Third sector global environmental governance, space and science: comparing fishery and forestry certification.

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Abstract.
This article examines two examples of environmental governance led by NGOs: forestry certification by the Forest Stewardship Council (FSC) and fishery certification by the Marine Stewardship Council (MSC). We use interviews with a range of actors in each certification network in the UK and the USA to examine how FSC and MSC use both space and science in similar (but not identical) ways. We show how certifications are spatialised differently on land (forests) and on water (ocean fisheries) and how certification units can be defined as socionatural hybrids, rather than tied to political boundaries. We also show how, without the benefit of governmental backing, they seek credibility and legitimation particularly through diverse alliances with scientific authority. However, although sometimes spaces of certification are hybridised beyond the traditional territorial concerns and boundaries, NGO-led governance often continues to reflect the traditional geographies of environmental government.

Introduction

Recent arguments for a shift from government to governance have suggested a stronger role for civil society in managing the environment, particularly the 'third sector' of voluntary and nongovernmental organisations (NGOs), and for 'new policy instruments' (Jordan et al. 2003) beyond traditional command and control approaches. Here, we examine two such cases of environmental governance led by NGOs and involving new policy instruments: forestry and fishery certification by the Forest Stewardship Council (FSC) and the Marine Stewardship Council (MSC) respectively. These NGOs seek to protect the environment by operating systems of global certification to mark products from well-managed forests and fisheries with their symbol, to guarantee traceability and, therefore, provide assurance to the customer, who can support better environmental management through choosing certified products.

We compare the resulting geographies of certification in two different spaces: land (forests) and water (fisheries). Previous research has tended to analyse spaces or sectors of certification separately (e.g. Cashore et al. 2004, 2007; Gulbrandsen 2005; Klooster 2005, 2006; McCarthy 2006; Mansfield 2004a, b, 2006; Meidinger 2006; Mutersbaugh 2002). Whilst valuable, such a singular approach to case studies can emphasise the effect of biophysical or sociopolitical characteristics, risking seeing each commodity chain as "unique" (Mutersbaugh 2005, page 395) rather than considering patterns across and between different nature-culture configurations. Addressing this through comparative work of different spaces and sectors is undoubtedly challenging, but ultimately it should be useful for understanding environmental governance and its problems.

Our aim in this paper is to consider how NGOs use space and science in environmental certification. In particular, we show how certification practices are scientised to build authority for governance and how the NGOs dealt (not always successfully) with the

problems of uncertainty and dispute that arose from uneasy alliances of industry and ecology. We also show how NGOs spatialise certification in ways that reflect the geographical variability of these heterogeneous alliances, not being tied to existing (governmental) boundaries of states, but defining hybrid spaces of certification.

Environmental governance and NGOs as civil regulators

Environmental governance is now widely prescribed to improve environmental policy and practice, but it is a vague and problematic term subject to multiple interpretations (Pierre and Peters 2000, 37; Risse 2004). We take a shift from government to governance to mean a shift from closed debates and state-led, reactive and technocratic decision making to more open, stakeholder-led debates in a civil society mode. This shift has a normative aim of generating more proactive, preventive and socially relevant decision making and greater societal involvement (Pierre and Peters 2000, 7). Pattberg (2005, 177) outlines four main elements particularly important for global environmental governance: (1) nonstate actors; (2) multiple political levels; (3) "new mechanisms of producing and maintaining global public goods;" and (4) "new spheres of authority."

The NGO sector is critical to this shift to governance, because nonstate actors like NGOs are seen as peculiarly capable of challenging both the traditional and bipartite corporatism of government-business decision making and also the exclusion of stakeholders who lack recognised scientific credentials. NGOs are already established players in science-policy communities in environmental government, from issues like climate change to recycling, energy generation and deforestation and, at least in industrialised countries, are often seen as having considerable trust and moral authority amongst the general public (e.g. Horlick-Jones et al., 2007). In industrialised countries, NGOs have therefore been cast as the new 'civil regulators' of corporate social responsibility (Zadek 2001; Giovannucci and Ponte 2005), filling the regulatory gap created by the rolling back of the state from environmental regulation (Mutersbaugh 2005, page 397) or by the inability of the state to control corporations (Gereffi et al. 2001, page 65).

One of the new environmental policy instruments frequently cited as part of a civil society mode and involving NGOs is ecolabelling (e.g. Jordan et al. 2003; Gale 2002). Ecolabels vary greatly, but many use third-party certification as the 'gold standard', the most credible way to verify claims made about goods and the least susceptible to conflicts of interest (Cashore et al. 2004; Gereffi et al. 2001; Hatanaka et al. 2005; Jahn et al. 2005). Both FSC and MSC have adopted third-party certification, meaning that forests, fisheries and their supply chains applying for certification are checked by a 'certification body' independent of the manufacturer or retailer (Table 1). Voluntary environmental certification thus becomes part of a wider politics of traceability and a key activity for nonstate actors as 'civil regulators'.

There is already a considerable literature about this politics of traceability, especially from agrofood researchers and economic geographers about the potentially damaging effects of corporate retailers demanding certification from small producers (e.g. Guthman 2004; Mutersbaugh 2002; Goodman 2004; Klooster 2005, 2006; Morris and Dunne 2004; Hughes 2000). In political science terms, this implies 'private interest government' (Streeck and Schmitter 1985) through the corporate capture of regulatory functions relinquished by government or through pre-empting future regulation by voluntary schemes (e.g. Humphreys 2006, 124). In geography, this implies the rolling back of the state and the seemingly inescapable neoliberal rhetoric of the power of market forces to solve environmental mismanagement (e.g. McCarthy 2006; Prudham 2005; Mansfield 2007, 2004a, 2003).

Table 1. Types of people interviewed for this study, by certification scheme and area.

Interviewee type	**Forest Stewardship Council (FSC)**	**Marine Stewardship Council (MSC)**
Representatives of FSC or MSC	4 UK*	7 UK
Representatives of certification bodies	4 UK, 3 USA	1 UK
Managers/primary producers of forest or fishery	4 UK, 5 USA	2 UK, 3 USA
Retailers and processors of certified products and related organisations	2 UK	6 UK
Representatives of other NGOs (current/previous members of FSC or MSC)	2 UK	4 USA
Total (47)	**24**	**23**

* includes UKWAS as the standard-setting body, because their standard was effectively adopted by FSC UK.

Certification schemes have therefore been described as 'nonstate market-driven governance' (Cashore et al. 2004, 195-6; also Cashore et al. 2007; Gulbrandsen 2005), suggesting that the market, rather than civil society, is the driving force and that certification is (merely) a vehicle for neoliberalisation. This has led to much debate about whether public sector or private sector influence is more important (Cashore et al. 2004; Gale 2004; Mansfield 2007). Unfortunately, such debates tend exclusively (and implicitly) to deal in the restrictive binary of public-private, leaving little room for examining nongovernmental or 'third sector' actors. Indeed, the very term 'third sector' denotes their problematic status outside this binary, as such networks "fall outside our accustomed categories" (Keck and Sikkink 1999, page 89) and may be driven far more obviously by values and political movements, than by markets (Meidinger 2006).

In this paper, we focus precisely on those nonstate actors in environmental governance, addressing their common exclusion in the focus on the public-private power struggle. Because they *are* nongovernmental, NGOs lack the well-established (if still problematic) authority of the state and its threat of coercion through regulations, sanctions and other top-down, hierarchical 'modes of steering' (Risse 2004). Instead, NGO-led governance initiatives like those of the FSC and the MSC are voluntary, so they must rely on persuasion and moral authority to have influence and enrol others (Pattberg 2005; also Cashore et al. 2004; Gulbrandsen 2005; Keck and Sikkink 1999; Risse 2004). In environmental debates, NGOs have traditionally drawn on the authority of science to gain influence and to legitimate their arguments because "scientific expertise remains the principal form of legitimation in the leading environmental organisations… there are no viable alternatives" (Yearley 1991 page 38; also Yearley 1993; Eden et al. 2006).

There is still surprisingly little truly empirical research that centres on NGOs and environmental science, with the notable exception of Yearley's (1991, 1993, 1996). But when researchers do comment on NGOs in passing, they have often been positive about how

NGOs can contribute to geographies of science and environmental knowledge. Some propose that NGOs can have a positive influence in opening science up in a democratic challenge to help (or force) knowledge production to become more socially accountable and more diffuse. Indeed, modern environmentalism flourished alongside similar 'counter-cultural' challenges to the hegemony of science and technology in the 1960s. Such a critique of science is also often coupled with the ability of NGOs to nurture and legitimate alternative knowledges and provide "a seedbed, or alternative public space, for the articulation of utopian 'knowledge interests' " (Jamison 2001: 46).

Jasanoff (1997: 591) particularly considers how NGOs might bring in 'lay' knowledge from indigenous people in developing countries, as an 'alternative' to traditional technocracy and as "a vehicle for scaling knowledge up from the grass roots." Their knowledge may be different in source - such as from non-scientifically authorised sources like local communities - or it may be different in type – such as bringing moral and ethical questions into debates dominated by scientific and technical questions (also Irwin and Michael 2003; Keck and Sikkink 1999). By such forms of 'information politics' (Keck and Sikkink 1999), commentators hope that NGOs can broaden scientific knowledge and change science itself by hybridising knowledges and nurturing more heterogeneous debates and networks.

But such a challenge to the status quo can produce a backlash against NGOs, when critics deny their ability to produce science and thus to understand, apply and judge it or denounce their claims to environmental expertise because their expertise is policy-oriented rather pure science (e.g. Turner 2001: 135). This is typical of boundary-work (Gieryn 1983, 1995; Jasanoff 1987; Kinchy and Kleinman 2003), which demarcates zones (and representatives) of scientific authority and non-authority in the interests of enhancing one's own authority. So, science can be an unreliable ally for NGOs (Yearley 1991a, page 38; also 1992, 1993; Eden et al. 2006), especially in seeking to shape environmental governance.

In response, NGOs are increasingly scientised, most obviously through employing people with recognised scientific and professional training (e.g. Yearley 1993; Jamison 2001), to seek forms of legitimation additional to moral authority. In thus deploying heterogeneous understanding from cognitive, scientific, moral and even emotional sources in campaigning, NGOs exemplify Irwin and Michael's (2003) 'ethno-epistemic alliances', working across the lay-expert divide so engrained in modernist, technocratic decision making and, in the process, challenging it. But, as we shall show by analysing how MSC and FSC use science and other forms of authority, such alliances must be built and maintained across multiple spaces and issues in complex and often precarious ways, if environmental governance networks are to persist.

Scale, NGOs and socionatural configurations

Another problem for NGOs in environmental governance is how to spatialise their networks, especially to ensure that their standards are globally coherent but nationally implementable in geographically variable, international supply chains. Space and scale are therefore highly significant but complicated in NGO-led environmental governance. Some have argued that certification creates 'new global spaces' because its arrangements link diverse actors in new ways (Mutersbaugh et al. 2005, page 384) and moves governance "beyond state borders" (Gereffi et al. 2001, page 65) through transnational networks (Keck and Sikkink 1999; Meidinger 2006). Others have seen certification as "an extraterritorial space, in that it is based on the support of producers and consumers along the market supply chain rather than on traditional state sovereignty" (Gulbrandsen 2005, 46). Both suggest that the scalar arrangements of certification are intrinsically globalised, rather than tied to existing (national)

governmental spaces. Others have instead seen certification merely as "another rule-making arena that business has set out to capture, just as it has tried to colonize other regulatory spaces, such as domestic environmental governance and multilateral environmental regimes" (Humphreys 2006, 124).

Such arguments are key to this paper, but again are predicated upon a binary of public sector-private sector – this time with reference to space. For example, Mutersbaugh (2005, page 392) writes of certification labour producing "a semi-public sphere existing between government-regulated production on the one hand and fully private regulation on the other." Perhaps this is relevant in the case of organic production, which is subject to regulatory controls by the US Department of Agriculture, the UK's Department of the Environment, Food and Rural Affairs or the EU. But other NGO-led schemes do not fit such a binary because, unlike the case of regulation by the nation-state, nonstate actors are not circumscribed by sovereignty at a particular scale. This can be an opportunity for NGOs like FSC and MSC to spatialise their certification networks globally in different ways, rendering them more footloose and less encumbered by particular scalar demands.

Geographers have particularly debated the question of scale. Although we cannot deal with all that debate here, we note the concern (e.g. Brown and Purcell 2005; Marston et al. 2005) that some researchers invoke scalar hierarchies when analysing power relationships, by regarding some scales as more powerful or essentially better than others. For environmental campaigning since the 1990s, 'the global' is often seen as the dominant scale in the hierarchy, so that actors can gain greater influence by 'jumping scale' (Brown and Purcell 2005; McCarthy 2005) or 'scaling up' (Campbell 2007) to global campaigning from more local concerns or national lobbying.

In contrast, a reversed scalar hierarchy is sometimes invoked by critics of certification, to support a moral discourse that champions 'the local' rather than 'the global.' This invokes size partly as a proxy for scale, in that commentators are concerned about the implications as production 'scales up' (Mutersbaugh et al. 2005, page 385; also Guthman 2003) from the (idealised) small, ethically-motivated producer to larger, especially global corporations that can produce more to supply a growing market, e.g. in organic food. Hence, 'small' and 'local' are seen as essentially better and certainly more ethically sound than 'big' and 'global' in commercial terms, for example when Mutersbaugh et al. (2005, page 384) refers to certification as a means for smaller producers to resist globalisation.

But invoking a scalar hierarchy to do political work has been criticised as a 'scalar trap' (Brown and Purcell 2005, page 608), because scale is not independent, causal or given, but socially produced, fluid and dynamic (also Jonas 2006). Thus, certification spaces are continually being coproduced with certification practices, interweaving national, local and international linkages in different ways and through different scalar arrangements, whilst rejecting any essentialising of power relations through a scalar hierarchy.

Finally, certification must literally travel across geographical borders constructed through ecology (different climate regimes), politics (different regulatory regimes) and economics (different trade regimes). As we shall demonstrate, the hybrid spaces of certification are not merely defined by business or politics, but also by technology, ecology, physical geography and climate, which raise other problems for how NGO-led environmental governance can travel across and between spaces. Actor-network theory has emphasised the intertwining of different nature-cultures but also the topological extension of networks as they spiral through space and time. This means that the precise configurations of certification spaces and

practices are highly contingent not only upon socioeconomic factors but upon the ecological and physical characteristics of the commodities, e.g. for coffee (Giovannucci and Ponte 2005) and forests (Pattberg 2005; Gulbrandsen 2005; McCarthy 2006, 88). It is therefore important to consider certification spaces and practices as involving not merely technology, economics and transport, but also environmental resources such as trees (Prudham 2005), wetlands (Robertson 2006) and fish (Mansfield 2007, 2004a). Certification practices are therefore not merely imposed upon these different nature-cultures in different spaces and at different scales, but coproduced by them. Our comparison of MSC and FSC shows how they use socionatural spatialisations of certification, hybridising political, ecological and technological conditions in organising environmental governance across (patchy) global networks.

Methodology

FSC and MSC are excellent case studies for several reasons: unlike organic production, they are NGO-led and branded; they are more globally organised and less dependent upon national regulation; MSC in particular is little researched as yet; finally and perhaps most importantly, because MSC initially modelled its system on FSC but applied it to a different environmental element (sea water, rather than forested land), the two together offer an excellent comparison of how different sorts of hybrid spaces were coproduced through supposedly very similar governance models.

In our analysis, we use documentation from FSC, MSC, their members and their critics, some of which is in the public domain and some of which we gained privately through contacts. We triangulate this with qualitative, indepth interviews held in private with 47 representatives of 30 organisations in the UK and the USA involved in certification in 2004-6 (see Table 2). Interviewees were identified through snowballing contacts from interviews with FSC, MSC and certification bodies and searching publicly available documents, such as lists of certificates and accredited certification bodies posted on websites.

Interviews ranged from one hour of discussion to day-long visits to an organisation's offices and forests. Most interviews were audio-recorded using digital equipment, fully transcribed and then coded using NVIVO software on grounded theory principles, that is, multiple coding across sources to saturation. For this paper, interviewees have been given pseudonyms and some organisations have not been named, in the interests of confidentiality.

We interviewed people in the UK and USA to include the experiences of certification in two very different countries. In the UK, FSC has received strong backing from industry and government (especially through the Forestry Commission), producing far more comfortable working relationships and a strong dominance for FSC over competitors, probably aided by the much smaller economic importance of the timber sector to the national economy. In the USA, competing certification initiatives such as PEFC and SFI (see Meidinger 2006; Gale 2002) are more significant, as is the timber sector generally, and more controversy over practices and allowable technology has arisen. Similarly, the USA includes the largest whitefish catch in the MSC-certified Alaska pollock fishery, whereas the UK is at the other end of the scale in terms of catch size, providing strong contrasts in economic and political status, as well as ecological conditions.

Despite including this diversity of countries, oceans and forests, we do not claim to survey opinion or 'prove' impact conclusively: others have attempted more detailed international comparisons, such as Gale (2004) and Gulbrandsen (2005a) for FSC. Indeed, we are not explicitly concerned with the national scale for our analysis, as is common, because we seek to highlight the problems of attempts at *global* environmental governance beyond the state.

Table 2. Comparing the Forest Stewardship Council and the Marine Stewardship Council.

	Forest Stewardship Council (FSC)	Marine Stewardship Council (MSC)
Launched	1993	1997
Headquarters	Bonn, Germany (previously Oaxaca, Mexico)	London
National offices	43	3
Annual income	US$ 5,410,433 in 2007	£ 8,039,654 in 2008-9
Number of certification bodies accredited	16	8 for fishery management + 13 for chain of custody only
Number of certification bodies, by location of head offices, as of September 2007	North America: USA (2), Canada (1) Europe: France (2), Germany (1), Italy (2), Netherlands (1), Switzerland (2), UK (2) Elsewhere: South Africa (1), Mexico (1)	North America: USA (2), Canada (1) Europe: Germany (2), Netherlands (1), Switzerland (1), UK (3) Elsewhere: Argentina (1), Australia (1)
Certificates issued, as of 2008	940 forest management/chain of custody certificates across 81 countries (plus 10,613 chain of custody only certificates across 88 countries)	56 fishery certificates across 15 countries (US, UK, Sweden, Japan, New Zealand, Australia, South Africa, Argentina, Mexico)
Principles	1. Compliance with laws and FSC principles. 2. Tenure and use rights and responsibilities. 3. Indigenous peoples' rights. 4. Community relations and workers' rights. 5. Benefits from the forest. 6. Environmental impact. 7. Management plan. 8. Monitoring and assessment. 9. Maintenance of high conservation value forests. 10. Plantations.	1. Status of the target fish stock. 2. Impact of the fishery on the ecosystem. 3. Performance and effectiveness of the fishery management system.

Sources: FSC 2008a, b, 2007a, b; MSC 2009, 2007a, b, c, 2005. The MSC Principles have been summarised. Some certification bodies only certify chain of custody, not forest/fishery management.

Introducing FSC and MSC

The FSC was set up to fill a perceived policy gap, particularly after the 1992 UN Conference on Environment and Development (the Rio Earth Summit) failed to produce a binding

convention on deforestation. Launched in 1993 after discussion meetings around the world, FSC promotes the three pillars of sustainable development in seeking "environmentally responsible, socially beneficial and economically viable management of the world's forests" (FSC 2000, 2; 2007a). The MSC was modelled on the FSC and thus launched a little later, in 1997, aiming to "harness market forces and consumer power in favour of sustainable, well-managed fisheries" (May et al. 2003, 17), again responding to perceived problems in global ocean fisheries protection. As Table 2 shows, both NGOs already have international coverage, although this is wider for FSC, having been established longer.

There are other similarities between FSC and MSC. Both have structures designed to balance the influence of nonstate actors in decision making. FSC International General Assembly has three chambers of members with equal voting rights and this threefold structure is replicated in most national branches (see Table 3). FSC Board of Directors is accountable to these FSC members and comprises nine people who are elected from each of the three chambers, but day-to-day FSC business is managed by the Executive Director and staff in the head office in Bonn, Germany. The MSC is run by a Board of fifteen appointed trustees, serving in a personal capacity, and is advised by a Stakeholder Council of 30-50 appointed representatives of eight stakeholder constituencies (Table 2).

Table 3. Membership categories for FSC and MSC.

FSC's three 'chambers' in the General Assembly	MSC's eight 'constituencies' in the Stakeholder Council
	Public Interest Category:
1. *Environmental* (e.g. Friends of the Earth, Greenpeace (in the UK), Soil Association, Woodland Trust, WWF UK)	1. Scientific, Academic & Resource Management Interests (e.g. universities) 2. General Conservation NGOs & Interests (e.g. National Environmental Trust, David Suzuki Foundation)
2. *Social* (e.g. The National Trust)	3. Marine Conservation NGOs & Specialist Interests (e.g. WWF, North Sea Foundation)
3. *Economic* (e.g. B&Q plc, Blueline Office Furniture Ltd, Boots the Chemist, Ecotimber Ltd, Habitat UK, Stanley Decorating Products	4. General Interests & Organisations (e.g. Seafood Choices Alliance)
	Commercial and Socioeconomic Category:
	5. Catch Sector Interests (e.g. At-sea Processors Association, Pro-Fish Pty Ltd.) 6. Supply Chain & Processing Interests (e.g. Youngs Bluecrest, Unilever) 7. Retail, Catering & Distribution Interests (e.g. Whole Foods Market, Wal-Mart) 8. Developing Nation & Fishing Community Interests (e.g. universities)

Notes: Examples of FSC members are taken from the UK (see FSC UK, 2005) and of MSC members from the US (see MSC, 2007e). FSC/MSC's classification of interests is used: for example, universities are (perhaps illogically) defined as representing other interests, probably because of the difficulties in getting representatives from some sectors, particularly the 'social'.

It is clear that both FSC and MSC seek the strength of a heterogeneous alliance by wide representation within a civil society mode of environmental governance.[1] The FSC's "broad constituency base and participatory approach" thus make it stronger than it would have been as a stand-alone NGO lobbying the forest industry from the outside (Humphreys 2006, 118). Indeed, both FSC and MSC were originally promoted through a partnership between WWF and a major multinational corporation: FSC was supported by B&Q, a major UK home improvement company and buyer of timber products, and MSC by Unilever, the world's largest seafood buyer at the time. Such household names gave the new NGOs a high profile and remain essential to their success, providing credibility for the certification process and potential markets for certified products. Retailers such as Marks and Spencer, Sainsbury's and Wal-Mart have since announced commitments to sourcing their fish from MSC-certified stocks. B&Q has a long history of requiring its suppliers to gain FSC certification in many countries (e.g. for South Africa, see Morris and Dunne 2004), although not in Finland, where they also accepted an industry-led alternative (Cashore et al. 2007).

However, as mentioned above, there is concern that governance projects can be too heavily influenced by large corporations, because close association of FSC or MSC with either supporting 'side' - WWF or B&Q/Unilever - risks accusations of eco-extremism on one hand and corporate capture on the other (e.g. Constance and Bonanno 2000). This emphasises the problems of nonstate actors in claiming independence, causing NGO-led certification to seek 'moral legitimacy' from other NGOs, policy makers and consumers *at the same time as* 'pragmatic legitimacy' from industry (Cashore et al. 2004, 195), to reach out to all 'sides':

> "if we're talking to a retailer, then yes, of course, WWF lends credibility and gives a bit of weight to what we're doing. But if we're talking to an Icelandic fishery, we would try and distance ourselves as much as possible from the WWF connection because of their anti-whaling campaigns and boycotts and things that they promote. You know, we want to make sure that it is known that we do have that separation from WWF." (MSC, interview with Liz)

Similarly, WWF claim that "there's been a big step back" (WWF UK, interview with Alison) from supporting FSC and MSC, precisely so that each NGO can more effectively claim financial and operational independence. But this tension between support and cooption by industry must be continually and consciously managed by FSC and MSC:

> "at the same time as we're saying that these people have conflicting interests and different opinions about how things should be done, we also want them to try and work together, so in creating this structure, we think that enables them to sit in a room together and talk." (MSC, interview with Jane)

This underlines the difficulties in NGO-led governance outside the state that is designed to create a hybrid space in which to bring together interests which, under other circumstances, would be unlikely to cooperate with each other:

> "You'll get radical views on each side [of FSC], you'll get timber processing people who just won't say a good word about any NGOs and the NGOs who are just so narrow-minded, but there's a fairly broad consensus and that's one of the merits." (UK certification body, interview with Sean)

Further, both FSC and MSC seek not only to include diverse nonstate actors in decisions, but to demonstrate that those decision making processes are inclusive, transparent and open to criticism and change. The MSC's Stakeholder Council includes outspoken critics to demonstrate that the MSC has wide support and that it is willing to listen to criticism (as well as support) from other NGOs.

Spatialising certification for environmental governance

Each NGO also spatialises its certification practices. Both have centralised Principles and Criteria which are intended to be universally applicable across various forests and fisheries (see Table 2) and that define "a global standard" (MSC, interview with Jonathan) against which applicants will be judged internationally. Both claim that this elevates their initiatives above the problems of (nation) state-led government:

> "FSC, MSC, the international organic stuff, the Fair Trade, it crosses borders. These are truly international standards. These are not things that try to fit within the UK, the Dutch, US or Australian mould." (MSC, interview with Jane)

How FSC spatialises its standards

However, the spatialisation of these standards at lower geographical scales and across land and water spaces differs greatly. FSC defines its voluntary standard of forest management through ten International Principles of sustainable forest management (FSC 2000). These are then operationalised through 57 indicators or Criteria against which the Principles can be measured, a process managed by FSC's Policy and Standards Unit, in Bonn, Germany. To this point, the Principles and Criteria are presented as sufficiently general to be globally applicable. However, these global Principles and Criteria are then tailored to geographical conditions - ecological, technological, sociological, political - by developing a national standard for each country seeking to join FSC's scheme, thus deploying traditional political borders to define its governance spaces, often using countries as proxies:

> "What constitutes certifiable, exemplary forest management in Sweden is not identical to what constitutes certifiable, exemplary forestry in Papua New Guinea or South Africa or Timbuktu. But there are bona fide regional contexts that need to be weighed or factored into a certification process." (US certification body for FSC, interview with John)

For countries where there is no existing standard, certification bodies can step in (FSC, interview with Liz). For example, when first certifying forests in Lithuania, there was no national FSC standard, so a certification body 'judiciously' adapted the generic FSC international standard and their own forest standard (UK certification body, interview with Sean), implying a fair amount of discretion by the certification bodies to undertake the governance work of defining certification on the ground in different places (also Meidinger 2006, page 65).

In large countries, even a national FSC Standard may be regarded as too general to cover several climatic zones. Hence, regional (subnational) FSC Standards are developed based not on political but on ecological zones that cross state lines. Unlike government regulation, therefore, FSC governance seeks a more deliberately socionatural spatialisation through a dynamic, hybrid approach to scaling certification practices that does not define areas by existing political boundaries. In the USA, there are now nine Regional Standards, wherein "globally applicable" FSC Principles and Criteria are operationalised as a series of "regional indicators" (FSC-US 2005) that "allow certifications to take into account the many distinctions between forest ecosystems and regions in the United States" (Washburn and Miller (of FSC-US) 2003, 12). Some within the network argue that even regions are too general to be of much use in specifying climatological and ecological geographies:

> *Interviewer* So even the regional standard is not specific really?
>
> *Brad* No, it varies so much. We're really more like, in some ways, the inner mountain region, so far as our climates and types. So the Pacific Coast [FSC regional standard] isn't really a coastal [standard], it's more California-Oregon, but California,

> if you were to go to Susanville, you'd get - a lot of our forests are on the edge of the desert there." (large US forestry company certified to FSC)

The 'social' aspect of the FSC standard also differs geographically: in the UK, it is accepted that indigenous peoples are not relevant for certification audits (e.g. SGS 2005), so that 'social' mainly deals with stakeholder consultation and public access to forest lands for recreational use. In the USA, by contrast, indigenous peoples are very important in FSC certification processes, both as applicants (e.g. Confederated Tribe of the Warm Springs Reservation and the Hoopa Valley Tribal Council) and through stakeholder consultation (q.v. Gale 2004). Moreover, the operational and technological aspects of forestry are also claimed to differ:

> "we use an awful lot more pesticide in the UK than we do in the rest of mainland Europe, for instance. And there are forest practices on mainland Europe which probably aren't certified but in terms of standards of management far exceeds anything that happens here." (UK NGO certified to FSC, interview with James)

Hence, the implementation of FSC's certification process is an intimately geographical one, its precise configuration shaped by local ecologies, societies and technologies. Moreover, the pattern of certified spaces produced by FSC's system is also highly geographically differentiated globally: more of the economically productive forests in the North have now sought certification than those in the South, so the geographies of FSC and other certification schemes that have followed it are skewed towards temperate and boreal forests and their softwoods, rather than the tropical hardwoods that were the focus of fears for deforestation and illegal logging. As of September 2008, 47% of the 102 million hectares of FSC-certified forests were in Europe, 35% were in North America, 11% in Latin America, 3% in Africa, 2% in Oceania and 2% in Asia (FSC 2008a). Hence, FSC's geography of certification reflects economic geographies of production in its coverage and buried within this are the ecological geographies of its adapted standard.

How MSC spatialises its standards

MSC's approach to dealing with geographical variations differs markedly from FSC's. First, the FSC certifies a forest operation on a piece of land, including all the tree species and logging operations (including plantations). Its object of governance is therefore defined in a fairly traditional and modernist manner through legal ownership by the applicant and the forest management certificate is issued to that applicant, usually a company or not-for-profit organisation, frequently within standards defined by reference to the space of the nation-state. By comparison, MSC must deal with spaces of water to which such ownership or sovereignty may rarely apply, forcing it to develop new ways of defining certification spaces. It therefore certifies a combination of site, species and fishing gear, making its object of governance a fluid hybrid of cartography, ecological taxonomy and technology.

> "Because principle 1 is interested in the health of the target stock and fisheries don't necessarily have lines on water that match the boundaries of where a stock is found, the way we define unit of certification is that it's a combination of the biological limits or boundaries of the stock itself with the gear or method and other factors – location, management boundaries and those sort of things. But basically it's a combination generally of the stock boundaries and the gear or method that's used." (MSC, interview with Jane)

Like FSC, MSC is not tied to political boundaries. Unlike FSC, it develops each certification not for a geographical space, but for a relational unit (see Bear and Eden 2008 for more details). As a result, the same cartographical space may carry multiple, overlapping

certifications based on different combinations of gear and species. Moreover, although FSC includes tree farming on plantations, MSC excludes fish farming, concentrating on marine 'wildcapture' fisheries. It does, however, include river fisheries inland where the fish, such as salmon, return from the sea to spawn. This led to a problem when one salmon fishery was originally certified as a single unit despite covering geographically diverse river habitats along the northwestern coast of the USA (see Bear and Eden 2008). To address this, when the fishery was recertified five years later (as required by MSC), the certification body devised a new set of 16 certification units, which drew on the Alaska Department of Fish and Game's regulatory areas, but customised by the certification body at their ion according to the species and fishing gear involved. Here, the spatialisation of certification both hybridises ecology and technology and also shifts over time. Indeed, some fisheries are also seasonally defined for certification, depending on the lifecycle of the target species.[2]

As well as changing in time, MSC certificates also vary in space; indeed, they overlap. Of the 26 fisheries certified to MSC Standard as of December 2007, several were in the same location but defined by different species or different fishing gear. For example, the Hasting Fleet Dover Sole Fishery and the Hastings Fleet Pelagic Mackerel *(Scomber scombrus)* and Herring *(Clupea harengus)* Fishery both fish waters in the English Channel between Beachy Head and Dungeness and offshore to the six mile limit (MSC 2007c), but have two different certificates issued to the same applicant, the Hastings Fishery Management Group, because of the different species targeted.

Hence, systems of property rights in these two sorts of spaces are reflected in differences in environmental governance and certification spaces. A forest as a private resource on land, even where publicly owned, can still be fenced and this fence policed and reflected in certification - indeed, 'fencing' is specified as one means of verification in FSC's certification processes in the UK (e.g. UKWAS 2006a). A fishery as a public resource at sea, even where privately owned or allocated through quota systems (e.g. Mansfield 2004), cannot fence in the fish populations due to their mobility and, in some cases, there is also considerable uncertainty about what stocks exist to be caught (also Campbell 2007). Scientific uncertainty about the environmental resource being certified is far more significant for MSC than for FSC, perhaps influencing the former's slower growth.

Moreover, a client for FSC certification usually pays to have forest lands that they own certified, or sometimes as part of a collective or 'group' certification. By comparison, the client for MSC certification may pay to have a fishery certified that it does not exclusively own and may risk non-certified vessels taking stock from that fishery while it is certified. The fluidity of the oceans that MSC seeks to govern are reflected in the fluidity of the certification spaces which it produces, which overlap regardless of any scalar hierarchies. As a consequence, MSC recognises that part of its certification process is defining a fishery as the object of its governance and that this has risks if it goes wrong:

> "where the stock of the certified fishery is shared with other (perhaps uncertified) fisheries, these other activities may deplete the stock and hence have a detrimental impact on the certified fishery. In this situation, the certified fishery risks losing certification because of actions of those outside the certified fishery. The exact choice for the boundaries of the unit of certification can have profound consequences for both the success of the assessment, and the maintenance of the certificate." (MSC 2005, 2)

Moreover, unlike for FSC, a global MSC Standard is not adapted for different nation-states or regions of the ocean; instead, even greater geographical diversity is claimed. For each fishery, the certification body must choose a set of 'sub-criteria' and 'performance indicators'

that will measure how far the fishery meets the Principles and Criteria, with 80 out of 100 points required per Principle to be certified.

> "When the process first began we got together as certifiers and whatever experts had been involved to that date, to try to produce a generic standard. And we came up with something but the MSC decided it couldn't be done. Fisheries were so different that you had to take each fishery on a case-by-case basis and you had to produce for that fishery a list of questions that you were going to ask. And the relevant requirements against each question." (UK certification body for MSC, interview with Dave)

Hence, MSC expected that "the precise assessment of a fishery *will vary* with the nature of the species, capture method used, the ecology of the fishery, etc." (MSC 2007a, 1, emphasis added). Hence, our interviewees frequently argued that this process of case-by-case certification of fisheries was necessary because "every one's different" (WWF US, interview with Luke) and "you have to exercise your brains a bit, because every fishery's unique" (MSC, interview with Jane). The geographies of MSC certification thus depend upon ecology, technology and cartography and how these are interpreted by the certification body in each case:

> "each Principle has a definition and there is an intent, so it defines what the aim of this Principle is. And underneath that there's a number of criteria, but none of these criteria have any intent. When the [certification body] comes to interpret these, it's variable as to how they're applied. There needs to be some flexibility but we can't be too proscriptive. Because every fishery is vastly different – from small cockle fisheries to a big herring fishery." (MSC, interview with Peter)

Not least this is because of differences of scale. For example, the MSC-certified Thames Herring fishery covers an area within 6 miles of the Thames Estuary off the coast of southern England and had a total allowable catch of 121 tonnes in 1999-2000. By comparison, the MSC-certified US Bering Sea/Aleutian Islands Alaska pollock fishery is the world's largest for whitefish, with a total allowable catch in 2005 of nearly 1.5 million tonnes or approximately 30% by weight of fish landed in the US (MSC 2007c). In some cases, therefore, the regional or local geographies are subsumed into such larger units for the purposes of certification, for example, when Alaskan salmon was being certified:

> "Alaskan salmon is called a fishery but within that you've got dozens, hundreds of river runs, breeding stocks and all that sort of stuff. Embedded within the assessment for that were many, many different units that were looked at. But overall it all chunked up to Alaska." (MSC, interview with Jane)

In 2008, after our research had concluded, MSC adopted a Fisheries Assessment Methodology (FAM) to guide the interpretation of the global MSC standard, apparently because of concerns about inconsistency in how certification bodies would approach such assessments. This listed the performance indicators that should normally be included in a certification and thus reduces, but did not elimiate, certifiation bodies' discretion:

> "Certifiers can still ask MSC to vary the default Assessment Tree for a particular fishery, but such changes have to be justified by the fishery's special characteristics. These cases are expected to be the exception rather than the rule." (MSC 2009)

Comparing spatalisations

Overall, therefore, although FSC and MSC are notionally both global governance schemes, they have different spatial approaches to dealing with geographical differentiation. FSC formalises this through developing national and regional standards, but these are then adapted to the specifics of the forest during certification in situ. MSC holds to its central principles

without developing national or regional standards, but certification bodies then adapt these principles to the specifics of the fishery being audited in each case. In this way, although FSC and MSC operate globally in principle, their certifications play out quite differently, because of the different socionatural characteristics of the land and water spaces with which they deal. Indeed, as McCarthy (2005, 749) notes, such complexity can be helpful for NGOs, because it allows "creativity and flexibility" in their spatial strategies, as they (re)invent practices of environmental governance. Rather than invoking a scalar hierarchy, as discussed earlier (e..g Brown and Purcell 2005; Jonas 2006), these certification schemes work between and through different scalar configurations in a two-way movement that is as opportunistic as it is flexible.

Moreover, their standards vary across time, as well as space, because of changing knowledge and practice. FSC National Standards should be revised every five years to allow adaptability and revision, so standards "can never be fully specified and are always subject to renegotiation in the light of future events," although, as Busch (2000, 276) notes, they may be *presented* as fully specified. Both FSC and MSC use five-year certificates, so that recertification at the end of that period may well be different again, due to changes in science, technology and the environment.

Science and independence in certification

We now turn to some of the processes and problems of scientising certification for environmental governance. This is because science and its associated norms of authority, expertise, disinterestedness and objectivity are highly valuable as legitimation for NGOs in environmental debates (Yearley 1991, 1992, 1993). MSC claims that theirs is "a very credible, very defensible, very scientific programme that retailers can engage with and actually find real answers, instead of something that's a bit surface level" (MSC, interview with Liz). Their Board of Trustees is supported by a fifteen-member Technical Advisory Board that provides advice specifically on technical and methodological issues and can make decisions on "technical, scientific and quasi-judicial functions" (MSC 2007d). The involvement of science and scientists at every level and in every function of MSC is emphasised throughout their literature to support the claim that their standard "uses an objective and scientifically verifiable method of assessing the sustainability of fisheries," drawing on "an international panel of experts from the fisheries, environmental and governmental scientific communities, together with representatives from the catching, processing and retailing sectors" (MSC 2006).

Indeed, certification processes were commonly referred to by our interviewees as involving 'experts' and, less frequently, 'scientists.' Both NGOs convene 'expert panels' of various sorts, particularly to review controversial issues. For example, FSC guidelines seek to reduce pesticides which are persistent, toxic or biomagnify up the food chain. In 2000, an Expert Panel drawn from from Oregon State University, the Centre for Ethics and Toxic Substances and FSC-US were asked to to provide "a conservative and scientifically defensible definition of persistence, toxicity, and biomagnification for selecting the least harmful pesticides where such use is deemed necessary by certifiers" (FSC US 2000, page 10; FSC, 2008b). Similarly, certification bodies also aim to recruit people with both scientific and industrial experience, who are thus able to bridge this divide. The MSC emphasised how the best certifiers had "a fisheries science background" (MSC, interview with Jane):

> "Because MSC certification's so different to most other types of certification - so science-based and protracted – [the certification body] wanted to get some specialists on board - so I'm actually a marine biologist by training." (UK certification body, interview with Dave)

These NGOs (literally) recruited fairly traditional sources of authority by enrolling scientists and emulating scientific practices. Both FSC and MSC use 'peer review' by 'experts' to echo traditional (if disputed) norms of scientific evaluation in establishing the quality of research: the UK standard for FSC stipulates that a draft certification report must be "subject to independent peer review by competent experts" (UKWAS 2006a: 4) and MSC's (2005b: 12) guidance to clients emphasises peer review "by chosen experts."

However, FSC and MSC define expertise much more broadly than this might suggest. For example, a 2006 panel convened to review how well the FSC-US standard was implemented drew on self-described "subject matter experts" (Dodge 2006, page 4) from universities, NGOs, business, social associations and regulators, thus defining scientific training but also practical experience as 'expertise.' This nicely reflects arguments for recognising heterogeneous assemblages of different kinds of knowledge in ethnoepistemic alliances (Irwin and Michael 2003; Eden et al. 2006) and valuing socially robust knowledge that is contextualised, useful and socially accountable, as well as generated by diverse knowledge producers (Gibbons et al. 1994). Knowledge in practice is therefore what FSC and MSC want, not simply unworkable science:

> "it really is a combination of the best available scientific knowledge for subjects like pesticides, which certainly is a very scientific subject really, to practical experience being realistic about something, what's achievable and what's workable?" (UK FSC-certified NGO, interview with James)

Problems with science for certification

But, as noted above, science can be an unreliable ally for NGOs (also Yearley 1991), especially where "grey areas" of certification are open to managers' discretion (UK FSC-certified NGO, interview with James; MSC, interview with Jeff) and general dispute. For example, when revising the US FSC standards in 2005, concern about pesticides was raised after an initial report for FSC by the Pesticide Action Network UK (PAN-UK), an environmental NGO. In December 2005, FSC agreed a Pesticides Policy that added 35 pesticides to their prohibited list as 'highly hazardous,' including some not listed as hazardous by the World Health Organization. Some interviewees used the fact that an NGO (PAN-UK) had prompted this change to critique the scientific justification and authority of FSC itself, invoking traditional views of NGOs as on the wrong side of a supposed emotion-science boundary:

> "there's serious questions about whether or not it makes sense to ask an advocacy group to do what is purportedly a dispassionate science-based assessment of persistence and toxicity. And I assure you that there's many landowners around the world who are certified under the FSC who are very unhappy with what the FSC did. Procedurally. In asking or hiring Pesticide Action Network UK to do this assessment." (US certification body, interview with John).

Forest managers we interviewed in the USA in early 2006 were divided about how problematic the new policy might be, although one argued forcibly that FSC was not banning the herbicide imazapyr (one of the 35 new additions) because of good "scientific" reasons, but because the FSC had "almost a chemical phobia":

> "[banning imazapyr] makes no sense, because it's safer and all this, but just because of some kind of arbitrary criteria, and for risk assessment you have to look at the wide range. You can't just look at one attribute. You have to look at how it actually becomes a risk… it just doesn't make sense what FSC has done with that" (large US forestry company certified to FSC, interview with Brad)

Such boundary work (Gieryn 1983, 1995; Kinchy and Kleinman 2003) is frequently deployed against NGOs in environmental debates, often by industry, in a highly combative way. In this case, this interviewee and many others affected by the ban made their feelings known within the system, through FSC-International, which then consulted on the new policy in an attempt to keep stakeholders on board whilst not immediately giving into pressure. An Expert Panel was set up in December 2006 to review the policy and a revised policy was approved in May 2007, which removed six of the pesticides added in 2005, including imazapyr.

This debate was therefore scientised, but also spatialised. From the start, the new policy had allowed certification bodies to apply for temporary (five-year) derogations (that is, exemptions) from the prohibition on using listed pesticides for particular applicants or sites. Further, an independent report on FSC-US's nine regional standards in 2006 proposed a complete exemption for the USA from FSC international guidance on herbicides, invoking Environmental Protection Agency (EPA) rules instead:

> "Blanket derogation across all US regions for EPA-accepted forestry herbicides could be applied for by FSC-US. Although such an application might draw criticism from opponents of herbicide use, it would allow the certified landowner community in the US to state a *rational* case that could be used in future whenever this issue surfaced." (Dodge 2006, page 3, emphasis added)

Here, NGO-led environmental governance is struggling to push through higher standards of management, but is encountering more traditional norms of science and long-standing forms of boundary-work that resist this. Opening up and diversifying science may therefore be held up as a positive agenda for NGOs, as noted above, but in practice it proves very difficult, resulting in this case in compromise on pesticides.

The problems of scientising seemed even greater for MSC, perhaps because the science of fisheries itself is problematic and uncertain, against the inherent ungovernability of the deep oceans, the fluidity of property rights and the mobility of fish (also Mansfield 2004a, 2004b; Campbell 2007). Our interviewees often perceived that "we have no idea what's going on in the ocean" in terms of, for example, salmon populations (US regional NGO B, interview with Lauren). Again, this highlights the importance of different socionatures in configurations of environmental governance:

> "there's a million things, a million unknowns, especially with a fishery like the pollock fishery. There's a million unknowns about how it is. The big defence of the Bering Sea fishery is that the biomass is huge. OK, fine. Does anybody know why? They don't even know why! Maybe the cycle's going to go like this and if it goes down does that mean that the fishery isn't sustainable? It's not like trees where you can go to a forest and fly over it or walk through it and see what condition the ecosystem's in. You just can't do that in the oceans. It just seems kind of hard to put your finger on, I guess." (US regional NGO A, interview with Meryl).

Also, MSC's claims to scientific rigour were challenged by some interviewees. The process of scoring fisheries for certification numerically was described by one interviewee in a UK certification body as "not much of a science," because it depended on professional experience and case-by-case discretion, again emphasising fairly traditional norms of scientific authority; similar issues have been noted for FSC (see Eden 2008). Moreover, some argue that fisheries science itself is industry-oriented, developing as it did alongside the interests of capitalism (St Martin 2005, page 962), and therefore tends to be "looking at fish to maximise fish for fisheries and not necessarily looking at it from an ecosystem perspective approach" (US

regional NGO B, interview with Lauren). So even science outside MSC may not be disinterested and thus lack credibility.

Like FSC, MSC often uses special panels to review cases of problematic scientisation, seeking authority for their decisions through claims to independence, transparency and expertise. For example, the initial certification of the Gulf of Alaska pollock fishery took an unusually long time (2001-2005) while the scientific basis for certification was contested. The fishing industry had initially sought certification as an attractive way of dispelling criticisms from environmental groups about the effect of pollock fishing on Steller sea lion populations, because of the scientific basis and independence of MSC certification processes:

> "we didn't think the science was there to really support that the conduct of our fishery had caused the decline of the sea lion or was inhibiting it from coming back as a species. And we thought one good way to dispel that was to get into a third-party science-driven programme to validate that." (US MSC-certified industrial group, interview with Bob)

But when the certification body's draft report on the certification was released for comment, as required by MSC, and was in favour of certifying the fishery, Greenpeace International, the National Environmental Trust and the Alaska Oceans Program jointly made two formal objections to MSC: that the stock size of Gulf of Alaska pollock was too small to fish sustainably and that the current levels of pollock harvesting were further endangering Steller sea lion populations (Sainsbury et al., 2005: 3). Both objections focused on what constituted appropriate science and measurement: how the B_{MSY} (Biomass corresponding to Maximum Sustainable Yield) figure should be interpreted for this particular fishery and the uncertainty that surrounds the decline of Steller sea lion populations. The MSC's Objections Panel reviewed these objections, but largely upheld the certification body's proposal to certify the fishery, invoking scientific uncertainty to justify its decision:

> "The mere fact that the Certification Body and the Objectors were able to come to different views faced with the same body of material does not necessarily undermine the legitimacy of either point of view; rather it demonstrates the complexity of the issues under consideration." (ibid.: 20)

Conclusions

We have shown similarities and differences in how NGO-led environmental governance deals with space and science. Governance is not achieved merely by involving nonstate actors, because they must still negotiate multiple levels of influence and operation, develop new mechanisms and seek new 'spheres of authority' (Pattberg 2005) to be credible. Both FSC and MSC must build such authority without a government's threat of coercion, relying instead on persuasion and moral legitimacy to have influence, especially through building "transparency, reliability, and neutrality" (Pattberg 2005, 181).

To do this, both seek to bring in scientific credibility through involving researchers as members and through putting controversial issues out to review by 'expert panels', although it has proved problematic in some cases. Both NGOs therefore seek to tap into science's modernistic norms of authority, objectivity and independence, not least to gain influence as nonstate actors. However, these are not the only sources of credibility used. NGOs also draw on notions of transparency, especially through claiming diverse membership and thorough consultation with stakeholders, and independence, especially through the at-a-distance use of accredited certification bodies to assess applicants for certification across diverse spaces within their globalised networks. Although this partly reflects the hopes of some

commentators that NGO-led environmental governance can draw in heterogeneous forms of expertise and challenge traditional scientific norms, this by no means *replaces* those norms and may sometimes rely on "a general technocratic confidence in expertise" (Meidinger 2006, page 71) embodied in experienced certifiers.

Table 4. Comparing use of science and space by Forest Stewardship Council (FSC) and Marine Stewardship Council (MSC)

	Forest Stewardship Council (FSC)	**Marine Stewardship Council (MSC)**
Scope	Naturally occurring forests and plantations in any region.	Naturally occurring fisheries only. Primarily ocean fisheries, but river systems included where these support spawning of ocean-going populations.
Scientisation	Expert panels convened, usually issue-specific. Expertise defined heterogeneously, including formal training and practical experience.	Expert panels convened as well as standing Technical Advisory Board. Expertise defined heterogeneously, including formal training and practical experience, but against significant uncertainties in marine science.
Spatialisation	Global standard. National standards adapted primarily for spaces defined by countries. Regional (subnational) standards adapted primarily for spaces defined by eco-regions.	Global standard. Fishery standards adapted for each hybrid combination of species, fishing gear and cartographically defined area.

Hence, simply involving nonstate actors does not implement a move from government to governance, nor does it solve the problem of credibility: indeed, it can make it more complex. NGO-led environmental governance is clearly an ongoing project for both FSC and MSC, requiring considerable work and bureaucracy to set up alternatives to national or supranational regulation, especially at a putatively global scale, and to maintain credibility without the resources or powers of a nation-state, through building heterogeneous alliances across various sources of authority, including science, industry and ecology.

These alliances are also reflected in the geographical variability and scalar arrangements of FSC and MSC. FSC is rather traditional in often piggy-backing its standards on the national scale, but remains open to developing smaller scale standards because of ecological variability. Rather than setting entirely 'new' spaces of certification beyond traditional territorial concerns of national politics and economics, FSC certification processes continue to reflect the geographies of environmental government. Dealing with multiple levels is therefore not solved merely by involving nonstate actors. By comparison, MSC is largely operating outside national scale boundaries and also within the three-dimensional, highly uncertain geography of the oceans, so its spatial solution is a more thoroughly and consciously hybridised one of technology and ecology. Moreover, both systems move between scales in different directions, working against a simple scalar hierarchy of local or global as more powerful, derministic or morally justifiable. Instead, both schemes adapt and

interweave their spatial configurations in mutually opportunistic and flexible ways, so that although their reach is putatively global, their certification processes are clearly also adaptively coproduced with local socionatures.

Clearly, therefore, whilst the particular spatial configurations of certification reflect the ecological characteristics of the environmental resources being certified, the problems of building and maintaining credibility for NGO-led environmental governance are remarkably similar between forest and fisheries certification. The cases are not necessarily 'unique', as some have argued, but comparable in many ways, suggesting a need for more comparative studies across commodity sectors in future geographical research. It is also clear that, as yet, NGO-led governance can only supplement government, rather than supplanting it entirely (Jordan et al. 2003; Pierre and Peters 2000, 68-9). A shift from environmental government to environmental governance still remains largely a normative aim, rather than a practical achievement.

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Notes

[1] However, "the social sector's very difficult to find anyone to get hold of" (UK certified NGO, interview with James) and tends to be underrepresented in FSC (also Gale 2004).
[2] We thank a referee for bringing this to our attention.