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Introduction

A New Journal for Contemporary Environmental Challenges

Social scientists have been writing about the relationships between people and their surroundings for as long as there has been social scientific inquiry. Fields such as anthropology, economics, history, human geography, law, political science, psychology, and sociology all have long and rich histories of contributing to and pioneering socio-environmental analysis. However, the past 20 years have seen a proliferation of scholarship in the social sciences that is focused on environmental issues. This is due, in part, to changes in our environment that have profound implications for the future of both human society and the environment. It is also due, in part, to the ways in which environmental practitioners have portrayed the causes of these changes. In the 1970s, social scientists, concerned with the ways in which the causes of environmental changes were being attributed to some peoples and not others, felt that their knowledge of social processes and social systems could shed light on these issues (see Blaikie and Brookfield 1987). They thought that the methods and theories of the social sciences could and should be brought to bear on questions about contemporary environmental changes. Climate change, the water crisis, deforestation, desertification, biodiversity loss, the energy crisis, nascent resource wars, environmental refugees, and environmental justice are just some of the many compelling challenges facing society today that were identified by these early scholars as sites in need of social scientific analysis.

Most social scientists approach environmental issues by asking why a phenomenon is taking place and then trace the answers out across time and space (cf. Vayda 1983). More often than not, they also contextualize the answers they find within larger conversations, debates, and theories in and across disciplines and thus attend to cultural, historical, political, and economic contexts. In asking questions and then contextualizing the answers within social scientific theory and discourse, they sometimes write in ways that are difficult for outsiders to decipher. This is also the case in the natural sciences. Within atmospheric science, biology, chemistry, ecology, geology, geophysics, hydrology, oceanography, physical geography, physics, and soil science, scholars have developed their own vernaculars and systems of contextualization. These competing vernaculars often make it seem as if social and natural scientists cannot (and do not) communicate at all.

Environment and Society: Advances in Research is meant to address these key issues, among others. This new journal focuses on contemporary environmental topics that large numbers of social scientists in multiple disciplines write about. We provide peer-reviewed articles that analyze and summarize existing research and that offer suggestions for new directions in research. These articles are not steeped in disciplinary vernaculars, but they do incorporate contemporary theory. With this, they afford a window into social science without editing out the insights brought to the empirical world through rigorous engagements with theory. The journal also offers reviews of books concerned with environmental issues that are of significance for both the social and

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natural sciences. The editors see the journal as a site for dialogue across disciplines within the social sciences and as a resource to which natural scientists, policy makers, environmental practitioners, and activists can turn in order to understand better the work that social scientists do.

This first volume of *Environment and Society: Advances in Research* focuses on social scientific analyses of climate-related topics. The first article, by Noel Castree, is titled "Neoliberalism and the Biophysical Environment: A Synthesis and Evaluation of the Research." Many social scientists working on the environment in general and climate-related issues in particular frame their work in terms of the socio-economic philosophy that has come to be known as 'neoliberalism'. Castree explains this philosophy and shows how the policy ideas and practices that emerge from it affect both environments and societies. He then reviews the ways in which social scientists have attended to neoliberalism and environmental issues for the past decade. Castree's article is about neoliberalism, but it can also be read as an example of the ways in which social scientists work to understand the confluence of the various processes mentioned above and then build social theory from these understandings. 'Neoliberalism', 'neoliberalization', and 'eco-neoliberalism' are terms in the social scientific vernacular. In reviewing a substantial literature, Castro unpacks these concepts in a clear and compelling way, opening them up to wider transdisciplinary understanding.

In "Neoliberal Water Management: Trends, Limitations, Reformulations," Kathryn Furlong frames her analysis of water policy and management in terms of neoliberalization. Furlong describes the claims of neoliberal reformers and of their opponents in Bolivia, her long-term site of research, situating them in a much broader discussion of the environmental aspects of the philosophical tenets that drive neoliberal reforms. She shows how that philosophy is mobilized, not only when it comes to addressing water shortage issues, but also when other matters, such as climate, are dealt with.

In his article, "Controversies in Climate Change Economics," Robert Eastwood explains how economists understand and evaluate the most pressing climate-related issues. He demonstrates how the economic and scientific uncertainty associated with climate creates a policy context that requires innovative measures in assessment and policy crafting. Eastwood also examines other economic reviews of climate change and climate change policy, illustrating how different approaches to climate policy analysis exist within economics. Part of what is compelling about Eastwood's article is the way in which he clearly documents the issues that are important to economists and how those issues then drive the analytic tools that they bring to the entire climate debate.

Richard Ladle and Paul Jepson's article, "Origins, Uses, and Transformation of Extinction Rhetoric," examines the role of extinction in climate-related discussion and illustrates how social scientists contextualize the questions they ask in wider frames. The authors trace the history of academic and political discussions about extinction in order to show how these discourses influence policy and practice. They carefully review studies concerned with extinction from multiple disciplines, and through this they provide suggestions as to how conservation practitioners and policy crafters might draw on this wide literature in order to create more robust approaches to issue of extinction.

The next two articles, "Climate Changing Small Islands: Considering Social Science and the Production of Island Vulnerability and Opportunity," by Amelia Moore, and "Adaptation—Genuine and Spurious: Demystifying Adaptation Processes in Relation to Climate Change," by Thomas Thornton and Nadia Manasfi, provide literature analyses that work to contextualize case studies. In doing so, they demonstrate how contextualization makes the social scientific analysis of empirical evidence richer. In her review of research literature, Moore examines the processes by which small islands have been incorporated into climate-related debates. She then

contextualizes state-specific discussions about climate change science and policy, vulnerability indexing, and sustainable economic growth in the Bahamas within this literature. Thornton and Manasfi review the social scientific literature on adaptation. After carefully assessing whether adaptation to climate change can be planned and managed, they show how contemporary governance frameworks fail to address the growing pressure that climate stress is exacting on indigenous peoples in the far north of Alaska and Canada and in the Arctic Circle. Both of these articles show the current and potential human aspects of the climatic-related economics discussed by other authors.

In their article "Climate Change Resilience and Adaptation: Perspectives from a Century of Water Resources Development," Clive Agnew and Philip Woodhouse argue that much of the debate about how societies adapt to climate change is in fact a discussion about water management. They offer a careful analysis of the literature on resilience and adaptation while exploring the reasons for failure and success in adapting to water scarcity and degradation in different circumstances. Their research is particularly pertinent for dialogues about coping with climate change.

Finally, in the book reviews section, we provide critiques of 12 environmentally focused social scientific books published between 2007 and 2010. Through this feature of the journal, we hope to show how publications in the social sciences speak to issues of broad concern across disciplines. The reviews in this volume examine environmental conservation practice, science and policy, long-term global environmental changes, the medical effects of pollution, the economic aspects of disasters, urban ecology movements, the relationship between ecological and social change, environmental history, and the environmental politics of economic development.

Paige West, Dan Brockington, Jamon Halvaksz, and Michael Cepek

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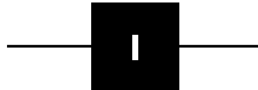

ARTICLES

Neoliberalism and the Biophysical Environment

A Synthesis and Evaluation of the Research

Noel Castree

ABSTRACT: This article both synthesizes and critically evaluates a now large, multi-disciplinary body of published research that examines the neoliberalization of environmental regulation, management, and governance. Since the late 1970s, neoliberal ideas and ideals have gradually made their way into the domain of environmental policy as part of a wider change in the global political economy. While the volume of empirical research is now such that we can draw some conclusions about this policy shift, the fact that the research has evolved piecemeal across so many different disciplines has made identifying points of similarity and difference in the findings more difficult. After clarifying what neoliberalism is and explaining why the term 'neoliberalization' is preferable, the article analyzes the principal components and enumerates the social and environmental effects of this multifaceted process. By offering a comprehensive and probing survey of the salient literature, I hope not only to codify the existing research but also to guide future critical inquiries into neoliberal environmental policy.

KEYWORDS: biophysical world, deregulation, environmental policy, governance, neoliberalism, neoliberalization

In this article I will examine the relationship between neoliberalism and the biophysical world. 'Neoliberalism' is very much a critics' term, an oppositional badge as much as an analytical concept.[1] For those who choose to use it, the word describes a worldview fleshed out over the last 30 years at the sub-national, national, and global scales. Rarely invoked before 2000, it is now part of the *lingua franca* of left-wing social scientists and activists. Researchers in development studies, sociology, area studies, anthropology, labor studies, political science, cultural studies, human geography, philosophy, environmental studies, international relations, education policy studies, and the radical fringes of the economics profession have—over the last decade—sought to define neoliberalism, identify its modes of operation, track its mutations, pinpoint its effects, and describe various modes of opposition to it. Where political activists have often used the term for polemical purposes, academic researchers have attempted to mount a rather cooler challenge to neoliberalism on both evidential and moral-political grounds. There have been

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two main camps, theoretically speaking: namely, a political-economic one, which is broadly neo-Marxist, and a Foucauldian one—with some overlap between the two (e.g., Lockwood and Davidson 2009).[2] Together, their members have produced a now sizable literature comprising monographs, co-authored books, edited collections, and peer-reviewed articles like this one. In surveying this literature, I will be focusing on those parts of it where the analytical attention has principally addressed neoliberal environmental use and management. I have selected only those publications in which the term 'neoliberalism' is—in my view—central to the arguments and research findings presented.[3]

The original architects of neoliberal thinking, such as Milton Friedman and Friedrich von Hayek, said little about environmental issues or natural resource management. However, since the mid-1980s, many neoliberal values and principles have steadily made their way into the domain of environmental policy,[4] conceived here in the widest possible sense to include situations where any element of the biophysical world is a major focus of policy makers' attention at any spatio-temporal scale. Accordingly, a previous trickle of research into neoliberal environmental governance has given way to something of a torrent over the last five years or so. As we will see, this research comprises predominantly single-site case studies, presented in rich empirical detail. It also covers the full spectrum of environmental and resource policy domains, from water to fisheries to farming and beyond. Up to the present, this research has grown organically in a rather disparate fashion, with some elements of disciplinary crossover.[5] In order to steer its future development, it is useful to take stock of the insights that the research offers to date, to draw wider lessons about neoliberal environmental governance, and to assess the way that critics have investigated it so far.

To summarize, this article will operate at two levels toward two rather different ends. First, it will parse the insights of numerous studies in order to clarify how neoliberal environmental governance has operated to date and with what effects. Secondly, it will treat the authors of these studies as a loose 'epistemic community' whose worldview and research practices do not simply hold a mirror up to a neoliberal world existing 'out there'. I identify broadly with its members' value set and normative agendas, but I also believe that this community may want to reflect critically on its own habits of thought and analysis. Having written along these lines for a human geography readership (Castree 2008a, 2008b), this article is directed at a wider and more intellectually mixed audience, spanning several social science disciplines (as befits the remit of this journal).[6] I hope that those who are new to the subject, as well as those familiar with it, will profit similarly from reading this comprehensive review.[7] As ever with review articles, there is the risk that I am imposing a false order on the literature I survey. I will thus try to be scrupulous about justifying my various 'moves' as I proceed, and I invite readers to assess these moves critically.

The article is organized as follows. I begin in a rather obvious place by seeking to define and delimit the term 'neoliberalism'. Here I summarize the insights of critical social scientists who do not themselves study environmental management but whose writings have influenced those who do. Then I introduce the research literature on the neoliberalization of nature in general terms. This done, the next two sections distill the substantive insights of this largely case study–based literature, focusing on the process of reregulation and its socio-ecological outcomes, respectively. I then further refine these insights into a small set of provisional 'take-home' lessons. The final main section presents a sympathetic critique of the literature, wherein I raise several key questions about the published research analyzed earlier. While this article is extensive, I believe that its length is justified. Considering the number of publications reviewed, as well as the scope of my 'take' on them, a shorter survey would sacrifice much detail and many key points—especially for those new to this literature.

Before I get down to business, I should make one final introductory observation. In light of the recent financial crisis and current global economic recession, some have suggested that the 'neoliberal era' has come to an end—or at least the beginning of the end. If true, this would imply no future for the sort of research surveyed here and would make this article very untimely indeed. Needless to say, I reject this suggestion (cf. Brand and Sekler 2009). Periodizing history is notoriously tricky, as is the identification of temporal 'breaks'. Craig and Cotterell (2007: 510) note that "the various conjunctural factors bundled together [by analysts] to constitute 'neoliberalism' (and any plausible period shift in it) are quite diverse in nature, so that first of all comparing the relative weight or importance of any them to an overall periodizing assessment is analytically fraught." Moreover, even supposing that we *have* been living through a historic period sufficiently homogeneous to be called neoliberal, experience tells us that there are rarely punctual transitions between one putative era and another. The traces of the recent past will inevitably continue to affect both the present and the short- to medium-term future (see Brenner et al. 2010). As *New Left Review* editor Susan Watkins (2010: 14) notes, "The widely proclaimed end of neo-liberalism looks more and more like the continuation of its agenda by other means." I doubt, in other words, that the term 'neoliberalism' will disappear from the vocabulary of social scientists (or political activists) any time soon. If it does, we will probably be employing new words to capture its meanings and to describe many of its real-world objects (Clarke 2010). Therefore, throughout this article I will talk of neoliberalism in the present tense, presuming that the term and the things that it names retain their currency for the time being.[8] The question then becomes not *whether* we should (still) use the term, but rather *how*.

What Is 'Neoliberalism'?

Conceptual Issues

The research into neoliberal environmental governance is in one sense parasitic on a wider theoretical and empirical literature in which environmental issues are not strongly thematized. This broader literature mostly predates the research being surveyed in this article, and this antecedence explains why it has proven formative for many who interrogate neoliberal environmental policy. There has, in my view, been a tendency for the latter to borrow definitions and insights from the former rather than to rework and question them. That does not make their work entirely derivative—far from it, in fact. As we will see later, the primarily empirical (rather than theoretical) character of recent research into neoliberal environmental governance is its major strength and contribution. Along with Adam Tickell, Nik Theodore, and Neil Brenner, Jamie Peck has done much to shape social scientific conceptions of neoliberalism. Not long ago, Peck (2006: 731) observed that "there remains a paucity of 'grounded' work on the specific and concrete routines, practices, networks, and structures through which the neoliberal project has been constructed and sustained." This is no longer true, and the recently published research into neoliberalism and the environment can take considerable credit for filling the empirical gap that Peck identified. Even so, in conceptual terms much of this research has tended to work with 'off the peg' definitions of neoliberalism developed by others (such as Peck himself). What is more, these definitions have been used selectively and partially, depending on the case.

Note that I use the word 'definitions' in the plural. The reason that economic sociologist Stephanie Mudge (2008) so recently felt compelled to ask "What is neoliberalism?" is because of the diversity of meanings and applications in play. Despite the term's current popularity among a cohort of left-wing social scientists, the more familiar it has become, the less consensus there

appears to be about what it means. James Ferguson (2010: 170) observes that "there is [now] huge variation in the way the word 'neoliberalism' is used in contemporary scholarship." And yet, perhaps curiously, most researchers who employ the term typically proceed as if the meaning is clear and maps onto a definite set of values, ideas, and/or practices that exist in the wider world. Thus far, there has been little sustained discussion about the term's ambiguities and complexities—a conversation that is now certainly overdue.

So what is going on here? One view is that neoliberalism is an unusually complex word (like 'globalization' or 'nature') and as such signifies a range of related meanings that can be applied to a plethora of real-world referents. Seen from this perspective, as long as the term's meaning is clear for each context of application, there is no especial problem with it signifying several things and having myriad objects of empirical reference through strong 'family ties'. Another view is that we should relieve the term of some of its current denotations, not least because we have other well-established words for them, such as privatization, commodification, the free market, the Washington Consensus, and structural adjustment. By doing so, we would restrict—and so render more precise—the meaning of those situations or things we still prefer to describe as neoliberal (see Boas and Gans-Morse 2009). Still another perspective is that we are now beyond the point of no return: so various and confusing are the meanings of neoliberalism that it has become as 'chaotic' a concept as globalization was after a decade of debate and use (circa 1990–2000). For instance, in their recent review, anthropologists Catherine Kingfisher and Jeff Maskovsky (2008: 123) confessed a temptation "to abandon the term altogether"—and they are not alone (see Barnett 2010).

For now, I will adopt the first of these viewpoints (although I will come back to the other two toward the end of this article). In other words, I will presume that while the term 'neoliberalism' is polysemic and refers to a plurality of material and discursive things, there are nonetheless a set of fairly stable, circumscribed, but also related meanings in use that are applied in a relatively consistent way by academic analysts. In effect, this is the viewpoint adopted by those social scientists investigating neoliberalism and the biophysical world (as we will see later). Each researcher has defined neoliberalism in a certain recognized manner and then undertaken an empirical investigation of environmental governance with this particular definition in place. The assumption is that there is a meaningful similarity (or even relationship) between otherwise different and separate studies.

The Meanings of Neoliberalism

As some readers will know, the term 'neoliberalism' was coined by a group of economists and legal scholars based in Freiburg between World War I and World War II. Subsequently, it was used quite briefly by those now thought to be neoliberalism's principal intellectuals, that is, the already mentioned Hayek and Friedman, even though neither man entirely accepted the Freiburg (or 'ordoliberal') model of a state-managed 'market society'. As I intimated above, those individuals and institutions that the critics choose to call 'neoliberals' did not/do not use the term as a self-descriptor and rarely ever have. After a smattering of appearances during the 1990s (e.g., Barry et al. 1996; Fraser 1993; Gowan 1995; Tickell and Peck 1995), these critics started to invoke the term with increasing frequency from the turn of the millennium. My own reading of the now voluminous academic literature suggests that, for this interdisciplinary epistemic community of social scientists, the term 'neoliberalism' describes one or more of the following three related things: first, a worldview (i.e., a body of normative principles, goals, and aspirations amounting to a philosophy of life, or something close to one); second, a policy discourse (i.e., a set of specific values, norms, ambitions, and associated policy proposals professed

by those who control, or realistically seek to control, the formal apparatuses of government); and, third, a set of practical policy measures (i.e., concrete regulations and procedures that make both the worldview and the policy discourse evident in some tangible way). As a shorthand, we can think in terms of 'three p's': philosophy, program, and practice.[9] I will now discuss each of neoliberalism's three aspects in turn.

1. *Neoliberalism as worldview (philosophy)*. Although Hayek, Friedman, and others of their ilk rarely used the term, their neoliberalism, according to David Harvey (2007: 24), "took the political ideals of individual liberty and freedom as sacrosanct." However, there are many different ways in which to define and engender liberty and freedom.[10] The neoliberal ideals articulated in books such as *The Road to Serfdom* (Hayek 1944), *The Constitution of Liberty* (Hayek 1960), and *Capitalism and Freedom* (Friedman 1962) accented two things. First, the state's role was to maximize the independence of both real and institutional-juridical individuals: anything less would be anti-liberal, a travesty of 'true freedom'. Governments and bureaucracies, it was argued, should refrain from imposing collective agendas and otherwise 'interfering' in the lives of people. In this sense, the early neoliberals strongly emphasized not only the rights of individuals but also their responsibility to make their own way in the world. Second, neoliberalism's founding thinkers saw money-mediated markets as the best mechanism for coordinating among the diverse needs and wants of ostensibly free people. This is because markets were seen as highly 'intelligent' and 'efficient'. Price signals, it was claimed, enable disparate providers and users of goods and service to achieve many of their desires, given whatever restraints of resource availability happen to be in place for those involved. Indeed, market competition was seen as bringing the best out of entrepreneurs, while delivering value for money to intermediate and end consumers. This belief segued into a critique of 'state failure', that is, the idea that government bureaucracies are administratively cumbersome and economically wasteful vehicles for service delivery.[11]

The neoliberal worldview, as summarized above, is not—despite appearances—fixated on economic liberty alone, although it is emphasized very strongly indeed. Political and civil liberties are featured as well: electoral democracy was the early neoliberals' favored political system, and freedom of expression (within or without the market) was also seen as fundamentally important. This wide-ranging doctrine began to take shape during World War II and its immediate aftermath. Fashioned in reaction to the totalitarian impulses of fascism and communism, it was also presented as an alternative to the new Keynesian welfare-state paradigm, which licensed state intervention in the market and in many aspects of citizens' daily lives. In the former respect, neoliberal thinking was at one with the *zeitgeist*, but this was not so in the latter respect. Commenting on *The Road to Serfdom*, Peck (2008: 5–6) says that "the book may have been a best-seller, but it was practically an act of self-immolation for Hayek-the-economist." Writing in the same year of its publication, Hayek's contemporary Karl Polanyi (1944: 142) declared that "our age will be credited with having seen the end of the self-regulating market." In advocating an alternative to Keynesianism, the neoliberal worldview remained well outside the perimeter of cognitive and moral 'common sense' until the economic and political crises of the 1970s.

2. *Neoliberalism as policy discourse (program)*. For over three decades, neoliberal ideas were incubated within a select group of university economics departments, foundations, and think tanks. As the excellent histories recounted by Peck (2008) and Mirowski and Plehwe (2008) show so well, the neoliberal 'thought collective' was transnational, composed of groups in both Europe and the US, with a good deal of interchange between them—not least because of the efforts of the Mont Pelerin Society (formed by Hayek in 1947 and based in Chicago).[12] The collective's eventual success was hardly predictable during the immediate post-1945 period.

Lacking political influence and much academic credibility, neoliberal thinkers initially produced a combination of general manifestos and fundamental works of theory, only later turning their attention to policy programs in live settings. In the latter respect, Pinochet's Chile was a key opportunity: a group of Friedman-trained economists were invited to remake the country's political and moral economy almost overnight (while being safeguarded by a military dictatorship). It was the first of several opportunities provided by domestic crises of one sort or another; however, without the groundwork laid by the prolonged efforts of the Mont Pelerinians, these opportunities could not have been exploited. As is well known, by the late 1970s, New Zealand, the United Kingdom, and the United States were the other three countries where some version of the neoliberal worldview was taken seriously by political-economic elites. It gained a subsequent hearing in many other countries—especially after the late-1980s 'revolutions' in Eastern Europe—and also in a range of US-dominated global institutions, such as the World Bank and the International Monetary Fund (IMF).

As a policy discourse, the neoliberal worldview is typically understood by critics to include the following seven proposals for significant society-wide change. Note that national governments are the major institutions tasked with delivering these changes. Like all political philosophies and programs, neoliberalism is necessarily a state-led project.

1. *Privatization*: assigning clear, legally enforceable private property rights to hitherto unowned, state-owned, or communally owned aspects of the social, cultural, and/or natural worlds.[13]
2. *Marketization*: rendering alienable and exchangeable things that might not previously have been subject to a market logic expressed through commodity transactions within and between nation-states measured in monetary terms.[14]
3. *State roll-back or deregulation*: withdrawing or diminishing state intervention in certain areas of social, cultural, and environmental life in order to enable firms and consumers to exercise 'freedom of choice'; creating new quasi-state or state-sanctioned 'non-political' actors to take on functions that states themselves could, in theory or in practice, otherwise perform; and contracting private or third sector bodies to deliver some state services through a process of competitive bidding or through partnership agreements.
4. *Market-friendly reregulation*: reconfiguring the state so as to extend the frontiers of privatization and marketization. The state in its various forms becomes more a 'market manager' and less a 'provider' to the citizenry or to 'special interests' therein: it intervenes *for* the market economy, not, as it were, *in* it. This entails fiscal discipline, a focus on supply-side investments, entrepreneur- and consumer-friendly tax policies, firm-friendly labor market policies, and measures to enable 'free' movements of money capital, as well as other less 'fluid' commodities.
5. *Use of market proxies in the residual state sector*: making the remaining state functions and services more market-like in their operation through the use of measures such as internal markets, cost recovery, and budget capping. This amounts to embedding an ethos and the practices of 'commercialization' into state services.[15]
6. *Strong encouragement of 'flanking mechanisms' in civil society*: using state-led measures to promote the growth of (a) robust informal and social economies, and (b) voluntary, charitable, non-profit, and community groups, all preferably well-funded and professionalized. Together, these mechanisms are intended to fill the vacuum created by the absence/diminution of direct state support in the social and environmental domains. They could be interpreted as a 'shadow state' that is emergent organically, once prodded by the state.
7. *Creation of 'free', 'self-sufficient', and self-governing individuals and communities*: cultivating an ethic among persons, other juridical units, and communities that emphasizes less

(and ultimately limited) reliance on public services and state agencies for life's necessities. This ethic extends to those operating within the state apparatus itself. It equates to a 'responsibilization' of all producers, consumers, citizens, families, communities, institutions, and spatial units of governance, as well as their 'autonomization'.[16]

Clearly, there is a dialectical relationship between neoliberalism as a worldview and as a program. To the extent that the program gains traction and exerts influence within any given context, it not only lends legitimacy to the worldview but poses a barrier to its future removal by critics.

3. *Neoliberalism as a set of actionable policy measures (practice)*. For any program to translate into actual policies, its advocates first need to legitimate their worldview. As Clarke (2004: 34) reminds us, "Politics is both a regime of truth (ruling out the irrational, marginal or unworkable …) and a field in which … some discourses [are allowed] to contend." Because the neoliberal worldview and policy program are so wide-ranging and ambitious, it is no surprise that they can be—and have been—translated into a plurality of concrete policy measures. The following are some common practices of neoliberalism in action that have been identified by analysts (even if these measures have frequently been more honored in the breach):

- *Macro-economic policies* that place controls on government borrowing, keep inflation low, place constraints on domestic money supply, keep taxation levels low, allow exchange rates to float, and allow interest rates to be determined by the market (or at least not to be determined by the government).
- *Industrial and business policies* that (a) remove selective subsidies, trade barriers, investment barriers, and ownership barriers, and (b) incentivize innovation, competition, and entrepreneurial risk taking. In effect, these policies widen and intensify commercial competition.
- *Labor market policies* that remove collectivist 'obstacles' to competition and reward, such as wage controls and trade union membership.
- *Education and training policies* that focus on the supply side and encourage individuals to build their 'human capital', be adaptable, and commit to 'lifelong learning'.
- *Managing, monitoring, and auditing measures* that—whether in the private, state, or third sector—focus hard on setting targets, establishing benchmarks, measuring performance, penalizing failure, and rewarding success. In the state sector, these measures have been inspired, variously, by approaches known as 'new public management', 'transaction cost theory', and 'principal-agent theory'.
- *Social policies* that are oriented to 'workfare' not 'welfare' and that offer state support only to the very needy or chronically disadvantaged. This entails a remoralization of the poor and the 'excluded', so as to 'responsibilize' them for their livelihoods, their successes, and their 'failures'. They are thus exposed to the various risks of life and to living without much assistance from society or the state.
- *Law and order policies* that take an uncompromising approach to rule breakers, 'troublemakers', and those who otherwise cause social disruption and infringe upon the rights of others.
- *Civil rights policies* that encourage free speech, freedom of information, lifestyle choice, privacy rights, and freedom of assembly—as long as the rule of law is observed.
- *Governance policies* that, in a range of policy areas, democratize and devolve decision making by empowering a wide range of actors outside the formal sphere of government.[17] Empowerment is about making decisions and dealing with their consequences, for good or ill.

I will deal with environmental and natural resource policies later in the article, but for now, suffice it to say that these policies aim to achieve given ends—such as environmental protection or resource conservation—in efficient and competitive ways by variously privatizing, marketizing, and de-statizing a range of biophysical goods and ecosystem services.

Again, it almost goes without saying that neoliberal policies are linked recursively to program and philosophy. For instance, Peck and Tickell (2002) have argued that the 'roll-back' policies of a 'hard' neoliberal program have, in countries like Britain and the US, given way to 'roll-out' policies that seek to embed core neoliberal principles and values as norms governing everyday life and living. A key point to make here is that a wide range of different concrete policy measures—alone and in combination—will 'deliver' various of the seven elements of the neoliberal policy proposals detailed above. There is no universal or perfect 'one-to-one' mapping of these elements onto discrete policy measures.

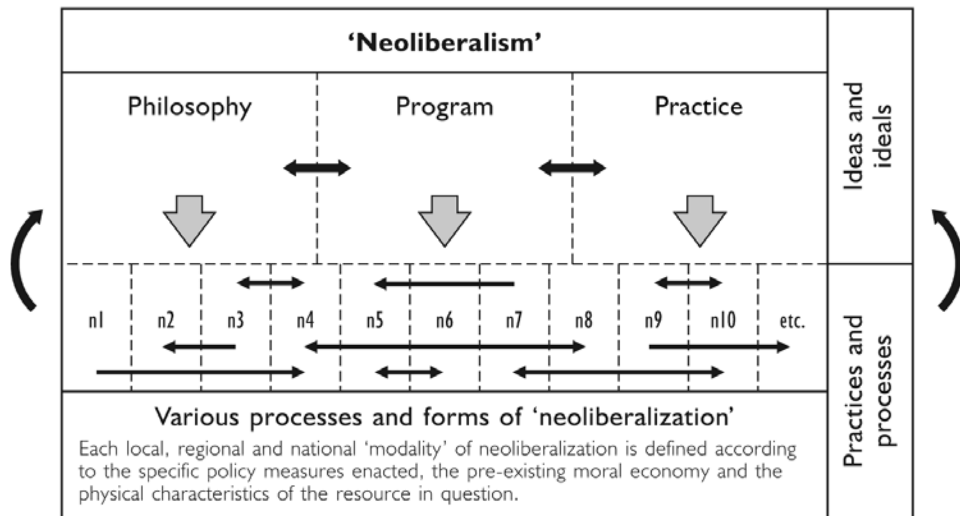
Neoliberalism or Neoliberalizations?

This three-part disaggregation of neoliberalism usefully clarifies the term's complex meanings and myriad referents. It may help readers to understand better what different researchers are referring to when they describe something as 'neoliberal'. Clearly, one should not elide philosophy, program, and practice, even though they are necessarily related. Mudge (2008), following sociologist Pierre Bourdieu's concept of different discursive-institutional 'fields', uses a 'horizontal' metaphor to understand the 'three p's'. For her, the philosophy is located in the 'intellectual field' (dominated by university economics departments, think tanks, and foundations), the program in the 'political field' (political parties, professional politicians, and elected leaders), and the practice in the 'bureaucratic field' (civil servants, administrators, managers appointed by elected politicians, nominated firms, sanctioned NGOs and charities, etc.). Obviously, the fields greatly overlap and mutually condition one another—but how?

Here, one or two commentators have come unstuck. For instance, in an uncharacteristically ill-judged (and much cited) observation, *New Left Review* editor Perry Anderson (2000: 7) once said that "neo-liberalism as a set of principles rules undivided across the globe: the most successful ideology in world history." Similarly, another observer, otherwise attentive to the uneven development of neoliberalism, has sometimes described it using blanket metaphors: "Neoliberal[ism] has in effect swept across the world like a vast tidal wave of institutional reform and discursive adjustment … no place can claim total immunity (with the exception of a few states such as North Korea)" (Harvey 2007: 23). Statements like these paint a picture of 'hegemonic neoliberalism', thus spatializing at the global scale the notion of a supposedly coherent period or era (with the oft-used term 'neoliberal globalization' performing the same function). Such statements imply a one-way, unadulterated relationship between philosophy, program, and practice in which a peculiarly homogeneous geography of neoliberalism (with a capital 'N') writ large is imagined—a sort of spreading ink blot that has its origins in the academic field. However, very few empirical analysts of neoliberalism see it in such simplistic terms, which is why the process term 'neoliberalization' has been favored since it was coined nearly a decade ago by Peck and Tickell (2002). Neoliberalization describes an ongoing, unfinished process of proposing, revising, testing, applying, and further altering neoliberal ideas and policies. As Neil Brenner and Nik Theodore (2002) have argued, 'actually existing neoliberalism' is not the same as the neoliberal philosophy. Indeed, Harvey (2005: 19) regards the latter as utopian, as a rhetorical cloak used to describe and justify the messy pragmatics of programs and policies in practice. It is thus ironic that he inadvertently bolsters the utopian rhetoric by discussing neoliberalism with a capital 'N'.

These arguments suggest that what is referred to as neoliberalism in the singular is, in reality, a complex historical-geographical formation that is marked by unevenness and variety as much as it is by similarity—that is to say, it is a set of interconnected local, regional, and national neoliberalizations (in the plural). Neoliberal ideas may well have 'gone global' from the mid-1980s, courtesy of the US and its influence on the World Bank and the IMF. But this has not resulted in a tidy process of downward and outward diffusion from neoliberalism's North Atlantic heartlands. Instead, there has been path dependency, contingent couplings, unplanned adaptations, organic mutations, and a good deal of social resistance to 'new liberal' policies. Varying combinations of coercion, consent, contestation, and compromise describe the spatio-temporal evolution of neoliberal projects in different parts of the world. In some cases, their reach is wide and deep; in others, it is not. Peck (2006: 732) summarizes well the research agenda that follows from this: "If neoliberalism can only exist in hybrid, in a kind of parasitic relation to the social formations that provide its hosts, then there is … considerable work to do in mapping varieties and transmutations of the project" (see fig. 1).[18]

Figure 1: From neoliberalism to neoliberalization



Note: In order to ensure that 'philosophy' and 'program' are not perceived by readers to 'determine' 'practice', the last has been placed in the top part of the figure. However, perhaps somewhat confusingly, the pragmatics of practice are signified in the lower half of the figure. This is confusing only if readers divorce practice from philosophy and program. In actuality, they are inseparable; hence, the dotted lines used in the figure above.

Neoliberal Environments: Introducing the Topic and the Published Research

As already stated, critical social scientists interested in environmental management, natural resource use, and related issues came late to the discourse of neoliberalism, when compared with most of those whose works I have cited previously. Even so, they had been discussing at least some of the same phenomena by way of other terms, such as 'free market environmentalism' (see, e.g., Eckersley 1993). Since roughly 2000, they have linked these terms to the concept of neoliberalism or, for various reasons, have eschewed the former and used the latter as an analytical framing device in their research.

Neoliberal Environmental Policy: History and Declared Benefits

Environmental and natural resource policies that deliver one or more elements of the seven neoliberal policy proposals have been implemented in a wide range of contexts and locations. The question arises: given that neoliberal ideas originally made little or no reference to natural resources or environmental issues, why did they find expression in water, forestry, and fisheries management (to take just three examples) in many places, regions, and countries? The published research literature suggests that there are five answers to this question, even though the complete history has yet to be detailed.

First, Steven Bernstein (2002) points to the entirely contingent coupling of environmentalism and neoliberalism during the 1980s—what David Driesen (2008) refers to as a 'shotgun wedding'. The global rise of environmental concern through the 1960s and 1970s, Bernstein argues, coincided with the success of neoliberalism in the Anglo-American world and, via the World Bank, the IMF, and the World Trade Organization, at the global level through the 1990s (see also Hartwick and Peet 2003). Yet the post-war origins of environmentalism can, of course, be traced back to the Fordist-Keynesian, pre-neoliberal period, one that ended with widespread talk of an 'environmental crisis'. Second, environmentalism aside, the idea of 'green' development took hold in several global institutions from the late 1980s. The idea was that in the global South there were many 'unpriced' and often unowned biophysical 'assets' that could, if inserted into global markets, create revenue streams that would be able to support much-needed socio-economic development. These assets to be traded overseas included everything from rare and beautiful animal species to plantation trees and mineral resources. Third, in some (but by no means all) domains of environmental management and natural resource policy, neoliberal ideas had already been aired quite separately from the broad manifestos authored by the likes of Friedman and Hayek. For instance, during the 1950s, economist H. Scott Gordon (1954) had suggested a proto-neoliberal solution to overfishing in which private property and markets played a major role, while the famous essays authored by Garrett Hardin (1968, 1974) more than a decade later popularized similar ideas for all 'open access' resources. The term 'neoliberal' was not used by Gordon or Hardin, but their arguments were consistent with the neoliberal philosophy. Fourth, because many natural resources (e.g., water and forests) had been managed by state bodies as public services or national assets following World War II, it was inevitable that neoliberal politicians, such as Margaret Thatcher, would seek to manage these resources using the same political-economic rationality utilized in all other areas of economic and social policy. Fifth, in the US a small group of think tanks and foundations worked very hard from the late 1970s to popularize 'green neoliberalism' (Goldman 2005) as a way of responding to the concerns of the green movement without capitulating to 'command and control' solutions. This later had effects on American environmental policy arguments on the world stage. In short, there was no single reason why neoliberal ideas seeped into the arena of environmental policy. It was an uneven process, both temporally and spatially, and the three fields identified by Mudge (i.e., intellectual, political, and bureaucratic) were all involved in various ways and to varying degrees.

With the benefit of hindsight, it is clear that the growth of environmental and resource economics as an applied field of academic research was very important in codifying an environmental version of neoliberalism as, variously, a worldview, a policy discourse, and a set of practical policy measures. This sub-discipline's prodigious growth in universities from the early 1980s was a reflection of and response to the five developments recounted above and, in turn, gave neoliberal ideas further impetus in the environmental domain. What is also clear in hindsight is that the international policy networks and epistemic communities, which ensured that neoliberal ideas 'traveled' in areas such as social and labor market policy, were also effective in

disseminating green neoliberalism and green developmentalism far and wide. The first United Nations Conference on Environment and Development (informally, the Earth Summit), held in 1992, was a key event in this regard because the now famous Framework Convention on Climate Change and the Convention on Biological Diversity both embodied neoliberal principles—and they did so at a global level. However, this is not to say that these principles infused environmental policy everywhere and equally.[19]

The neoliberalization of environmental management and resource use necessarily occurs against the background of pre-existing political and moral economies. It must also grapple with the biophysical specificities and peculiarities of particular resources, ecosystems, and environmental assets. In short, the world is never a *tabula rasa*, waiting to be freshly inscribed by omniscient elites. Seen in this light, neoliberalization must overcome, or at least adapt to, challenges and barriers residing in both the human and non-human domains. In any given case, neoliberal ideas, policies, and practices must hybridize—more or less successfully—with what is already there.

The socio-economic and cultural obstacles to the neoliberalization of nature are, in theory at least, more tractable than the biophysical ones. Although 'nature'—in the sense of the environment in general and natural resources in particular—is undoubtedly a social construction at one level, it also possesses material properties that any governance regime or policy measure must work with (or around).[20] By contrast, those stakeholders who stand to lose or gain from the neoliberalization of nature in any given case can, in principle, be persuaded about its merits or otherwise be obliged to live with it. The various arguments in favor of neoliberal environmental policies, made by their various supporters, include the following:

- open access resources can be protected, once private property rights and prices are assigned to them, with the result that the 'tragedy of the commons' (Hardin 1968) can be avoided;
- currently unowned or unpriced portions of the biophysical world can yield a profit for existing or aspiring entrepreneurs, either through conservation/protection/remediation or through productive use;
- environmental goods that are not currently valued economically, or are not in some way subsidized by the state, equate to 'lost income', 'unrealized value', or 'mispriced/underpriced assets' for nature and people;
- the private sector can manage natural resources and environmental services so as to deliver value for money for consumers or citizens relative to state bodies and other non-market actors;
- the introduction of competition and pricing into the management of the biophysical world can boost both management standards and environmental outcomes;
- instilling commercial principles into state bodies can make them more efficient managers and deliverers of resources and environmental amenities and/or services;
- the off-loading of some state responsibility for the quantity and quality of environmental goods and services to civil society actors not only empowers those actors but also allows for tailored, creative, and non-bureaucratic approaches to resource governance; and
- empowering consumers, citizens, firms, and other juridical units to take responsibility for their environmental impact respects the rights of the individual (real, communal, or corporate).

We might synthesize these various arguments as follows. Depending on the case, neoliberal environmental policy can (so its advocates claim) deliver benefits summarized in the acronym GEDDS (growth/efficiency/development/democracy/sustainability). In more detail,

this acronym stands for economic growth (through privatizing and marketizing biophysical resources, goods, and services); economic efficiency (the best environmental outcome per unit cost, where outcomes are described in various management standards and codes); economic and social development for marginal or low-income communities (as new revenue streams kick in, underpinned by secure property rights in land and other resources); democracy (by de-statizing responsibility for, and the benefits of, environmental management); and environmental sustainability (by making conservation, preservation, restoration, and renewable use into profitable activities). I am aware that this is something of a contrivance on my part because I am grouping arguments made by different advocates who operate in different fields of environmental thinking and policy. In any given case, all five criteria would not be relevant. However, to the extent that these arguments are advanced selectively to support the policies analyzed by the critics whose work I turn to in the next main section, I think GEDDS is a useful heuristic when seeking to map the diverse effects of these various policies, as detailed later in this article.

Researching Neoliberal Environmental Policy

Most analysts of 'neoliberal nature' are not so sanguine about the purported benefits of market-led environmental governance. The first purposeful and collective use of the idea of neoliberalism to investigate environmental questions occurred in 2004 and 2005, when the journals *Geoforum* and *Capitalism, Nature, Socialism* both devoted whole issues to the subject.[21] This led to the edited book *Neoliberal Environments* (Heynen et al. 2007), inspired special issues of the journals *Antipode* (Mansfield 2008) and *Conservation and Society* (Igoe and Brockington 2007), prompted a special section of *Geoforum* (Guthman 2008a), and triggered a steady stream of empirical studies in several disciplines that use neoliberalism as a framing concept or analytical lens. These studies focus on the full spectrum of environmental and natural resource uses, from extraction (e.g., mining or agriculture) to conservation, and from green policies to those in which nature is simply something to be exploited for profit. Neoliberal environmental policies are neither intrinsically 'anti-ecological' nor always hard-wired to the sustainability agenda: it very much depends.

As I said earlier, the signature feature of this recent literature is its commitment to case study research. Although some of it is synoptic and general (see, e.g., Buscher et al., forthcoming; Guthman 2007; Roberts 2008), for the most part it comprises in-depth analyses of neoliberal environmental policies in specific places, regions, and countries. To recall Peck and Tickell's term, this literature is thus interested in various neoliberalizations. What is more, and broadly speaking, it takes a political-economic perspective on neoliberalization rather than a Foucauldian one.[22] The latter, sometimes called a 'governmentality' approach to neoliberalization, has inquired into the 'technologies of government' or the 'rationalities of rule', not just administrative ones, but also those rhetorical and discursive technologies that have generated new subject positions and identities in the wider society. The key point has been that neoliberalism, despite its principles, has involved more (or as much) government, not less—especially outside the formal apparatuses of the state. It is 'rule at a distance' or by 'remote control' because of the way it reformats social norms so as to create—rather than simply activate—the supposedly latent and intrinsic capacities of individuals (be they mortals or corporations).[23]

Inspired by neo-Marxist, Polanyian, and Gramscian ideas, some political-economic perspectives differ from Foucauldian ones in that they see neoliberal statecraft as, variously, (1) a project of class domination hidden behind, or expressed in terms of, the rhetorical worldview; (2) a means to create new social inequalities and injustices or to intensify existing ones; and (3) a far-from-smooth process that is often generative of social resistance framed in class, community, gender, or other terms (which power elites within or without the state then have to manage in

some way—what Polanyi termed 'the double movement'). I might add that some of this Marxian-Polanyian-Gramscian literature has analyzed neoliberalism in light of recent theoretical studies on capitalism-ecology relations in general, including the works of 'eco-Marxists' such as James O'Connor. A motif of these eco-Marxists, unsurprisingly, is contradiction—not just the classic first contradiction internal to capitalism as identified by Marx, that is, between the forces and relations of production, but also the second contradiction between a growth-oriented capitalism and the finite biophysical world upon which that growth depends. In this light, three questions arise. First, does the neoliberalization of nature constitute a widening or deepening of class-based social power?[24] Second, does neoliberalism simply perpetuate, mitigate, or possibly even overcome the 'ecological contradictions' that are characteristic of capitalism to date?[25] Third, how successful have neoliberals been in framing their policies discursively in order to gain the support of various affected constituencies? When combined, the answers to these questions speak to the organic relationship between issues of social justice and of environmental justice.

These theoretical-political commonalities in the research literature notwithstanding, the empirical inquiries are far from easy to parse and synthesize so that a broader understanding of 'neoliberal nature' can be achieved. Why is this so? Five reasons help to explain this difficulty. First, the published studies are now relatively numerous and are scattered across a wide range of journals in a variety of academic fields (e.g., human geography, rural studies, planning, anthropology, agrarian studies). Second, these studies together cover a wide range of environmental policy areas (e.g., water resources, forestry, mining, fisheries). Third, while some studies are on a local scale, others examine national or international policy measures. Fourth, the geographical cases that have been selected are highly diverse and span the developing and developed worlds. Fifth, specific studies have focused on different aspects of neoliberalization. For instance, geographer Julie Guthman's (2007) excellent research on voluntary food labels combines a focus on one specific policy instrument (devised in the policy field) with a wider discussion of how 'neoliberal consumers' are created (an aim of the neoliberal worldview writ large). Due to the scope of what neoliberalism is (or is understood to be), few studies would be able to consider all of its elements in one go. For these five reasons, a major effort is required on the part of readers of this literature to detect the proverbial signals in the noise. The empirical studies into 'neoliberal nature' have emerged bit by bit and, in many cases, have not been cross-referenced by their authors to all the relevant published literature. Additionally, these studies have recently increased in number in a short space of time.[26]

In what follows, I will attempt to locate the findings of these separate studies on a broader cognitive map without, I hope, imposing a false sense of order or unity on them. The value of this exercise is, I trust, obvious. If neoliberalism is as widespread and influential as its critics have claimed, we need to examine it holistically and comprehensively, rather than fixating on one or a few cases and examples, as if they could tell us the whole story. Because the published studies have proceeded according to no common template or method, it is timely to create a greater sense of analytical order when deciphering their potentially disparate results and insights. Inevitably, some of the empirical (and conceptual) richness of the research I describe will be sacrificed in the process of presenting my synopsis.[27]

Neoliberalizing Nature 1: Processes of Reregulation

Above I summarized the purported benefits of neoliberal environment policies with reference to the acronym GEDDS. In toto, the arguments made by advocates here can be said to constitute the neoliberal worldview in the environmental domain. In what real life situations

have they been translated into practice? I will address this question systematically, according to the seven neoliberal policy proposals presented earlier. Note that no one author's study speaks to all of these points, yet when taken together, different studies do speak to these points as a whole. I will then, in the next section, describe the outcomes of the neoliberalization of nature, organizing these according to social and environmental impacts and then the GEDDS template. This, it seems to me, is far more incisive than discussing policy change on a sector-by-sector basis (e.g., agriculture, fisheries, forestry, etc.). It also allows us to see how sector-specific reforms are part of a broader transformation of economy, society, and environment. Together, specific neoliberalizations of environmental and natural resource use amount to the neoliberalization of nature as a whole.

1. *Privatizing and propertizing nature.* Assigning rights of ownership in, or use of, the biophysical world can occur in three situations: (1) where state bodies relinquish or 'loan' their sovereign rights, (2) where a recognized or established rights regime outside the state realm is fundamentally altered by policy makers, and (3) where no recognized (or enforceable) rights currently exist.

Karen Bakker (2003, 2005) and Loftus and McDonald (2001) provide examples of the first situation. Bakker's detailed studies of water and sewerage services in post-1989 England and Wales show how a few large private sector firms took direct control of the hydrological infrastructure. Similarly, Loftus and McDonald describe Argentine President Carlos Menem's 1989 Administrative Reform Law and focus on the privatization of water delivery and sewerage services in Buenos Aires through the 1990s. This reform concentrated water management rights in the hands of one large company, Aguas Argentinas, an entity established by a consortium of private European water companies with the assistance of the World Bank.

Studies of the second situation identified above include those by Thomas Perreault, Diana Davis, Gavin Bridge, and Becky Mansfield. Perreault (2005) focuses on the legal enclosure of Bolivia's water resources in the 1990s and its gas resources too (Perreault 2006). In the former case, central state control of the resource was relatively weak prior to privatization. Davis (2006) describes the several laws passed in Morocco in the 1990s pertaining to unfenced, rural farmland and to dryland agriculture. These laws have involved enclosing the environmental commons or communal lands and creating large parcels of agricultural land, with ownership being concentrated in a new set of well-capitalized farmer-operators. Bridge (2002) charts the enclosure of land in Guyana by small and medium domestic investors and by large overseas investors, who together have purchased prospecting and extraction gold mining rights from the national state. After the 1989 liberalization of mining laws, this poor and indebted country saw a 15-fold increase in the area given over to mining permits or claims by 1994. Gold mining in the country has historically been dominated by small and medium domestic operators. An early 1990s amendment to national mining legislation was designed to encourage large overseas investors to enter the Guyanese gold industry. But the amendment was designed so that overseas interests had to have domestic partners—a way of trying to make external investment pay dividends for certain Guyanese nationals. In contrast to Bridge's land-based study, Mansfield's (2004a, 2004b, 2007b) excellent essays examine the enclosure during the 1990s of the US portion of an open access fishery in the North Pacific Ocean.[28] This enclosure has excluded new fishery entrants and, indeed, reduced the number of existing ones.

With respect to the third situation identified above, geographer Scott Prudham (2007) analyzes a 2004 Canadian Supreme Court decision to reject a Monsanto patent claim covering genetically modified canola. Prudham focuses on the legal complications involved in trying to abstract discursively parts of nature from their social and environmental integument in order to be presented, by companies such as Monsanto, as putatively 'autonomous inventions'. This

case is linked to ongoing attempts by many other pharmaceutical, biotech, and agro-foods companies to privatize previously unowned (and unownable) elements of the biophysical world. Relatedly, there are Morgan Robertson's (2004, 2006, 2007) fascinating studies of the wetland banking and water quality credit markets in the US during the 1990s and the 2000s. His essays examine how the right to destroy and create wetlands was invented and institutionalized, along with the right to produce dirty and clean water. In both cases the rights were new, creating a property regime where one had not actually existed before. The same applies to the Californian conservation easements investigated by Amy Morris (2008).

2. *Marketizing biophysical resources, goods, and services*. Rights of ownership and the use of nature do not necessitate the marketization of biophysical resources, services, or assets (Bakker 2005). However, for neoliberal policy makers the two are umbilically connected. Once property rights are assigned and legally 'real', the assets owned or accessed should, neoliberals argue, generate a stream of revenue. Therefore, each of the studies cited in the previous three paragraphs necessarily includes mention of marketization. For instance, Mansfield's research explores how a transferable quota system was introduced—one that allowed fishermen and other stakeholders (e.g., coastal indigenous peoples in Alaska) to establish a price for the annual right to harvest a given amount of fish. Additional studies in which marketization is a central theme include the following. Fraser Sugden (2009) reports on the Nepal government's Agriculture Perspective Plan, which was initiated in 1995. This plan aimed to get subsistence farmers in rural areas to commercialize their operations so as to earn exchange values from food sales to domestic and overseas markets. In other words, the plan sought to replace a long-standing peasant way of life with a capitalist one, characterized by numerous agrarian entrepreneurs vying for market share. Likewise, Cristobal Kay's (2002) superb analysis of Chile's neoliberal agrarian transformation in the 1990s includes a discussion of attempts to bring peasant farmers into the country's capitalist economy by trading their produce overseas or domestically. This 'second modernization' of Chilean agriculture is also the focus of Warwick Murray's (2002) wide-ranging study of rural 'reconversion'.

A striking case of marketization is presented by James McCarthy (2004) in his analysis of how large firms within the North American Free Trade Agreement (NAFTA) region use the investor protections written into this compact. Whereas Robertson (2004, 2006, 2007) and Morris (2008) both show marketization to be an attempt to mitigate environmental harm, McCarthy tells a different story. In 1993, Metaclad, a US waste disposal company, bought and subsequently developed an inactive toxic waste dump in the Mexican state of San Luis Potosí. The local government halted Metaclad's activities in 1995 on health and safety grounds. Metaclad subsequently began a proceeding against the Mexican government under Chapter 11 of NAFTA, citing the 'regulatory takings' concept, which presumes that investors are entitled to earnings lost through the actions of others. In 2000, a NAFTA tribunal found in favor of Metaclad, ordering Mexico to pay $16.7 million for outlays and lost revenue. McCarthy calls this the 'primitive accumulation' of the conditions of production, because revenues are earned from the biophysical world through compensation for *not* undertaking extractive activities. In this case, the right of firms to make money regardless of the human or environmental cost is taken as sacrosanct, in McCarthy's view.

3. *State roll-back or deregulation*. Clearly, the withdrawal (or decrease) of state control over environmental goods, ecological services, and natural resources has not been universal during the last 30 years. In many countries, the level of state involvement has been minimal from the beginning (e.g., in developing countries), while in others it has been considerable (notably in Western capitalist democracies, former communist states, and former 'developmental states' in the global South). Only in these latter cases is roll-back a significant and tangible process,

often driven by a perceived need of state bodies to save money and reduce public borrowing or taxation. For instance, Harold Perkins (2009) reports on a sharp reduction in local government expenditure on environmental amenities in the famously 'green city' of Milwaukee through the 1990s and 2000s (see also Heynen and Perkins 2005). Also in the US, Paul Robbins and April Luginbuhl (2005) show that in California, Colorado, Nevada, New Mexico, Oklahoma, Oregon, Utah, and Washington there has been a transfer of fiscal and management responsibility for wild game from states to (mostly) private landowners, such as farmers, according to their land acreage and the habitats involved. As already mentioned, Bakker (2003, 2005) relates how the post-1989 central government off-loaded responsibility for water supply and sewerage infrastructure in England and Wales. Also in the Anglophone world, Brad Coombes (2003) reports on New Zealand's 1991 Resource Management Act and its effects on habitat husbandry in the Auckland region. After the act was passed, central government devolved many of its strategic planning powers, in the process weakening the influence of professional planners on land use decision making. In turn, this left the protection of rare or otherwise valuable habitats on privately owned land parcels to a combination of voluntary agreements and market-based instruments. More dramatically, Prudham's (2004) study of a serious water poisoning incident in Walkerton, Ontario, describes the context as being a contracting out of provincial government responsibility for water testing as part of Ontario Premier Mike Harris's 'common sense' agenda in the 1990s.

Western capitalist democracies aside, Maria Rodrigues (2003) recounts how one of Brazil's post-1945 parastatals, Companhia Vale do Rio Doce (a conglomerate of 50 firms operating in the mining, transportation, and forestry sectors), was sold off to private investors in 1997. This involved a massive withdrawal of national state authority, although it generated an equally massive infusion of funds into the public purse. Also in South America, Jessica Budds (2004) focuses on the Pinochet government's reversal of previous government policy on water rights and water delivery so that the hydrosocial cycle was de-statized.

4. *Market-friendly reregulation*. The processes of privatization, marketization, and deregulation do not, of course, mean that national governments somehow play a minor role in neoliberalization. On the contrary, their active involvement is imperative, both as lawmakers and as direct (or indirect) regulators of actors inhabiting the private and civil society domains. This involvement can redefine market relations across the board and affect all market participants, not least by creating new markets altogether or by significantly altering existing ones. Typically, the regulatory environment has shifted from formal, state-centered government to more dispersed, extra-state forms of governance.

Studies of market-friendly reregulation by national governments abound. Once again, I need to mention Bakker (2003), whose book *An Uncooperative Commodity* details the extraordinary lengths to which technocrats operating under British Conservative governments went to create a market in the water supply. Bill Pritchard (2005a, 2005b) and Cocklin et al. (2006) relate how post-1980s Australian governments lent their full support to free trade policies in the agricultural arena, creating a 'hyper-competitive' farming sector oriented to global export markets. This contrasts with the EU, which used the idea of multi-functionality to protect certain of its farmers and rural communities from the negative effects of *laissez-faire* (see Dibden et al. 2009). Relatedly, Clive Potter (2006) reports on how a globally powerful discourse of free trade in the agricultural sector, which cast a long 'discursive shadow', has heavily conditioned national attempts to exempt some rural spaces from competitive, productivist agriculture.

Budds's (2004) already cited study of Chile's 1981 Water Code shows how it created an expanded market in water rights and thus in water itself. Focusing on nearby Peru, Jeffrey Bury

(2004, 2005) explains how successive governments opened up their country's mineral resources to overseas investors through the 1990s, echoing Bridge's (2002) study. Arielle Levine (2007) describes how Zanzibar's Environmental Management for Sustainable Development Act of 1996 devolved responsibility for protected areas to private parties. These parties can include local communities, as detailed by Igoe and Croucher (2007) for Tanzania and by McCarthy (2006) for British Columbia. In her account of Madagascar's turn to ecotourism as a major source of overseas income and a way of protecting special or biodiverse sites, Rosaleen Duffy (2008) places emphasis on the wide array of actors who have been invited to neoliberalize access to the island's flora and fauna. These actors cross-cut both geographical scales and the public, private, and third sectors. Together they show how a national government has been influenced by, or has actively enrolled, quasi-state institutions (such as the World Bank), well-funded environmental NGOs, and many others besides. This theme of the state-sanctioned turn away from government to governance is emphasized by Perreault (2005, 2006) in his already mentioned accounts of the privatization of rights to water and gas resources in 1990s Bolivia. This privatization entailed a radically altered access regime and a newly centralized regulatory system dominated by national 'quangos'.[29] Relatedly, Buscher and Dressler (2007) show that national states in the global South have, since the early 1990s, designated more cross-border areas in order to encourage the emergence of privately (or communally) managed conservation spaces.

Prudham and Morris (2006) also look at a quango, this one in Canada. They scrutinize a national review of genetically modified (GM) foods regulation by the Canadian Biotechnology Advisory Committee (CBAC) between 1999 and 2004. GM foods have, of course, been heavily criticized on environmental and health grounds by organizations such as Greenpeace and the UK's Soil Association. Prudham and Morris show that, from the start, the CBAC—a supposedly impartial expert body advising the Canadian government—was already committed to creating a market for GM foods and spent a good deal of its resources trying to persuade the Canadian public that this was a good thing. Finally, there is Julie Guthman's (2007) study of voluntary food labels that purport to connect farmers and shoppers. These schemes, she argues, create an ethical market in socio-environmental 'goods' and 'bads' in place of direct national state regulation of farming and food prices. They thus put a monetary value on morality in competitive markets, making exchange values a vehicle for expressing consumers' environmental and social values.

5. *Use of market proxies in the residual state sector*. In relation to the non-human world or society, the use of market proxies entails making the remaining state-run activities as economically efficient as possible. 'Efficiency' here means that, whether delivering goods and services to citizens or acting as a regulator, state institutions operate as if they were private sector firms subject to a competitive environment. Where 'artificial' competition cannot be created among state institutions for practical reasons, other measures can be used, such as rules insisting on full cost recovery, balanced budgets, and high standards of service provision.

In the biophysical domain, one service area where even many neoliberal states find it difficult to 'let go' relates to basic natural resources, such as water and oil. These resources are either universally required by all citizens or have strategic importance for a given country. Laila Smith's (2004) study of water provision in Cape Town is a case in point. In an empirically rich essay, Smith shows how the Cape Town government introduced water demand management through metering and pricing, the outsourcing of some water services as a cost recovery strategy, and water cutoffs for non-paying citizens. This, she concludes, was done in the name of economic efficiency and a market-defined notion of citizens' rights and privileges. Relatedly, Priya Sangameswaran's (2008) study of water resource governance in the Indian state of Maharashtra suggests that attempts to commercialize a parastatal service provider—Maharashtra

Jeevan Pradhikaran—are radically altering its *modus operandi*. However, aside from Smith's and Sangameswaran's studies, there are currently few others that interrogate the neoliberalization of nature in the residual state sector.

6. *Strong encouragement of 'flanking mechanisms' in civil society*. The gaps left in environmental provision by state bodies can be plugged by various civil society actors, operating either outside or within the market. The Milwaukee research conducted by Perkins (2009) provides an example of the former, as does Ryan Holifield's study (2004). Perkins recounts how three volunteer organizations stepped into the vacuum created by the Milwaukee municipal government's partial withdrawal from maintenance of public parks and trees. Holifield examines how so-called environmental justice communities (EJCs) were, during the Clinton presidency, brought into the regulatory practices of the US's Environmental Protection Agency (EPA). In neoliberal terms, EJCs are those communities suffering the ecological 'externalities' of economic activity—that is, they are victims of 'market failure', including the inability to gain financial compensation for toxic waste being dumped nearby or to ensure that the offending firm(s) will pay the clean-up costs. Holifield shows how, under Clinton, EJCs—whose politics over the last 30 years have typically been radical left, linked as they are with the civil rights movement of the 1960s—were given much more visibility within the EPA's remit to remediate toxic sites. Although EJCs are not, Holifield argues, products of neoliberalism, they have been brought within its logics of property and payment by the EPA. This contrasts with the previous situation in which EJCs were typically ignored by state officials unless they fought hard and loud enough to get their grievances heard. In a recent study of agricultural biosafety in Costa Rica, Thomas Pearson (2009) recounts the appearance of 'informal' auditors in civil society who are called on to check the work of state-sanctioned private auditors. In contrast to Holifield's study, Pearson shows that these auditors were not, in fact, brought forth intentionally through state encouragement. They appeared because of a lack of trust in the private sector auditors.

As I intimated above when discussing Guthman's (2007) research into voluntary food labels, civil society actors have been increasingly enjoined to take on a regulatory role outside the state apparatus through the moralization of certain commodity markets. Paige West (2010) and Lovell et al. (2009) examine similar cases where commodity exchange becomes a substitute for state management of environmental and labor conditions. West looks at how Papua New Guinean specialty coffee is marketed to US consumers, whose dollars purport to deliver decent wages and to improve environmental conditions on the other side of the world. She shows how the subject effects of marketing—to the extent that they exist—individualize consumers and systematically misrepresent coffee producers' lives in neo-colonial, romanticized narratives of peasants and family farmers. The equally contrived ethical narratives-cum-discourses thrown at purchasers of voluntary carbon offsets by offset retailers is described by Lovell et al.

Consumers are, of course, positioned at the end of 'commodity chains'. But these commodities are often produced and marketed according to standards that are prescribed by non-state actors and are adhered to voluntarily by certain firms and commercial outfits. Dan Klooster (2010) details the globally widespread adoption of Forest Stewardship Council (FSC) certification standards for wood product emanating from plantation forests. These voluntary schemes have the value—so argue their advocates—of creating global standards without the need for complicated, cross-jurisdictional administration by national regulators.

7. *Creation of 'free', 'self-sufficient', self-governing, and entrepreneurial individuals and communities*. Most markets involve a wide array of actors who are often separated in space and time and whose relations are scrutinized by commodity chain analysts. Because all markets are

'embedded', their operation affects other diverse constituencies. We can thus imagine neoliberal discourse having to work in several different arenas so as suitably to 'interpellate' commodity producers, sales, and marketing intermediaries, commodity consumers, regulatory actors, and other stakeholders affected by the neoliberalization of nature. These various actors may inhabit the same national space. But then again, they may not.

The already mentioned studies by Sugden, Murray, Kay, and St. Martin focus squarely on those who derive a livelihood directly from natural resources (e.g., land or fish). Sudgen (2009) points to the failure of neoliberal agrarian reform in the Nepali lowlands: existing social identities and relations have not been dislodged discursively or practically. By contrast, although identities and subject positions are not examined, Murray's (2002) research into agrarian transformation under Chile's center-left Concertación coalition governments demonstrates how small, medium, and larger farmers embraced neoliberal policy, if not always willingly. This, too, is the message of Kay (2002) in a similar study of Chilean agriculture. St. Martin (2007) examines how a neoliberal fisheries discourse promoted by policy makers articulates with a non-capitalist political and moral economy specific to New England fisheries. It does not, in his view, erase this existing economy, but it does threaten to unsettle it considerably, even as fishermen seek to maintain their traditions (see also St. Martin 2006).

Other key research that focuses on commodity production includes works by Peter Wilshusen, Wendy Wolford, Becky Mansfield, and Gabriela Valdivia. Wilshusen's (2010) field research in southeastern Mexico in the state of Quintana Roo relates how rural communities have creatively worked with, and around, neoliberal discourses and policies emanating from the national state. These communities, he shows, have accommodated neoliberalization by blending its favored subject positions and rationalities with those of a moral economy based on collectivist ideas of sharing and mutual aid. Wolford's (2007) investigations of land reform in northeastern Brazil demonstrate how neoliberal discourse has been adopted enthusiastically by members of the populist Movement for Landless Workers. However, the price for their support, she argues, is that many now feel obliged to participate in a competitive food economy (based on exchange values), rather than a peasant one. In an essay on indigenous Alaskan peoples' involvement in a transferable quota fisheries scheme, Mansfield (2007b) reports a similar enthusiasm for neoliberalism among an otherwise excluded social group. The rights and revenues enjoyed by First Nations Alaskans, she shows, are consistent with their sense of themselves as a distinct community with historical and cultural claims to a share of the fishery and with a need for money to address poverty and to underpin socio-economic development. Relatedly, Valdivia (2005) examines the way that neoliberal reform measures in the Ecuadorian Amazon have affected indigenous peoples' discourse with respect to land and other resources. She reports a creative, complex engagement with neoliberal principles and ideas that allows indigenous peoples to adapt their claims and agendas to changing political-economic circumstances. Of course, in many cases involving the neoliberalization of nature, there is little or no need to 'cultivate' suitable producer identities—notably, in situations where large private corporations are invited to invest in land, water, forests, and fisheries in order to make money.

Perreault's studies of Bolivia's water and gas wars cross-cut people's identities as citizens and commodity consumers. Although the reasons are very different from those recounted in Sugden's (2009) Nepal study, Perreault (2005, 2006) shows how neoliberal rhetoric failed to prevent serious public protests over the reform of water and sewerage services and the management of natural gas reserves. By contrast, and as earlier mentioned, in her more consumer-oriented study, West (2010) suggests that neoliberal subjectivity 'works' for specialty coffee sellers in the US, but not because consumers really understand (or even care about) the ethical issues or the salient facts. Meanwhile, Guthman (2008b) maintains that voluntary labeling schemes for organic products

have taken hold among food activists and many left-wing consumers because these measures appear to deliver some sort of genuine socio-ecological justice at the production end of the commodity chain. As she explains elsewhere (Guthman 2008c), this appearance is made possible in part by the active interpellation of individuals into the policy norms and moral goals of neoliberal discourse—norms and goals that are, as it were, the only 'realistic' ones on offer.

Neoliberalizing Nature 2: Social and Environmental Effects

In the previous section I focused on the multifaceted process of neoliberalizing human engagements with the non-human world. Depending on the study cited, more than one facet of the process has been the focus of analytical attention. Although the precise details vary, I have described these facets under one or more of the seven neoliberal policy proposals. This reveals the sheer breadth of projects that are intended to neoliberalize environmental use and resource management. These undertakings range from the reform of ownership rights to engendering new forms of subjectivity among resource users. So far so good. But what have been the effects of the neoliberalization of nature in various times and places, according to the research published to date? In posing this question, the answer to which I have only hinted at in the previous section, I am well aware that separating process from outcome is, ontologically speaking, artificial, since arguably the latter is part of the former and not some sort of stable endpoint. Even so, the distinction has a heuristic value in that it describes the (albeit eventually changeable) outcomes of process at a given moment in time. Indeed, several published studies have focused specifically on these outcomes, as we will see below. I will further distinguish between the social and environmental effects of policy measures, although, again, in reality they are intertwined. Needless to say, the precise socio-environmental effects of neoliberal policies vary in their details according to their particular type and the spatio-temporal scale we are interested in. It almost goes without saying too that all effects are relative with regard to who (or what) is affected, in what way, and to what degree.[30]

Rather than summarize the findings of all the relevant studies, I will discuss some of the indicative ones and simply tabulate the many others that I could mention if I had more space (see table 1). Several contributions highlight problems of ordinary people's exclusion from, or reduced access to, environments and resources upon which their livelihoods or well-being depends. For instance, consider Davis's already mentioned research in Morocco and Sugden's research in Nepal. Davis (2006) shows how peasant pastoralists were alienated from grazing territory in the name of large-scale, irrigated dryland farming by private landholders. Sugden (2009), meanwhile, confirms that agricultural reform has done little to release the very poorest farmers from disadvantageous feudal and rentier relationships. Budd's (2004) research in Chile reveals that, subsequent to neoliberal water reform, large-scale farmers have gained greater access to rural water compared with peasant cultivators. In her study of conservation policies in the Virgin Islands, Crystal Fortwangler (2007) points to the increase in real estate prices outside the conservation zone, which makes land ownership more difficult for local people. Lisa Grandia (2007) reports on the exclusion of Guatemalan peasants from land given over to new commercial tree farms, while Igoe and Croucher (2007) make a similar observation about rural Tanzanians who live adjacent to a new wildlife management zone. Finally, Smith's (2004) Cape Town research shows the socially regressive effects of water pricing under a new cost recovery regime in the late 1990s—an arrangement that prioritized economic equity over social equity.

By contrast, a minority of other studies are more equivocal than those just mentioned. In his detailed examination of how several rural households in the Cajamarca region of Peru have

Table 1: Social and environmental outcomes of the neoliberalization of nature, as specified by the authors named

Location	Biophysical Resource	Issue	Socio-economic Outcomes	Environmental Outcomes	Author/s
British Columbia	Forests	Forest management	Democratization of management for small percentage of forest area and new income streams	N/A*	McCarthy (2006)
North America	Forests	Forest management	Co-optation of community groups to neoliberal ideas plus new income streams	N/A	McCarthy (2006)
England and Wales	Water	Water and sewage management	Increase socio-spatial inequity in relative water costs and cutoffs	Improved national water quality; regional water shortages	Bakker (2001, 2003)
Cajamarca, Peru	Gold	Gold mining	Less access to produced and human capital resources, and greater access to social capital and natural resources among rural households; reworking of land tenure to favor private owners	Intensified land use by house-holders in areas adjacent to mining	Bury (2004, 2005)
Southeastern Mexico	Forests	Forest management	Community adaptation to neoliberal norms	N/A	Wilshusen (2010)
Bolivia	Water	Urban water management	Serious public protest	N/A	Nickson and Vargas (2002)
Morocco	Land	Land ownership	Enclosure of the grazing commons and exclusion of many pastoralists	N/A	Davis (2006)
Nepal lowlands	Land	Agricultural production and trade	Failure of agrarian plan to improve the livelihoods of many peasant farmers	N/A	Sugden (2009)
Northeastern Brazil	Land	Agricultural livelihoods	Land given to the landless, but on condition that they now 'work' the land and conform to the norms of the agrarian elite	N/A	Wolford (2005, 2007)
Brazil's Amazonia	Forest ecosystem	Environmental protection from the externalities of private mining and metals production	Indigenous communities offered less support under the post-public regime	Environmental improvements locally, but wider environmental externalities	Rodrigues (2003)
Ecuador	Land and oil	Rescripting of indigenous identities	Complex reworking of identities to both accommodate and challenge neoliberal reform	N/A	Valdivia (2005)
Cochabamba, Bolivia	Water	Dam project	Regional resistance to damming	N/A	Laurie and Marvin (1999)

(Continued)

Table 1: Social and environmental outcomes of the neoliberalization of nature, as specified by the authors named (*cont.*)

Location	Biophysical Resource	Issue	Socio-economic Outcomes	Environmental Outcomes	Author/s
US	Hazardous waste	Environmental justice procedures	Attempted co-optation of community activism by federal state and depoliticization of community claims about environmental injustice	N/A	Holifield (2004)
Walkerton, Ontario	Water	Water quality testing	Poisoning of public	Drinking water pollution	Prudham (2004)
NAFTA	Pollutants	Right of corporations to pollute the commons	Taxpayers having to pay firms for 'regulatory takings'	Actual or potential point pollution of the commons	McCarthy (2004)
Chicago area	Wetlands	Wetland mitigation scheme	Creation of new profit opportunities for firms; partial subsumption of ecological science to abstractions imposed by monetary valuation	Loss of wetlands and creation of 'equivalents' elsewhere	Robertson (2004, 2006, 2007)
Cape Town	Water	Water service delivery	Attempted depoliticization of water distribution issues; increased socio-spatial inequity in customer charges and service delivery	N/A	Smith (2004)
Milwaukie and global atmosphere	Trees	Management of urban forests	Decline of public forest area; concentration of urban trees on private land; increased urban energy use	Increased city level of hydrological and temperature ranges; minor loss of CO_2 absorption globally	Heynen and Perkins (2005)
Chile	Land	Land ownership and agricultural production	Increased rural income inequality and poverty among farmers and farm workers	N/A	Murray (2002)
Chile	Land	Land ownership and agricultural production	Proletarianization of peasants, land ownership concentration, and economic success for relatively few farmers	N/A	Kay (2002)
Buenos Aires	Water	Water service delivery	Increased water network coverage; price increases for consumers; layoffs of water sector workers	Inadequate sewage treatment capacity	Loftus and McDonald (2001)
Rural Guatemala	Forests	Carbon offset tree farm projects	Displacement of rural peasants	Reduction in forest biodiversity	Grandia (2007)
Rural Tanzania	Land	Conservation easements	Inadequate compensation to local residents for loss of access to land; exclusions from land use	N/A	Igoe and Croucher (2007)

Location	Biophysical Resource	Issue	Socio-economic Outcomes	Environmental Outcomes	Author/s
California	Land	Food certification and labeling schemes	Reduced farm worker representation in decisions about farm labor practices	N/A	Brown and Getz (2008)
California	Land	Pesticides on farmland	Visible and effective forms of activism against pesticide drift	Off-farm pesticide drift	Harrison (2008)
California	Land	Food politics	Co-optation of normative goals of a sustainable production project to neoliberal norms	N/A	Guthman (2008c)
Bolivia	Rural water resources	Water management	Popular protests against water reform based on an existing moral economy	N/A	Perreault (2008)
Mexico	Rural water resources	Water management	Democratization of water governance but no gains in the efficiency, equity, or sustainability of water use	N/A	Wilder and Lankao (2006)
Southern Africa	Land-based ecosystems	Transfrontier conservation	Neoliberal discourse depoliticizes conservation issues, attenuates existing community-based conservation discourse, and as yet has delivered few tangible development gains	Little evidence of improved levels or geographical spread of environmental conservation	Buscher (2010a, 2010b)
Botswana and Thailand	Elephants	Ecotourism	Income streams and jobs from elephant tourism	Productive use for elephants that might otherwise be neglected or culled	Duffy and Moore (2010)
Various locations	Plantation forests	Environmental and social standards	Attenuation of some, but not all, elements of FSC standards	Attenuation of some, but not all, elements of FSC standards	Klooster (2010)
Southern Africa	Land-based ecosystems	Transfrontier conservation	Private sector benefits while communities benefit less than previously	N/A	Buscher and Dressler (2007)
California	Commercial farmland for crop production	Management of permissible seed and nursery stock	Corporate attempts to remove local ordinances banning genetically modified crops failed	N/A	Roff (2008)
South Island, New Zealand	Commercial sheep farming	Farming practices: intensive-productivist or organic?	Changing consumer demands for meat may produce post-productivist sheep farming but do not guarantee it	Some moves toward a more organic style of farming, with beneficial effects for sheep and farmers	Haggerty et al. (2009)

*N/A (not applicable) means that environmental outcomes were not a focus of the research.

Note: Only resolutely empirical studies are included in this table, rather than ostensibly conceptual ones or those including empirical 'vignettes'.

been affected by overseas mining investment, Bury (2004, 2005) concludes that many families now enjoy increased access to both produced and human capital, although several have fewer opportunities to acquire both natural and social capital. Somewhat differently, Perkins's (2009) analysis of third sector involvement in the maintenance of Milwaukee's green spaces shows that such involvement has proven personally empowering for many citizens.

Of course, the implementation of neoliberal policy in the environmental domain has resulted in several spectacular and well-publicized reactions within civil society. Andrew Nickson and Claudia Vargas (2002) report on the failure of the Cochabamba water concession in Bolivia: in 2000 the private company Aguas del Tunari had its contract canceled after just six months. Several factors—low rates of economic growth, persistent poverty, and low or stagnant wages among large segments of the population— came into play. The sharp increase in water tariffs in 2000, allied to a loss of water use rights by many stakeholders, contributed to the national unrest that resulted in the cancellation. Similar large-scale dissent was repeated following the privatization of gas resources in 2003 (Perreault 2006). Less dramatically, Jill Harrison (2008) shows that neoliberalized agriculture in California has led to increased pesticide drift, eliciting vocal expressions of agro-food activism in civil society. Still, in other cases neoliberal environmental policy has persisted despite manifest problems. This is (or was) true for water governance in Buenos Aires. Loftus and McDonald (2001) demonstrate that even though consumer prices increased, many workers were laid off in the water sector, and advances in new sewerage connections and treatment were slow, the citizenry tolerated the policy shift—grudgingly or otherwise.

On the environmental side, neoliberal environmental policy seems to have had mixed effects. There was the shocking water poisoning case in Walkerton, Ontario (Prudham 2004). Equally alarming was the attempt of two American firms to seek monetary compensation from state bodies for *not* polluting the commons in Mexico and California (McCarthy 2004). Less dramatically, Robbins and Luginbuhl (2005) examine recent attempts to create 'game farms' in some Midwestern and Western US states. These initiatives, they show, go against a long US history that considers wildlife just that—wild. They also represent attempts to make wildlife pay for the benefit of a select group of ranchers and hunters. Robbins and Luginbuhl find little evidence to support the contention that private wildlife managers are delivering effective animal and habitat husbandry as compared to a previous generation of state officials.

Coombes's (2003) study of bush lot subdivision in New Zealand (conceived as a new way to protect indigenous habitats on private land) suggests that this approach is too ad hoc. In addition, strategic interventions in order to ensure proper levels of ecological protection are proscribed. Nik Heynen and Harold Perkins (2005) find that local government divestment from the maintenance of urban tree cover has led to a noticeable loss of ecological services (e.g., provision of shade) and that private landholders cannot, left to their own devices, compensate adequately for the reduction in tree numbers. A more mixed picture is painted by Rodrigues (2003). Recently, privatized iron ore and manganese operations in the Brazilian Amazon, she shows, are much more effective at protecting the local environment than their state-run predecessor. But, she argues, they remain ineffective at tracking environmental externalities outside the areas immediately adjacent to the mines. Bakker (2003) is more positive about the environmental effects of neoliberal reform. Her study of water privatization in England and Wales shows both a reduction in leakage rates (due to a huge investment in infrastructural renewal) and a notable increase in the quality of drinking water.

Bakker, like Bury, is among the few analysts who has sought to record both social and environmental effects of neoliberal reform in some detail. Although she acknowledges the environmental benefits of the shift away from direct state management of water resources in England and Wales, she also points to new social inequities in water service delivery that were evident in

the early 1990s. Specifically, lower income households were subject to water cutoffs on a scale previously unmatched, leading to a response by concerned regulators (Bakker 2001).

What do these social and environmental effects tell us about the neoliberalization of nature when mapped against the criteria of GEDDS? To start with, it is clear that certain kinds of growth, efficiency, development, democracy, and sustainability have, in fact, been delivered by market-led environmental policies. However, the key—and obvious—point is that each of these terms has a contested meaning. The lack of universal or agreed upon definitions means that analysts of the neoliberalization of nature, as well as the many people directly affected by it on the ground, have good reason to question the 'success' of the project. In various situations, economic growth has disproportionately benefited private sector actors; economic efficiency has been achieved at the expense of social equity and justice; a very particular kind of development, one that does not reflect the full range of development thinking, has been achieved; democracy has been neutered; and sustainability has been realized, but only to the extent that it is consistent with the peculiarities of private property rights and market pricing.

Key Points and Lessons to Be Learned

Important as it is to pay close attention to the insights afforded by each of the empirical studies cited in the last two sections, it would be easy to get bogged down in the details. What, then, are the principal take-home lessons from the literature reviewed above, quite aside from the suggestion that the realization of GEDDS is open to question? In my view, there are six lessons to be learned, and I have identified them on the basis that they are evident in several separately conducted studies (although by no means in all). In each case I present an illustrative example or two. Most of the key points below apply to neoliberal statecraft more generally, regardless of whether or not we are discussing environmental management, regulation, or governance.

1. *Markets in environmental goods, services, and assets typically require considerable state intervention*. One of the shibboleths of the neoliberal worldview is that a reduction of state intervention in economy and society is both desirable and possible. However, as Polanyi (1944: 141) realized over 60 years ago, "Laissez-faire [is] planned; planning [is] not." In one of her several investigations into the privatization of open access fisheries, Mansfield (2004a) makes the same point with compelling detail. She examines the implementation of the 1998 American Fisheries Act (AFA) as it affected the Alaska pollock population, the world's largest single-species fishery, which is of great economic and social importance to Alaskans. The AFA led to sweeping changes in the organization of this open access fishery, introducing a catch quota system among a restricted group of relevant parties in order to prevent overharvesting on environmental and economic grounds. Mansfield highlights the remarkable degree of state regulation that was required to privatize and marketize the pollock fishery, as the AFA had to be interpreted and enforced by the North Pacific Fishery Management Council. This involved the development of exceedingly detailed and complex regulations in order to (1) negotiate fair relations between inshore fisherman, offshore fisherman, fish processors, commercial fishers, independent fishers, and indigenous (Native American) communities; (2) sort out the AFA's relations to endangered species legislation (e.g., pollock are eaten by the Steller sea lion, a threatened species); and (3) determine the impact that pollock fishery rules would have on other Alaskan fisheries, such as crab. In short, Mansfield shows that the neoliberalization of the pollock fishery involved as much (if not more) state regulation than previously. The conclusion appears paradoxical: the market is both created and regulated by the state. It suggests that, in Mansfield's view, neoliberalization

is not about the state stepping aside. Rather, the state has changed its role to ensure actively that markets work where they might founder, if left to arise spontaneously.[31]

2. *Markets in environmental goods, services, and assets must carefully adapt to biophysical obstacles in order to avoid being inhibited by them.* Throughout the 1990s, many social scientists were wont to say that nature is a social construction. However, research into the neoliberalization of nature shows that policy makers must pay very close attention indeed to the biophysical specificities of their intended targets; otherwise, their best laid plans might come to grief. In short, nature's material properties and affordances matter, and they can complicate the form and functioning of neoliberal policies. The title of Bakker's 2003 monograph, *An Uncooperative Commodity*, indicates as much. Because water is both heavy and bulky, and because the infrastructure needed to both purify and move it is very expensive, it has proven almost impossible for policy makers to create direct competition between private water companies on a regional scale in post-1989 England and Wales. As a result, policy makers and regulators have had to devise solutions that simulate direct competition in order to prevent water companies from abusing the de facto privileges that attach to natural monopolies. The resulting market is, necessarily, highly contrived and a far cry from the textbook model—an act of political will, if you like. This is why most water privatization schemes over the last 30 years have been at the level of one or another locality, city, or region, rather than genuinely national.[32]

3. *Markets in environmental goods, services, and assets must carefully adapt to the prevailing socio-cultural and political-economic context, unless they can reconfigure it.* All plans to neoliberalize environmental goods, services, and assets necessarily occur against the background of existing policies, established conventions, and prevailing economic interests. As I intimated earlier, this context must be either changed or (failing that) negotiated in order for neoliberal measures to realize their self-declared ambitions. In Polanyi's terms, if one wishes to establish a market economy, then one needs to alter the moral, cultural, and political climate—that is, one needs to create a market society in which neoliberal norms become the prevailing common sense of the day. This is why several analysts of the neoliberalization of nature have seen fit to use Antonio Gramsci's ideas when analyzing the way that neoliberal environmental policies have (or have not) taken hold. Consent, after all, must be constructed: it is never suddenly or spontaneously achieved.

An example of neoliberal environmental policies that encountered relatively little communal or public opposition is presented by Wolford (2005, 2007), who analyzes the mid-1990s national land reform program in Brazil. Led by President Fernando Cardoso, this program offered many landless rural workers the possibility of owning and working their own land, in the context of a long history of large landowners controlling a disproportionate amount of rural space. As Wolford explains, even though members of the Movement for Landless Workers had a very different understanding of the role of land and property than did agrarian elites, many supported Cardoso's reform program because it seemed to promise a degree of justice (via the language of 'rights') and the prospect of improved livelihoods. In other words, the language of reform could be made consistent with the moral economy of many landless workers.

In contrast, Perreault (2006, 2008) examines the reasons why neoliberal environmental policy failed the test of popular legitimacy in Bolivia. As indicated earlier, Perreault focuses on the now famous water and gas 'wars' of 2000 and 2003, respectively. In the former case especially, neoliberal reform triggered widespread protests (especially among peasant farmers) in which historic norms and cultural values were crystallized into a powerful anti-neoliberal discourse. Quite aside from the fact that the water reforms were antithetical to these established norms

and values, both water and gas are viewed as basic resources that are crucial to people's well-being. In Bolivia, they are seen as national resources that should be shared fairly, not appropriated privately.

Clearly, in any given case the precise mix of factors determining the relative degree of traction and longevity of neoliberal environmental policies will vary. In cases where a fair bit of policy adaptation has occurred (so to speak, when some rooms have been rebuilt in order to spare the foundation), the gap between the ideals of the neoliberal worldview and the messy specifics of practice becomes manifest (see also Bakker 2005).

4. *Neoliberal environmental policy is often and in large measure constitutively 'impure'*. Earlier in this article, it was argued that neoliberalism is a spatio-temporally differentiated process—following Peck and Tickell (2002), a set of connected neoliberalizations (in the plural)—and not a globally homogeneous thing. Building on the third point above, some have suggested that this insight applies as much to environmental management, regulation, and governance as to anything else. Both Becky Mansfield (e.g., 2007a, 2007b) and James McCarthy (2006) have been especially vocal in this regard. As part of her extensive research into the enclosure of North Pacific fisheries, Mansfield has looked closely at how catch quotas are allocated in practice. As marketable rights to fish, the quotas have commanded considerable economic value since their creation in the late 1990s. They have included a so-called community development quota (CDQ) for the poor, mostly indigenous communities of western Alaska. Within the neoliberal logic of privatization and marketization, the CDQ addresses issues of both social justice, as an anti-poverty measure, and cultural justice, as a recognition of and partial redress for indigenous people's historic exclusion from land and water, following the European occupancy of North America. As Mansfield (2007b: 495) concludes, "What is interesting about the CDQ … is not that it is incoherent or inconsistent, but that … privatization [here] manages to bridge seemingly contradictory goals." This is done by enhancing personal (in this case, communal) freedom while redistributing wealth to favor the needy.

The wider significance, when the second and third points above are connected to this one, is that "neoliberalism … is something created in *practice*, and that through practice, it becomes varied, fractured, and even contradictory. In this sense, 'neoliberalism' is inherently geographical" (Mansfield 2004a: 580; emphasis added). In his analysis of community forestry projects, McCarthy (2006: 87) concurs: "Processes of neoliberalization never occur on blank slates, but rather hybridize with existing institutions, regionally and nationally specific policy ensembles, and so on in ways that always and inevitably produce unique, contingent variants." This explains why empirical research is so important and why blanket descriptions, explanations, and evaluations are likely to founder on the shoals of spatio-temporal difference.

5. *Neoliberal environmental policy frequently tends to disadvantage the poor and the powerless.* As detailed in the previous section, this fifth point is evident in Bakker's (2003) findings, Budd's (2007) research on Chilean peasant irrigators, Prudham's (2004) Walkerton study, McCarthy's (2004) analysis of regulatory takings, Smith's (2004) review of Cape Town water resources, and several other works as well, including Tad Mutersbaugh's (2003, 2005) investigations of Mexican small farmers. Buscher's (2010a, 2010b) research on transfrontier conservation likewise suggests that local communities tend to lose out. And where neoliberal policies appear to offer openings for the socially disadvantaged—as described in Wolford's (2005) research on Brazil—there is evidence that these opportunities are more apparent than real. However, as noted earlier, there are exceptions to this very rough rule, depending on how analysts choose to define and measure disadvantage.

6. *Neoliberal environmental policy produces environmental improvements as much as problems, and problems as much as improvements*. This point, which has been detailed in the previous sections, challenges the argument that applying neoliberal principles to natural resource management and environmental problems is usually an effective way to 'green' capitalism. Quite how fundamental that challenge is remains a subject for discussion. For critics, the question is whether the improvements in environmental quality and protection delivered by certain neoliberal policy measures could have been—or could be—delivered by alternative, non-neoliberal policy devices. Another issue is how consistent such measures are with the achievement of social justice. Regardless, it is clear that neoliberal environmental policies can deliver certain benefits for nature, depending on the circumstances. Bakker's research on water quality shows this, so too Duffy and Moore's (2010) research into elephant tourism.

What light do these six summary observations shed on the questions I posed earlier when discussing neoliberal environments and the research published on this topic? There, you will recall, I contrasted the political-economic approach to the neoliberalization of nature (favored by many of the authors whose work I have reviewed here) with a more Foucauldian approach. The former viewpoint focuses our attention on whether the neoliberalization of nature constitutes (1) a widening or deepening of class-based social power; (2) a perpetuation, mitigation, or even overcoming of the 'ecological contradictions' that are characteristic of capitalism to date; and/or (3) a 'winning over' of the various constituencies with a stake in the reform of resource and environmental regulation and use. These are grand questions, and the findings of the studies reviewed in this article cannot be satisfactorily summed up to provide robust answers to any of them. What we *can* say is that there is now plenty of evidence to suggest that neoliberal environmental policy respects the rights of owner-operators above those of other stakeholders; that it does something, but not nearly enough, to address the ecologically destructive and wasteful patterns of capital accumulation; and that it frequently co-opts (often unwilling) people into its rationalities. The neoliberalization of nature is a project that is far from complete and perhaps precarious.

Researching the Neoliberalization of Nature: Problems of Conceptualization, Theory, Method, and Evaluation

As the previous paragraph has intimated, I believe that a critical examination of the research literature on the neoliberalization of nature is warranted. There are, it seems to me, two forms that such a critique could take. The first would focus on some rather obvious and important limitations of the studies conducted so far. For instance, one might ask for more balance in the number of studies centering on the three fields (i.e., the academic, the political, and the bureaucratic) where neoliberal ideas and practices have environmental and resource content and implications. Alternatively, one might ask for a greater number of studies involving a wider range of locations with a better sectoral balance so that, for example, water resource issues are not favored over investigations of mining. Despite the large number of published studies into the neoliberalization of nature, there are arguably not nearly enough when compared to the sheer number and variety of policy experiments that could be investigated. A second form of critique would focus in more detail on some fundamental cognitive and normative questions when analyzing the way that researchers are conceiving and executing their research projects. It is this second approach that I want to take because I believe that there are several key issues that deserve serious attention, as they speak to the (perhaps unconscious) analytical habits of the loose, multi-disciplinary epistemic community whose research I have been reviewing.

The first key issue relates to how the word 'neoliberalism' is defined and conceptualized in any given empirical case. Early on in this article, I noted—but then bracketed—the lack of conceptual consensus among analysts about the meaning of the term. Opening the brackets, it is clear that different investigators have employed the word in a range of ways when examining environmental and resource issues. Some authors (e.g., Kay 2002; Murray 2002) use very generic or highly implicit definitions that are fairly devoid of conceptual substance. Others (e.g., McCarthy 2006) are conceptually precise, yet they define the term in a way that does not quite correspond with the equally precise definitions employed by still others (e.g., Robertson 2004). Throughout, there is no real agreement about which (or how many) of the seven elements of the neoliberal policy program need to be evident or implemented in any given case for us to describe it reasonably as neoliberal in degree or kind. This is unfortunate.[33] For example, should moves toward privatization alone be deemed instances of neoliberalism in action? And is what we call privatization in one place really the same as that in another? Surely, the significance of the seven neoliberal policy proposals listed earlier depends entirely on the context in which they are embedded and operate. In this sense, conceptual abstraction is a fraught process.

This last observation directs our attention to what 'context' means in any given case, and to the related question of how we recognize different modalities or variants of neoliberalism—that is to say, related but different neoliberalizations. As I have suggested, the sheer presence of one (or more) of the seven neoliberal policy proposals does not necessarily mean that it is a definitive element of the situation in which it is enacted. Mansfield (2007a, 2007b) rightly points to the constitutive 'impurity' of all neoliberal environmental measures (see also Sugden 2009). But the researchers whose work I have surveyed have yet to separate conceptual from empirical impurity. It is not surprising that there are detailed variations in the way that neoliberal environmental policies have been implemented in different times and places. The more exacting task is to identify conceptually the varieties of neoliberalism by abstraction from some of the concrete empirical details. Otherwise, we are left with empirical variation alone, meaning that each and every situation in which neoliberal policy measures are implemented is considered a specific and unique neoliberalization. This then greatly limits the potential for cross-case comparison and the identification of commonalities between different sets of cases. Indeed, it risks falling into the trap of 'idiography'—that is, the study of spatio-temporal difference for its own sake, at the expense of identifying common processes and outcomes across space and over time (see Castree 2005).[34]

Just as there is currently no uniform definition of neoliberalism among analysts, those researchers whose work I have reviewed here utilize a range of theoretical lenses when examining environmental and resource policy. Although all are critical political economists (in the general sense of the term), attempts to achieve greater theoretical consistency have been rather limited thus far. In discussing this second key issue, I use the word 'theory' in a conventional sense to denote a descriptive and explanatory framework that focuses researchers on what they presume to be the most salient processes, relationships, or issues in any given case. For instance, Mansfield has made ample use of Polanyi's concept of a 'fictitious commodity' in her fisheries research, while McCarthy deploys James O'Connor's Marxist notion of the 'underproduction of the conditions of production'. To cite one more case, my colleague Erik Swyngedouw (2005) uses David Harvey's concept of 'accumulation by dispossession' to discuss water resource privatization. The challenge, it seems to me, is to weave some of this otherwise disparate use of political-economic theory together into a more coherent framework, one that can sensitize us to the complex, contradictory, and dialectical dynamics of neoliberal environmental and resource governance in practice. Currently, what seems to happen is that any given researcher employs a theoretical insight or idea drawn from one of his or her favored thinkers. Thus, one rarely finds a research project that integrates critically the ideas of, for example, Gramsci *and* Polanyi, or O'Connor *and* Gramsci.[35]

A third key issue I wish to highlight is methodology. Here, by the word 'issue', I really mean a family of issues. Whether they focus on human-environment relations, or anything else, social scientists must typically deal with 'open systems' in which it is virtually impossible to exert 'experimental control'. Given this, they are faced with a large number of methodological choices and options that relate to the quality and quantity of evidence, the methods of data acquisition and analysis, and the scale (micro-, meso-, or macro-) of methodological resolution. Decisions must be made about what evidence and data to include and exclude, how to code and categorize this information, and which questions will (and will not) be asked. Inevitably, all research projects are tailored to the specific opportunities and constraints operative in any given case, even as analysts aim for rigor and systematicity. In respect of the literature reviewed in this article, what is striking is the multiplicity of ways in which the neoliberalization of nature has been investigated. In many cases, it is not even clear how—methodologically speaking—the research was conducted or why it was carried out in the way that it was. The question arises: does this reflect the specifics of the situations being investigated (i.e., necessary compromises and adjustments), or is it a contingent reflection of investigators' varied expertise, time availability, level of experience, energy, commitment, etc.? Regardless, the upshot is that it is very difficult indeed for readers of the research to identify methodological consistency between disparate studies. I am not so naive as to expect, or wish for, more researchers to use the same, fairly detailed methodological template. However, it is difficult to combine the insights offered by diverse studies when those studies have been conducted so very differently. It is not simply an issue of having to somehow correlate very different kinds of evidence; there is also the issue of how robust and comprehensive the evidence from different research projects really is.

One specific methodological concern worth highlighting relates to comparative research. Thus far, there has been virtually no attempt made to investigate two or more cases of the neoliberalization of nature simultaneously. This is a pity because, in theory at least, it could help us to determine with some precision what a 'variety' or 'modality' of 'actually existing neoliberalism' looks like (in reference to my earlier point about how analysts have defined neoliberalism). One could look at two or more situations where the same translocal (or transnational) policy measures have been implemented; or one could look at two or more cases of *sui generis* environmental policy that appear to be ostensibly similar—or very different—cases of neoliberal reform. McCarthy (2006) is almost alone in having tried to conduct a cross-case study and, in my view, has set a precedent that ought to inspire others (see also Bailey 2007b; Duffy and Moore 2010). One methodological virtue of comparative research is that it is incumbent upon the investigator to ensure a certain consistency in the questions posed, the methods used, and the evidence garnered.

Finally, with regard to a fourth key issue—evaluation—let me voice some normative concerns about the way that research into the neoliberalization of nature has thus far been conducted. Setting oneself up as a 'critic' of anything presumes not only that one has clear criteria against which the item being analyzed is measured, but also that one can flesh out and justify those criteria in a moral-ethical sense. As I have stated, the term 'neoliberalism' is very much one that is employed by the academic and activist arms of the political Left, which are typically in opposition to this policy. Those who have researched the neoliberalization of nature are thus in some sense skeptical about, or even opposed to, their objects of analysis. But on what grounds and in what ways? The answers to these questions are surprisingly difficult to decipher because, for the most part, the act of evaluation is left implicit by those whose work I have reviewed in the preceding pages.[36] In my view, they need to be made far more explicit. What is more, the basis on which any evaluation is undertaken needs to be fleshed out in reasonable detail and justified—no simple matter. As Andrew Sayer (1995) noted many years ago, social scientists

typically devote far more of their energy to issues of theory and method than they do to issues of normative reasoning. That is certainly true of the work I have examined here.

The exceptions prove the proverbial rule. Mansfield's (2006) highly normative essay on the success/failure of North Pacific fisheries policy is a form of internal or 'immanent' critique. In other words, she holds the marked-based fisheries policy to its own evaluative criteria in order to provide a systematic assessment of how its performance to date should be judged. This is one example of what could (and arguably should) be a wider effort to evaluate neoliberal environmental policy by focusing on whether GEDDS (i.e., growth/efficiency/development/democracy/sustainability) is a myth or reality. But there is another form of evaluation that has not yet been employed in a formal and explicit way in research on the neoliberalization of nature—namely, 'external' critique. Here the critic evaluates the world using criteria and related moral-ethical arguments that are intentionally different from those contained within the object of analysis. Bakker's (2010b) new book, *Privatizing Water*, hints at this alternative form of evaluation. Her assessment of water resource markets rests, not uncritically, on the idea of water as a human right. Although the concept of 'rights' is central to the neoliberal worldview, Bakker reminds us that it is a far more expansive and complex idea than liberals would have us believe. It can speak to issues of social justice and resource redistribution to the needy and vulnerable, as much as to issues of individual sovereignty.

The utility of explicit and robust forms of normative assessment is clear. They are a potentially powerful weapon to use against the authors and advocates of neoliberal forms of environment management, regulation, and governance. But they also keep critics honest, obliging them to acknowledge those situations where the ostensible object of their animus can be credited with certain successes.

Conclusions

This article is a multi-disciplinary review of social scientific research into the neoliberalization of nature, possibly the most inclusive to date.[37] Reviews such as this one organize and codify research that is developing organically over time, in this case in more than one academic field. The published research is the raw material out of which the survey is actively fashioned. But the cognitive mapping exercise is by no means easy. In the present case, it is not possible to begin with a uniform understanding of neoliberalism that is evident within the literature (let alone a coherent theoretical approach to it), and then straightforwardly track the operation and effects of neoliberalism in the fields of environmental management and natural resource governance. Instead, the published literature has examined different aspects of the neoliberalization of nature in different times and places and at different scales of analytical resolution. As Diana Liverman and Silvina Vilas (2006: 358) note in their recent attempt to review systematically the research on this topic, "Most studies tend to be case specific and difficult to generalize." They also maintain that there has been a lack of "comparative research … set within a rigorous *a priori* framework." I have therefore tried to throw a rope around these disparate studies in the hope of making some sense out of them overall. In so doing, I have made an admittedly contrived distinction between the processes and outcomes of neoliberal policy reform in the environmental domain. Inevitably, I have also organized the insights of the studies into other analytical categories that may, in the end, be too neat and tidy to be either useful or plausible.

Let me close with what might seem to be a very self-serving observation, although it is meant sincerely and relates to Liverman and Vilas's candid reflection on their own attempt to author a comprehensive review. In my experience, surveys of established or new fields of

research are sometimes regarded as 'lesser outputs', academically speaking, compared to works of original empirical research or fundamental contributions to philosophy, theory, or method. This is unfortunate. As I tried to show in the previous section, surveying a research field is not about piecing together a jigsaw whose parts happen to be scattered hither and thither, so that the bigger picture eventually becomes clear—even though this is often assumed to be the case. The fact that a plethora of researchers use the same keywords and core concepts does not mean that they are, upon close inspection, actually analyzing or evaluating the same thing, let alone in a theoretically or methodologically consistent or commensurable way. In the present case, one can suggest that the nominal commonality of the work I have surveyed belies a set of serious substantive differences that are variously conceptual, theoretical, methodological, and normative in kind. Some might say that these differences are productive—although this is surely not the case if the differences are so significant that they threaten to prevent meaningful advances in research.

What is to be done? Many decades ago, Thomas Kuhn, the physicist and historian of science, popularized the term 'paradigm' as a way of characterizing the working habits and outputs of a set of like-minded researchers. Perhaps those investigating the neoliberalization of nature have not been paradigmatic enough and need to be much more so in the future. Indeed, this suggestion might apply to a great deal of contemporary social science, which is resolutely post-paradigmatic for the most part (economics being a notable exception). Topics such as neoliberalism bring disparate researchers from various disciplines together to interrogate what is ostensibly the same thing. However, they also make plain the quantitative and qualitative variations in the ways that social scientific research is being conducted. Perhaps it is not possible to change this state of affairs. But, looking ahead, it would surely pay dividends to aim for greater analytical consistency among researchers operating in different academic disciplines. There is hard mental labor to be performed, but it has very practical—and not purely cerebral—implications. The sorts of policy measures that analysts of the neoliberalization of nature have been concerned with are rarely trivial in their effects, for good or ill. A more collaborative and less piecemeal effort by social scientists to examine these and future policy measures could have a positive and very material bearing on the well-being of people and of the non-human world. Ideally, their research would actively shape the thinking of the politicians and policy makers whose decisions significantly affect our lives in so many different ways.

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NOTES

1. The term 'neoliberalism' initially gained popularity in left-wing circles in Latin America as a reaction to the market-led reform agenda of General Augusto Pinochet in Chile.
2. Those in the Foucauldian camp are sometimes given to calling neoliberalism 'advanced liberalism'. In the political-economic camp, Karl Polanyi's economic history is used by some in conjunction with Marx's late political-economic writings because of Polanyi's critique of the 'classic liberalism' of the nineteenth and early twentieth centuries. Others call upon Antonio Gramsci's ideas in order to assess whether and how neoliberal values and practices are embedded in everyday life outside the formal spheres of 'state' and 'economy'. Few authors whose work is reviewed here have used all of Marx, Polanyi, and Gramsci together in a substantive way. Typically, one or two of these theorists' ideas are used (usually selectively) in any given study. (I say more about this in the penultimate section of the article.) Although some authors in the political-economic fold have drawn upon other theorists—such as Jean Baudrillard and Jim O'Connor—Marx, Polanyi, and Gramsci currently seem to be the favored ones.
3. In other words—for better or worse—I have not included publications in which environmental use and management have been analyzed in the context of policy changes that some would describe as neoliberal, such as 'structural adjustment policy' in the global South in the 1980s and 1990s. Unless authors discuss neoliberalism explicitly, I have excluded their publications, even when these publications cover related matters such as the privatization of environmental goods and services.
4. In part, the fact that neoliberal values and principles have made their way into the domain of environmental policy reflects the nature of many environmental goods and services: they inevitably impinge upon, or are themselves affected by, ostensibly 'non-environmental' policy domains, such as international trade policy. But it also reflects two other things. First, many environmental goods and services are of great social and economic importance (water and sewerage being prime examples). It is no surprise, therefore, that neoliberal reformers were intent on altering the modes of delivery and governance of these services, for they were hardly marginal to any project of remaking the economy, state, and society *tout court*. Secondly, a set of worrying environmental problems already evident in the 1960s have subsequently grown in number, diversity, and seriousness. Neoliberal policy makers have sought to address these problems in ways consistent with their particular worldview. The terms 'free market environmentalism', 'liberal environmentalism', 'green capitalism', 'ecological modernization', 'green neoliberalism', and 'ecological capitalism' all capture, with rather different cognitive and normative valences, this explicit problem-solving agenda.
5. For instance, researchers in geography, anthropology, and development studies have drawn upon each other's research of late when thinking through new developments in nature conservation. See, for example, the recent special issue, titled "Capitalism and Conservation," of the journal *Antipode* 42 (3) (2010): 469–799.
6. There is also a good review by Himley (2008) in the online journal *Geography Compass*. I have three new student-oriented essays on neoliberalism and nature in the same journal (Castree 2010a, 2010b,

2010c). Because I am presuming little prior knowledge of at least some readers, this article inevitably recapitulates ideas presented in my back-to-back 2008 articles for *Environment and Planning A*. However, knowledgeable readers will, I hope, see the 'value added' in the present article compared to the two earlier ones—not least in my attempt to cast a wider net and encompass works published in several disciplines outside my 'home base' of geography.

7. Inevitably, despite my attempt to be thorough, I will have missed some things. For instance, a special issue of the journal *Review of Radical Political Economics* (42 [2] [2010]) on the political economy of water service privatization was published as this article went to press. As stated in note 3, absences like this raise the wider question of how far I should have cast my net when researching this article. My rule of thumb was to read only those studies in which the term 'neoliberalism' is used in a more-than-passing way. However, this means that numerous works that focus on topics such as markets and privatization without mentioning neoliberalism are not included in this review. Only studies that have gone through peer review and are published are referenced here; working papers and conference papers are excluded.
8. I am in good company. At a three-day conference titled "A Brief Environmental History of Neoliberalism," which was held on 6–8 May 2010 at Lund University in Sweden, many researchers presented their findings pertaining to this topic. To view the working papers from this conference, see http://www.worldecologyresearch.org/?p=1.
9. A leitmotif of all these aspects is more or less far-reaching change, which is why neoliberalism has been commonly described using action terms such as 'project', 'strategy', 'roll-back', 'roll-out', and 'regime change'. It is understood by the critics to pose a definite challenge to what has heretofore constituted 'common sense' discourse and practice in the domains of state, economy, and society. This strongly performative element leads Harvey (2007) to regard neoliberalism as a synonym for 'creative destruction'—that signature element of capitalist modernity in all its geographically and historically varied forms.
10. Modern liberal philosophy is a diverse and complex thing. Not all self-declared liberals could be fairly described as neoliberals in the sense meant by critical social scientists or left-wing political activists. What is more, the neoliberal worldview is rather more radical than that of the Freiburgers, who originally claimed the term as their own. Indeed, some of the latter considered the likes of Hayek to be 'paleo-liberals', a pejorative reference to their aspirations for a world of *laissez-faire* writ large.
11. In this latter respect, the neoliberal worldview has frequently been called 'market triumphalist', 'market extremist', or 'free market capitalist'. More than any other institution in modern society, the market is seen as the handmaiden of liberty and freedom, by virtue of Adam Smith's famous 'hidden hand'. This also dovetailed with a belief that markets should, in many cases, substitute for decisions made currently within the domain of politics. In other words, Friedman and those who shared his views argued that in many Western democracies the political sphere had, in some senses, become 'bloated' since World War II. They believed that this was the case not just in the administrative-technical sense ('the big state', reliant on too much tax income and borrowing), but in the sense that too many private issues were being made into matters of public concern ('the nanny state', intruding into matters that should rightly be decided by individuals, families, and communities).
12. Still in existence, the Mont Pelerin Society is an international organization composed of economists, philosophers, historians, intellectuals, business leaders, and others who champion classical liberalism. The society advocates free market economic policies and the values of an open society, with political freedoms and human rights as its foundation. See http://www.montpelerin.org.
13. In spatio-temporal terms, privatization typically amounts to geographical exclusion and denying current and future generations the use and/or benefits of a given portion of the biophysical world. All privatizations are, at one and the same time, acts of inclusion and preclusion, creating both entitlements and proscriptions.
14. It is worth noting that, for many commentators, it is the conjunction of privatization and marketization that defines commodification (i.e., the reshaping of goods and services into commodities). Needless to say, in practice both privatization and marketization take a number of concrete forms, as befits the particular commodities, firms, consumers, and other relevant parties in question.

15. In the West, the term 'new public management' has become a familiar descriptor for this process, denoting a management paradigm that emphasizes value for money, budget capping, cost recovery, and the avoidance of deficit spending whenever possible.
16. Three things make this policy discourse 'neo' (i.e., new) -liberal when compared with the so-called classical liberalism of Adam Smith. First, from the 1970s it was presented as an explicit critique of post-war 'managed capitalism', be it in parts of the former communist bloc, the Western social democracies, or the many 'developmental states' of the global South. Secondly, it takes a fairly dim view of the state, public goods, and common resources—except insofar as any of them can aid the cause of individual freedom or liberty. In Colin Crouch's (2004: 248) words, "Not only is the state seen as having no goals or *modi operandi* different from those of market actors, but it is seen to gain by subordinating its activities as much as possible to those of market actors." Finally, this discourse has traveled far and wide geographically, courtesy of various institutions and networks in which US neoliberals have played a highly active role (for more, see Peck 2010).
17. Because many of these empowered individuals not only are outside the formal sphere of government but also are unelected, many observers have regarded neoliberal policies as anti-democratic.
18. This research agenda is advocated by several others, including Castree (2005), Clarke (2004), England and Ward (2007), Kingfisher and Maskovsky (2008), Larner (2000, 2003), and Leitner et al. (2007). It amounts to tracking the temporal and geographical circulation, modification, hybridization, implementation, revision, and (in some cases) abandonment of neoliberal ideas. At its most ambitious, it involves determining the reciprocal links between, and conjoint effects of, neoliberalism as philosophy, program, and practice in any given case. This would enable us to identify varieties of neoliberalism and to understand whether, how, and why they have succeeded in their own less-than-homogeneous normative terms. It would also oblige us to acknowledge the fact that, in some cases, the mere presence of elements of philosophy, program, and practice does not, in itself, entitle us to conclude that these are defining elements. They may, in fact, be less than hegemonic in certain situations, since their presence in one or another policy domain does not make them definitive of an entire policy regime, let alone an entire social formation. As things stand, there is no consensus on how one identifies a 'variety' of neoliberalism, although several economic sociologists and international relations scholars have scarcely hesitated here—as if the complex ontological, epistemological, and methodological issues just highlighted were of little consequence. For now, I will also put aside these complexities as I move on, at long last, to discuss the neoliberalization of nature.
19. Before proceeding any further, we should make an important distinction between real and analytical consequence (which has only been implicit thus far in this article). When considering the neoliberalization of nature, we can discuss one or both of the following, depending on how thoroughly we wish our examination to be. First, there are those neoliberal policies that are not ostensibly about environmental goods and services (such as free trade policies) yet nonetheless have real biophysical impacts. Secondly, there are those neoliberal policies (such as water resources policies) that take environmental phenomena as the explicit object of attention. In what follows I will be surveying research that focuses on the latter for the most part, meaning that I am—in truth—omitting a key section of literature on the neoliberalization of nature. However, including this other literature would, at the least, double the length (and complexity) of this already long article.
20. These properties are relative rather than absolute, but they are real nonetheless. They can perhaps be ignored in the short term but not in the medium to long term, since inappropriate regulatory measures will eventually lead to visible and possibly harmful environmental problems.
21. The special issues referred to are "Neoliberal Nature and the Nature of Neoliberalism," *Geoforum* 35 (3) (2004), and "The Commodification of Nature," *Capitalism, Nature, Socialism* 16 (1) (2005).
22. Higgins and Lockie (2002), Sullivan (2006), and Fletcher (2010) are among the relatively few exceptions to this viewpoint. Some regard the two approaches to neoliberalism as complementary: see, for example, Lockwood and Davidson (2009).
23. I suspect that this Foucault-inspired research into neoliberalism and environmental governance will grow in importance, not least because Foucault's lectures on biopolitics were recently translated into English.

24. This matter of class-based social power has frequently arisen in respect to enclosures of environmental commons (i.e., community land and resources).
25. The theoretical literature authored by eco-Marxists such as James O'Connor, Ted Benton, Elmar Altvater, and John Bellamy Foster is undecided on this question of ecological contradictions.
26. For example, in 2010 several publications by Bram Buscher appeared in a range of journals, with more to come (see Buscher 2010a, 2010b; Buscher et al., forthcoming).
27. I hope, therefore, that this article will lead readers to a close study of the many publications that have been cited in it.
28. See also St. Martin's (2007) study of recent New England fisheries and Ibarra et al.'s (2000) analysis of Chilean, Mexican, and Peruvian fisheries management.
29. The acronym 'quango', coined and used primarily in the UK, signifies a quasi non-governmental organization that is either financed by the government or formally linked to it but operates at arm's length.
30. The relativity of effects invites complex and differentiated judgments about how they are to be registered and evaluated. It would be facile to suppose that all the effects of the neoliberalization of nature registered in the published research can somehow be added up and included in some sort of aggregate scorecard, although table 1 gives the impression that this is a permissible practice. For more on this, see Castree (2008b: section 4).
31. A similarly convincing case about the state and its involvement in markets is provided by Bakker (2003). See also Bailey (2007a) and Bell and Quiggin (2008).
32. See Mansfield (2004a, 2004b) and Robertson (2004) for similar arguments about the impact of nature's material properties.
33. According to Clive Barnett (2010), this lack of agreement is symptomatic of the role neoliberalism plays as a shibboleth for the Left, its value being more symbolic than analytical.
34. In her most recent article, Bakker (2010a) makes a serious attempt to provide a vocabulary for undertaking such single-site and comparative studies.
35. See Castree (2008a) for a rather abstract attempt to synthesize some of the different theoretical ideas that have been used in the literature, and Bakker (2009) for a constructive critique of it.
36. For instance, Jessica Budd's (2004) article on Chilean water reform makes use of the concept of social equity but nowhere details or defends this normative idea.
37. Leila Harris (2009) has recently published a useful review, focusing specifically on the gender dimensions of neoliberal environmental policy.

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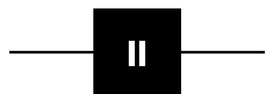

BOOK REVIEWS

DOWIE, Mark, *Conservation Refugees: The Hundred-Year Conflict between Global Conservation and Native Peoples*, 336 pp. Cambridge, MA: MIT Press, 2009. ISBN 978-0-262-01261-4.

The publication of Mark Dowie's *Conservation Refugees* provides a landmark in debates about the social impacts of conservation and protected areas—the point where it shifted from being a discussion among academics, conservationists, and indigenous peoples' organizations into the realm of popular writings. Academic studies of the relationship between protected areas and local peoples have expanded and developed considerably since the publication of West and Brechin's (1991) *Resident Peoples and National Parks*, which could be considered the first book on the subject. Evictions, exclusions, and injustices resulting from conservation actions, both historical and current, have been recorded throughout the world. Detailed analyses have revealed the wide range of power relations involved, their efficacy, and the implications for both biodiversity and local residents. Conservationists too have recently been debating dynamically, prompted in part by critiques from academics and indigenous activists.

Variously, past and ongoing injustices have been acknowledged, new commitments have been made, and new forms of action and partnership have been undertaken, although there remains considerable differences of opinion among conservationists about what the obligations and strategies of conservation should be with regard to local peoples. While in recent years there have been a few articles in environmentalist and conservation magazines and newspapers about evictions and exclusions involving protected areas (some authored by Dowie), *Conservation Refugees* represents the first time that this topic has been the subject of a book intended for the lay public. Aimed at exploring how indigenous peoples have long suffered as a result of conservation and how they can, and must, be part of the preservation of biodiversity, the volume also happens to be a well-researched, insightful, and pretty comprehensive read by a veteran and respected investigative reporter.

Starting with the case of Yosemite National Park in California, the book chronicles the evictions of indigenous peoples since the inception of modern protected areas. Subsequent chapters explore examples of evictions and exclusions in Ethiopia, the Congo, India, the Amazon, East Africa, and other places, examining the reasoning behind these actions and their consequences. Mixed in throughout is an exploration of the organizations and the conservation practices, concepts, and ideologies that underpin certain forms of protected areas. These observations enrich the analysis and help to explain what has led to the evictions. Also included are a few examples in which indigenous peoples have benefited from, or at least have not been harmed by, conservation. The book is clearly the result of a thorough review of the current academic literature on indigenous peoples and conservation, covering many well-known case studies, as well as key arguments on wilderness, the positive role of disturbances, and traditional ecological knowledge. However, the extensive

research is not adequately represented in the slim documentation.

The opening line of the preface, which refers to the "good guy vs. good guy" (p. ix) struggle between conservationists and indigenous peoples, reveals the author's intent not to expose the evils of conservation but rather to promote forms that are good for both biodiversity and local people. Dowie considers that conservation efforts can succeed only when the latter are encouraged to become part of saving biodiversity, rather than being opposed to it. Overall, the book's treatment of large NGOs is less harsh than in Dowie's (1995) earlier work. The analysis of the big international conservation NGOs, who generally bear the brunt of criticism for their role in evictions, is rather nuanced, with a recognition that they can also treat indigenous peoples with respect, involving them in conservation. It explores how NGOs' attitudes toward indigenous peoples have changed (in Dowie's view, improved) in recent years—albeit with some distance left to travel—and how contradicting ideas can co-exist within the same NGO.

There are minor problems regarding some matters that are left out, which perhaps reflects a desire to have a cohesive book that is accessible to the non-specialist reader. Much blame is put on the largest international NGOs rather than on smaller organizations or states, which is of particular importance in countries, such as India, where the presence of large NGOs is thin. The writings of well-known conservationists are quoted, but the analysis could have benefited from personal interviews, particularly since some conservationists have rethought their attitudes toward indigenous peoples since the cited pieces were written. While Dowie rightly criticizes the perceptions of many conservationists regarding indigenous peoples' destructiveness, he could also explore in more detail situations in which these views are correct and the circumstances that might encourage local peoples to take destructive actions toward biodiversity. Likewise, Dowie's coverage of the ills that conservation NGOs can bring to rural peoples greatly outweighs that on potential benefits. The exclusive focus on indigenous issues ignores the impacts of conservation on other vulnerable groups who have been involved in long-standing stewardship of the environment but who lack or do not lay claim to ethnic indigeneity. Making it an issue solely of indigeneity excludes these other victims of conservation from our analysis and our sympathy, and possibly from better, more compassionate conservation practices. Despite this, *Conservation Refugees* should be read by anyone with an interest in conservation, indigenous issues, or the complexities of sustainability and development.

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ESCOBAR, Arturo, *Territories of Difference: Place, Movements, Life, Redes*, 437 pp. Durham, NC: Duke University Press, 2008. ISBN 978-0-8223-4344-8.

The anthropologist Arturo Escobar is well-known for his work examining new social movements, 'post-development', and post-structural political ecology. Those who have found inspiration from these earlier works will enjoy his latest book, *Territories of Difference*, a lengthy monograph that draws together more than a decade's work with disparate literatures and social movements (especially in his native Colombia). Any attempt to state what the book accomplishes runs into difficulties. In the first place, the

text's problematic is vast and poorly defined. As the title indicates, the volume is concerned with territory, difference, place, social movements, life, and networks (or *redes*). The one-word chapter titles do little to indicate the content of the distinct chapters, which in turn deliver few straightforward arguments. The same could be said of the book as a whole.

Consider two introductory passages in which Escobar defines the book's aims. The first comes immediately after a description of his collaborations with the Proceso de Comunidades Negras (PCN): "This book can be seen … as an ethnography of the practices, strategies, and visions of [a] particular group of activists [with whom Escobar has collaborated], including their own knowledge production. While the book is largely conceived from this perspective [i.e., as a study that emerges at the intersection of political and intellectual practice—JDW], however, it is more than that … [T]he book proposes a way of analyzing some of the most salient social, cultural, and ecological issues of the present day" (p. x). We are not told what this "way of analyzing … issues" is, but readers will gather that it involves examining the socio-natural networks within which political-economic issues arise (more on this later). Here is a second key framing passage (pp. 4–5):

> [This] book is about the incredibly complex intersections of nature and culture, space and place, landscape and human action, culture and identity, knowledge and power, economy and politics, modernity and globalization, and difference and sameness associated with imperial globality and global coloniality in a particular corner of the world; it is also about what has been called uneven geographies of poverty and livelihoods, and how they are related to historical political economies and culturally inflected patterns of development … I render these geographies manageable by a particular design in term of six basic concepts: place, capital, nature, development, identity, and networks. These concepts are both chapter titles and notions that articulate my argument throughout the book.

The reader might then expect the "argument [articulated] throughout the book" to be stated, but it is not. This points to the central weakness of this original and creative book. It sags under the weight of its diverse topoi, never uniting around a coherent theme or argument—perhaps by design. Two of the book's central tropes are weaving and networks, and the text is nothing if not an interweaving of threads of text and social life. The best way to enjoy it is to dip in, follow a thread, skip to another section, draw some connections, and move on. The book is an often frustrating mishmash, but that is not to say that it has nothing to teach. For while Escobar lacks a clear argument, there is no shortage of new ideas. While the book could be fairly described as an ambitious compilation of readings, the key question, then, is, how does Arturo Escobar read?

I will offer two brief observations to this question. The first concerns Escobar's approach to theory. He reads widely and with a penchant for upending every metaphysical pairing he finds (e.g., 'nature and culture') in post-structuralist fashion, thus producing a narrative that is productively fragmented, layered with bits and pieces of concepts that are neither wholly embraced nor discarded. Escobar seems less motivated to solder analytical arguments carefully together than to mix social theory with cultural-political experiences. His is a practiced blending, and much of the appeal of the text comes from the moments when it works. His reading is also practiced in the sense that it has an intended effect. As Escobar explains, one of his paramount aims is to "demystify theory that ignores subaltern experiences and knowledge … *in order to relocate their politics of place as key to our understanding of globalization*" (p. 15). This position could be characterized as populist insofar as it calls for an explicit return to the representation of subaltern experience by anti-colonial intellectuals like

Escobar. We should register the considerable distance between this ethnographic strategy and the post-colonial criticism of Gayatri Spivak, Partha Chatterjee, and Qadri Ismail.

My second observation is that Escobar's readings are not Marxist, at least not in any sense that the word is normally understood. Escobar posits that "Marxism was not very good at dealing with nature" (p. 8), and I get the impression that he thinks it was not very good at much else. Consider chapter 2, 'Capital', which prosecutes one of the most coherent sub-arguments in the book, concerning the status of the relations of production and consumption of the black communities under study. Escobar's opening salvo is to ask "whether these communal forms [of economic life] could be considered noncapitalist forms of economy" (p. 72). Citing the work of J. K. Gibson-Graham (a major influence on Escobar), he claims that "what is at stake is the possibility of finding noncapitalist forms of economy at play in concrete situations" (p. 74). Reviewing familiar histories of livelihood transformation wrought by African oil palm, "global shrimp" (p. 85), and their attendant market relations, Escobar explains that he will "bracket the assumption that these enterprises can be described in purely capitalist terms" (p. 83)—a reasonable strategy, particularly since arguing against their seemingly obvious capitalist character would "require more detailed study," as he rightly notes (ibid.). But within 20 pages, his questioning and 'bracketing' have become displaced by positive assertions, cast as research findings. We find the communities that he studied being compared against "Gibson-Graham's criteria for noncapitalism" (p. 100), and then, in the chapter's conclusion, the decisive claim that "in this region there exists a complex dynamic of various types of economies, economies one needs to understand without subjecting them to a single capitalist determination" (pp. 106–107). Translation: the Marxists are wrong; capital is not dominant here. Thus, his question is answered, albeit without ever making the case. (For a different reading of black practices, see Asher 2009).

I am not sure what motivates this rhetorical strategy, but I suspect that it derives from a desire to show that these communities reproduce non-capitalist spaces within which to resist coloniality. Or that Escobar can help the black community find itself in such spaces. In either case, his logic seems to be that if we can find socio-natural networks that are relatively autonomous from capital and bring them to light, alternatives will grow. Reasonable thinkers may disagree as to whether this political theory is tractable, or whether Escobar's research successfully demonstrates the existence of such non-capitalist economic networks. What is certain is that many readers will find this an ambitious and creative book.

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Asher, Kiran. 2009. *Black and Green: Afro-Colombians, Development, and Nature in the Pacific Lowlands*. Durham, NC: Duke University Press.

FAGAN, Brian, *The Great Warming: Climate Change and the Rise and Fall of Civilizations*, 304 pp. New York: Bloomsbury Press, 2008. ISBN 978-1-59691-392-9.

We are often told that those who do not know history are doomed to repeat it. As societies around the world come to terms with the complexities of global warming, historians and archaeologists are increasingly turning to the past, arguing that droughts, rising temperatures, and environmental degradation caused the collapse of various ancient civilizations. For these scholars, abandoned cities and the toppled monuments of their kings sound a clarion call, providing a preview of our own destiny if we fail to take global warming seriously. Such studies often have a moralizing quality, as clear as the verses of Shelley's *Ozymandias*. For example, in his widely read

book *Collapse: How Societies Choose to Fail or Succeed*, Jared Diamond (2005) argues that the short-sightedness and avarice of rulers and leading elites repeatedly led societies to collapse, a clear indictment of our present condition.

Many scholars—anthropologists in particular—have reacted to Diamond's book and similar studies that give environmental and climate change starring causal roles in the collapse of ancient civilizations. Without downplaying the urgency of addressing global warming, they argue that these studies underestimate the ability of societies to respond to environmental and climatic changes; that they focus on the political dissolution of kingdoms and empires, while ignoring the resilience of past societies and the cultural continuities that persist in the wake of political collapses; and that they oversimplify the interaction between people, their environment, and climate change. Like the case studies brought together by McAnany and Yoffee (2010), Brian Fagan's *The Great Warming* serves as an important counterweight to simplistic environmental explanations of ancient social collapses. Fagan's book appeals to a wider audience, however, as it is written to be accessible to scholars in other disciplines and the general public as well.

The Great Warming is impressive in its comparative scope, analyzing case studies that show how climate change affected ancient societies around the world during the Medieval Warm Period, which he dates to about AD 800–1300. Two critical observations emerge from Fagan's synthesis, both of which are pertinent to the ways we think about global warming and make plans for the future. First, global climate trends affect local climate regimes in quite variable ways. To explain why this is so, Fagan nicely synthesizes recent advances in our understanding of global climate forces and processes, such as El Niño and the Intertropical Convergence Zone, while pointing out that there is much yet to learn. He also masterfully takes the reader through the various proxy records used to reconstruct climate histories (e.g., sediment records from lakes, ice cores from glaciers and ice sheets, historical documents, etc.), pointing out the strengths and weaknesses of each. One comes away with an awareness of how much our models of global climate and our reconstructions of climate history have advanced in the last 25 years, and with renewed appreciation for the fact that global warming will have many diverse local manifestations.

The second observation is equally critical: no matter how detailed our models of past and present climate change are, understanding its role in shaping human history requires an equally detailed study of people and culture. In this respect, Fagan provides a welcome nuanced treatment of the ways in which ancient people responded to changes in the natural world around them, and, in doing so, he demonstrates the limitations of Western constructs of collapse. He argues convincingly that the migration undertaken by the ancestral Puebloan peoples of the Southwest was an effective response to a long period of drying and drought. Thus, he recasts the abandonment of the great houses of Chaco Canyon and Mesa Verde from catastrophic collapse to wise long-term strategy.

Fagan's comparative analysis also demonstrates that drier conditions do not inevitably lead to collapse. For example, his discussion of the Chimú civilization of Peru's arid Pacific Coast illustrates a successful response to heightened desiccation. It is also refreshing to see a scholar address the ways that climate change has affected realms of culture beyond agriculture. For instance, Fagan shows how wind conditions during the Medieval Warm Period favored long-distance voyages by Polynesian sailors that led to the arrival of the Rapa Nui on Easter Island.

As an anthropologist, Fagan puts people and culture front and center in his analyses. He emphasizes the rich and detailed environmental knowledge of agrarian societies, past and present. Across the globe, people have developed effective methods of weather

prediction on weekly to annual scales (see, e.g., Orlove et al. 2000), and thus they could pro-actively respond to changing weather. Fagan also highlights the role of technology in shaping the way that people interact with the environment. He discusses how technological innovations such as the moldboard plow, camel saddles, and toggle harpoons opened up new possibilities, allowing people to interact with both the environment and one another. By including these important observations about culture and technology, Fagan focuses the readers' attention squarely on the intersection between social and cultural history, on the one hand, and environmental and climate history, on the other.

Occasionally, one detects a whiff of moralizing in Fagan's analyses. For example, he suggests that the Maya collapse was due in part to an "inflexible ideology" and a "constant preoccupation with warfare" (p. 171), while the Chimú prospered during a period of drought because the increasingly dry conditions on the Peruvian coast had forced them to adopt careful conservation measures (pp. 171–172). I would suggest that the important differences lie in the fact that the Maya lacked the rich fisheries and the larger-scale imperial political economy of the Chimú, which, as Fagan duly notes, provided the latter with a buffer against agricultural shortfalls and spread the risk of drought across a broader geographic region.

In any broad, comparative synthesis, experts may take issue with the presentation of their area of expertise. *The Great Warming* is not immune, and I take some exceptions to Fagan's presentations of Tiwanaku and Classic Maya civilizations. In the case of the latter, in particular, Fagan overstates the Maya 'obsession' with water and overemphasizes the importance of water control to the authority of Maya rulers. He revives an old chestnut of Maya exceptionalism—that they developed in a particularly inhospitable environment—but underscores the long dry season and unpredictable rainfall instead of the impenetrable jungle.

These minor quibbles do not change the fact that *The Great Warming* is an engaging and well-written presentation of a remarkably large body of information that is accessible to experts and non-experts alike. They also do not detract from the larger, important contributions that Fagan's book makes to ongoing debates about the role of climate changes in shaping our past and our future. Anthropology and archaeology have demonstrated that human responses to changes in climate, no matter how severe, are always conditioned by culture and mediated by a society's institutions and technologies. Anthropologists and archaeologists are fortunate to have in Brian Fagan a gifted and committed intellectual ambassador who can convincingly articulate this critical point to a broader audience.

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HORNBORG, Alf, J. R. McNEILL, and Joan MARTINEZ-ALIER, eds., *Rethinking Environmental History: World-System History and Global Environmental Change*, 207 pp. Lanham, MD: AltaMira Press, 2007. ISBN 978-0759110281.

During an environmental history class, I once discovered that my students did not believe in capitalism. More precisely, they believed that capitalism differed in degree but not in kind from other economic systems, since everyone, at all times, was basically greedy and interested

only in maximizing profit. What differentiated the capitalist mode of agriculture (if indeed such a thing existed) was not the new kinds of social relations, market structures, land tenure regimes, or debt, credit, and investment cycles that it entailed, but rather technology, which the students also saw—along with population growth, of course—as the great driver of environmental change.

After recovering from my initial shock, I realized that my students lacked exposure to a systematic theory of capitalism and its relationship to global environmental change. Thus, I welcomed the opportunity to review *Rethinking Environmental History*, which promised to fill this need. Containing 20 chapters by scholars from history, anthropology, geography, and ecological economics, among other fields, this edited volume seeks to integrate a structural political economy approach—particularly, Immanuel Wallerstein's world-system theory (WST)—with empirical analyses of international flows of materials, energy, wastes, capital, and people, from ancient times to the present. Yet, as is the case with many edited volumes, the end result is uneven, unwieldy, and disjointed. While certain chapters stand out, the analytical incoherence of the book as a whole may not advance the cause of using WST as a lens for a systematic exploration of global environmental change.

The argumentative thread that runs through the book, albeit somewhat sporadically, is that our global ecological crisis stems from the spatially uneven economic relations between core and periphery in the world-system. The story of modern times is thus the gradual expansion of the political influence and market territory of the core, which turns external arenas into peripheral units of the system, immiserating them and stripping them of natural resources in the process. This line of argument should be abundantly familiar to anyone with a passing interest in international development, colonialism, or global environmental change. Yet, as my classroom anecdote suggests, big theories require constant retesting, modification, and propagation through diligent empirical research. One major problem with *Rethinking Environmental History* is that only some of the contributors use WST as their primary analytical lens (Alf Hornborg, one of the editors, admits as much in his introduction). For example, Mats Widgren offers an illuminating chapter on the concept of landesque capital, and J. R. McNeill makes a compelling case for yellow fever's determining role in the imperial geopolitics of the New World, but their connections to WST are unclear. Perhaps fewer contributions, more tightly bound to the WST framework, would have generated greater analytical coherence and precision.

Yet, taken together, even the more WST-oriented chapters left me skeptical about the theory's usefulness for understanding environmental change. In part, this is due to the weakness or inconsistency of empirical claims, exacerbated by the editors' evident lack of interest in providing synthesis across chapters. In a rhetorically overheated chapter, Jason W. Moore proposes that a "metallurgical revolution," fired by wood fuel, drove Europe's early modern crisis of deforestation. But how does this jibe with the preceding chapter by the late Michael Williams, covering roughly the same period of Europe's forest history, which demotes metallurgy to a minor cause of forest clearance? In fairness, a much more coherent and innovative empirical program is presented in four chapters that attempt quantitative analyses of "unequal ecological exchange" and global-scale "social metabolism." This kind of historical accounting is extremely complex and necessary for refining increasingly popular concepts, such as the "ecological footprint," and for weighing intergenerational distributive justice claims (as highlighted by Wallerstein himself, in an ominous concluding chapter).

At a more theoretical level, the volume fails to resolve one of the more persistent critiques of WST: how countries advance from periphery to semi-periphery to core. Although Williams categorizes the world-system as a "highly dynamic arrangement" (p. 106), this assessment is not borne out much in his chapter or

elsewhere. In fact, the spatial, economic, and geopolitical arrangement between core and periphery, as portrayed in this book, seems to crystallize irreversibly by the 1800s. The core hosts the 'productive' economies, with the periphery bound to focus on 'extractive' industries, leading to ever-diminishing terms of trade and spatially uneven development. This structure captures the world economy circa 1914, but today the lines between core and periphery (production and extraction) seem quite blurry. For example, how do we explain the transformation of the Powder River Basin of Wyoming, one of the world's richest sites of resource extraction (coal), being nestled in the heart of the global 'core'? Or the rise of China? Or the industrialization of Brazil?

Even more unnerving, the concept of 'ecologically uneven exchange', as elucidated by Joan Martinez-Alier and the late Stephen Bunker, seems, in the final analysis, to verge toward environmental determinism. At first glance, environmental determinism would seem to find little purchase in a critical, structural, Marxian political-economic analysis. Yet Martinez-Alier and Bunker, in their respective chapters, suggest that the unevenness of exchange and core-periphery relations are essentially structured by the heterogeneous nature of the spatial distribution of natural resources on earth—indeed, to use Bunker's phrase, it makes uneven development "physically inevitable" (p. 241). If that's the message, it is conveyed in much clearer prose by Jared Diamond in *Guns, Germs, and Steel*.

Ultimately, *Rethinking Environmental History*, by dint of its inconsistent analysis and confusing message, fails to displace Diamond and other popularizers of global environmental history, who succeed because of the simplicity of their mega-scale narratives and the primacy given to natural and technological, rather than political and economic, determinants. Such apolitical and triumphalist tales certainly deserve 'rethinking'. In the end, this book will be judged a success by a cadre of true believers in Marxian ecological economics and world-system theory, but—save for a few outstanding chapters—it is unlikely to convince those who are so fully immersed in capitalism that they misperceive it as the natural order of things.

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JONES, Eric C., and Arthur D. MURPHY, eds., *The Political Economy of Hazards and Disasters*, 351 pp. Lanham, MD: AltaMira Press, 2009. ISBN 978-0-7591-1309-1 (cloth).

Eric C. Jones and Arthur D. Murphy's edited volume *The Political Economy of Hazards and Disasters* represents a valuable contribution to cross-cultural scholarship on the political-economic and historical dynamics that figure into the creation of and the response to disastrous situations. By synthesizing a diverse body of ethnographic and archaeological material, the book offers valuable insights into the vulnerability profiles and other determining factors that structure the experience of such events. As a key text in the anthropology of hazards and disasters, it provides an important perspective on the ways in which communities and governments manage the calamitous situations that are constant factors in human history.

Jones and Murphy state that their main interest is the social distribution of vulnerability and the relation between economic patterns and the occurrence of hazards and disasters. They define disaster as "a tragedy experienced by a human group at the hands of an identifiable event, mitigated by local capacity and broader intervention, and measured in terms of economic, spiritual, psychological, biological, political, or social impact" (p. 5). As a concept, 'vulnerability' ties together the book's 14 chapters. The ethnographic and archaeological analyses describe how disasters affect populations in a multiplicity of ways. In turn, the accounts portray local peoples' agency as they confront a cascade of crises.

The volume begins with two sections that focus on economic dynamics. Part 1 ("Economic Parameters of Disasters") sets the tone by discussing historical and contemporary trends in the examination of disastrous situations. The contributing authors strive to create a balanced perspective on the importance of economic parameters among the multitude of complex variables that analysts must confront when examining disaster and recovery. Part 2 ("Class-Based Vulnerability in Disaster Exposure, Impact, and Recovery") examines how class structures vulnerability within a population's social groupings. The section does a superb job explaining the socio-economic dynamics that structure the unequal experience of and recovery from disastrous situations. Moreover, it shows that little has changed for the most vulnerable populations and that major adjustments of recovery efforts are necessary.

Part 3 ("The Line between Hazard and Disaster for Primary Producers) and part 4 ("Product Distribution in Hazardous Settings") review variations in risk strategies and hazardous product distributions at a global level. Part 3 details how production strategies are adapted in Central and South America in times of crisis, from shifts in stone tool manufacturing in ancient Mexico to the accommodation of modern Ecuadorian life to the volatility of a volcanic environment. Part 4 follows this lead by examining disaster-related adaptations in the distribution patterns of various goods in the Philippines, the Indian Ocean, and Madagascar. Parts 3 and 4 use ethnographic and archaeological material to show how populations at high risk of repeated disasters must be able to adapt their production and distribution techniques if they hope to survive and recover as quickly and efficiently as possible.

Part 5 ("Political Economic Mitigation of Disasters") concludes the volume by focusing on the role of the state in assisting (or neglecting) populations in times of crisis. The chapters describe how governments both exacerbate and mitigate disasters and their local consequences. Analyses revolve around themes of industrial recovery, the use of knowledge from past catastrophes, and the idea of an effective 'culture of response'. The section does an excellent job tying together the topics from the rest of the book in relation to discussions of both effective and inadequate responses to calamitous events.

Overall, the volume presents a wonderfully detailed exploration of the different forms of theory, data, and methodology that can ground convincing analyses of disastrous situations. In a collaborative spirit, the authors provide a well-rounded perspective on all of the variables that contribute to the formation of hazards and disasters, as well as the experiences and responses of local populations. The book would be a useful addition to courses in economic anthropology and the anthropology of disasters and hazards, and in business or economics classes that seek to develop a more nuanced and political-economic understanding of disaster mediation.

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LANGSTON, Nancy, *Toxic Bodies: Hormone Disruptors and the Legacy of DES*, 256 pp. New Haven, CT: Yale University Press, 2010. ISBN 978-0-300-13607-4.

In *Toxic Bodies*, environmental historian Nancy Langston traces the cultural history of DES, the synthetic estrogen diethylstilbestrol. DES acts as a hormone disruptor. It was used as medication for women and girls (1950s–1970s) and as growth supplements for poultry (1947–1953) and cattle (1950s–1970s). The dangerous potential of hormone disruptors to promote reproductive cancers and interfere with sexual development was recognized as early as the 1940s. How then, Langston asks, did DES use in humans and their food become so widespread?

Langston contends that specific institutional and cultural practices kept DES in circulation.

In the early 1940s, the Food and Drug Administration (FDA) made a historic shift in perspective from a 'precautionary principle', whereby drug companies had to demonstrate that a chemical was safe, to a more industry-friendly approach, whereby it was the responsibility of a chemical's critics to demonstrate harm. Moreover, disagreement over the relevance of animal studies to human health, confusion over the relationship between natural and synthetic chemicals, and outdated risk and dose/threshold models for establishing cause and effect tragically compounded the situation. Finally, political pressure from pharmaceutical, chemical, and agricultural industries, alongside cultural beliefs in the technocratic authority of biomedicine over women's bodies, kept DES circulating for decades as either a medication for women and, later, girls or as a growth supplement for poultry and cattle.

The book is part history and part anthropology. Throughout, it is infused with activism (and rightly so). Langston takes us back to the beginnings of the FDA and its early administrators to highlight how the FDA has had a variable but consistently close relationship with industry. She tells disturbing stories of how pharmaceutical companies sent out free samples of DES and thalidomide (later withdrawn in the early 1960s when found to cause congenital deformities), in order to get 'data' to submit for new drug applications. The process obviously violated informed consent and in no way followed a scientific approach to demonstrating effect. Langston ties these actions into wider cultural beliefs in the primacy of technology over the unruly female body. From there, she uses gender theorists, such as Anne Fausto-Sterling and Judith Butler, to unpack implicit biases of a male-female dichotomy, a genetic determinist model of gender, and a Western split between body and environment. She shows how each bias shaped the use of samples, the motivation for the development of the drugs, and their ultimate uses.

Langston ends the book with a call to restructure our understandings of the impact of hormone disruptors. Borrowing from Steingraber's (2003) ecological reconceptualization of pregnancy, Langston advocates for a new ecology of health, one in which our bodies are semi-permeable entities in a web of interconnectedness with surrounding physical and socio-cultural worlds. Our bodies—specifically, our immune systems—are in constant negotiation with these worlds. Health is the result of resiliency to past and present threats, not simply the absence of immediate threats. In Langston's refashioning, models of risk would thus include ongoing epigenetic effects that can encompass the often late manifestations of low-dose exposure to hormone disruptors. These models of risk challenge the FDA's current quantitative risk assessment that ostensibly measures the potential harm of a new drug. Langston then calls for the return of the precautionary principle and a new dialogue that would bring diverse voices to the research and (re)assessment of chemicals in our medications, foods, and environments.

Certainly, Langston's proscriptions are timely, and they give us a frame by which to assess current regulatory institutions' positions and policies on chemicals used in food production and medication. For example, on 27 February 2010, *Science News* reported on new Environmental Protection Agency (EPA) findings for atrazine, a popular commercial pesticide and hormone disruptor (Raloff 2010). Recent analyses demonstrate a persuasive correlation between atrazine and birth defects/reproductive disorders. As Langston forecast in the last chapter of her book, the EPA admitted that pressure from environmental advocates—not new findings from a disembodied group of scientists—forced the re-examination of its earlier approval of atrazine. And, just as with DES, available data are problematic because they come from animal studies and necessarily inexact epidemiological research. Human data are compounded by a lack of control, the delayed observable impact of hormone disruptors, numerous other chemical confounders, and unknown

exposure timing, duration, and amount. Previous atrazine research was funded in part by industry and (not surprisingly) failed to find correlations. On the other hand, the EPA had not released research that had noted atrazine concentrations in drinking water that exceeded its standards. Indeed, Langston's analysis of DES gives us the ability to assess critically the multiple layers of influence on regulatory agencies' decisions.

Perhaps the major drawback to Langston's book is that it is almost too persuasive. The DES story she tells us is convincing. At the least, the permitted use of DES was an abrogation of the fiduciary responsibility of regulatory agencies. At the worst, it was intentional malfeasance. We get little in the way of industry documentation and perspective on DES, although, understandably, industry information is proprietary. One is left wondering about the individual actions and institutional processes that make up this thing we recognize as 'the bottom line' (i.e., profit). Moreover, how do cultural notions of 'risk' impact public response to industry and FDA findings? How do ideas of 'natural' impact the public's willingness to ingest certain chemicals? Indeed, how is 'chemical' defined in different contexts? To better regulate, as Langston suggests, we will need a more intimate historical and cultural understanding of the dynamics involved in the relationship between industries, regulatory agencies, and the public.

In sum, Langston deftly demonstrates that we need a closer and more critical look at the individuals and processes that have shaped the FDA and its response to DES. *Toxic Bodies* would be a powerful learning tool in upper-level undergraduate and graduate courses in history, anthropology, environmental studies, and sociology. It would also be of significant interest to environmental advocates and health professionals who regularly deal with the after-effects of hormone disruptors.

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LI, Tania Murray, *The Will to Improve: Governmentality, Development, and the Practice of Politics*, 392 pp. Durham, NC: Duke University Press, 2007. ISBN 978-0-8223-4027-0 (paperback).

The Will to Improve is an ethnographically rich study of development and conservation in the highlands of Central Sulawesi, Indonesia. Li places this project in the context of the history of civilizing missions, migration and cash cropping, indigenous rights, and the cultural assumptions of the environmentalists who were active in establishing the Lore Lindu National Park. Li's close focus on the social positionality of the actors within the fields of power and her ability to expand the concept of governmentality toward the cultural nexus of the actors who carry it out make this essential reading for environmental activists and development agents, as well as anthropologists.

The ethnography and analysis of chapters 3 through 6 will be of particular interest to environmental activists, anthropologists, and sociologists. The ethnography is set up in chapters 1 and 2 with a rich social history of plans and policies for development in Indonesian history. Li concludes chapter 2 with a masterful discussion of the 'emergent positionings' of the subjects of these interventions, indigenous peoples who have been 'civilized' by forced resettlement out of the forests and hills. Chapter 3 traces the effects of global capital, stimulated by national development policies, which transformed land and labor relations. Growing cacao for global markets and accumulating land, migrants excluded indigenous populations, who were increasingly constructed as poor and unworthy of development. Resulting conflict over

land was classified by government officials as anarchic rather than class-based. Into these sets of social relationships came a plan to protect the forests—the Lore Lindu National Park. The vision of improvement underlying the establishment of the park was that of saving biodiversity. High value was placed on the landscape of the rainforest. The defined problem was the "destabilizing practices" of highlanders (p. 125), their destruction of biodiversity. Huge amounts of money were committed on the basis of this connection that was drawn between these problems and potential solutions.

Methodologically, chapter 4 is interesting. Through a close reading of documents, Li analyzes conservation projects associated with the national park and assesses the effect of the plans on villagers who would be excluded from the park. Through this, she discerns the progressive stripping away of caveats and specific local information until, regardless of the actualities, the proposed project comes to look like the already existing vision of conservation and development agencies. This is 'rendering technical', a process that reduces planning to techniques, making politics invisible. Furthermore, at no point in these visions of 'integrated development' did project plans realistically calculate the actual cost of conservation that would be borne by the villagers. Their lives were simply to be improved.

To the dismay of conservationists, these plans resulted in organized resistance to the park by indigenous villagers. In essence, landless indigenous villagers asserted the right to be their own trustees, pro-park activists attempted to reassert their own position as trustees, and a leading conversation organization, the Nature Conservancy, lost an opportunity to integrate villagers into conservation plans. Li contends that "[t]he objective of trusteeship is not to dominate others [at least not openly, I might add]—it is to enhance their capacity for action, and to direct it" (p. 5). The power of trustees is often legitimated by science, and 'rendering technical' works alongside problematization to define problems and solutions. The project plan "constructed a boundary around a knowable, improvable, technical domain" (p. 154), from which villagers' knowledge was excluded.

Li's work is particularly powerful because it highlights villagers' agency within the construction of the capacity for that agency through their particular history (p. 228). She positions their agency not as a simple opposition to power, but as agency within multiple fields of power—intersecting matrices that had been brought to life during the processes of development. Similarly, Li refuses to examine development merely in terms of hidden motives of profit and domination; rather, she maintains that the trustees are sincere and try to manage the balance between orderly rule, capitalist profit, and the good of the natives (see, e.g., the conclusion of chapter 6). Nevertheless, I found her discussion of the pro-park activists far less empathetic than that of the villagers. Li does not take us into the world of the development actors—their historically constructed social positionality—nearly as effectively as she engages us in the life of the indigenous villagers.

Nevertheless, I found this volume to be a rich and theoretically significant contribution. Concepts such as 'the will to improve', 'trustees', and 'rendering technical', as well as Li's approach of situating agency within governmentality and her careful textual analysis of project documents, make a strong addition to the literature on environment and development.

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RADKAU, Joachim, *Nature and Power: A Global History of the Environment*, 448 pp. Cambridge: Cambridge University Press, 2008. ISBN 978-0-521-85129-9 (hardback).

In *Nature and Power: A Global History of the Environment*, German historian Joachim Radkau examines how human actions have affected the environment and addresses how

these actions should be understood in the context of the ongoing, reciprocal relations between humanity and non-human nature. Originally published in German in 2002, first released in a revised English translation in 2008, republished in English in 2009, and widely reviewed in multiple languages, this is a work of global environmental history that has received something approaching a global readership, at least among scholars at work in environmental history and adjacent fields.

This volume is notable for tackling not only the global scale but also the *longue durée* of its topic. The author addresses the significant organizational challenges of such a broad work by structuring his account according to "the geographic reach of environmental problems, the level of social authority that deals with them, and the type of knowledge that is employed in the process" (p. 36). This approach allows Radkau to integrate an analysis of water and forests with attention to colonialism and globalization, resulting in a work that is as historiographically ambitious as it is geographically and temporally so. For Radkau, the key to all of this is power. It is the central issue, regardless of whether the matter at hand is the local management of hunting rights or the European exploitation of overseas colonies. This book makes clear that, around the world and over a broad swath of time, the management of nature has often been about the management of humanity.

A self-described reluctant global historian (p. xi), Radkau is concerned with the relations between seemingly local developments and evolving global processes. The cumulative effects of the daily practices of the world's population receive a great deal of attention in this work. Indeed, some of Radkau's most persistent concerns are intensely local, even intimate: dietary changes, the uses of excrement, and the effect on populations of early forms of birth control are all important and recurrent themes in *Nature and Power*. Ultimately, it is the national scale that receives limited attention in this rendering. While Radkau recognizes the significance of the nation-state (along with other institutions and organizations) in the establishment and enforcement of environmental regulations, the structure of the book implies that the national scale does not provide an especially useful frame through which to analyze the character of relations between humanity and non-human nature.

Particularly in the English edition that was revised to accommodate readers most familiar with environmental history as practiced in English-speaking regions, Radkau is concerned to bring the insights of what he calls Old World environmental history to bear on the field as practiced in North America. While acknowledging his debt to the US field in particular, Radkau hopes that the resulting shift away from debates over ideas of wilderness and toward considerations of sustainability in long-inhabited landscapes might provide insights of value in contemporary efforts at environmental administration. Such concerns come to the fore in the latter third of *Nature and Power*, reflecting a shift in emphasis over the course of the book from historiographical critique of the environmental history field to policy prescriptions for those interested in improving environmental management. Notably, however, in both cases Radkau's advice seems fairly similar. He emphasizes the need for greater complexity in understandings of relations between human and non-human nature, arguing that both environmental historians and those involved in contemporary environmental discourse have often failed to accommodate the variety of forms that these relations have taken or may take.

Nature and Power is intended to demonstrate the utility of an environmental perspective to an understanding of global history, which implies an audience that includes those outside the field of environmental history. However, it is professionals or senior students working in environmental history and closely allied fields that are most likely to appreciate Radkau's combination of history and historiography. For the English-speaking reader who is not fluent in German, this work has the advantage of making available some of

the insights produced by so-called Old World environmental historians, although frustration is a likely outcome when the linguistic barriers to tracking down Radkau's source material become apparent. *Nature and Power* certainly demonstrates the value of closer dialogue among those practicing environmental history in different linguistic and cultural contexts, however difficult that may be to facilitate.

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ROBBINS, *Paul, Lawn People: How Grasses, Weeds, and Chemicals Make Us Who We Are*, 186 pp. Philadelphia: Temple University Press, 2007. ISBN 978-1-59213-579-0.

In her 2008 review of Paul Robbins's *Lawn People*, Julie Guthman celebrates this book as "a classic" that marks "political ecology's long overdue entry into American suburbia" (Guthman 2008: 425). Guthman's praise is not hyperbole. Robbins has produced a work of extraordinary range and sophistication. He has uncovered a hidden factor in human-environment relations and has brought a novel reading of social theory to bear on a remarkable set of empirical data. *Lawn People* is indeed a classic.

What makes the book so important? It is the first to provide scholars of environmental issues with a coherent theory of 'socio-natural' subject production. In the field of political ecology (where Robbins is unquestionably a central figure), a roiling debate has frothed about how geographers should theorize, and interpret, nature and society. One leading position within this debate argues that the very distinction between nature and society must be rethought by critically examining socio-natural phenomena, that is, things that are simultaneously natural and social. Meanwhile, many social theorists have sought to explain particular forms of subjectivity. *Lawn People* is the first book to bring together these two strands of inquiry effectively and to produce something genuinely new. Like a mad scientist zapping a biochemical brew with positive and negative electrodes, Robbins wields these two cutting-edge lines of inquiry to bring new life to an old problem: the lawn.

Space does not permit me to elaborate on the book's strengths, so I will focus only on its most novel quality: its thesis about nature and subjection. The central argument of the book is that the lawn—understood not as a mere natural thing but as a socio-natural assemblage, connecting grass, soil, and insects, as well as human labor-power, industrial chemicals, and so forth—produces a subject. We read that the "lawn is a system that produces a certain kind of … turfgrass subject" (p. xvi). But who or what is this subject? It is the very lawn person that gives this book its title. The term 'lawn person' is not hyphenated in the book, but it could be, the hyphen indicating the interconnection forged through the mutual adequation of lawn work: people work on lawns, and lawns work on people. How? Lawns, Robbins demonstrates, condition our behaviors and thoughts, particularly about ourselves and our neighbors. In conforming to the demands of the lawn, the lawn worker reproduces capitalist social relations. Chapter 5 documents how lawn care functions through a roughly $10 billion industry (dominated by a few chemical companies). This industry requires constant inputs of unpaid labor. Lawns and lawn people therefore cannot be understood outside of capitalist social relations.

Conceptually, *Lawn People* departs from others in its emphasis on Louis Althusser's (1971) concept of interpellation (to date, nearly all political ecologists have approached subjectivity through Foucault). Yet Althusser's essay says nothing about nature, let alone lawns. It offers a sonorous theory of subjection, one that emphasizes the ways that subjects are interpellated, or hailed, by ideology.[1] Yet a lawn cannot hail us like a cop. Therefore, Robbins's focus on Althusser is curious and, some have said, a failure. I do not think that these criticisms hold.

On its face, the turn to Althusser may seem unsuccessful for two reasons. First, Robbins does not offer much of an explanation for

how he uses Althusser. Second, *Lawn People* departs from Althusser's account on several key points. To weigh these limitations, we need to return briefly to Althusser's theses on ideological state apparatuses (ISAs). What are ISAs? Althusser writes, "They must not be confused with the (repressive) State apparatus … Repressive suggests that the State Apparatus in question 'functions by violence.'"[2] ISAs rather function through "distinct and specialized institutions" that stand outside the state. Althusser gives many examples, including the "religious ISA," "the educational ISA," and "the family ISA." Notwithstanding this diversity, all ISAs "contribute to the same result: the reproduction of the relations of production, i.e., of capitalist relations of exploitation." And how? ISAs "function by ideology." What is ideology? Althusser contends that "[i]deology represents the imaginary relationship of individuals to their real conditions of existence."[3] Crucially, ideology is neither mere ideas nor propaganda.[4] Ideology, Althusser insists, "has a material existence." It is the lived, practical relation between humans and their world.[5] This brings us to Althusser's central thesis and the clearest link to *Lawn People*, which is that "*all ideology hails or interpellates concrete individuals as concrete subjects*, by the functioning of the category of the subject … [I]deology 'acts' or 'functions' in such a way that it 'recruits' subjects among the individuals (it recruits them all), or 'transforms' the individuals into subjects (it transforms them all) by that very precise operation which I have called *interpellation* or hailing, and which can be imagined along the lines of the most commonplace everyday police (or other) hailing: 'Hey, you there!'"

Part of the importance of this account of subjection stems from, in Mowitt's (2002: 46–47) words, the fact that "interpellation at once presupposes and settles a certain ambiguity in the boundaries of subjective identity." This is because interpellation "relies on an individual's ability to perceive themselves addressed" and "the signal is received regardless of whether one is paying attention" (ibid.: 47). The hailing was not the result of attentive listening; on the contrary, it simply happened. It was an 'event' that productively ruptured the subject. As Butler (1997: 114–115) elaborates: "For Althusser, the efficacy of ideology consists in part in the formation of *conscience,* where the notion 'conscience' is understood to place restrictions on what is … representable … [I]t designates a kind of turning back—a reflexivity—which constitutes the condition of possibility for the subject to form." Crucially for the account of the 'lawn ISA' that is implicitly advanced in *Lawn People*, Butler (ibid.: 118) explains: "For Althusser, to perform tasks 'conscientiously' is to perform them … again and again, to reproduce those skills and, in reproducing them, to acquire mastery. Althusser places 'conscientiously' in quotation marks …, thus bringing into relief the way in which labor is moralized … To become a 'subject' is thus to have been presumed guilty, then tried and declared innocent. Because this declaration is not a single act but a status incessantly *reproduced*, to become a 'subject' is to … have become an emblem of lawfulness, a citizen in good standing, but one for whom that status is tenuous." The key point is that the iterative, practiced quality of subjection is closely tied up with the challenge of producing a certain status—for instance, the status of suburban citizenship that is earned through conformity to lawn norms.

We can now return to *Lawn People* and a criticism of the work, which is that the text does not elaborate how the lawn works ideologically in the respects that are key for Althusser. The ties between the lawn and ideology are not demonstrated, so it is hard to see what the lawn ISA does. In addition, the aurality of the hailing is unclear. How should we weigh this? First, we should acknowledge that Althusser never elaborated on the practical ties between the church, the school, and ISAs. (Perhaps part of what made his essay so fruitful was this very sketchiness.) In any event, *Lawn People* does not challenge Althusser's account of interpellation with regard to the state, churches, and schools as much as it asks, but what about the non-human? Herein

lies *Lawn People*'s ambition. It is perhaps the first attempt to read the interpellative scene onto the natural spaces not mentioned by Althusser and, in so doing, to critique socio-natural subjection.

To his credit, Robbins recognizes that this task requires us to rethink the work of environmentalism as an ideology along Althusser's guidelines (e.g., we have to stop thinking of lawns as 'natural' and humans as 'social'). Taking his cue from Donna Haraway, Robbins (2007: 16) insists that this critique of environmentalist ideology must involve bringing in the non-human: "[Althusser's account of interpellation] really says very little about the daily interactions that actually dominate people's lives and human behaviors in nature, economy, and community. In the case of vast ecologies, what does the interpellating? Not the Church, nor the police. Who calls to the lawn chemical user so that they consistently respond as lawn workers? Whose voice does the lawn owner hear as they open the door and look out on the grass …? We hope to demonstrate here that it may be the lawn itself." Note that this claim is hedged: it 'may be' the lawn itself. And it turns out that there really is no such a thing as the lawn 'itself', because it already involves us and other things that are not usually considered part of the lawn. So, no, grass does not hail. The lawn hails us as a socio-natural ensemble.

But can the lawn act as an ISA in Althusser's terms? On this point, I think *Lawn People* is on strong ground, since Robbins demonstrates that, for many suburbanites at least, the lawn acts in a way that is analogous to the church and school in France of the 1960s: it conditions behaviors and thoughts. Consider one of the most important findings of the study: people who tend to know more about the hazards of lawn chemicals—that is, relatively well-educated consumers—are *more likely* to use chemicals. This upends the nostrum that the key to environmentalism is 'consciousness raising'—that if people only knew the real costs of their actions, their behavior would change. It turns out that 'they know not what they do' is wrong. They do know, yet still they do.

Yet again, what of the hailing? If interpellation is supposed to operate through the possibility of being hailed, then *Lawn People* forces the question about how we hear nature. Who or what is the parallel here to the friend knocking on the door? *Lawn People* asks that we accept that it is the lawn: as the text heading of one chapter declares, "The Lawn Speaks." The serious point to this joke is that hailing is not sonorous. It involves passive human listening. But where listening is understood broadly, hearing nature involves resonance, an openness to being affected by nature. And in hearing nature, we resonate with things that are not limited to what we narrowly call 'nature' (Nancy 2007). To take one example from Robbins (2007), 'Suzanne' persists in spraying her yard and strapping dog booties on her pet. She explains: "You try to make [the lawn] look as nice as you can, without offending other people" (ibid.: 113). This is socio-natural conformism of the first order. And how did it come to be? We read that people "have become 'responsible' lawn managers because a number of things are simultaneously at work on them—including their communities, their families, and their property values—all mediated by an aesthetic designed far away … They [have] become anxious" (ibid.: 130). Rather than a knock on the door, we resonate with the dry, bald patches in the grass and perceived glances over the fence (whether real or not). Thus, the character of interpellation is more than social, but it is emphatically *not* nature or grass that hails us. The nature of interpellation is socio-natural.

Lawn People does not teach us that the lawn hails us. Instead, it shows that who we are is formed through socio-natural relations that take place in our lives in mundane and demanding spaces, including, pre-eminently, lawn spaces. To say this differently: no, the lawn as such does not knock on the door. Rather, the lawn is a becoming-space of subjection, a space that exists and surrounds lawn people. It is that which surrounds us and thus

opens up to our being what we are. The lawn is not Althusser's policeman who hails, "Hey, you there!" It is the 'there' at the end of that hail where we find ourselves today, as lawn people, such that we may be hailed.

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Notes

1. My emphasis on interpellation as a "conspicuously sonoric event" is inspired by John Mowitt (2002: 45–47).
2. All quotations in this paragraph are from Althusser (1971).
3. Althusser warns that ideology as such "is nothing insofar as it is a pure dream (manufactured by who knows what power …) … [I]deology has no history, which emphatically does not mean that there is no history in it … but that it has no history of its *own*."
4. As Mowitt (2002: 45) writes in his discussion of interpellation: "Prior to the Althusserian intervention, ideology was still essentially confused with propaganda."
5. This formulation draws on Brewster ([1969] 1997). In his glossary of Althusserian terms, Brewster states: "Ideology is *the 'lived' relation between men and their world*, or a reflected form of this unconscious relation, for instance, a 'philosophy' … It is distinguished from a science not by its falsity, for it can be coherent and logical … but by the fact that *the practico-social predominates* in it over the theoretical, over knowledge" (ibid.: 314, italics added). Here Brewster is summarizing Althusser, who is drawing from Marx.

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SHERIDAN, Michael J., and Celia NYAMWERU, eds., *African Sacred Groves: Ecological Dynamics and Social Change*, 240 pp. Athens: Ohio University Press, 2008. ISBN 978-0-8214-1789-8 (paperback).

Often overlooked in the literature is the importance of small, interstitial gallery forests in Africa. Much attention, especially with regard to conservation, human-wildlife conflict, and human livelihoods, has focused on larger forested tracts. The smaller forests, often completely surrounded by agriculture, are regarded as highly denuded, degraded, and of little conservation value. However, these smaller forests are essential for sustaining rural populations, providing fuel, income, food, and ecosystem services. Mysterious and often misunderstood, sacred groves are places whose existence and management is shaped by religious beliefs. This book is a valuable contribution to that discourse in its examination of the three-way importance—social, ecological, and spiritual—of gallery forests. Sheridan and Nyamweru bring together an impressive cadre of scholars whose interests in the sacred groves of Africa vary thematically and geographically.

The book is divided into four themes: human ecology, social organization, symbols, and the future of African sacred groves. The editors open with a comprehensive introduction that explores the symbolic and ideological aspects of these "power-laden landscape features" (p. 1). Sheridan continues in chapter 2 with a more in-depth analysis of sacred

groves. Drawing from landscape ecology, he discusses the misplaced approach of many scholars to appreciate these groves as relics (i.e., relic theory) rather than purposeful manifestations of spiritual and livelihood needs. Their importance lies in what they represent more than a static physical entity. Sheridan claims that a proper evaluation of these sites for community-based resource management and the conservation of African culture and biodiversity must consider the social, ecological, and spiritual components that are involved and their interaction.

The first two sections mainly examine the social-ecological linkage between these forests and local communities with a diverse set of case studies. Alongside their historical, cultural, or religious significance, these groves, despite their island character, can concomitantly play important roles in conservation. These small sites (5–250 hectares) are often overlooked by international NGOs and conservationists in favor of larger tracts (e.g., Amazonian fragments of hundreds to thousands of hectares), but they are no less important. The last bastions of natural landscapes in the human-dominated mosaic, these floristically rich areas provide resources and buffers to reserves. In their chapters, co-authors Aiah Lebbie and Raymond Guries and author Tsehai Berhane-Selassie challenge the notion that these forests are relics (concurring with Fairhead and Leach [1996]). Rather, they are seen as purposeful establishments that evolve spatially and temporally, based on cultural, spiritual, and community relationships, and whose meanings and social values tend to shift according to the forests' changing symbolism and uses. In their chapter about kaya forests of coastal Kenya, Nyamweru et al. conclude that forests should be recognized more for their presence and how their dynamic (temporal and spatial) nature changes due to external influences, rather than for their diminishment. Much of Nadia Rabesahala Horning's chapter focuses on usufruct rights and the prohibitive and prescriptive rules that govern access to these groves.

The third section examines the symbolism associated with these forests, using examples from Côte d'Ivoire, Benin, and Ghana. Alma Gottlieb provides an insightful discussion about forests and the importance of local perception in modifying the behavior of actors. Many loggers in Côte d'Ivoire have become fearful of forests in the Beng region because of the powerful spirits who reside there and whose demands must be accommodated. Cultural patterns, traditions, and access privileges in communities neighboring these sacred spaces are often shaped, at least in part, by fear, respect, and worship for the powerful spirits that guard or reside in the groves in Benin. Ute Siebert stresses the importance of new 'integrative approaches' that account for cultural and religious values in local perceptions and their interaction with the environment. But while conservation initiatives can take advantage of 'sacred sites', this is a foreign designation, and these spaces are defined differently. Often the spiritual significance of these groves is entwined with daily life and exists as a by-product of human land use.

What does the future hold for these forests? Banana et al. and L. Alden Wily attempt to address this important question. Since informal tenure regimes and usufruct rights mainly dominate sacred groves, Banana et al. stress the need to strengthen existing and to create new pathways for legally recognized holdership and tenure. However, one of the difficulties with *de jure* designation of sacred groves is that the use and values bestowed on these groves is dynamic, and laws tend to capture these landscape elements as static spaces. Alden Wily argues that decentralized governance, improved legal status for customary land rights, and the involvement of communities in managing spaces and resources are all necessary. The human element (moderate land use and religious activities) should be included with the management of these groves, rather than excluded.

While the messages are clear and the writing is strong throughout, two aspects of this book give this reviewer pause. First, there

is no distinction between sacred groves and multi-use forests managed by the community (with spiritual/religious purposes as one use, but not necessarily the most dominant one or even the motivating factor for conservation). Moreover, none of the authors define the term 'sacred grove', making it difficult to assess these groves as sacred per se. The absence of a definition aligns well with the general thesis of the book—that these places are fixed, but their meanings and the cultural values attached to them change over time. Perhaps the authors intend for the reader to wonder how a proper designation of 'sacred' is achieved when this definition is largely foreign. If a forest is designated as sacred, should these groves be viewed differently from other protected areas? And if so, how? Nonetheless, the sacred forest distinction is an important mechanism to unify different interests and rally community support and compliance. Sacred groves can function as spiritual and physical defense mechanisms against external threats. While the spiritual nature of a forest can enhance conservation objectives, it does not provide the sole motivation for those objectives to be met. I agree with Banana et al. and Alden Wily that local actors and communities should be engaged and involved, since designation has local implications and importance. Informal rules and customary regulations are no longer sufficient to mediate the effects of increased population, land shortage, and growing demands on resources.

Second, the book misses a golden opportunity at the end to synthesize these chapters and leave the reader with a clear way forward (e.g., regarding policy initiatives, research imperatives, etc.). The introduction provides a roadmap, but I felt that the individual chapters diverge thereafter, with the flow from one chapter to the next being lost. Chapters are loosely organized under four content areas, but in reading them, it did not seem that they all fit in this book. Further, each chapter did not build on the previous one. I recognize that a cohesive and fluid structure is difficult with edited volumes, but after the last chapter, the reader is left hanging. The editors could have added an afterword or epilogue to identify research and policy imperatives.

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WALKER, Richard A., *The Country in the City: The Greening of the San Francisco Bay Area*, 378 pp. Seattle: University of Washington Press, 2008. ISBN 978-0-295-98701-9 (hardback).

One of the most iconic diagrams of the social sciences captures 'the growth of the city' (Burgess [1925] 1967: 55). In it, concentric rings of development radiate outward from an urban core, rapidly consuming, transforming, and ultimately downgrading everything in their wake. Chicago, the modern metropolis that this diagram idealized as 'the city', had in actuality two geographical features that challenged its growth—vast reaches of prairie and a great inland lake. Nevertheless, its master planner exhorted that both should be overcome to realize "a population capable of indefinite expansion" (Burnham and Bennett 1909: 80) and the commercial growth that such expansion would bring. In his environmental history of the San Francisco Bay Area, Richard Walker shows how the problem of urban growth took a profoundly different turn. This impressively comprehensive book details the emergence of a peculiar species of urban expansion that chose not to overcome nature by developing it into extractable and expendable forms of value. Walker narrates how, instead, locals built their nature and, in the process, achieved a distinctly green public culture whose repercussions have echoed far beyond the Bay Area.

Scholarship on contemporary urbanism in the United States does not suffer from a lack of work that condemns or celebrates the polycentric metropolis. Ever attune to these discussions, Walker nevertheless departs from them by asking what else a polycentric metropolis might wreak, beyond novel design aesthetics, lax zoning, or an automobile-oriented 'placelessness'. Walker focuses on the San Francisco Bay Area, a complex ecosystem that, by the turn of the last century, had already begun to bare the scars of feverish industrialization. Mining runoff had poisoned its rivers, railroad and construction booms had thinned its ancient redwood stands, and its prominent shallow bay choked on silt, infill, and refuse. By narrating how area locals and newcomers encountered and sought to hem in the rapid ecological degradation around them, Walker effectively deflates commonplace myths about the Bay Area's unusual 'natural endowments'. He demonstrates that intensive human engineering was instead responsible for forging these endowments. Walker thus persuasively argues that the way in which urbanites imagine and interface with the materiality of their landscapes steers the paths that urban expansion ultimately takes. In so doing, he challenges facile divides between 'the city' and 'the country', while also complicating analyses of sprawl as generalizable and random growth. More than that, he shows how the co-evolution of natural environments and asphalt jungles in the Bay Area gradually fashioned a distinct civic ethos. This is an ethos that anchors citizenly virtues and obligations in a regional consciousness—and conscience—that is underwritten by ecological stewardship.

The bulk of Walker's book charts a century of grassroots politics that produced a remarkable metropolis now consisting of 'ruralized cities' within an 'urbanized countryside'. Each of the volume's 10 chapters unpacks struggles that have yielded some of the most definitive characteristics of Bay Area urbanism. These include chapters on the development of robust greenswards, the pioneering of growth boundaries, the cultivation of rich and specialized agricultural zones, and finally early organizing efforts that fed the environmental justice movement. Walker investigates the intricacies of political maneuvering and coalition building from which a regional ecological conscience emerged. He also attends to the refraction of this conscience within broader domains by demonstrating how Bay Area actors incubated experiments that later inspired state and federal regulations. Most notably, these regulations include water conservation, toxic remediation, and ecological restoration policies. This book will therefore interest both academics and practitioners who seek to understand or affect environmental interventions at the complex interface of municipal, state, and federal governance.

Walker makes a pointed effort to broaden awareness about the Bay Area's role in state, national, and now international environmental politics beyond the work of a few elite men. He certainly does not overlook the contributions of those such as John Muir and David Brower. However, he shows that their grand gestures became possible only in a context where elite women—and later less elite people of color—did the work of rendering environmentalism into a matter of everyday politics. This is a politics preoccupied with smaller-scale but nevertheless high-stakes issues, for example, the dearth of adequate recreational space or the toxicity of fish caught to supplement meager diets. By attending to pragmatic efforts to resolve such concerns, Walker not only writes back into American environmental history those who have been eclipsed by its heavyweights, but also highlights the kind of painstaking organizing practices that are needed to shape broad-based and effective environmental coalitions. He thus tracks the evolution of an environmental conscience and the projects it engendered, from relatively narrow and elite preoccupations with conservation and consumption toward more inclusive questions about public well-being.

Walker's investment in the capaciousness of the Bay Area's ecological conscience and its record of achieving pragmatic solidarities

across race, gender, and class divides makes it difficult for him to square the fissures that threaten environmental coalitions. He despairs especially over fragmentations that have plagued the environmental justice movement. In fact, after commenting on rapacious developers and the poor planning of San Jose, Walker reserves his sharpest words for environmental justice militants who sacrifice strategy by dwelling on essentially correct, yet also unrealistic and distracting, critiques of racism and capitalism (p. 248). This surprising tone stands out within an otherwise evenhanded narrative. It suggests the need to advance representation work—here, the important effort of inflecting the myriad voices that made the 'city in the country' thinkable and doable—toward a separate but not necessarily unrelated task.

In the spirit of this advancement, we might turn to the case of the Miwok, a people indigenous to northern California's coastal and mountain areas. The Miwok do not escape Walker's admirable representational commitments, and he notes briefly the stunning natural bounties that they must have enjoyed before the advent of Euro-American settlement. Yet these passing and past tense mentions are curious, as Miwoks living within the Yosemite Valley needled John Muir. They also seriously confounded subsequent national park boosters, officials, and tourists well into the twentieth century (Spence 1999). Exactly how did confusion surrounding the Miwok and efforts to reconcile their presence within settler anxieties about the nobility, purity, endangerment, and 'naturalness' of nature inform regional and national commitments to environmental stewardship? Rather than flagging the limits of representational work, to entertain such a question points toward a new task: clarifying how and with what effects public moral orders, including green or civic ones, distribute benefits, aspirations, and especially risks and demands differently across different populations.

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Richard Wrangham and Elizabeth Ross's edited volume *Science and Conservation in African Forests: The Benefits of Long-Term Research* makes an important argument: the establishment of long-term research projects and field stations in African forests has been essential to successful wildlife conservation. Contributors from various backgrounds provide testimonies from seven of Africa's oldest research stations, which have played an important role in countering the disappearance of our closest living relatives, the great apes. Throughout the 20 chapters, the authors employ a myriad of methods to support the book's central argument, and the reader is left convinced that long-term conservation research gives us reason to be hopeful about the future of Africa's forests.

The book's chapters are divided into two sections. The first several chapters focus on Uganda's Kibale National Park and its main field station, Makerere University Biological Field Station, while the following chapters explore research and conservation in six other African forests. Each contribution is interesting and enjoyable, filled with engaging data on wildlife ecology and the social, political, and economic entities that influence

each field site and its associated conservation activities. The editors arrange the collection in a fluid fashion, offering not only a detailed history of parks and the cultures that surround them but also an honest account of the successes and failures in each research situation, along with the hopes and dangers that confront protected areas.

Because the contributions make use of both the natural and the social sciences, *Science and Conservation in African Forests* represents an integrated resource for anyone interested in practicing conservation. The information offers a set of guidelines for establishing long-term research projects and successful conservation initiatives. Giving special attention to primatology and the great apes, the book features contributions from several renowned scholars, including Jane Goodall. For novice primatologists such as myself, this volume is a guiding light on a path to conserving the species that we so deeply respect.

Although the book focuses primarily on conservation of the African great apes, the insights are valuable for any practitioner or researcher, and they can be applied in almost any conservation situation. A major strength of the book is its clear statement that conservation does not happen by declaring an area a national park, evicting its human inhabitants, and ignoring their influence on natural processes within the region. Several authors adamantly stress the importance of working directly with local populations. According to them, long-term research and any associated conservation efforts cannot be realized without the acceptance, support, and participation of locals and nationals. This can be accomplished in many ways, including training nationals as scientists with legitimate advanced degrees, as well as providing health care, education, and community development to people who live in and around protected areas.

Unfortunately, there is little direct evidence to support the main argument of the book. As the editors state in the first chapter, this weakness results from the absence of studies that chart the actual effects of long-term research on forest ecology. All of the supposed positive outcomes—including higher reforestation rates, increasing animal populations, and intensifying community involvement—need to be studied in more detail to distinguish the genuine benefits of the proposed conservation and research strategies from chance occurrences, whether human or non-human in origin.

Nevertheless, the evidence of successful conservation of African forests is all but undeniable. As *Science and Conservation in African Forests* states, such positive findings can be attributed to the work of established field stations, their long-term research projects, and their associated conservation initiatives. Anyone interested in conservation will find this book a must-have resource that provides both concrete information and an inspiring sense of hope for a biologically diverse future.

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