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Preprint / Preprint
Zeitschriftenartikel / journal article

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Empfohlene Zitierung / Suggested Citation:
Lippert, I., Krause, F., & Hartmann, N. K. (2015). Environmental management as situated practice. *Geoforum*, 66, 107-114. https://doi.org/10.1016/j.geoforum.2015.09.006

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https://nbn-resolving.org/urn:nbn:de:0168-ssoar-47434-3

This document contains a pre-print of the introduction to the 2015 *Geoforum* Themed Issue "Environmental management as situated practice":

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Environmental Management as Situated Practice

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Abstract

We propose an analysis of environmental management (EM) as work and as practical activity. This approach enables empirical studies of the diverse ways in which professionals, scientists, NGO staffers, and activists achieve the partial manageability of specific "environments". In this introduction, we sketch the debates in Human Geography, Management Studies, Science and Technology Studies to which this special issue contributes. We identify the limits of understanding EM though the framework of ecological modernization, and show how political ecology and work-place studies provide important departures towards a more critical approach. Developing these further, into a cosmopolitical direction, we propose studying EM as sets of socially and materially situated practices. This enables a shift away from established approaches which treat EM either as a toolbox whose efficiency has to be assessed, or as simply the implementation of dominant projects and the materialisation of hegemonic discourse. Such a shift renders EM as always messy practices of engagement, critique and improvisation. We conclude that studying the distributed and situated managing agencies, actors and their practices allows to imagine new forms of critical interventions.

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Keywords

conservation, political ecology, ecological modernization, workplace studies, post-constructivism, cosmopolitics

Highlights

- Introduction to special issue on "environmental management as situated practice".
- Reviews empirical studies of EM from political ecology and management studies.
- Introduces "situated practice" as generative framing for empirical studies of EM.
- Foregrounds EM workers and their agencies in configuring environmental realities.
- Draws general conclusions and relates them to post-constructivist "cosmopolitics".

Acknowledgements

This special issue is the product of collaborative work within the Environment, Management and Society Research Group. We are therefore particularly grateful for generative conversations with Anup Sam Ninan, Hannah Strauss and Anna Schreuer. The workshop on which this issue is based was generously hosted by Bielefeld University's Center for Interdisciplinary Research (ZiF) and funded by the Volkswagen Foundation; our collective analysis was further supported by a follow-up workshop hosted by Tallinn University, co-funded by the European Association for the Study of Science and Technology (EASST). We would like to thank the participants of these workshops. In particular we are thankful to the generative engagement we have had with Lancaster University's Centre for the Study of Environmental Change, Claire Waterton and Lucy Suchman as well as with Kristin Asdal and Tim Ingold. Ingmar Lippert's work was hosted and supported by the Institute of Advanced Studies of Science, Technology and Society and with scholarships by the Hans-Böckler-Foundation and the German National Academic Foundation. Franz Krause's work was enabled through the Estonian Research Mobility Scheme, grant ERMOS146. Niklas Hartmann's work was funded by a Lancaster University Faculty of Science and Technology PhD Studentship in the Lancaster Environment Centre.

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1 Introduction

Ecological crises are the effects of mis-management of human-nature relationships – this tenet is widely shared among influential actors in environmental policy. Such a framing implies that current human-nature relationships would become sustainable if only managed properly. Consequently, institutionalised *environmental management* emerges as the logical solution (e.g. EPA 2007; UNEP 2011; European Commission 2015). At the same time, critics argue that environmental management provides governance for, and thus sustains, unsustainability rather than addressing the actual problems (Levy 1997; Blühdorn 2013).

This special issue addresses environmental management as situated practice: it examines the manifold socio-techno-natural relations through which 'environmental management' is constituted. In focus are those actors who conceptualise themselves as environmental managers or are framed by others as such. How do they manage? Our methodological-analytical trajectory is committed to opening up how natures and material agencies are constituted or enrolled in the doing of management whilst furthering the conversation between environmental studies and post-constructivist social sciences (Bingham and Hinchliffe 2008; Asdal and Marres 2014).

The approach advocated here contrasts with dominant takes on environmental management which tend to reproduce the entrenched dichotomy in environmental thought of utilitarian logic (consider the discourse of 'internalising externalities') versus romantic imaginary (such as protecting species or wilderness). Sidestepping this dichotomy helps to shed shared assumptions: both sides of these dominant takes and analyses separate the world into humans and nature, transforming environments into resources and extending market logics to new domains (see Glacken 1967, Costanza et al 1997; Stern 2006; UNEP 2009). In these kinds of analysis, focus tends to be on the tools and outcomes of environmental management, while little attention is paid to the situated practices – that is to the practical, local, social and material contingencies – of using the tools and producing the effects. This special issue turns to and critically explores these understudied aspects, offering an analytics that – as we outline in this introduction – is highly generative for understanding and rethinking the set of practices, actors and instruments that come under the notion of 'environmental management'.

As critical social science has observed for a long time, environmental management often enough systematically impacts marginalised communities and the very ecological features it was instituted to protect (Peluso 1992; Scott 1998). However, within the traditional analytical framework of

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environmental management, such effects cannot be adequately addressed (Bryant and Wilson 1998); the systems of environmental management cannot detect their own failings (Power 1996). From these critical contributions we derive an alternative tenet: the manageability of environments is inherently limited. That is to say, these limits are not only located in the deficiencies of management plans and prescriptions, but also in the particularities of specific 'environments' and in the peculiarity of environmental management work (see also Lippert 2011).

Taking the results of such critical studies as a starting point, the approach of this special issue shifts the focus away from repeated contestation of environmental management's claims to 'success' and potential. We suggest that the management of environments needs to be approached analytically not only as a set of tools and plans, but also as a job, a configuration of situated practices: managing environments may very much be about getting the job done, an end in itself or a process. By asking *how environmental managers manage to manage*, we conceptualise environmental management as politically charged *work practices* that need to be studied and theorised in their own right (see also Lippert 2014).

We focus on people's practices, grounded in the understanding that realities only come into existence as they are enacted (Bourdieu 1990; Ingold and Palsson 2013). Decisively, our perspective analyses not only the transformation of environmental objects but also their performative achievement (A. Mol 2002). We approach the managing agencies, entities and their practices as configuring how and what environments are (Suchman 2012). Management practices always fold in and impact on particular social and ecological relations and are therefore necessarily *situated* in concrete but changing relations (Haraway 1988; Suchman 2007). A central aspect of this is the practices' *embeddedness* in existing arrangements which not only constitute the possibilities and limitations for action, but also configure the object of management. We approach environmental management practice, thus, as situated in particular material and semiotic relations – recognising, *inter alia*, the manager's social, political and historical position, and how the manager relates to other actors, instruments and environmental entities. Management situations exist in time and they are located in space. Asking how environmental managers manage allows us to attend to the minute details that matter in terms of shaping management, the realities subject to management, and how management constitutes its objects.

One way to start reimagining environmental managers as *workers* in this way is to think of job descriptions in areas like nature park management or corporate environmental management. However, dominant approaches that attempt to reconcile capitalism with the environment tend to simply presume the environmental manager as a more or less successfully performing and

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implementing agent of the respective plan or prescription for rendering capitalism green (Lippert 2010). At the same time the 'manager' becomes invisible: such approaches eclipse the agents, their practices and therewith the practicalities of management from view.

Much more visible in environmental management are so-called solutions. Discursively, solutions are significant: they promise ways out of environmental crises. The environmental governance discourse assumes *inter alia* institutions, incentives and sanctions as effective solutions to such crises (Adger et al. 2001; Jordan, Wurzel, and Zito 2003; Biermann and Pattberg 2008). While the implementation of such solutions in particular cases is presented as a 'challenge', implementation is also staged as inherently doable and merely requiring all of 'us' to collaborate to make this implementation a success. This discourse does not empower a multitude of humans as social and political actors but primarily casts 'us' as consumers, narrowly positioned as indicators of demand for environmental goods and services. One of the most significant policy discourses and academic schools of thought that attempts to theorise how capitalism is reconciled with the environment is 'ecological modernisation' (Hajer 1995; Christoff 1996). Ecological modernisation theory posits that more efficient resource use will solve the environmental crisis (Huber 2008). It also posits that institutionalised modernisation of capitalism will foster the required efficiency. It then 'finds' proof for reduced environmental impact in macro-economic data of 'ecologically modernised' countries in the Global North and rapidly developing countries[4]. From that, it concludes that the institutions it has been advocating all along – such as corporate environmental management systems, environmental market solutions and the 'green consumer' – 'work' (A.P.J. Mol 2010; York and Rosa 2003).

The approach taken in this special issue, in contrast, attends to the actual workers charged with implementing the policy programmes of ecological modernisation and their practices. This allows for a very different way to evaluate the supposed materialisation of the desired effects of green governance 'on the ground'. Analytically, we approach environmental management as partially professionalised practices in modern institutions and organisations, as work achieved by the managers. Our interest, in other words, turns to a large range of actors including, but not limited to, environmental governance advisors and consultants, corporate environmental managers, environmental scientists and practitioners of sustainability sciences, environmental NGO staff and activists. Along these lines, David Rojas (2016) addresses scientists working on climate and policy, Franz Krause (2016) hydropower engineers and Ingmar Lippert (2016) carbon accountants. Here,

4 This optimist interpretation, of course, is problematised e.g. in engagements with the outsourcing of environmental costs (Ninan 2011), rebound effects (Alcott 2005; Jänicke 2008) and discussions of boundary assumptions (Lohmann 2009).

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then, is a concern with what we might call 'agents of ecological modernisation' (Lippert 2010) – agents for, in or against dominant political paradigms of the environment, agents whose practical work often enough risks sustaining 'unsustainabilities' (Blühdorn 2013).

Some of the studies in this issue also use this understanding of environmental managers as a generative heuristic, rather than literally. So our discussions partially intersect with recent discussions in geography, philosophy and feminist theory on 'cosmopolitics' (Stengers 2005b) in that they open up conversations about new forms of living together in more-than-human worlds. Uli Beisel (2016) analyses management (im)possibilities around mosquitos, Israel Rodríguez-Giralt (2016) addresses birds, and activists enrolling these animals, and Manuel Tironi and Ignacio Farías's (2016) humans attempt to isolate themselves from tsunamis. This shows how it is fruitful to examine people's work practices and their effects on environmental management even if no particular actor explicitly identifies as environmental manager. That is to say: as environmental management work produces relevant effects in the world, studying how these practices actually achieve their effects is insightful independently of whether any of the actors is explicitly designated in the field as an environmental manager.

2 On Empirical Studies of Environmental Management

To locate the space in which this special issue's contributions are placed, we relate to two bodies of literature that engage with environmental management empirically.

First, we identify critical studies that are theoretically and empirically relevant. These analyse the effects of environmental management on other parties, such as marginalised communities and the ecological features supposedly protected through management. This is the world of political ecology, drawing *inter alia* on broadly Marxist and Foucauldian approaches. Three well-developed focuses of political ecology are a) on problematic practices that turn environmental management into a problem for others (e.g. West et al 2006; Leach et al 2012); b) on resistance to management on the part of both people and the materialities of socio-natures (e.g. Kaup 2008); and c) on the constitutive gaps between management discourses/ideologies and the realities even of exemplary policies and projects on the ground (e.g. Fletcher and Breitling 2012). Such studies turn environmental management into an object worthy of critical questioning, and they problematise the economic and power relationships actualised in environmental management endeavours. Their accounts, however, rarely attend to the everyday work practices of those charged with

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implementing the respective project or policy.

When political ecology does attend to managers' work practices, focus tends to be on proving that even though actors may be positioned and act in complex ways, in effect they just work to materialise hegemonic discourses on the ground (e.g. Büscher 2012). This narrative of reality being largely remade in the image of theory (perhaps in the tradition of Ferguson's seminal *Anti-Politics Machine*, 1990) curiously contradicts political ecology's own narrative tenets of (partially) successful resistance and of constitutive gaps between discourse and 'implementation'.

Second, studies abound from within academic articulations of environmental management discourse itself. These works often talk about practice and performance in environmental management, but do so in a significantly different manner than we propose in this collection. They produce 'best practice' studies which either praise practitioners for their exemplary implementation of management technologies or scold them for not achieving stated goals (see some of the over 450.000 google hits on 'environmental management' and 'best practice'). The need for management, as well as the basic constituents of a 'pragmatic' process – managers, plans, images of nature and particular natures (specific species, toxic substances, etc.) – are taken for granted (Prasad and Elmes 2005). There is also a strong conviction that gradual improvements in planning and implementation will accumulate through 'management cycles' and result in altogether better practices. In emphasising journey, learning and performance (Milne, Kearins, and Walton 2006), this vision is often contrasted with the ideology of high modernist planning and management, based on command & control of environmental conduct (Berry and Rondinelli 1998) and on implementing rationally optimised blueprints on an artificially created blank slate (cf. Scott 1998).

Several social scientists and cultural commentators have traced these changes in environmental management discourse through interview- and survey-based studies (e.g. Sinclair 1997; Asplen 2008). These analyses are generative insofar as they document the shift from unrealistic claims to act on nature as it were from the outside to reflexive and reflective modernist approaches in which management discursively acknowledges that nature and culture are intertwined and that management itself is always learning, never perfectly in control. However, rather than opening this shift up for questioning, these commentators tend to take actors' talk of adaptive management and iterative learning as sufficient evidence for both the actual implementation and for the practical efficacy of such approaches. That is, their accounts repeat the field's narrative about itself: that shedding high modernist commitments has resulted in a truly rational, adaptive and flexible approach poised to render things as sustainable as they can get.

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This special issue, in contrast, critically addresses environmental management both as construct and as work. We are not the first to attend to management practices in detail. In particular, critical studies of development cooperation have analysed *inter alia* the work of development professionals, collaboration practices in particular contexts, as well as the practices of national, 'indigenous' and 'local' environmental and resource managers (Brosius, Tsing, and Zerner 2005; Rottenburg 2009; Mosse 2011). Inspiring approaches can also be found in the field of workplace studies (Luff, Hindmarsh, and Heath 2000), and in ethnographies of organisations (e.g. Harper 1998, Strathern 2000, Yanagisako 2002) which detail the everyday practices by which organisations are created, maintained, and changed.[5] Some of these studies show that workplace processes not only configure organisations internally, but also have tangible effects in the world beyond. This is particularly true for the work practices in environmental management, which are aimed at producing new discursive and material realities: environmental management shapes and reconfigures environments 'out there' as much as 'in here' (Law 2004) - in nature parks, rural and urban landscapes, in companies, team meetings, documents and databases.

3 Analysing Environmental Management Work

This special issue opens a space for the analysis of environmental management work and its effects. In the six studies of this collection, we identify two shared core commitments. First, the studies are grounded in empirical attention to the practices of people who manage or perform the imaginary of 'management'. Second, the studies attend to the simultaneously material and semiotic dimensions of this work, as well as its effects in and on environmental management. The former commitment resonates with an ethnographic approach that does not mistake the making of plans and policies (and performances of their implementation) for situated practice (Suchman 2007). The latter commitment indicates a generative engagement with the field of material-semiotic or relationally materialist studies (Law 2009). With these commitments, the special issue contributes to ongoing methodological, analytical and political conversations between social studies of science and technology and environmental studies (Bingham and Hinchliffe 2008; Green 2013; Asdal and Marres 2014).

In addition to these shared commitments, each contribution elaborates a specific dimension of environmental management as situated practice, responding to the question: "how do you

5 Tangential to our interest would also be studies of the professionalisation of environmental management (Power 1991; Fineman 1997; Caron and Fortin 2014).

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manage?"[6] Following a brief overview, we indicate key concerns of each paper in more depth.

[Managing in & across time] Setting out from Krause's (2016) analysis of managing the production of and resistance to a Finnish hydropower project in and across time,

[Managing environments as data] we turn to Lippert's (2016) study of corporate environmental accounting practices in which 'carbon emissions' emerge as an effect of data practices.

[Managing without hope] Rojas' (2016) discussion of how environmental scientists manage (or not) to study environmental destruction notes the difficulty of maintaining hope in the face of capitalist-industrialist forces. In a related but different way,

[Who or what manages?] Beisel's (2016) account of managing malaria scrutinies how non-human agencies play out, foregrounding contingencies of manageability and of its 'benefits'.

[What nature is managed?] Where Rodríguez-Giralt's (2016) approach to studying an environmental controversy presents a radical reconfiguration of what *is* the nature that is managed,

[Managing against nature] Tironi and Farías (2016) focus on the emergence and maintenance of a management commitment against a particularly destructive nature, the tsunami.

In a decades-long struggle about a hydropower project in Finnish Lapland, Krause (2016) identifies environmental management as practices of both opponents and proponents of the planned reservoir. Both groups perform their respective goals as the more sustainable development path, emphasising and cultivating those ecological and political dynamics that resonate with their vision. Krause suggests that they thereby engage in what can be seen as engineering practices, conceived as a purposeful re-arrangement of reality. The contestants engage with building materials, people and their ideas as much as with river flows, mires and fish. These projects unfold as real-time improvisations and adaptations to changing societal and environmental circumstances: alongside people, the river and the fish also change in the process. Krause suggests that three temporal dimensions are at play in this environmental management: first, the moments in which practices and strategies emerge; second, the future that the conflicting parties are performing differently; and third, the duration of the conflict, which leaves its marks on local communities, two

6 The question originates from a workshop, *How do you mange? Unravelling the situated practice of environmental management*, Bielefeld, 2012; the results were further reflected in a follow-up meeting *Doing Environments: Social Studies of the Techno-Managerial Enactment of Natures*, Tallinn, 2013 (see Environment, Management, Society Research Group et al. 2012; Environment, Management, Society Research Group et al. 2014)

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generations of activists, and the landscape. The contestants work in these three temporal registers to create the conditions favouring the reservoir plan, or alternative development visions for the area.

Through close descriptions of moments of corporate environmental management, Lippert (2016) turns to environmental accountants who provide decision-makers with environmental footprints, i.e. a type of fact that is widely employed in environmental management and governance. This focus foregrounds how environmental data is created, translated and reported. Illustrated with an analysis of the work that brings carbon emissions into corporate reality, the environment that can be managed emerges as inextricably bound to the material work practices and infrastructures that the environmental managers and accountants use. While the environmental managers internalise carbon accounting into the centre of their firm by linking it with financial accounting, the numbers they produce become successively detached from their referent ('real' molecular CO_2 emissions). For the company, this detachment is highly productive for it allows to digitally format and revision environmental impacts. Thus, here, the environment under management in practice is the accountants' datascape – a carbonscape. Tactical management of environments-as-datascapes allows the company to optimise their environmental impacts. Of course, these rather messy practices and often seemingly arbitrary decisions used to produce environmental data are silenced when the carbon facts are presented in glossy public relations material and official statistics. Through detailed descriptions of work practices and meetings, Lippert shows how, despite the environmental managers' own scepticism, the carbon data that is created in accounting practices is staged in environmental reporting to be the carbon that counts.

In recent years, the virtues of leaving laboratories and offices, and conducting appraisals and research in field-work, the 'open air', instead have been emphasised. This, many hoped, would not only re-join datascapes and socio-material landscapes, but also instil an acknowledgement of the entangled relationships that make up the world, displacing the problematic conception of nature as an external bounded domain ruled by fixed laws. The promise of ecological research in the complexities of the 'real world' matters for its dual resonances with, on the one hand, discourses of pragmatism and flexibility that dominate neoliberal agendas of the environment and, on the other hand, conversations about naturecultures and the hybridity of socio-environmental realities. Rojas (2016) investigates the practices of scientists who are conducting open air experiments in the Brazilian Amazon. Installing and monitoring measurement devices, experimentally altering forest habitats, or feeling and tasting soil samples on agro-industrial land, these scientists indeed do not work with an external nature, but with a world that is constituted by complex entanglements of human and non-human processes. The realisation of this entanglement,

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however, does not make the scientists any more optimistic about potential futures. On the contrary, witnessing through ever more sophisticated monitoring devices the profound impact of ongoing large-scale capitalist transformations in the area and beyond, the scientists identify a trajectory towards less, rather than more, inhabitable worlds. Their work reveals that, beyond offices and laboratories, we find a world that is already configured by capitalist accumulation processes and skewed power relations, within which scientists have little influence. Unlike the accountants in Lippert's study, however, the scientists in Rojas's work are not aiming at polishing this world to meet optimistic expectations of green capitalism; instead, they stoically monitor the unfolding of a world that is likely to be hostile to the large majority of its population.

Shifting focus from the efficacy of particular knowledges to that of specific material practices of environmental management, Beisel (2016) investigates mosquitoes and mosquito nets in Ghana. In the context of a global health discourse that measures malaria control in terms of the number of insecticide-treated mosquito nets in use, the ostensible success of these measures hides, or externalises, two significant effects of the strategy. First, focusing on distributing the nets to their users, current practice leads to the import and distribution of foreign produced nets, externalising the option of producing nets locally and thereby making malaria management beneficial also economically. The second externalised effect of the particular net-number based strategy of malaria management relates to the fact that, for increased efficacy, many new nets are treated with insecticide. Whereas this can improve the mosquito-repelling function of a single net, on a cumulative level, and seen in context of other uses of insecticide in agriculture and homes, the spread of such 'improved' nets in fact engenders evolutionary adaptive responses by the mosquitoes, changing their biting habits and developing resistances. Beisel's account situates environmental management in multiple fields – including global health, development economics, and mosquito ecology – and illustrates how any singular conceptualisation of its purpose eclipses other significant effects. Furthermore, her detailed argument tracing the entanglements of nets in wider economic and ecological relations powerfully demonstrates how environmental management never deals with a given and external environment, but confronts a world that responds and acts in unforeseen ways, a world always larger than any management plan can ever encompass. Constructing life-affirming separators between hazardous environments and human bodies is therefore also a way of experimentally relating with a changing world that can never be brought under control. Beisel concludes that a more adequate set of environmental management practices may be based on a 'slower' approach that, rather than attempting to eradicate mosquitoes in a cat-and-mouse game of insecticides and resistances, attempts to find ways of living with mosquitoes; not for the sake of the mosquitoes, but for the benefit of human health.

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Rodríguez-Giralt (2016) finds that similarly to the way corporate environmental managers created a 'carbonscape' through particular situated configurations, so did environmental activists enact an alternative spatiality and urgency of an enormous toxic spill in the vicinity of an Andalusian national park. The social technologies used for these reconfigurations were not accounting-like databases, but volunteering field surveys and bird ring reading. Through enrolling the feeding and migrating behaviour of birds into the controversy of the toxic spill, certain environmental groups successfully unsettled the simplistic explanations and management strategies with which the Spanish government attempted to contain the disaster. Rodríguez-Giralt emphasises that the mere fact that birds migrate was not sufficient for re-framing the disaster in terms of ever extending lines that obliterate the assumed boundaries of national park and spill site. Rather, it was through the environmentalists' and birders' practices of observing, collecting and communicating that some of these unbounded 'lines' were made to matter in the political debate. Without these practices, such lines would perhaps exist, but not matter. The enactment of a manageable world was therefore called into question neither through counter-discourse, nor through the brute forces of a volatile world; instead, Rodríguez-Giralt argues, it is through the 'tactical' enrolling of specific participants of this world that particular groups manage to re-cast management. The canary in the mine would be meaningless without the miner attending to it and telling others.

Re-conceptualising environmental management as material-semiotically situated practice must not be misread as claiming that this practice necessarily engenders further and deeper engagement with the non-human world. As Tironi and Farías (2016) argue, environmental management can equally be about separating or 'immunising' human lives from parts of the non-human environment. Their study foregrounds the principal significance of non-human agencies and shows the distinction between an environment that can fit into a workplace and an environment that does not fit in. They detail how, in the wake of a tsunami hitting the coast of Chile, the inhabitants and administrators of the city of Constitución worked not towards integrating the urban structures more with potential oceanic waves, but towards creating a protective membrane between city and water. Behind the different and conflicting visions and activities of city planners, fishermen, rich landlords and other residents of how to protect Constitución from the sea, there was a broad consensus that an effective division had to be constructed to assure the city's well-being. In detailing this process, Tironi and Farías emphasise that material semiotics does not imply that the material world is exhausted by human semiosis. Rather, the non-human world may – as in the case of a tsunami – directly challenge human structures, both semiotically and materially. The sheer extent of the tsunami makes it incommensurable with ideas of the 'social production of nature'. For environmental management

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practices, this means that their relationality includes problematic and 'overflowing' relations, some of which these very practices are meant to undo or contain. In Constitución, environmental management is to ensure continued urban life by erecting a barrier between the city and the sea, the space of manageable human activities and the space of uncontrollable tsunamis, respectively. Nevertheless, the practices involved in constructing this barrier, which is to be a forested park along the shore, exhibit the full gamut of political ecology, including debates about the borders and set-up of the park, its winners and losers, the kinds of trees used, and the safety offered by this safety belt for urban residents.

4 Rethinking Environmental Management

In sum, the contributions to this collection trace the practices that constitute environmental management in a variety of settings. They all highlight the intrinsic situatedness of these practices: mediated by other people's activities, by work routines and expectations, by social and material infrastructures, the growth patterns of plants and the movement of animals, these practices are not so much the executions of previously designed blueprints, as they are series of improvisation and making-up on the go, that, if at all, relate in practical and messy ways to formal plans. Environmental managers do not appear as autonomous agents external to the environment but as enmeshed with configuring environments. The sheer diversity of the settings, dimensions and management practices covered makes clear that there is little hope in prescribing a single comprehensive framework for analysing this field.

Nevertheless, this very diversity suggests two sets of wider conclusions. First, non-human agency is a critical constituent of the situations that configure the practices of environmental management. This is far from saying that natural forces determine what environmental managers do, let alone how they do it. What it does say, is that management practices are caught up not only in other social and political fields of relationships, but also in relationships with non-human agents. These relationships may be highly asymmetric, but 'management' does not turn non-humans into passive objects, the action goes both ways. This also implies that the different management configurations constitute, or allow, different spaces for such interference. For example, the practices of containment following the Aznalcóllar toxic spill could have easily proceeded without paying attention to the feeding and migratory behaviour of birds, as Rodríguez-Giralt (2016) describes. It was the environmentalists' conscious enrolment of the birds-as-lines, and the concomitant re-configuration of the spatial stakes of the toxic spill that turned

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non-human agency into a matter of concern in Southern Spain and beyond. Conversely, the carbon accounting practices and infrastructures in the firm that Lippert (2016) studied effectively establish an ontology in which carbon-as-molecules is insignificant vis-a-vis carbon-as-data. The opposite extreme is illustrated in Tironi and Farías' (2016) account of urban tsunami protection in Chile: whereas an awareness for earthquakes has long been part of urban planning procedures in the country, tsunamis were not part of the national 'planning DNA'. Nevertheless, the tsunami did happen and contributed to reconfiguring both urban planning strategies, and urban space itself.

The contributions show in detail how specific environmental management practices acknowledge or silence particular non-human relations, as well as how some of these relations are more easily silenced than others. For instance, Krause (2016) details the reservoir lobby's attempts to inscribe a particular vision for the future of Eastern Lapland in the process of 'engineering' a major reservoir. Part of their failure was due to the intimate knowledge many riverside inhabitants had of the effects of previous hydropower projects on landscape, water quality and fishing. Conversely, part of the renewed popularity of the reservoir plans a bit later was due to an exceptional flood in the catchment which affected some residents and infrastructure. At both stages, the experiences of the riverside population – through residence, fishing and recreation – was key in configuring the management practices. In a similar vein, the 'open air' experiments in the Brazilian Amazon that Rojas (2016) describes were explicitly designed to extend observations and measurements beyond the scope controlled by human-made laboratories; concurrently, the scientists witnessed dynamics that they would likely not have found in laboratory settings. Also the mosquito net campaigns in Ghana, analysed by Beisel (2016), can be understood as experimental engagements in an 'open air' in which malaria-vectors fly. And in this case, too, non-human agents perform in ways that could not have been anticipated in laboratory experiments or at the planning stage of a management cycle. In both the Brazilian Amazon and the Ghanaian malaria areas, an awareness of this social and ecological situatedness of management practices illustrates how these practices – while participating in configuring the non-human world they are involved with – are themselves critically configured by this wider world just as much.

Thus, what distinguishes, say, the practices of Lippert's (2016) corporate managers from those of Krause's (2016) riverside inhabitants is not that one group is more or less interested in 'nature' or 'the real world' than the other. Rather, their work practices and everyday experiences are situated differently. For example, many of the specificities of the version of carbon that prevails in corporate environmental management, carbon-as-data, derive from long-established work practices in accounting – which are at least as much part of the 'real world' of company offices as carbon-as-molecules. Conversely, if carbon dioxide molecules actually were rendered as present

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and threatening in the corporate offices as hydrological alterations are for the population living along the river, we would expect different carbon accounting practices. Similarly, in the reservoir conflict, a significant difference in the performance of sustainable futures lies in the situatedness of the respective contestants: hydropower engineers assemble the river predominantly through their intricate systems of water gauges, weather records and electricity orders; this is a river with a different trajectory for the future than the one assembled by riverside inhabitants through boating, fishing and watching the water level fluctuate. The material particularities of the specific natures enacted or enrolled, thus, make a difference. It is not the case that a supposedly singular 'real nature' of 'carbon' or of the river in question either matters or does not matter; much rather, this issue follows new materialisms in emphasising the generative quality of asking *how* particular natures come to matter (Barad 2007). Different forms of environmental entities and agents inter- and intra-act and configure each other in practices of environmental management.

The second set of wider conclusions we can draw from the specific situations of environmental management concerns the field of environmental management itself. The contributions make it clear that working towards more sustainable reconfigurations of human-environment relations is not simply an issue of increasing the efficiency of management schemes, as ecological modernisation assumptions would have it. More efficient carbon accounting would still follow very similar accounting logics, improved scientific experiments in the Amazon would – on their own – still leave capitalist exploitation unaffected, and the total containment of the Aznalcóllar toxic spill would have meant culling entire bird populations passing through Doñana Park. The contributions also distance us from dominant environmental discourses that call for rendering (consumer) 'lifestyles' more 'sustainable', for 'improving' the relations between human ways of life and the non-human environments they depend on, while imagining continuous optimisation of management as instrumental to reach these ideals. We conclude that such ideal(ised) more livable human ways of life can be *achieved neither by simply improving the 'tools' of environmental management, nor by reimagining and enacting our lifeworlds in the logics of a 'toolbox' of environmental management and governance.*

"Rethinking environmental management" – this was also the title of Bryant and Wilson's (1998) influential article that argued for recognising the deeply political, cultural and economic dimensions of environmental management (cf. Wilson and Bryant 1997; Wilson 2009). It made clear that this field cannot be reduced to a state-centred, technical exercise, but rather is constituted by processes couched in, and revealing of, specific human-environment relationships. By unpacking the socially and materially situated practices of environmental managers, this special issue applies such 'critical theory' approaches on a wider, more-than-human level. Rethinking

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environmental management in this way may lead us along a 'cosmopolitical' trajectory. The cosmopolitical imagination, as it is frequently understood, invests hope in rethinking the socio-techno-natural relations we live and work in and allowing the non-human political space in these assemblages. Cosmopolitics is about slowing down the practices of relating with others, working together, performing new spaces of collective work, while recognising and working with indeterminacies, non-linear causal structures, not eschewing the lack of control but embracing complexities, constantly challenged and reconfigured by a multitude of humans and non-humans. Cosmopolitics, in short, undermines most of the assumptions of modern forms of environmental management. Thus, such a cosmopolitical imagination would imply a new kind of assembly of humans and non-humans, predicted to configure more ethical and democratic relationships amongst all parts/parties/participants of a common environment.

Are we, therefore, on the way to a world 'after (environmental) management'? The contributions in this collection that explicitly engage with cosmopolitical propositions (Rojas 2016, Tironi and Farías 2016, Rodríguez-Giralt 2016) end up criticising this approach for risking simplistic conclusions. Instead, they find that even in cases where environmental managers do practice distinctly cosmopolitical relationships of hybrid, carefully assembled, more than human assemblages, moral and political economies are not easily transformed. Hegemonic relationships persist in the face of the cosmopolitical aspirations of both environmental management agents and posthumanist scholars. This underlines the continually important role of detailed, ethnographic studies to examine and qualify grand theories of social and ecological changes, their political positioning (how is what being done in the name of these theories) and the practices of management or governance interwoven with these theories. It also points to the extremely multifaceted situatedness of environmental management, where practices, subject positions and effects are never reducible to any simple set of factors.

This second set of conclusions chimes with expressly feminist, less enthusiastic, and power-sensitive versions of cosmopolitics, like the one mobilised by Hird (2015) in her study of waste management. Such more cautious versions of cosmopolitics – rather than aiming to simply extend liberal understandings of the right to be heard from humans to the more-than-human – question whether these forms of politics ever were adequate for anyone. For example, Hird (2015) draws extensively on a less well-known contribution by Stengers (2005a) which denounces the use of a politics of voice and 'participation' as a strategy to make environmental governance more benign as just another 'Empty Great Idea'.

These two sets of conclusions are thematically interrelated. The kind of studies of the practical

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reality of environmental management that we advocate carefully examine the range and the configuration of agencies and entities, both human and non-human, while investigating the politics of how the managing agencies, entities and practices configure the modality of environments. At the same time we recognise that such studies do not easily lend themselves to an optimistic version of the cosmopolitical outlook imagining to channel ecological crises onto a different trajectory. These concluding considerations crystallise in the key contribution of the present special issue: we relate recent discussions of cosmopolitics to the practical reality of work and workers in doing, redoing and alter-doing environments. By addressing environmental management practice as situated, we actually leave behind (rather than continuing to challenge) the dichotomy between imagining humans as subject to a determining nature versus fantasies of managers as all-powerful and autonomous agents who can direct environments as well as other people. We contribute to new materialist considerations not only by addressing the agencies as well as practices of constituting environments, but also by emphasising the subjects and the situatedness of their practice. The environmental management worker's work is merely a part of the assemblages in which heterogeneous entities and agencies are configured, effecting always situated environmental realities. Thus, this issue encompasses as well as transcends other studies' foci on how nature speaks as well as on how lay people are implicated in worldings. Studies of environmental management as situated practice scrutinise the lived realities of managers as workers and the socio-techno-natural contingencies of their work.

What room do these considerations leave for the practices of environmental management? It is clear that there can never be a single instrument to bring about a single solution to the problems that environmental management sets out to solve (prudent managers might agree so far). This does not mean, however, that these and other problems matter any less, and that we should refrain from our attempts to improve the relationships with the non-human world (or within the human world, for that matter). It does mean, however, that these attempts need to be framed differently:

- with less claims of control and order (even if high modernist emphasis on direct control of results has been supplanted by reflexive modernist emphases on second order control over procedures) and more appreciation of mutual imbrication and surprise;
- less reliance on corporate, market and accounting logics, and more focus on openly contesting ethics and incommensurable values;
- less fantasising about a genuine natural world existing outside of our corrupted economic

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systems, and more tracing how this fantasy and the economic system are implicated in each other;

- less grand plans for making the world conform to some people's ideas of it, and more openness to the multivocality of both the world and the people inhabiting it.

These recommendations imply a call for a more careful – perhaps modest – and continually self-reflexive and critical environmental management; but they inherently go beyond a call for 'better' management, recognising that the currently fashionable models of cyclical or iterative project planning reproduce and employ simplistic imaginaries of how management, managers and environments are related. What differentiates our conclusions from these models is that we have found environmental management practices to be situated in much wider webs of relationships that cut across the boundaries of any single particular project or strategy. Environmental management practices draw on and are conditioned by everyday life, corporate logics, uncertain oceans, bird-watching networks, world-market dynamics, and evolving mosquito populations, among many other relations. Many if not most of these either cannot be possibly foreseen during the crafting of the project, or are systematically sidelined by its very operation. Therefore, we need to acknowledge that genuine environmental management, i.e. endeavours embodying and accomplishing more sustainable relationships between humans and the non-human world, must always be messy practices of engagement, critique and improvisation. This does not mean that anything goes; but it insists that the situated practices of environmental management must be considered as the critical moment, rather than relegated to the role of 'mere implementation' based on the assumption that it is plans and procedures that really matter, in struggles for a more liveable word.

In political terms, and working towards a generative research programme on environmental management, this special issue indicates a space of conducing reflexive and critical research on environmental management as situated practice that is relevant for both proponents and critics of environmental management 'solutions'. While a) the dominant discourse imagines current models of good management as adequate and successful and while b) most critical discourses identify negative effects of management without explications and theorisation of the situated practices that produce these effects, our proposal emerges: studying the distributed and situated managing agencies, entities and their practices – which configure how and what environments are – allows to imagine and experiment with new forms of political alliances, subversion through research and other forms of critical interventions.

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Our proposal to study environmental management as situated practice lends itself to scrutinising the ways in which material semiotic management situations come into being. This involves reconsidering the spatialities and temporalities of management, the forming and configuring of environments, different ideas of 'control', coping with lack of hope, learning how to 'live with' or how to survive. But it also allows working towards alternative assemblages, temporalities, spatialities, controllabilities and moral universes of management.

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