse and shape sustainability policies circulate around a particular notion of what Nature is and how Nature should be managed on the one hand while evacuating proper dissensual democratic political arguments from the terrain of policy-intermediation. As such, the marker of ‘sustainability’ signals a depoliticizing gesture that further re-enforces the sedimentation of post-political frameworks and configurations (see Swyngedouw 2007; 2010).

Indeed, despite the calls to bring together the three apparently supportive pillars of sustainability the economic and, to a lesser extent, the environmental imperatives nearly always take priority over the inherently political issues of social justice and cohesion, which are at best an afterthought, at worst ignored. As several scholars have argued, the urban sustainability framework has been ‘neo-liberalized’ and merged with ideas around ecological modernization, which promotes the economic benefits of reducing environmental pollution and of mobilizing more ‘ecologically’ rational resource management operations (Baker 2007; Keil 2007; cf. Gibbs, 2006; Mol and Spaargaren, 2000). It promotes market-led, technocratic

approaches to ‘greening’ capitalism and almost completely ignores issues of social justice and the processes of social inclusion and exclusion that run through urban environments and the very technological advancements they are advocating.

Rather than re-applying the social to the concept of sustainability, we propose – as do many radical scholars and activists – that we move beyond sustainability if we are to truly understand the links between cities and the environment (Braun, 2005; Keil, 2007; Swyngedouw 2009; Kaika and Swyngedouw 2010). In this light, it is important to consider alternative, more radical frameworks that place the social at the centre of their analysis are needed. One such approach is urban environmental justice, which we shall now turn to.

Urban environmental justice: from the black lung-producing workplace to the smog-laden playground¹

Environmental Justice (hereafter EJ) is at once a normative concept and a social movement (or rather a group of social movements). Its roots are in the United States where a large number of Environmental Justice Movements (EJMs) have emerged since the late 1970s alongside a voluminous set of academic literature which has rapidly gained in popularity since the mid 1990s. As we will show, however, an increasing multitude of scholars and

social movements that work in, and on, European cities have increasingly drawn on the concept, discourses and networked resources of EJ to understand and contest the key *problématique* of EJ: that is, “the differential exposure to environmental ‘bads’ and access to environmental ‘goods’ experienced by different social groups” (Bickerstaff et al., 2009, p.592) (see also Holifield, et al., 2010). Viewing the environment as “where we live, where we work, and where we play” (Dana Alston, quoted in Whitehead, 2009, p. 665) and linked to a variety of social injustices, EJ scholars and activists do not shy away from the social in the social cohesion, cities and environment nexus.

Unsurprisingly, the notion of justice is fundamental to EJ. Despite this, however, Schlosberg (2003) and Walker (2009a) have argued that although the literature and movements are abound with references to justice, they are often vague or imprecise about “what the justice in environmental justice should constitute and why” (Walker, 2009a, p. 203). Developing Iris Marion Young’s (1990) work on the politics of difference, Schlosberg (2003, 2007) suggests that four inter-linking dimensions of justice are central to EJ:

1. *Distributional justice*. The need for environmental bads not to be concentrated in, or nearby, disadvantaged communities but (re)distributed more equally.

2. *Procedural justice*. The need for fairer and more democratic decision-making process and the involvement of disadvantaged groups within this.

3. *Recognitional justice*. The need for recognition and respect for the disadvantaged communities who suffer from environmental injustice and for those who participate in the EJ movement.

4. *Justice of capabilities*. The need to create “the capabilities necessary for a healthy, functioning community” (Schlosberg, 2007, p.72).

This four-pronged normative understanding of justice goes beyond the often uni-dimensional focus of much of the early work on EJ which, as Lake (1996) argued, prioritized the distributional aspect of environmental injustice. Schlosberg also maintains that these four dimensions of justice cannot be conceived of or actualised in isolation. The justice of capabilities necessitates a political focus on distributional justice: healthy communities require some form of redistribution of environmental bads and goods. In order to achieve distributional justice and the justice of capabilities, procedural justice and recognitional justice are necessary.

In a recent review of the EJ literature, Holifield *et al.* (2009) demonstrate that the EJ has evolved significantly. For us, their review highlights particularly important evolutions in the EJ literature. First, EJ studies have moved beyond the valuable but somewhat insular fascination with “whether polluting facilities or land uses were disproportionately sited in communities of color, or whether their spatial allocation simply reflected

the dynamics of real estate markets” (ibid, p.593; see for instance Been 1994; Pastor, Sadd and Hipp 2001) to examine a multitude of socially-mediated environmental injustices from ‘natural’ disasters (Smith, 2005; Peck, 2006; Bullard and Wright, 2009) to transportation (Lucas, 2004; Sze, 2007) and the working conditions in and struggles over ship-building industries (Hillier, 2009; Bickerstaff and Agyeman, 2009). Second, EJ studies have become increasingly inter-disciplinary, theoretically sophisticated and engaging with a wider variety of theoretical approaches from critical race theory (Kurtz, 2009) to actor-network theory (Bickerstaff and Agyeman, 2009) and Deleuzoguattarian perspectives (Hillier, 2009). Third, EJ research has become more methodologically diverse with more emphasis on qualitative studies of the experiences and struggles of environmental injustice emerging (e.g. Kurtz, 2002; Sze, 2007; Armiero, 2008). Fourth, empirical studies have moved beyond short-sighted debates over whether class or race are the key determinates of environmental inequality and injustice, to consider the multiple and intersecting axes of inequalities that are wrapped up in EJ. Gender, age, disability, sexuality and several other factors from access to health care and insurance have been shown to influence the vulnerability of individuals and communities to socio-environmental harm (e.g. Chaix, *et al.*, 2006; Sze, 2004; Buckingham and Kulcur, 2009; Walker, 2009b). On top of this, following calls by Pulido (2000) and Morello-Frosch (2002), scholars have become increasingly

conscious of the more structural and insidious processes that produce inequality rather than laying the blame solely at instances of overt deliberate discriminatory decision-making (for instance, by a factory owner or a city council committee).

The fifth evolution identified by Holifield and colleagues is the transnationalisation of the increasingly sophisticated EJ literature beyond its US heartlands. In part, this transnationalisation reflects the mobilisation of EJ campaigns to Europe, Africa, Asia and Australasia (Agyeman, 2002; Schlosberg, 2007; Schroeder et al, 2008; Walker, 2009c) and the rise of transnational EJ movements and networks (Martinez-Allier, 2004; Carruthers, 2008; Cook and Swyngedouw, forthcoming; Pellow, 2007). Studies of EJ in Europe have, for instance, considered the formation of EJMs in Western as well as Central and Eastern Europe (Varga, *et al.*, 2002; Walker, 2009c; Agyeman and Ogneva-Himmelberger, 2009), the quantitative distribution of socio-environmental harm (Laurian, 2008), struggles over the distribution of toxicities (Bickerstaff and Agyeman, 2009; Davies, 2006), and the openness of environmental decision-making (Buckingham and Kulcur, 2009). As part of this internationalization of EJMs, geographers have also begun to consider the nuanced ways in which understandings of EJ are transformed as its discourses and resources are mobilized and re-contextualized in different localities and are structured by past political, economic and social legacies (Debbané and Keil, 2004;

Walker, 2009c). As well as showing the necessity for EJ claims and movements to reflect the needs of particular contexts, the literature has shown that its initial US-centrism does not necessarily prevent critical and situated engagement with its ideas and resources by scholars and activists in Europe or places elsewhere.

With its widening empirical scope, its advancing theoretical sophistication, and its increasing sensitivity to the multi-dimensionality of justice and place, and, unlike the sustainability literature, its insistence on focusing on the social in the social/cities/environment nexus, we believe that the EJ approach has much to offer. Nonetheless, we argue that such an approach can be complimented by the emerging work on Urban Political Economy, a perspective that focuses directly on the socio-ecological mechanisms and relations that produce socio-environmental conflict and on urban socio-ecological conflicts and struggles, thereby foregrounding the political character of socio-ecological relations.

Urban political ecology

Whereas the EJ literature is primarily focused on the *patterns* of socio-spatial environmental inequality and the political *procedures* through which they are mediated, the urban political ecology (hereafter UPE) literature is primarily concerned with the political-economic processes involved in the

reworking of human-non-human assemblages and the *production* of socio-environmental inequalities. These processes are not backdrops to environmental injustice but actively constitute it and, as such, cannot be ignored. This section will outline how UPE scholars understand environmental inequalities and how this can complement the work of EJ scholars and activists.

UPE is a school of critical urban political-environmental research (Heynen et al., 2006b). UPE takes many of its bearings from the wider and more voluminous, albeit by no means homogenous, school of political ecology (for reviews, see Castree and Braun, 2001; Keil, 2003, 2005). Inspired by the early work of Piers Blaikie (1985; Blaikie and Bloomfield, 1987), David Harvey (1996) and Neil Smith (1984) amongst others, urban political ecologists have sought to understand the socio-material basis of environmental problems, while attempting to transcend binary perspectives on the nature-society interaction. A growing number of academic monographs have begun to chart the terrain of urban political ecology. *Nature's Metropolis* (Cronon, 1991), *Dead Cities* (Davis, 2002), *Concrete and Clay* (Gandy, 2003), *Social Power and the Urbanization of Nature* (Swyngedouw, 2004), *Nature and City* (Desfor and Keil, 2004), *Cities of Flows* (Kaika, 2005) and *In the Nature of Cities* (Heynen et al., 2006a) constitute some of the foundational texts of urban political ecology. UPE has exposed two key popular misunderstandings about the relationship

between society and nature. First, the artificial ontological divide between nature and society that exists in both mainstream academic and popular understandings of nature/society is questioned and alternative formulations explored. Political ecologists argue that nature and society do not exist independently of each other, but are intricately tangled in mutually constituted socio-natural assemblages. To illustrate this point, some writers have argued that there are few, if any, spaces of nature which are pristine or unaffected by human processes (think, for instance, of the global environmental effects of increasing carbon emissions). UPE scholars have countered the myth that towns and cities are “places where nature stops” (Hinchcliffe, 1999, p. 138), positing instead that nature has become urbanized and used in the process of making and remaking the cities. Cities are conceptualized as metabolic vehicles constituted in and through metabolic circulatory socio-ecological flows. Drawing upon the work of Bruno Latour (1993) and Donna Haraway (1991), several UPE scholars have claimed that capitalism and urbanization are fundamentally hybrid processes through which social and biophysical elements are assembled, entangled and transformed, and socio-natural cyborgs are produced (see Swyngedouw, 2006). Rethinking nature and society relations in this way has important implications for how we think about environmental justice. As Castree and Braun (1998, p.34) state:

“The crucial issue therefore, is not that of policing boundaries between “nature” and “culture” but rather, of taking responsibility for how our inevitable interventions in nature proceed – along what lines, with what consequences and to whose benefit.”

Secondly, UPE is critical of Malthusian-influenced explanations of environmental degradation and resource depletion, which implicate overpopulation and poor people as the primary cause and culprits. Instead, it is argued that the variegated socio-ecological relations that shape capitalist market societies are responsible for the environmental condition the world is in. Drawing on historical materialism, O’Connor (1996) and Henderson (2009) have shown that the ceaseless quest for surplus value compels capitalists to extract and commodify more and more biophysical resources. In doing so, the capitalist circulation process and the drive to ‘accumulate for accumulation sake’ degrade the very resources that are necessary for capitalism’s reproduction. For many UPE scholars, the notion of metabolism is vitally important. Metabolism is the process whereby biophysical matter such as oil, pigs or oranges are transformed into “useable, ownable and tradable commodities” (Coe et al., 2007, p.161) through the exploitation of human labour (Swyngedouw, 2006). In this light, the act of socio-physically metabolizing nature is a key process through which environmental injustice is exercised.

Power, urbanization and scale are also central to UPE studies and, as we shall explain, all three provide useful frames through which environmental injustice can be understood. To begin, UPE scholars assert that unequal power relations are inherently bound up in the metabolism of nature and, therefore, the urban environment is created by and embodies unequal power relations (see below). Those in power are able to control who has access to resources (primarily through the money/property nexus), the quality of these resources, and who can decide how resources are utilized (Swyngedouw, 2004; Swyngedouw and Heynen, 2003). Although the state plays a vital role in shaping these power relations (as we will explain later), class and other forms of social power are seen as the primary structure of inequality. The wider Political Ecology literature has also considered questions of gender and race relations. A number of studies have sought to demonstrate how gendered and racial identities are constructed and performed, and how these identities influence their “access to particular types of knowledge, space, resources, and social-political process” and *vice versa* (Nightingale, 2006, p. 169; see also Rocheleau et al., 1996).

Urbanization is produced through particular forms of socio-physical metabolism (e.g. Swyngedouw, 2004, 2006). Exploitation and injustice are wrapped up in the metabolic making and remaking of the urban under capitalism. Directly and indirectly, key processes within contemporary urbanization such as white flight, suburbanization, gentrification, de-

industrialization and the development of new urban service sector-based economies alter the lines of environmental inequality in the city (Morello-Frosch, 2002; Pulido, 2000; Schweitzer and Stephenson Jr., 2007) (Domene et al., 2005). Environmental inequality cannot be understood in isolation from these intersecting processes. In addition, these geographically uneven and socially unequal metabolic processes take on a decidedly 'scalar' form (Heynen, 2003; Swyngedouw and Heynen, 2003). On the one hand, activists utilize material and discursive scalar strategies (such as lobbying national and international governments) in order to advance their struggles (Kurtz, 2002; Towers, 2000). On the other hand, extra-local processes actively shape urban environmental injustices, from regional government decision-making over waste management to global climate change. As scales and the relations between scales are socially produced, particular scales can be empowered or disempowered (Swyngedouw and Heynen, 2003) (Bulkeley, 2005). Therefore, local communities can suffer from neglect or be exploited by actors and institutions operating at wider scales. Likewise local activists and communities can have their abilities to 'jump scale' curtailed by actors and institutions at other scales. What is clear, therefore, is that excessively localist readings of environmental injustice are completely inadequate at understanding the production and contestation of environmental injustice. Heynen (2003), for example, argues that environmental justice produced at one scale may lead to environmental injustices at other scales. Similarly, the

production of environmental justice in one place may be produced through the degradation and exploitation of places elsewhere.

In summary, then, UPE scholars focus less on the instances of environmental justice and injustice than their EJ counterparts. Rather it is the socio-ecological production of urban inequality where emphasis is placed. These approaches are by no means incompatible. Indeed, UPE can draw upon the insights provided by EJ studies of the experiences and patterns of environmental injustice to highlight empirically the inequality produced through urban metabolism. Emphasis on metabolism, urbanization, scale and power, likewise, can add conceptual and theoretical depth to the more empirically-driven analyses of EJ scholars.

New and future directions

Although many of the ways in which we understand the nexus between cities, social cohesion and the environment have become increasingly sophisticated, particularly in the field of urban political ecology, important gaps remain in our understandings of this nexus. In this section, we will explore four pressing issues that need to be addressed and how recent developments within the field can be utilized to address these.

The socio-ecological circulation of urban metabolisms: (hybrid) natures and (cyborg) cities

The urban political ecological approaches explored above illustrate how the city and urbanization more generally can be viewed as a process of de-territorialisation and re-territorialisation 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 in which social actors strive to defend and create their own environments in a context of class, ethnic, racial and/or gender conflicts and power struggles. Under capitalism, the commodity relation and the flow of money attempts to suture the multiple socio-ecological processes of domination/subordination and exploitation/repression that feed the urbanization process and turn the city into a metabolic socio-environmental process that stretches from the immediate environment to the remotest corners of the globe (Kaika and Swyngedouw, 2000). Metabolism is not confined to the boundaries of a city but involve a complex process of linking places, and the humans and non-humans within these places, in uneven and contingent ways. These often deeply unjust networks through which cities and their inhabitants are linked with people and places elsewhere have begun to be revealed in recent work on the transportation of e-waste, household recycling and redundant ships from the cities of global North to those in the global South (Buerk, 2006; Pellow, 2007).

‘Circulation’ and ‘metabolism’ have become increasingly popular and theoretically advanced lenses through which to understand a series of

interconnected, heterogeneous (human and non-human), dynamic, contested and contestable processes of continuous quantitative and qualitative transformations that re-arranges humans and non-humans in new, and often unexpected, assemblages (Gandy, 2004; Swyngedouw, 2004). Such lenses permit grappling with the social and the physical in non-dualistic and deeply political ways. The modern city becomes viewed as a process of fusing the social and the physical together to produce a distinct ‘hybrid’ or ‘cyborg’ urbanisation (Gandy, 2005; Haraway, 1991). Cyborg metaphors, in particular, are valuable ways in which to understand these urban assemblages, as Matthew Gandy (2005, p.28) details:

“The emphasis of the cyborg on the material interface between the body and the city is perhaps most strikingly manifested in the physical infrastructure that links the human body to vast technological networks. If we understand the cyborg to be a cybernetic creation, a hybrid of machine and organism, then urban infrastructures can be conceptualized as series of interconnecting life support systems. The modern home, for example, has become a complex exoskeleton for the human body with a provision of water, warmth, light and other essential needs. The home can be conceived as a ‘prosthesis and prophylactic’ in which modernist distinctions between nature and culture, and between the organic and the inorganic, become blurred.”

Natures and cities are always heterogeneously constituted, the product of actants in metabolic circulatory processes. Metabolic circulation, then, is the socially-mediated process of environmental-technological transformation and trans-configuration, through which all manner of actants are mobilised, attached, collectivised, and networked. These relations are invariably infused with myriad configurations of power and social struggle that saturate material practices, symbolic ordering and imaginary visions. Urbanisation, in fact, is a process of geographically-arranged socio-environmental metabolisms. It is mobilised through relations that combine the accumulation of socio-natural use and exchange-values, which shape, produce, maintain, and transform the metabolic vehicles that permit the expanded reproduction of the urban as a historically determined but contingent form of life. Such socially-driven material processes produce extended and continuously reconfigured, intended and non-intended spatial (networked and scalar) arrangements. These are saturated with heterogeneous symbolic and imaginary orders, albeit 'overdetermined' (Althusser, 1969) by the generalised commodity form that underpins the capitalist 'nature' of urbanisation. The phantasmagorical (spectacular) commodity-form that most socio-natural assemblages take not only permits and facilitates a certain discourse and practice of metabolism, but also, perhaps more importantly, 'naturalise' the production of particular socio-environmental conditions and relations (Heynen et al., 2006b).

Empirical research has begun to explore the assemblages, power inequalities and injustices wrapped up in the metabolism of cities (see, for instance, Desfor and Keil, 2004; Gandy, 2003; Kaika, 2005; Swyngedouw, 2004). However, we believe further consideration of the metabolism and circulation of cyborg cities is necessary. On the one hand, it will reveal further the contingent, constantly shifting and deeply uneven power relations and injustices wrapped up in its production. On the other hand, it will help us think critically about the types of cities we want to live in the future, and what metabolisms and circulations make up these urban utopias. Such a research project requires unraveling the complex, shifting and power-laden social relationships that operate within cities, and how these are mediated by and structured through processes of socio-ecological change. As part of this, future research must examine how the urban is constituted through socio-ecological metabolic flows (such as energy, CO₂, water, food, materials), sustained by a series of technological infrastructures and social, political and institutional support structures, and how these are wrapped up in the production of highly uneven socio-ecological configurations. Not only do we need to map, chart, analyze and understand the socio-ecological metabolism of cities, past and present, we also need to critically imagine the metabolised socio-ecological relations that would operate under the more radical utopian alternatives – for instance, of a post-carbon communities (e.g. Heinberg, 2006; Hopkins, 2008) – that are

beginning to emerge. As part of this agenda, research must pay attention to the networked relations that stretch beyond the contemporary city to different scales and places (urban and rural), as well as those extra-urban relations that are being proposed (explicitly and implicitly) in urban utopias. How, might we ask, will a post-carbon city affect its inhabitants and, just as importantly, what will its ramifications be people in places elsewhere?

Neo-liberalising urban environments

The state plays a pivotal role in the process of environmental injustice. Whether deliberately or not, it helps shape who is exploited, ignored, rewarded and listened to, and how this privileging is exercised. It also has considerable power to exacerbate, displace or alleviate existing socio-environmental injustices or create entirely new ones. Many EJ and UPE studies have briefly highlighted the role of formal state institutions and actors as decision-makers in, for example, the decisions about where toxic facilities should be located or how non-renewal resources will be utilized. Lavelle and Coyle (1993) have also shown that while state laws can be highly discriminatory (e.g. allowing some groups and not others access to environmental resources), the enforcement of these laws can be just as discriminatory, if not more so (e.g. less rigorous enforcement of environmental protection laws in minority communities). These insights aside, the varied role of the state and the practices of governance are

somewhat under-researched in the EJ literature and, to a lesser extent, its UPE counterpart. The role of the state, we argue, needs to be placed more centrally within these literatures with increased linkages to the expansive and emerging work on neo-liberalization.

Viewing neo-liberalization as a contingent, path-dependent, amorphous and selective process of market-like state restructuring, scholars in geography and cognate disciplines have begun to reveal its discursive constructs, actually-existing and mutative forms, and its often socially regressive consequences (see, for instance, Castree, 2008; Béal, 2009; Peck et al, 2009). Studies have also shown that towns and cities in Central and Eastern Europe (CEE) are undergoing an uneven and path-dependent process of neo-liberalization in the years after the breaking up of market socialism (e.g. Smith, 2007). The neo-liberalesque selective pluralization of policy circles to incorporate business elites (primarily) and selective experts and community ‘representatives’ often through the setting up of partnerships, as well as the increasing reliance on industry ‘self-regulation’ in the form of non-binding voluntary standards have also been revealed and critiqued (Guthman, 2007; Swyngedouw, 2005, 2009). Studies in political ecology have also shown how environmental management in Western Europe and North America increasingly revolves around neo-liberal strategies – most noticeably privatization, commercialization and

commodification – which seek, ultimately, to open up new avenues for capital accumulation (Bakker, 2005; Castree, 2008; Himley, 2008).

Clearly then, neo-liberalization has implications for environmental justice and urban socio-ecological cohesion. It could be hypothesized that neo-liberalization is widening rather than resolving environmental injustices in our towns and cities, making it more difficult for minority groups to have equal access to good quality environmental resources or for procedural equality in environmental decision-making to be achieved. As yet, we do not really know. Future research, therefore, needs to take up this glaring lacuna to see how the nexus of neo-liberalization and environmental (in)justice is actualized in different urban contexts in and beyond Europe. Following Peck *et al.* (2009, p.49), such analyses must view the practices and ramifications of neo-liberal statecraft *vis-à-vis* the “imprints of past regulatory struggles” – for instance, the contradictory legacies of market socialism in Central and Eastern Europe – “which recursively shape political capacities and orientations, and future pathways of neoliberal restructuring”. The socio-ecological implications, displacements and rhetoric of neo-liberal technologies and strategies such as auditing, ‘joined-up’ policymaking, urban spectacles, place marketing and gentrification should be critically analysed in relation to previous and long-standing technologies and strategies.

Urban socio-ecological movements and the struggles for justice

A key focus of the EJ literature is the ways in which people from disadvantaged communities in various localities have formed, or joined, movements to struggle for environmental justice, inclusion or equality. As Agyeman (2005) points out, rather than taking a progressive stance that outlines a vision of socio-ecological utopia, these movements have overwhelmingly taken a reactionary, defensive stance, demonstrating against existing or proposed injustices. Through case study research, the EJ literature has examined the formation and evolution of movements, their translation of grievances into 'repertoires of action', their collective identity politics, and their influence on the targeted 'mechanisms' of injustice. The UPE literature has focused less empirical attention on these movements but insists that how socio-natural relations are produced, by whom and for whom are subjects of intense social struggle and contestation (Swyngedouw and Heynen, 2003).

What is striking about the EJ literature in particular is the lack of criticism directed towards the EJMs rather than the social structures and injustices they are faced with (Brulle and Pellow, 2005). We must ask difficult questions about EJMs. For instance, have movements developed agendas and alternatives that if implemented would simply act to reproduce or relocate injustices? Have they misunderstood or overlooked any environmental injustices? How inclusive are these movements? Are these

movements' goals co-opted by more powerful bodies and, if so, how and why? Why have some movements dismantled or failed to achieve their goals? Why have certain disadvantaged communities not developed EJMs? What unequal power relations run through these movements and how does it influence their operations? These questions, of course, are suggested as way of better understanding these movements rather than as a means of undermining or belittling those who participate in such movements.

On top of a sporadic engagement with the social movement literature, the EJ and UPE literatures have rarely drawn upon the Geographies of Social Movements (GSM) literature. At its core, the GSM literature considers the role of spatiality in the emergence and performance of social movements (see, for instance, Leitner et al., 2008; Miller, 2004; Nicholls, 2009; Routledge, 2007), and we believe that engagement with this literature can provide more nuanced understandings of how the socio-spatial relationships between ecological conditions, urban politics and social movements operate. Work in UPE and political economy more generally, as noted earlier, has begun to show the importance of scale, showing how social movements engage in scalar strategies such as 'jumping scales' and discursively framing their plight as an 'issue' at one scale or across multiple scales amidst the continued reworking of scalar power relations. Like scale, place is also important to the dynamics of social movements. For Nicholls (2009, p. 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.” Questions, therefore, need to be asked about how those involved in producing, receiving and contesting environmental injustices view place (e.g. workplace, community, river) and how this influences their willingness to pollute, exploit, struggle, persist and so on.

As noted earlier, a growing number of studies have pointed towards a growing interconnectedness of place-based urban socio-ecological movements and a supposed internationalization of environmental politics (e.g. Carruthers, 2008; Pellow, 2007; Walker, 2009c). These studies have provided valuable insights but more research is needed on how and why such movements alter, expand, or rescale their spatial focus; how and why their structures, tactics and discourses are replicated by groups in other places; and how and why they liaise and share resources with other groups. We also need to understand more about how meanings and values are constructed and contested within these trans-local and trans-national networks (Miller, 2004; Walker, 2009c). How, for instance, are one group’s understandings of gender/environment relations projected, evaluated and reworked when they engage with groups in place elsewhere? To what extent have these meanings and values been universalized and, if so, how do communities in particular places ‘ground’ these universalized meanings and values and with what implications? Following Routledge (2007) we also

need to ask difficult questions about the uneven power relations, disagreements and fractures within these networks. And of course, we must consider those groups who do not or rarely engage with groups elsewhere, their motivations for doing so and their structural constraints.

Urban socio-ecological imaginaries: the discourses of urban natures

(In)justice and (in)equality in the urban environment cannot be understood without reference to discursive practices and their intertwining with material practices and outcomes. Three important and inter-linked claims have been made in the more radical literatures on sustainability, discourse and the post-political condition which are pertinent to the nexus of cities, social cohesion and the environment. First, Nature and its more recent derivatives, like ‘environment’ or ‘sustainability’, are ‘empty’ and ‘floating’ signifiers (Swyngedouw, 2010). Second, there is no such thing as a singular Nature around which an urban environmental policy or environmentally-sensitive planning can be constructed and performed. Rather, there are a multitude of natures and a multitude of existing, possible or practical socio-natural relations. Nature becomes a tapestry, a *montage*, of meaning and equivalences, held together with quilting points (or *points de capiton*) through which certain meanings of Nature are knitted together, much like the upholstery of a Chesterfield sofa (Žižek, 1989; Stravakakis, 1997; Swyngedouw, 2010). Third, the obsession with a singular Nature that

requires 'sustaining' or, at least, 'managing', is sustained by a particular 'quilting' of Nature that forecloses asking political questions about immediately and really possible alternative urban socio-natural arrangements (Swyngedouw, 2010)

In part due to the growing global awareness of 'the environmental crisis', contemporary representations of Nature have become more acute. The Real of Nature, in the form of a wide variety of ecological threats (global warming, new diseases, biodiversity loss, resource depletion, pollution), has invaded and unsettled our received understandings of Nature. This has forced yet again a transformation of the signifying chains that attempt to provide 'content' for Nature, while at the same time exposing the impossibility of capturing fully the Real of natures (Žižek, 2008a).

These radical arguments are structured by the fundamental belief that the natures we see and work with are necessarily imagined, scripted, and symbolically charged as Nature. These inscriptions are always inadequate, they leave a gap, a remainder and maintain a certain distance from the natures that are there materially, which are complex, chaotic, often unpredictable, radically contingent, historically and geographically variable, risky, patterned in endlessly complex ways, and ordered along 'strange' attractors (see, for instance, Lewontin and Levins, 2007; Prigogine and Stengers, 1985). This means, quite fundamentally, that there is no Nature out there that needs or requires salvation in name of either Nature itself or a

generic Humanity. There is nothing foundational in Nature that needs, demands, or requires sustaining. The debate and controversies over Nature and what do with it, in contrast, signal rather our political inability to engage in directly political and social argument and strategies about re-arranging the socio-ecological co-ordinates of everyday life, the production of new socio-natural configurations, and the arrangements of socio-metabolic organisation (something usually called capitalism) that we inhabit. The notion of urban sustainability and sustainable planning/development have symptomatically become the hegemonically and consensually agreed metaphors to signal the ecological quandary we are in (Swyngedouw, 2007b). Indeed, one of the key signifiers that has emerged as the pivotal 'empty' signifier to capture the growing concern for a Nature that seemed to veer off-balance is, of course, 'sustainability'.

This scripting of Nature permits and sustains a post-political arrangement sutured by fear and driven by a concern to manage things so that we can hold on to what we have (Swyngedouw, 2007a). This constellation leads Alain Badiou to insist that ecology has become the new opium for the masses, replacing religion as the axis around which our fear for social disintegration becomes articulated (but also from where redemption, if the warnings are heeded, can be retrieved). Such ecologies of fear ultimately conceal, yet nurture, a conservative or, at least, reactionary discourse/message. While clouded in rhetoric of the need for radical change

in order to stave off immanent catastrophe, a range of technical, social, managerial, physical and other measures have to be taken to make sure that things remain the same, that nothing really changes, that life (or at least our lives) can go on as before. Is this not the underlying message of, for example, *An Inconvenient Truth* or of the report of the United Nation's Intergovernmental Panel on Climate Change (IPCC) on the human consequences of global climate change? 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-organisational management of the socio-natural environment in order to assure that the world as we know it stays fundamentally the same (Žižek, 2008b). 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, p. 76).

The discursive framing of Nature as singular and in need of saving together with the simultaneous post-political arrangement has enormous implications for inequality and injustice in the city. It could be reasonable argued that they rupture hopes for environmental justice, whether that be procedural justice (through the removal of real debate and dissensus) or the justice of capabilities (through blockading potential pathways to building a more socially and environmentally just society beyond the current status quo). As yet, research has yet to fully delve into the complex linkages

between discourse, post-political management and environmental (in)justice. More research is therefore needed on this issue. It is necessary to ask questions about what visions of Nature and what socio-environmental relations are being promoted; what quilting points are being used and how they are being stitched together; and who are promoting these visions and why. Future research must also look at what issues and whose voices are being silenced in the process and how these discourses are competing with, altering and being altered by other alternative discourses. In this respect, research also needs to consider the discourses of the more radical voices such as those of the environmental justice movements or the post-carbon protagonists. As part of this, it must critically examine how they portray nature and socio-environmental relations in the past, present and the utopian/dystopian future.

Conclusion

This paper has considered the important nexus between cities, social cohesion and the environment. It has critically overviewed a number of approaches through which this nexus has been considered by academics and non-academics, most noticeably those of urban sustainability, environmental justice and urban political ecology. It has argued that while urban sustainability is fundamentally flawed – suffering from technocratism and

an ignorance of the social – the approaches of environmental justice and urban political ecology hold significant merit. A fusion of these two approaches can offer a deeper understanding of the processes and patterns of environmental injustice and exclusion. Such a fusion, nonetheless, must place considerable emphasis on the city's positionality in wider political, economic and ecological processes and networks. Ontologically, it must be a political ecology *of* the city, not a political ecology *in* the city. Nevertheless, a simple fusion of the two approaches as they stand is not enough. As this paper has shown, four key areas in which further research are necessary if we are to get a more nuanced understanding of this nexus.

The key areas for future research can be summarised as follows:

1. Research into the metabolism of past, present and future cyborg cities, focusing on the shifting power relations and inequalities within these transformations and the 'extra-local' networks and processes that constitute urban metabolism;
2. Research into the linkages between urban neo-liberalisation and environmental injustice, and the dynamics and ramifications of neo-liberal urban environmental projects such as ecological gentrification;
3. Research into the geographies of environmental justice movements and the contradictions of operationalising and networking such movements;

4. Research into the relationships between discourse, post-political management arrangements and environmental (in)justice, together with critical research into the visions of, and marginalisation of, alternative discourses.

Following this four pronged research agenda, we believe, can bring new life into political ecological and environmental justice research. We also believe that it can help stimulate a critical and political rethinking of the types of city-natures that we want to be living now and in the future.

¹ The section title is inspired by Whitehead (2009: 665) who argues that by “relocating environmental politics and protest from the ex-urban spaces of (seemingly exotic) nature, to the black lung-producing workplace, the asbestos-clad home and the smog-laden playground, the EJM has moved environmental policymaking into a locus of passion for many urban dwellers.”

References:

- Agyeman, J. (2002) Constructing environmental (in)justice: Transatlantic tales, *Environmental Politics* 11, pp.31-53.
- Agyeman, J. (2005) *Sustainable Communities and the Challenge of Environmental Justice*. London: New York University Press.
- Agyeman, J. and Ogueva-Himmelberger, Y. (2009) *Environmental Justice and Sustainability in the Former Soviet Union*. London: MIT Press.
- Althusser, L. (1969) *For Marx*. London: Allen Lane.
- Armiero, M. 2008: Seeing like a protester: nature, power, and environmental struggles, *Left History* 13(1), pp. 59-76.
- Astleithner, F., Hamedinger, A., Holman, N. and Rydin, Y. (2004) Institutions and indicators – The discourse about indicators in the context of sustainability, *Journal of Housing and the Built Environment* 19, pp.7-24.
- Baker, S. (2007) Sustainable development as symbolic commitment: Declaratory politics and the seductive appeal of ecological modernisation in the European Union, *Environmental Politics* 16, pp.297-317.
- Bakker, K. (2005) Neoliberalizing nature: Market environmentalism in water supply in England and Wales, *Annals of the Association of American Geographers* 95, pp.542-565.

-
- Béal, V. (2009) The Neoliberalisation of Urban Environmental Policies. Analysing the Transformation in the Management of Environmental Issues in Western European cities (1975-2005). *International Sociological Association RC 21 (Urban Sociology) Conference*, Tokyo, December 2009.
- Been, V. (1994) Locally undesirable land uses in minority neighborhoods: Disproportionate siting or market dynamics? *Yale Law Journal* 103, pp.1383-1422.
- Bickerstaff, K. and Agyeman, J. (2009) Assembling justice spaces: The scalar politics of environmental justice in north-east England, *Antipode* 41, pp.781-806.
- Bickerstaff, K., Bulkeley, H. and Painter, J. (2009) Justice, nature and the city, *International Journal of Urban and Regional Research* 33, pp.591-600.
- Blaikie, P. (1985) *The Political Economy of Soil Erosion in Developing Countries*. London: Longman.
- Blaikie, P. and Bloomfield, H. (1987) *Land Degradation and Society*. London: Methuen.
- Blowers, A. and Pain, K. 1999: The Unsustainable City? in Pile, S. Brook, C. and Mooney, G. (Eds) *Unruly Cities? Order/Disorder*, pp,247–298. London: Routledge.

-
- Braun, B. (2005) Environmental issues: writing a more-than-human urban geography, *Progress in Human Geography* 29, pp.635-650.
- Brenner, N., Peck, J. and Theodore, N. (2005) Neoliberal urbanism: Cities and the rule of markets. Department of Geography, University of Wisconsin-Madison (mimeographed).
- Brulle, R.J. and Pellow, D.N. (2005) The future of environmental justice movements. In Pellow, D.N. and Brulle, R.J., (Eds.) *Power, Justice, and the Environment: A Critical Appraisal of the Environmental Justice Movement*, pp.293-300. London: New York University Press.
- Buckingham, S. and Kulcur, R. (2009) Gendered geographies of environmental injustice, *Antipode* 41, pp.659-683.
- Buerk, R. (2006) *Breaking Ships: How Supertankers and Cargo Ships are Dismantled on the Beaches of Bangladesh*. New York: Chamberlain Books.
- Bulkeley, H. (2005) Reconfiguring environmental governance: Towards a politics of scales and networks, *Political Geography* 24, pp.875-902.
- Bullard, R.D. and Wright, B. (2009) (Eds.) *Race, Place, and Environmental Justice after Hurricane Katrina: Struggles to Reclaim, Rebuild, and Revitalize New Orleans and the Gulf Coast*, Boulder, CO: Westview Press.

-
- Carruthers, D.V. (2008) The globalization of environmental justice: Lessons from the U.S.-Mexico border, *Society and Natural Resources* 21, pp.556-568.
- Castree, N. (2008) Neoliberalising nature: The logics of deregulation and reregulation, *Environment and Planning A* 40, pp.131-152.
- Castree, N. and Braun, B. (1998) The construction of nature and the nature of construction: Analytical and political tools for building survivable futures. In Castree, N. and Braun, B., editors, *Remaking Reality: Nature at the millennium*, pp.2-41. London: Routledge.
- Castree, N. and Braun, B. (2001) *Social Nature: Theory, Politics and Practice*. Oxford: Blackwell.
- Chaix, B., Gustafsson, S., Jerretm, M., Kristerson, H., Lithman, T. and Boalt, A. 2006: Children's exposure to nitrogen dioxide in Sweden. Investigating environmental justice in an egalitarian country. *Journal of Epidemiology and Community Health* 60, 224-234.
- Coe, N., Kelly, P.F. and Yeung, H.W.-C. (2007) *Economic Geography: A Contemporary Introduction*. Oxford: Blackwell.
- Cook, I. R. and Swyngedouw, E. (Forthcoming) Cities, nature and sustainability, in: R. Paddison and E. J. McCann (Eds.) *Cities and Social Change*. London: Sage.
- Cronon, W. 1991: *Nature's Metropolis: Chicago and the Great West*. London: Norton.

-
- Da Cunha, A., Knoepfel, P., Leresche, J.-P. and Nahrath, S. (Eds.) (2005) *Les Enjeux du Développement Urbain Durable. Transformations Urbaines, Gestion des Ressources et Gouvernance*. Lausanne: Presses Polytechniques et Universitaires Romandes.
- Davies, A.R. (2006) Environmental justice as subtext or omission: Examining discourses of anti-incineration campaigning in Ireland, *Geoforum* 37, pp.708-724.
- Davis, M. (2002) *Dead Cities, and Other Tales*. London: IB Tauris.
- Debbané, A.M. and Keil, R. (2004) Multiple disconnections: Environmental justice and urban water in Canada and South Africa, *Space and Polity* 8, pp.209-225.
- Desfor, G. and Keil, R. (2004) *Nature and the City: Making environmental Policy in Toronto and Los Angeles*. Tuscon: University of Arizona Press.
- Domene, E., Sauri, D. and Pares, M. (2005) Urbanization and sustainable resource use: The case of garden watering in the metropolitan region of Barcelona, *Urban Geography* 26, pp.520-535.
- Fishman, R. (1982) *Urban Utopias in the Twentieth Century: Ebenezer Howard, Frank Lloyd Wright, Le Corbusier*. London: MIT Press.
- Gandy, M. (2003) *Concrete and Clay: Reworking Nature in New York City*. London: MIT Press.

-
- Gandy, M. (2004) Rethinking urban metabolism: water, space and the modern city, *City* 8, pp.363-379.
- Gandy, M. (2005) Cyborg urbanization: Complexity and monstrosity in the contemporary city, *International Journal of Urban and Regional Research* 29, pp.26-49.
- Gibbs, D. (2006) Prospects for an environmental economic geography: Linking ecological modernisation and regulationist approaches, *Economic Geography* 82, pp.193-215.
- Giradet, H. (1992) *The Gaia Atlas of Cities*. London: Gaia.
- Giradet, H. (1999) *Creating Sustainable Cities*. Totnes: Green Books.
- Guthman, J. (2007) The Polanyian way: Voluntary food labels as neoliberal governance, *Antipode* 39, pp.456-478.
- Haraway, D. (1991) *Simians, Cyborgs and Women: The Reinvention of Nature*. London: Free Association Press.
- Harvey, D. (1996) *Justice, Nature & the Geography of Difference*. Oxford: Blackwell.
- Heinberg, R. (2006) *The Oil Depletion Protocol: A Plan to Avert Oil Wars, Terrorism and Economic Collapse*. Forest Row: Clairview Books.
- Henderson, G. (2009) Marxist political economy and the environment. In Castree, N., Demeritt, D. and Rhoads, B. (Eds.) *A Companion to Environmental Geography*, pp.266-293. Oxford: Wiley-Blackwell.

-
- Heynen, N. (2003) The scalar production of injustice within the urban forest, *Antipode* 35, pp.980-998.
- Heynen, N., Kaika, M. and Swyngedouw, E. (2006a) *In the Nature of Cities: Urban Political Ecology and the Politics of Urban Metabolism*. London: Routledge.
- Heynen, N., Kaika, M. and Swyngedouw, E. (2006b) Urban political ecology: Politicizing the production of urban natures. In Heynen, N., Kaika, M. and Swyngedouw, E. (Eds.) *In the Nature of Cities: Urban Political Ecology and the Politics of Urban Metabolism*, pp. 3-20. London: Routledge.
- Hillier, J. (2009) Assemblages of justice: The 'ghost ships' of Graythorp, *International Journal of Urban and Regional Research* 33, pp.640-661.
- Himley, M. (2008) Geographies of environmental governance: The nexus of nature and neoliberalism, *Geography Compass* 2, pp.433-451.
- Hinchcliffe, S. (1999) Cities and nature - Intimate strangers. In Allen, J. and Pryke, M., editors, *Unsettling Cities*, 137-180. London: Routledge.
- Holifield, R., Porter, M. and Walker, G. (2009) Spaces of environmental justice: Frameworks for critical engagement, *Antipode* 41, pp.591-612.
- Hopkins, R. (2008) *The Transition Handbook: From Oil Dependence to Local Resilience*. Totnes: Green Books.

-
- Jameson, F. (2003) Future City, *New Left Review*, 65-79.
- Kaika, M. (2005) *City of Flows: Modernity, Nature, and the City*. London: Routledge.
- Kaika, M. and Swyngedouw, E. (2000) Fetishizing the modern city: The phantasmagoria of urban technological networks, *International Journal of Urban and Regional Research* 24, 120-138.
- Kaika, M. and Swyngedouw, E. 2010: The urbanization of nature. Great promises, impasse, and new beginnings, in Bridge, G. and Watson, S. (Eds.) *New Companion to Urban Studies*. Oxford: Wiley/Blackwell (forthcoming).
- Keil, R. (2003) Urban political ecology, *Urban Geography* 24, pp.723-738.
- Keil, R. (2005) Progress report - Urban political ecology, *Urban Geography* 26, pp.640-651.
- Keil, R. (2007) Sustaining modernity, modernizing nature: The environmental crisis and the survival of capitalism. In Krueger, R. and Gibbs, D. (Eds.) *The Sustainable Development Paradox: Urban Political Ecology in the United States and Europe*, pp.41-65. London: Guildford Press.
- Kurtz, H.E. (2002) The politics of environmental justice as the politics of scale: St. James Parish, Louisiana, and the Stintech siting controversy. In Herod, A. and Wright, M. (Eds.) *Geographies of Power: Placing Scale*, pp.249-273. Oxford: Blackwell.

-
- Kurtz, H.E. (2009) Acknowledging the racial state: An agenda for environmental justice research, *Antipode* 41, pp.684-704.
- Lake, R. (1996) Volunteers, NIMBYs, and environmental justice: Dilemmas of democratic practice, *Antipode* 28, pp.160-174.
- Latour, B. (1993) *We Have Never Been Modern*. Cambridge, Mass.: Harvard University Press.
- Laurian, L. (2008) Environmental injustice in France, *Journal of Environmental Policy and Management* 51, pp.55-79.
- Lavelle, M. and Coyle, M. (1993) Unequal protection: The racial divide in environmental law, 136-143. In Hofrichter, R. (Ed.) *Toxic Struggles: The Theory and Practice of Environmental Justice*, Philadelphia: New Society.
- Leitner, H., Sheppard, E. and Sziarto, K.M. (2008) The spatialities of contentious politics, *Transactions of the Institute of British Geographers* 33, pp.157-172.
- Lewontin, R. and Levins, R. (2007) *Biology under the Influence - Dialectical Essays on Ecology, Agriculture, and Health*. New York, NY: Monthly Review Press.
- Liebig, J.F.v. 1855: *Principles of agricultural chemistry*. [S.l.]: Walton and Maberly.
- Lucas, K. (2004) (Ed.) *Running on Empty: Transport, Social Exclusion and Environmental Justice*. Bristol: Policy Press.

-
- Martinez-Allier, J. 2004: *The Environmentalism of the Poor*. Oxford: University Press.
- Miller, B. (2004): Spaces of mobilization: Transnational social movements, pp. 223-246. In Barnett, C. and Low, M. (Eds.) *Spaces of Democracy: Geographical Perspectives on Citizenship, Participation and Representation*, London: Sage.
- Mol, A.P.J. and Spaargaren, G. (2000) Ecological modernisation theory in debate: A review, *Environmental Politics* 9, pp.17-49.
- Morello-Frosch, R.A. (2002) Discrimination and the political economy of environmental inequality. *Environment and Planning C* 20, pp.477-496.
- Nicholls, W.J. (2009) Place, networks, space: Theorising the geographies of social movements, *Transactions of the Institute of British Geographers* 34, pp.78-93.
- Nightingale, A. (2006) The nature of gender: Work, gender, and environment, *Environment and Planning D: Society and Space* 24, pp.165-185.
- O'Connor, J. (1996): The second contradiction of capitalism. In Benton, T. (Ed.) *The Greening of Marxism*, pp.197-221. London: Guildford Press.

-
- Pastor Jr., M., Sadd, J.L. and Hipp, J. (2001) Which came first? Toxic facilities, minority move-in, and environmental justice. *Journal of Urban Affairs* 23, 1-21.
- Pavlínek, P. and Pickles, J. (2000) *Environmental Transitions: Transformation and Ecological Defence in Central and Eastern Europe*. London: Routledge.
- Peck, J. (2006) Liberating the City: Between New York and New Orleans. *Urban Geography* 27(8), 681–713.
- Peck, J., Theodore, N. and Brenner, N. (2009) Neoliberal urbanism: Models, moments, mutations, SAIS Review XXIX, pp.49-66.
- Pellow, D. (2007) *Resisting Global Toxics: Transnational Movements for Environmental Justice*. London: MIT Press.
- Prigogine, I. and Stengers, I. (1985) *Order out of Chaos: Man's New Dialogue with Nature*. London: HarperCollins.
- Pulido, L. (2000) Rethinking environmental racism: White privilege and urban development in Southern California, *Annals of the Association of American Geographers* 90, pp.12-40.
- Rocheleau, D., Thomas-Slayter, B. and Waugh, E. (1996) *Feminist Political Ecology: Global Issues and Local Experiences*. London: Routledge.
- Routledge, P. 2007: Transnational political movements. In Low, M., Cox, K.R. and Robinson, J. (Eds.) *The Sage Handbook of Political Geography*, pp.335-349. London: Sage.

-
- Schlosberg, D. (2003) The justice of environmental justice: Reconciling equity, recognition, and participation in a political movement, pp.77-106. In Light, A. and de-Shalit, A. (Eds.) *Moral and Political Reasoning in Environmental Practice*. London: MIT Press.
- Schlosberg, D. (2007) *Defining Environmental Justice: Theories, Movements, and Nature*. Oxford: Oxford University Press.
- Schroeder, R., St. Martin, K. and Wilson, B. (2008) Third world environmental justice, *Society and Natural Resources* 21, pp.547-555.
- Schweitzer, L. and Stephenson Jr., M. (2007) Right answers, wrong questions: Environmental justice as urban research, *Urban Studies* 44, pp.319-337.
- Smith, A. (2007) Articulating neo-liberalism: Diverse economies and everyday life in postsocialist cities. In Leitner, H., Peck, J. and Sheppard, E.S., editors, *Contesting Neoliberalism: Urban Frontiers*, pp.204-222. London: Guildford Press.
- Smith, N. (1984) *Uneven Development: Nature, Capital and the Production of Space*. Oxford: Basil Blackwell.
- Smith, N. 2005: "There's No Such Thing as a Natural Disaster." *Understanding Katrina: Perspectives from the Social Sciences*. New York: Social Science Research Council, 2005.
- (<http://understandingkatrina.ssrc.org/Smith/> - Accessed 19 May 2010.

-
- Stavrakakis, Y. (1997) Green ideology: A discursive reading, *Journal of Political Ideologies* 2, pp.259-279.
- Swyngedouw, E. (2004) *Social Power and the Urbanization of Water*.
Oxford: Oxford University Press.
- Swyngedouw, E. (2006) Metabolic urbanization: The making of cyborg cities. In Heynen, N., Kaika, M. and Swyngedouw, E. (Eds.) *In The Nature of Cities: Urban Political Ecology and the Politics of Urban Metabolism*, pp.21-40. London: Routledge.
- Swyngedouw, E. (2007a) Impossible “sustainability” and the postpolitical condition. In Krueger, R. and Gibbs, D. (Eds.) *The Sustainable Development Paradox: Urban Political Economy in the United States and Europe*, pp.13-40. London: Guildford Press.
- Swyngedouw, E. (2007b) The post-political city. In BAVO (Ed.) *Urban Politics Now: Re-imagining Democracy in the Neo-liberal City*, pp. 58-76. Rotterdam: Netherlands Architecture Institute NAI Publishers.
- Swyngedouw, E. (2009a) The antinomies of the post-political city: In search of a democratic politics of environmental production, *International Journal of Urban and Regional Research* 33, pp.601-620.
- Swyngedouw, E. (2010) The trouble with nature: Ecology as the new opium for the masses. In Hillier, J. and Healey, P. (Eds.) *The Ashgate Research Companion to Planning Theory*, pp.299-318. Aldershot: Ashgate, 299-320.

-
- Swyngedouw, E. and Heynen, N. (2003) Urban political ecology, justice and the politics of scale. *Antipode* 35, pp.898-918.
- Swyngedouw, E. and Kaika, M. (2000) The environment of the city... or the urbanization of nature. In Bridge, G. and Watson, S. (Eds.) *A Companion to the City*, 567-580. Oxford: Blackwell.
- Sze, J. (2004) Gender, asthma politics, and urban environmental justice activism. In Stein, R., editor, *New Perspectives on Environmental Justice: Gender, sexuality, and activism*, 177-190. London: Rutgers University Press.
- Sze, J. (2007) *Noxious New York: The racial politics of urban health and environmental justice*. London: MIT Press.
- Towers, G. (2000) Applying the political geography of scale: Grassroots strategies and environmental justice, *The Professional Geographer* 52, pp.23-36.
- Varga, C., Kiss, I. and Ember, I. 2002: The lack of environmental justice in Central and Eastern Europe. *Environmental Health Perspectives*, 110(11), A662-A663.
- Virilio, P. (1986) *Speed and Politics: An Essay on Dromology*. New York: Semiotext(e).
- Walker, G. (2009a) Environmental justice and normative thinking, *Antipode* 41, pp.203-205.

-
- Walker, G. (2009b) Beyond distribution and proximity: Exploring the multiple spatialities of environmental justice, *Antipode* 41, pp.614-636.
- Walker, G. (2009c) Globalizing environmental justice: The geography and politics of frame contextualization and evolution, *Global Social Policy* 9, pp.355-382.
- Whitehead, M. (2005) Between the marvelous and the mundane: Everyday life in the socialist city and the politics of the environment, *Environment and Planning D: Society and Space* 23, pp.273-294.
- Whitehead, M. (2007) *Spaces of Sustainability: Geographical perspectives on the sustainable society*. London: Routledge.
- Whitehead, M. (2009) The wood for the trees: Ordinary environmental injustice and the everyday right to urban nature, *International Journal of Urban and Regional Research* 33, pp.662-681.
- World Commission for Environment and Development (1987) *Our Common Future*. (<http://www.un-documents.net/wced-ocf.htm> -- accessed 1 July 2010)
- Young, I.M. (1990): *Justice and the Politics of Difference*. Princeton, NJ: Princeton University Press.
- Žižek, S. (1989) *The Sublime Object of Ideology*. London: Verso.

Žižek, S. (2008a) Censorship Today: Violence, or Ecology as a New Opium
for the Masses. URL: <http://www.lacan.com/zizecology1.htm>
(accessed January 2010).

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