

# Politics and scale: some implications for environmental governance

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## Abstract

This essay explores themes related to differences of scale and the challenge of environmental governance. It argues that scale issues are always important in politics, but that the density of physical and social scales implicated in the constitution and resolution of environmental problems is particularly notable. It discusses recent changes in governmental approaches to managing environmental burdens in the developed countries, and considers the implications of scale-complexities for the future of environmental governance.

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*Keywords:* Politics; Scale; Environmental governance

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## 1. Introduction

It is now relatively common for analysts to emphasise the variable and cross-cutting temporal and spatial scales associated with environmental problems, and to note the difficulties these present for political institutions charged with managing environmental burdens (Dryzek, 1987; Lafferty and Meadowcroft, 1996). There is widespread criticism of the ‘short-termism’ built into contemporary politics—that electorates are pre-occupied with immediate issues (such as the economy, crime or health care), while politicians rarely think beyond the next election. And there are obvious spatial disjunctures: environmental problems do not respect political boundaries, instead they cut across established jurisdictions or link discontinuous regions. Critics complain that governments have trouble responding at the relevant spatial scales, and some have called for a radical redrafting

of political boundaries to coincide more closely with ecological realities (Sale, 1980; Dobson, 1995).

Scale crops up in environmental politics in other ways. There is widespread concern that ‘the scale’ of the political response to environmental dilemmas is inadequate (too small or too slow), particularly in relation to ‘third generation’ challenges such as climate change or biodiversity loss. Then there is the idea of natural limits, which has exercised such a profound influence on the ecological imagination since the early 1970s (Meadows et al., 1974; Daly, 1977). ‘Limits’ and ‘scale’ are, after all, closely interconnected. A limit is a boundary beyond which certain forces, processes, or rules no longer apply. In other words, it is a boundary beyond which scale matters: for what held true within the limit can no longer be relied upon to hold true once the threshold is crossed. In political terms the worry is the apparent inability of existing governance institutions to restrict social and economic behaviour within the frontiers of ecological sustainability.

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This essay will explore themes related to scale and environmental governance under three headings: scale and politics; scale and environmental problems; and scale and environmental governance.

## 2. Politics and scale

Real world politics is always predicated upon specific temporal and spatial scales, although these sometimes form part of the unquestioned background conditions of political life. Spatial scales relate most obviously to the territorial delimitation of political power, to the physical area over which one political structure, rather than another, holds sway. Since political jurisdictions can be divided and combined, ordered into nested hierarchies, or configured differently for different administrative purposes, the territorial matrix of politics existing at any given moment may be complex. Temporal scales relate to the ebb and flow of events, to continuity and change in government personnel, policies, and institutions, and to regular cycles which impart a periodicity to political life—elections for the president, convening of the legislature, and so on. Moreover, spatial and temporal scales interact and inter-penetrate in complex ways; and as technologies and cultures change so do these contexts of the politics (Braudel, 1984; Finer, 1997).

Scale has often appeared as a central consideration in theoretical reflection upon political life. Consider just two examples. For Aristotle the *polis*, or political community, was a particular form of human association existing to promote the good life. It depended upon an intimate moral union where each citizen made some contribution to the governance and defence of the city. According to Aristotle, only as a member of such a body could human life be complete. The polis was broader than a household (which was based upon the unions of man and woman, master and slave), and had to be adequate to secure ‘self-sufficiency’ for economic, social, and defensive purposes. Yet the size of the polis could not be extended indefinitely. Beyond certain parameters, it would no longer be possible for citizens ‘to know one another’s characters’, and so the ‘distribution of offices and the giving of decisions’ would suffer (Aristotle, 1946, 292 pp.). Aristotle described the optimum population as ‘the greatest surveyable number required for achieving a life of

self-sufficiency’. In practical terms this limited the polis to a community of a few thousand individuals. Similarly, with respect to territory, the polis needed to be large enough to provide for the needs of its population, but no larger than could be defended easily by the citizenry. While Babylon was a city, it could not be a true polis for its scale was simply too vast. In other words, getting the scale right was absolutely essential to establishing an authentic political union.

This idea of an appropriate ‘proportion’ in political life was important elsewhere in Aristotle’s argument—for example, in relation to political stability. Just as the beauty of a human form or of a work or art could be compromised by exaggerating one feature beyond a certain limit (no matter how perfect that feature might be regarded in isolation), so a constitution could be undermined by unilateral emphasis on one element, or by an unchecked growth in the influence of one group or class. Beyond a certain point tolerable strains would become unmanageable, the political order would be compromised, and a new regime would emerge. Again, scale mattered; but here it was with respect to the interaction of the different parts making up a functional whole.

For Hegel, it was the broader horizons of the 19th century European state which provided the appropriate institutional context for politics. While admiring the Greek ideal of citizenship, Hegel noted the parochial character of the city-state, and the naiveté of the all-inclusive form of unity on which it was predicated. He maintained that in the wider, complex, and differentiated life of the (country) state, valid elements from the politics of antiquity could be reinterpreted in a new context. Here the ethics of the family, economic life, and citizen loyalty could develop more fully, and the individual could acquire freedom to make a worthy contribution to the common life (Hegel, 1952). The state provided a framework for morality, ultimately making possible the achievement of the finest features of human civilisation. Again, scale mattered: the state constituted a setting that transcended the narrow concerns of locality, but stopped short of the abstraction of universal or trans-national fellowship.

In Hegel’s theory temporal scales were also central. It was not just (as it had been for Aristotle) that with time all things change. But rather that a canvas spanning millennia was required for human civilisation to mature, for freedom to be realised on an increasing

scale, and for the universal spirit to come to know itself (Hegel, 1956). Nor was time homogenous: the slow pace of everyday events—bounded by a particular cultural matrix—could accelerate dramatically at points of transition when ‘world historical’ figures walked the stage, expressing the spirit of a new age and forcing the pace of change.

Separated by more than 2000 years, these theorists reflected concerns with scale manifest in the political worlds in which they lived. Many of the features of contemporary political systems—which carry forward experience with earlier political forms—can also be understood as relating to the management of scale. Distinctions between *executive*, *legislative* and *judicial* functions establish boundaries among different spheres of political authority and help to prevent the emergence of unchecked political power. *Written constitutions* establish legal limits to political intervention, define the responsibilities of various bodies, and specify processes by which rules of the political game can be amended. *Representative institutions* provide a way to combine a specialisation of political function with a measure of popular control, making possible a form of democracy for territories and populations larger than that known in the ancient city-state. *Party* provides a mechanism to aggregate and discipline large numbers of political personnel to contest elections and exercise power.

Issues of political scale continue to pre-occupy theorists and practising politicians today. Think, for example, of ongoing debates about ‘globalisation’, about deepening European integration or enlarging the Union to the east, and about the pace at which all these developments are occurring. Questions of economic efficiency, political effectiveness, legitimacy and accountability, and the constitution of collective identities (whether sub-national, national or supra-national) are all central to these discussions; and each of these is understood to be related in some way to matters of scale. They depend on the questions—how much? how far? how big? how soon?

Stepping back from these immediate controversies, it is worth pausing to consider prominent scalar features of contemporary political life. Territorially, the country-state remains the sovereign unit recognised by international law: each portion of the globe (with a few exceptions such as Antarctica) belongs to one and only one state. These states are sub-divided

into territorial governance units—provinces, ‘states’, counties—which (particularly in federal systems) can have substantial power and autonomy. Below these lie the local governments of cities, towns and rural communities. ‘Above’ the level of the country-state stand institutions of regional and global governance which achieve their most inclusive form in the United Nations system. But while the scale here is wider, the lines of formal authority and the depth of political integration are weaker. Officially, power still resides with the sovereign sphere of national decision-making.

Yet there are many inconsistencies in this formal hierarchy of scale. Territory and population do not necessarily go hand in hand, so geographically extensive states may have small populations, and geographically restricted states may have large populations. Indeed, mega-cities (such as Mexico City or Shanghai) take up more room and have more inhabitants than a substantial proportion of the countries represented at the United Nations. Moreover, the formal autonomy of states has always been constrained by real differentials of economic and military power. Only the most powerful countries have ever even approximated the idea of the free and self-determining ‘sovereign’ state. With increasing integration of global production systems, high capital mobility, and growing international trade, even the most powerful states find their room for manoeuvre circumscribed. And there is little doubt that over past decades the continued elaboration of structures of international governance has further delimited the parameters within which individual states may act.

It is equally important to appreciate just how much of political life cuts across the ‘vertical’ divisions of the formal hierarchy. All sorts of political problems cross jurisdictions; feelings of identity coincide only approximately with established borders; while common interests and concerns unite geographically remote constituencies. Many organisations (ranging from multi-national companies to churches, labour unions, and environmental groups and other NGOs) find themselves acting in political ‘spaces’ which cut across conventional boundaries. And territorially rooted institutions are constantly being stretched to engage with issues which escape their jurisdiction or infiltrate their frontiers. These ‘horizontal’ or ‘diagonal’ political linkages and structures are not a recent accretion, even if they have received more attention from political scientists in this era of ‘globalisation’.

What of the relevant temporal scales? From the standpoint of voters and politicians, there is a linear flow of events, measured in weeks and days, that constitutes the continuing material of which politics is built—this protest by farmers over subsidy cut-backs, that negative report from the prisons inspector; this threat of trade sanctions, that negative opinion poll, and so on. These everyday events are ephemeral, but are anchored in more stable conflicts and dilemmas which help characterise the texture of a more enduring political context. There is also a rhythmic time, defined by cycles that make and remake politics—the presentation of the budget, the sessions of parliament, elections for office. Here change and stability are associated with an established periodicity. Finally, there is time from the perspective of institutions themselves—where political personnel and immediate pre-occupations may change at a relatively rapid rate, but the longer term practices and patterns of interaction evolve at a more measured pace.

Recent commentators have emphasised the increased pace of change in the modern world, the compression of time and space as technology has drawn the world together and altered our conceptions of fast and slow, near and far (Giddens, 1990; Beck et al., 1994). Yet political time remains highly variable, and longer periods of stability or incremental change are punctuated by phases of rapid development, where sweeping changes are realised in the space of a few weeks or months. Time remains uneven in another sense too, with various domains of social life appearing more dynamic or quiescent at any given moment.

Finally, it is important to emphasise that political scales are not arbitrary. For example, the 4–5 years electoral cycle with which we are so familiar appears essentially conventional. Could we not adopt terms of 3 or 6 years for our representatives? In fact, some jurisdictions do operate electoral politics on just such a basis. And yet, there also seem to be underlying constraints: the idea of holding national elections four times a year or just once in a decade appears incongruous. Clearly the established periodicity reflects some sort of balance between the advantages of a longer term (providing time for politicians to learn their jobs and to get things done, reducing the disruption generated by elections, and so on) and of a shorter term (greater accountability, more frequent opportunities for electors to ditch unpopular govern-

ments, and so forth). And the form of this balance relates in turn to wider rhythms in the lives of individuals and organisations. That a particular district is now part of one country, rather than of its neighbour, might be ascribed to a peculiarity of history—a military advance which stopped because of bad weather or a swap organised by delegates at peace negotiations. And yet such an ‘accident’ creates a political reality that rolls forwards through time and may only be challenged in exceptional circumstances: another war, a referendum on independence, and so forth. In other words, features of scale are already ‘hard-wired’ into the political world, and while these are not immutable nor are they infinitely malleable.

### 3. Scale and environmental problems

The scale of environmental problems can be conceptualised in various ways. In the first place, there is the scale of the *physical impacts* of a given activity on natural processes—the effects of a particular disturbance, and how these are distributed in space and time. Impacts may be confined to a relatively small area or widely dispersed. They may be of short duration or persistent. As time passes, additional consequences of an original impact may emerge, the spatial distribution of effects may alter, or a gradually accumulating burden may provoke an abrupt change in environmental state. Material impacts on natural systems can be assessed by physicists, chemists, biologists, and ecologists, and they may be expressed in figures of parts per million, species counts per hectare, and so on. Needless to say, as the scale over which such impacts are being tracked changes, so too will perspectives on their relative significance for different kinds of biospheric processes.

Yet all this is only to begin to get to grips with scale. After all, environmental disturbances are only defined as ‘problems’ because they are experienced as problematic by humans, because they are perceived to have consequences for our health or welfare, because we are shocked when established expectations are frustrated, or because we are disturbed by changes our intervention are causing in the non-human natural world. And as *social phenomena* their scale dimensions relate not just to physical processes but to social structures, practices and understandings. Physical

impacts generated by a given activity will be linked to a complex of societal impacts; and the scale-profiles of these physical and these social impacts will be similarly coupled. But this coupling is 'loose' rather than determinate. Societal impacts and impact-scales are mediated through culture, economy and politics, and are constructed and re-constructed through conflict. In a different economic and political context physically similar environmental burdens may lead to quite different cumulative societal effects. Moreover, the human activity that causes a given physical impact will be part of a social practice which will itself be more or less deeply embedded in a broader system of socio-ecological interaction. Thus, an appreciation of the scaling of physical impacts on natural systems is a necessary, but not yet a sufficient, condition for understanding scaling in the social constitution and resolution of environmental 'problems'.

Levels of economic and technological development, population densities, asset and income distributions, cultural norms, political and administrative forms—all influence the way environmental problems are perceived and managed across both space and time. Starting from a given 'problem', it is possible to track the scale of its reach—'forward' into the domain of social consequences and 'backwards' into the realm of social causation. For such an effort it is particularly important to consider: the way physical impacts effect the perceived interests of particular societal groups; the character of the practice with which the impacts are associated and how this is embedded within the larger socio-ecological formation; and the distribution of social power resources and the character of the institutional frameworks within which solutions are to be worked out. Of course, environmental 'problems' are not given, but are defined by human agents. Redefining problems may shift the configuration of relevant scales, and this is a typical discursive strategy for those involved in environmental conflicts.

To see what this means in practice, let us consider a reasonably straight forward example of a controversy involving a choice between development and conservation. It involves a proposed extension to a quarry in the UK. The working in question has been in existence since the early 1980s, extracting fluorspar (for the chemical industry) and associated limestone

(for construction aggregates) by open cast methods. The site also serves as a landfill, with building and industrial waste being trucked in from nearby urban centres to fill the void. What is particular about this operation is that it is situated within the protected landscape of the Peak District National Park. Historically, mining has been an important industry in Derbyshire and there are a number of active mineral sites within the UK's first National Park. Nevertheless, opponents argue that the local planning authority should refuse to grant an extension for this quarry, and should ensure a speedy restoration of the site.

What sort of scale issues are involved in this debate? In physical terms, the proposed extension would nearly double the size of an existing working, creating an operational area of about 7 ha. Located just below the skyline on an exposed hillside, the quarry is visible from an area of about 15 km<sup>2</sup> along the Derwent valley. One and a half million tons of rock (a modest amount in terms of modern mineral operations) would be extracted, and a similar quantity of inert waste would be imported as landfill. Truck movements would extend to a radius of about 30 km from the quarry. Extraction would take place over a 15 year time frame, with a further 3 years for restoration—assuming, of course, that no further extension applications were forthcoming.

How do these physical impacts translate in social terms? The most obvious environmental impact is to the landscape. Several thousand homes and many kilometres of public roads and footpaths have long distance views of the quarry from the far side of the valley. Inhabitants of the village located nearest the workings would be effected by noise and blasting. Truck movements concern a wider constituency, as the district has a poor highway network and suffers heavy traffic congestion. Moreover, because the area is a popular tourist destination and the site is situated within a National Park, the application has attracted critical attention from ramblers and conservationists across the country. Thus, the social 'footprint' of this quarry extends far beyond the area of immediate environmental dislocation.

Issues of scale feature prominently in the campaigns mounted by both sides. Quarry supporters emphasise that the mineral industry has long been an employer in the region, that the visual impact is similar to that from

other existing or abandoned quarries, that limestone extraction and sale would make the fluorspar operation practical and profitable, and that disruption will be for a limited period. Opponents argue that tourism is now a bigger employer in the area than the mineral industry, that the proposed development would take 10 times more limestone (per tonne of fluorspar) than is currently permitted, that the operation is in close proximity to a 'Site of Special Scientific Interest' and two 'Scheduled Ancient Monuments', and that by 2018 the quarry would have been operating in the National Park for nearly 40 years—a significant proportion of a human lifetime.

Even this does not exhaust the ways social scales bear on the dispute. For example, there is a degree of local tension because supporters of the development complain that opposition has been stirred up by 'incomers'—non-natives of Derbyshire who have moved to the area, in part because of its beautiful scenery. Patterns of international trade are also relevant, for the company which operated the UK's only fluorspar processing facility recently withdrew from the industry after its major client shifted to a Chinese supplier. Local opponents have tried to draw attention to wider environmental impacts—that transport emissions are relevant to air pollution and CO<sub>2</sub> emissions policy, for example. In a final irony, the landscape which quarry opponents are trying to protect was itself largely created by mineral extraction: the Derbyshire ore field has been worked for more than 2000 years. Indeed, the 'Ancient Monuments' that lie close to the extension site are actually the remains of 17th century lead workings. Yet the conservationists point out that the scale of contemporary extraction is very different from the working of earlier generations: mining now employs but a few percent of the work force, and yet modern equipment can shift huge volumes of material in days rather than years. Whether or not the development actually goes ahead is to be determined by the local planning authority acting under guidance provided by national government.

This example has been presented at some length, precisely because it is relatively simple. At issue is an essentially local disturbance, with some broader societal interest. Moreover, there is *virtually no uncertainty over the character* of the physical impacts themselves. The argument is simply whether the effects are to be deemed acceptable, and how costs and

benefits are to be distributed among different social groups (the minerals industry, nature lovers, etc.). Yet still the relevant social scales are tangled, and a great deal of detailed contextual knowledge would be required to predict how the issue will ultimately work out in political terms.

Many environmental problems involve considerably more diverse and uncertain physical impacts, and the range of effected social groups and implicated social practices may be vastly more complex. Consider issues such as the prudent management of an off-shore fishing resource (such as the Newfoundland Grand Banks); disposal of a disused oil platform (such as the Brent Spar); or the reprocessing of nuclear fuel (at Sellafield, in the UK, for example). In each case there is considerable uncertainty about physical effects and impact scales, and the social, economic and political repercussions extend far beyond the immediate theatre. And this is to say nothing of even more complex challenges raised by issues such as climate change or the wide-scale release of genetically modified organisms.

General patterns in the coupling of physical and social scales, and in the difficulties they present to those concerned with practical solutions, are discernible; but so much depends upon the particular circumstances. An impact which touches many people, or extends over a large area, might be thought a prime target for political action. But the scale of the effect may mean it is simply accepted as part of the way the world is, or that actors are deterred from attempting to address such a broad issue. Practices with highly visible and immediate effects are generally more likely to attract a regulatory response than practices with discrete or remote effects. But public anxiety over impacts that cannot be perceived directly (such as radioactive or chemical contamination) may mean that the converse is the case. Thus, it is impossible—on an a priori basis—to determine in advance just which social scales will be relevant as an environmental problem takes physical form: for the scales will be partly determined by the understandings of the actors themselves, and by their interactions as they construct the problem and delimit the possible solution-space.

In this context it is worth briefly discounting the potential of the idea of 'natural limits' to radically simplify the tangled scales involved in environmental controversies. Environmental critics have long

juxtaposed the image of a finite planet with a limited carrying capacity to the ceaseless quest for economic development. The idea of natural limits has been invoked to suggest that the scales to which we really need to pay attention are those where such limits may be breached: in Daly's idiom, the environmental Plimsoll line beyond which lies potential catastrophe (Daly, 1991). The collapse of the Grand Banks cod fishery of eastern Canada in the early 1990s provides a good example here—for the disappearance of the fish was directly related to the scale of extraction: at a certain point the size of the catch surpassed the rate at which the stock could recover, and the fishery was 'mined' to exhaustion.

The difficulty is that while the analogy between a single resource and the global ecosystem is suggestive, it is not clear that it takes us much further. In the first place there are very many different physical limits on resource extraction and waste deposition, operative over many different scales, and these limits are being approached at different rates (WCED, 1987). Second, in many cases these limits are 'elastic', so the result is less straightforward than a simple collapse, involving a complex trade-off among values. Moreover, the limiting factor in each specific context is often unclear, nor is it always evident which contexts should be prioritised. Even when there is agreement in principle over the existence of a particular limit, there may be uncertainty (and argument) over what that limit actually is, how closely it has been approached, and the risk entailed by drawing nearer still. And even where agreement existed upon all this, that would not alter the cross-cutting scales that might be involved in the practices generating the environmental pressure, in the networks of interest among whom the cost and benefits of remedial action would be distributed, and in the political and social structures involved in the design of any solution.

#### 4. Scale and environmental governance

Over the past three decades there has been a remarkable evolution in the general approach to the management of environmental burdens in the developed industrial states. As many analysts have noted, for much of the first decade following the initial establishment (in the late 1960s and early 1970s) of

the institutions of modern environmental governance policy-makers were influenced by a particular set of assumptions about the character of the environmental challenge and the appropriate remedy (Weale, 1992; Glasbergen, 1996; Janicke and Weidner, 1997). Environmental problems were largely understood as a by-product of industrial development and the new affluence. There was quiet optimism about the capacity of governments to manage pollution and arrest further environmental degradation. The focus was on cleaning up accumulated contamination and 'end of pipe' treatment of continuing discharges. Regulatory mechanisms, focused on particular media (air, water, land), formed the mainstay of the pollution control infrastructure. Dedicated environment ministries (and or agencies) were charged with orienting the nationally focused clean-up efforts. By the mid 1990s, however, these assumptions had largely been eclipsed. The new perspective was more cautious: it gave increased recognition to the complex and contested nature of environmental issues, and accepted that they would remain of acute concern for the foreseeable future. The environment was now seen to present problems to developing, as well as to developed, countries. Emphasis shifted to 'integrated pollution control' (across media), and to including environmental considerations in the work of all government departments and agencies. And attention began to be focused on efforts to prevent pollution, modify production processes and even transform patterns of consumption. The idea of sustainable development—with its emphasis on viewing economic, social and environmental dimensions together—was associated with many of these shifts (Lafferty and Meadowcroft, 2000).

It is possible to interpret this change in the prevailing management paradigm as a re-conceptualisation of the scales at which environmental problems (and potential solutions) are to be approached. From the vantage point of the later understanding, it appears that on each dimension there has been movement from a narrow or partial view to a broader a more comprehensive vision: from some countries to all countries; from naive self-confidence to a more mature appreciation of complexity; from reliance on a single dedicated ministry to insistence on all ministries; from clean-up to prevention; from almost exclusive dependence on regulation to a balanced portfolio including negotiation

and tax-based instruments; from national responsibility to international collaboration; and so on. Presenting these shifts in scalar perspective in a more synthetic light, one could say that: on the one hand, there has been a realisation that the physical scale of the human impact on the non-human natural world has reached a point where not just local or regional, but truly global ecological processes are being effected; and on the other hand, there has been an acknowledgement that the social practices which give rise to environmental stress are more deeply embedded, the range of effected interest are more substantial, and the magnitude of the necessary social reforms are larger, than was first imagined.

Yet this idea that the scale-shift in the prevailing approach to managing environmental burdens has been towards the wider and the more comprehensive is somewhat misleading. For with movement in this direction there has also been an increase in the diversity, specificity and complexity of initiatives. Innovations associated with more recent approaches have everywhere been *layered on top of* pre-existing structures and processes, rather than serving as replacements for them. Remedial clean-up operations and ‘end or pipe’ treatment, for example, remain fundamental to the pollution abatement strategies of the developed countries (continuing to absorb huge financial resources and the attention of officialdom), even as experiments with prevention strategies and attempts to modify production and/or consumption patterns get underway. The emphasis on market-based or negotiated environmental instruments has not supplanted established ‘command and control’ routines, but has been added to them. Thus, while the new approach to environmental governance appears to emphasise broader scales, and the locating of problems and solutions in wider contexts, it is also leading to more variegated and complex practices.

Consider three areas on which there has been considerable movement since the late 1980s: the internationalisation of environmental governance; the emergence of more comprehensive approaches to environmental planning; and the development of multi-partite environmental governance (Lafferty and Meadowcroft, 2000). In some way each corresponds with this image of a shift towards a wider scale in the approach to managing environmental burdens. The proliferation of regional and international initia-

tives and accords (including the Climate Change and Biodiversity Conventions, Protocols under the Convention on Long Range Transboundary Air Pollution, and increased involvement of the European Union in environmental issues) (Schreurs and Economy, 1997) represents a step up from the relatively narrow arena of national regulation, to address issues on scales that correspond to wider physical and social impacts. The adoption in OECD states of national environmental policy plans and sustainable development strategies (Janicke and Jorgens, 1998) signals a move to consider environmental impacts across society as a whole and to adopt a longer term approach to their management. And the tendency for governments to draw social partners (including business and NGOs) into dialogue to develop agreed responses to environmental challenges (Meadowcroft, 1999c) heralds a partial opening of previously closed policy networks, and a widening of the range of social actors whose input is considered significant for the social management of environmental problems.

Nevertheless, each of these developments has also added to the diversity and complexity of the system of environmental governance. Regional and global environmental regimes have not replaced national regulation and initiatives, but rather have generated an elaborate, multi-tiered system of governance, which actors at all levels find difficult to navigate. National plans have provided overviews and contributed to certain kinds of policy ‘integration’. But such plans have been established along side existing processes of planning (such as national budget cycles, and land use planning systems) creating a more heterogeneous whole. Moreover, national plans have been accompanied by the development of specific plans of all sorts (for sub-regions and localities, for particular economic sectors such as transport, for environmental themes such as waste disposal, and so on). Here general objectives become more concrete, but they also become more detailed, specific, and varied; and the result is a patch-work of ever more differentiated perspectives, approaching matters at finer as well as larger scales. Much the same can be said about the emergence of multi-partite environmental governance: on the one hand, the process is broader and more inclusive, on the other it is more fragmented and differentiated—as different groups participate in different contexts, according to their interests.



## 5. Conclusion

Section 2 of this paper argued that scale is of on-going concern in politics, while Section 3 emphasised the complexity of the physical and social scales implicated in the constitution and resolution of environmental problems. Section 4 discussed shifting perspectives on environmental problems in policy-making circles in the developed countries, and suggested that while issues are now conceptualised on broader scales, there has also been a marked increase in the complexity of the organisation of environmental governance. In the final part of this essay I would like to make some suggestions about what all this implies for the future of efforts to manage environmental burdens.

The first observation is that theoretical reflection and practical experience both indicate that there are limits to the extent to which it will prove possible to reconcile institutions concerned with environmental governance into a single hierarchy, or to implement a comprehensive and fully-integrated (spatially and temporally consistent) approach to managing environmental burdens. Despite continuing efforts to harmonise environmental regulation at the international level, and/or to prioritise and reconcile initiatives at the national level, patterns of environmental governance are likely to remain radically disjointed, with disparate sets of structures pre-occupied with impacts at varied and cross-cutting scales. This is not to deny the importance of efforts to attain coherence across policy domains, or to achieve coordination among different institutions. It is to argue that the extent to which issues and structures can be integrated within a single self-consistent frame will prove limited.

Thus, the image one sometimes encounters in the environmentalist literature of human communities settled tidily into 'eco-regions', arrayed on a hierarchy of increasing scales, where social interactions and environmental loadings coincide, is implausible. The patterns of economic, cultural and environmental interdependence in the modern world are simply too diverse, intricate, and rapidly changing to be disentangled in such a way. As the first section of this essay noted, politics *is already* predicated upon scales, and the existing temporal and spatial delimitations of political phenomena are not arbitrary. They result from long-term patterns of societal development; and while in a sense they are 'merely' social constructs, and con-

tingent conditions undoubtedly played an important role in their constitution, they cannot simply be redrawn at will. Thus, the elaboration of modes of environmental governance must continually be reconciled with existing scalar modes of political life which have their roots in varied economic, social and cultural realities. Moreover, because the physical and social scale dimensions of environmental problems are so diverse, mutable, and complex, it is far from obvious which sorts of spatial or temporal 'eco-scales' should be privileged even if one had a free hand to remake the social world according to a new design. Thus, a fractured mosaic of institutions pre-occupied with different sorts of problems, manifest at different sorts of scales, could be expected to persist into the indefinite future.

The second observation (which is essentially a corollary of the first) is that while it may be important to establish new organisational frameworks to confront environmental problems whose scale dimensions are not adequately addressed by existing institutions, this does *not* mean that the new structures must be held up as replacements for the old. Indeed, the most effective response may often involve drawing representatives from pre-existing bodies into a context where a collaborative response to emergent issue can be constructed (Meadowcroft, 1999a). For example, if it becomes clear that a river catchment faces common problems, but the area cuts across existing administrative boundaries, then a new structure may be appropriate. Whatever the form adopted by such a trans-jurisdictional or inter-jurisdictional body, it would not displace all pre-existing governance structures. Inhabitants of a mountainous region who had come to appreciate the existence of shared concerns (say the pressures of tourism on the fragile terrain) might launch a new institutional frame to draw together communities divided by established political frontiers. But again, the 'old' political structures would still retain significance. Environmental loadings would in any case never *all* be coterminous with the new unit—the communities might, for example, be in different river catchments; and this is to say nothing of the continuing relevance of pre-existing political, economic, and cultural ties.

The third observation (which presents the first two in a more positive light) is to affirm the value for environmental management efforts of two sorts of pluralism. One—to which allusion has already been made—is an institutional pluralism, where

many different sorts of structures, with different scale pre-occupations, are changed with responsibilities for environmental governance. The idea here is that a mosaic of institutions, with different and partially overlapping geographic and temporal loci, is best equipped to address effectively the complexity of environmental issues. If such arrangements appear ‘untidy’ and ‘disjointed’, so be it. For such a fractured institutional mosaic corresponds with the actual (‘untidy’ and ‘disjointed’) character of social–ecological interactions. Here redundancy, more or less continuous collision, and considerable fragmentation, are seen as virtues which reduce the risk that major issues will go unnoticed, or be subsumed in a mono-scalar perspective (Meadowcroft, 1999b).

But this ‘pluralism of institutional frames’ needs to be matched by another form of pluralism—a ‘pluralism of participating groups’. In other words, while it is good to have a variety of public bodies responsible for environmental management over different sorts of physical areas and time frames, it is also necessary to have a great diversity of social organisations (representing many different kinds of interest) actively drawn in to the system of environmental governance. Why is a group-based pluralism so important? Because groups experience environmental problems in different ways, and by channelling group inputs into the governance structure, different perspectives and considerations can inform social decision-making processes (Meadowcroft, 1999a). The knowledge resources of dispersed actors are brought together to enhance policy formation. Moreover, by involving diverse groups in implementation the reach and legitimacy of governance structures can be enhanced. Of course, institutional fragmentation could be taken too far, and policy coherence sacrificed entirely. And group pluralism is not without a down side: unless carefully managed, group process can lead to polarisation or paralysis. Nevertheless, the perspective advocated here sees both sorts of pluralism as crucial if governance structures are to adapt to the diverse scales at which environmental management initiatives are required.

The fourth observation is that one should not be surprised that quite some time is required to develop sets of institutions to manage environmental burdens more effectively. Since 1970 progress in developing social institutions to manage environmental impacts has been rapid. But three decades is a rather short

span in the life of states, even if it represents a substantial chunk in the life of an individual. Consider a comparison with the development of modern social welfare institutions. Welfare issues began to emerge on to the political agenda in the wake of the industrial revolution, yet it was not until the end of the 19th century that some states had begun to take practical steps to address issues such as unemployment or industrial injury. And it was not until after the Second World War that a comprehensive set of state-sponsored welfare institutions were fully established in developed nations. Thus, it took perhaps a century (give or take few decades) for the structures of the modern welfare state to emerge fully. It is plausible that a similar sort of span will be required to develop a more comprehensive response to issues raised by the increased scale of human impacts on the environment.

The final observation is perhaps the most obvious—that we should anticipate continued innovation in approaches to environmental governance. Certainly the one constant over the past three decades has been change. And this is not only because institutional adjustment and social learning require time, but because we cannot anticipate that society will finally settle upon a permanently ideal combination of structures and protocols for managing the environment. In part this can be understood by returning to the welfare state analogy invoked above. Although we can say that it took a century for the modern welfare state to emerge, we cannot say that welfare institutions have reached any ultimate configuration. Changing economic and demographic circumstances, shifts in political perspectives and alliances, assure that debates about welfare issues continue to pre-occupy political leaders. Consensus is only relative. No doubt the same will prove true of environmental issues. But environmental challenges are if anything even more complex, because of their close interdependence with other socio-economic and cultural issues. Continuing economic development, and scientific and technological progress, are constantly extending the potential human impact on our surrounding. Each new substance or process, each shift in production and consumption regimes, has the potential to generate new (or to aggravate or recast old) environmental ‘problems’, with distinctive physical and social scale dimensions. This is not to imply that technological change can not also result in reduced environmental loading or improved

clean-up mechanisms. But it is to suggest that technological advance continually throws up the potential for new forms of environmental burden. Consider biotechnology, one of the most dynamic areas of current scientific development. Certainly it holds out the potential for undreamed wonders, but also for novel environmental problems, in the coming century. Thus, the one safe prediction in a very uncertain world is that robust, flexible, and continuously evolving mechanisms, attuned to perturbances at many different scales, will be required to cope with the management of environmental challenges in the years ahead.

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