FROM WATER TO WATERSHED:
AN ANALYSIS OF RESCALED WATER GOVERNANCE IN CANADA

by

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Abstract

Recent water governance reforms (in Canada and internationally) promote a shift from political to watershed boundaries for the purposes of water governance. This 'watershed approach' typically includes a shift from political to hydrologic boundaries, increased extra-governmental participation in decision-making, and some degree of delegation to watershed-scale organizations.

This dissertation analyzes the uptake of the watershed approach in four Canadian jurisdictions: Alberta, Ontario, New Brunswick, and Nova Scotia, and answers the following research question: why has rescaling to watersheds occurred, and what are its governance implications? The empirical analysis employs primary data derived from legislative and policy reviews, as well as from forty-nine in-depth interviews with representatives from provincial governments, watershed-scale organizations, and non-governmental organizations in four case study provinces. The theoretical framework of the dissertation draws on – and engages with – recent debates about scale, governance, environmental management, and political ecology.

On this basis, the dissertation makes three interrelated arguments. The first argument is that the justifications for choosing a watershed approach are often ambiguous. Specifically, Chapter 3 of the dissertation highlights a conceptual slippage between watersheds' development as a technical tool and uptake as a governance framework. The second argument is that the widespread appeal of watersheds can be explained, at least in part, by their status as boundary objects (defined as a common or shared concept interpreted differently by different groups). And third, the dissertation argues that the implications of rescaled water governance can usefully advance current

conceptualizations of rescaling by informing debates with respect to the political ecology of scale.

Together, these arguments contribute to current knowledge by pointing to a new approach to the study of watersheds. Moreover, the synthetic findings of the dissertation make a key contribution to practical and conceptual debates about rescaling by drawing connections between the reasons for, and implications of, rescaled water governance. In particular, the research suggests that the reasons for watersheds' uptake do not align with the governance implications associated with their implementation.

Preface

The work presented in this dissertation was originally written as a collection of three papers (what are now Chapters 3, 4, and 5) designed to stand alone. The papers have been expanded and modified to fit with the dissertation as a whole.

Papers arising from work presented in the dissertation

Cohen, A. and S. Davidson (2011) The Watershed Approach: Challenges, Antecedents, and the Transition from Technical Tool to Governance Unit" *Water Alternatives* 4(1) 1-14.

Cohen, A. (accepted for publication) "Watersheds as boundary objects: scale at the intersection of competing ideologies" *Environment and Planning A*.

Co-authorship statement

A version of Chapter 3 has been published in *Water Alternatives* (see below). The published paper was co-authored with Seanna Davidson. For this paper, Seanna Davidson and I worked together to write a first draft of the paper, which included a literature review, analysis of key trends, and exploration of the roots of these trends. I was the contact author for the journal and took the lead on suggested revisions, which included the addition of a discussion section. For Chapter 3, the paper was expanded and modified to fit with the dissertation as a whole. As part of this modification, approximately 400 words from the *Water Alternatives* paper appear in Chapter 2 in the context of the international history of watersheds, rather than in Chapter 3.

Ethical Issues

The research presented in this dissertation was carried out in accordance with the standards of the University of British Columbia Behavioural Research Ethics Board, certificate # H05-80269, "Watershed Governance in North America".

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Finally, I am especially gratefully to my family. Although we are separated by the geography of this enormous country, they have been invaluable throughout this entire endeavour; I surely would not find myself here without them. And finally to Jamie, whose support has been unwavering and humbling – an enormous thank you for being 'support crew' in marathons of all kinds.

1. INTRODUCTION

"All the water that's here now is all there ever was–and ever will be"
Postel 2010

1.1 General introduction

Water is a flow resource, constantly changing states between a liquid, a solid, and a gas, crossing political boundaries of all kinds, and being incorporated into living and non-living things. As such, exercises in governing or managing water are limited to only a small fraction of water's movement through hydro-social systems. From this perspective, water governance – broadly defined as the processes through which water-related decisions are made and implemented (Nowlan and Bakker 2007) – is an exercise not only in making decisions about how water is to be used and allocated, but also about defining the geographic areas bounding a particular initiative. The question of geographic scope has until recently been self-evident: in most jurisdictions, water policy was made (and re-made) on the basis of political boundaries or, in the case of transboundary initiatives, negotiated between nations or states.

Recent water governance reforms, however, promote a shift away from political boundaries for the purposes of water governance. Supplanted by hydrologic or ecological considerations (Warner 2007), political boundaries have become framed as an obstacle to overcome in efforts to carry out more participatory and ecologically meaningful forms of governance. Governing at an ecologically or hydrologically

meaningful scale holds a certain appeal: it offers a concrete and 'natural'[1] unit (Smith 1969) reflecting the interrelations between various water uses in a particular area (Blomquist and Schlager 2005), and, through its ajurisdictional properties, holds the promise of surmounting the "major impediments to regional water resources management that are inherent to [ ] political and legal systems" (Goldfarb 1993, 504). Under these reforms, decision-making along watershed boundaries (typically defined as an area of land draining into a common body of water) (US EPA 2008a), has become an "almost unassailable" water governance ideal (Warner 2007, 2).[2] The move away from jurisdictional boundaries and toward hydrologic ones is reflected in the rescaling of water governance in Canada and elsewhere in the uptake of the 'watershed approach', which typically includes a shift from political to hydrologic boundaries, increased extra-governmental participation in decision-making, and some degree of delegation to watershed-scale organizations (Adler and Straube 2000; Born and Genskow 2000, 2001; Brun 2009; Cohen and Davidson 2011; Kearney et al. 2007; Imperial 2005; Lane et al. 2010; McGinnis 1999; Parkes et al. 2010; Pyle et al. 2001). For the purposes of this dissertation, I use uptake to mean the absorption or incorporation of the watershed approach into the existing policy landscape of a particular jurisdiction.

This incorporation, and the subsequent carving of a given jurisdiction into its constituent watersheds, is a policy choice fraught with questions about scale: Where will decision-making processes take place? Who is inside and outside of these 'new'

[1] 'Nature' is a highly loaded term that I use throughout this dissertation to denote the non-human world. I realize that this is only one of many possible interpretations of the term. For a more comprehensive discussion, see Castree 2005.

[2] In Australia, New Zealand, the UK and other parts of the world, the word "catchment" is used to denote a hydrologically-defined area of similar size. Watersheds and catchments are significantly smaller than River Basins.

boundaries? Which hydrologic, hydrogeologic, or ecosystem boundaries should be chosen as the definitive watershed boundary? These types of questions all relate to different kinds of scales: cartographic, hydrologic, organizational, and social. A switch from jurisdictional to watershed boundaries is therefore, at a most fundamental level, a question of rescaled governance.

There is a gap in the literature with respect to the reasons for and implications of this particular form of rescaling.[3] This gap is especially notable given the significant body of work in geography on the political and ideological drivers of rescaled environmental governance more generally (e.g. Batterbury and Fernando 2006; Brenner and Theodore 2002; Gibbs and Jonas 2001; Jessop 2002; McCarthy and Prudham 2004; Reed and Bruyneel 2010) and the existence of a considerable water governance literature, both at the international level (e.g. Conca 2006; Rogers and Hall 2003; Wolf 1998) and within Canada (e.g. Bakker 2007a; Sandford 2010; Sproule-Jones et al. 2008). Scholarship articulating issues of water and scale tends to focus on the relationships between actors at different scales (e.g. Norman and Bakker 2008; Sneddon 2002) or on the role of scaling water in supporting national identity, institutional capacity, or social order (Harris and Alatout 2010; Swyngedouw 2004a).

This dissertation weaves together empirical work on water and conceptual work on scale to explore the drivers (both practical and ideological) and the governance implications of this particular form of scalar change. In so doing, it broadens the scope of current analyses and debates on watersheds, which have typically focused on identifying challenges associated with a watershed approach (e.g. Blomquist and Schlager 2005;

[3] The notable exception here is Andreas Theil, whose work (2010, 2011) has undertaken the documentation of the specific political drivers of rescaled water governance in Portugal following the enactment of the European Water Framework Directive in 2000.

Griffin 1999); the approach's utility as a means to particular policy ends, such as transboundary cooperation or increased extra-governmental participation (e.g. Cervoni et al. 2008; Fischhendler and Feitelson 2005); and tracing the use of this approach across space and time (e.g. Molle 2009; Woolley and McGinnis 1999). The expanded scope of this dissertation critically explores watersheds as governance scales in and of themselves.

1.2. Defining the research

1.2.1. Research objectives and questions

The dissertation mobilizes original empirical research data to engage with and advance practical and conceptual debates about water governance and management, scale (and rescaling), and political ecology. I contribute to these debates through an examination of the drivers (both practical and ideological) and governance implications of rescaling to watersheds in Canada, a country in which a significant shift from jurisdictional to watershed boundaries for the purposes of water governance has recently occurred.

Broadly, the research presented in this dissertation seeks to answer the following question: why has rescaling to watersheds occurred, and what are its governance implications? This question can be further broken down into three more precise questions:

1. In light of past experience and existing literature, what might we expect to find as the drivers and implications of rescaled water governance in the case study provinces? (Chapter 3)

2. Why have watersheds become so popular in the case study provinces, and what epistemic commitments might be reflected in their uptake? (Chapter 4)

3. What have been the governance implications of this rescaling in the case study provinces, and how might these inform current understandings of rescaled environmental governance? (Chapter 5)

1.2.2 Scope

In defining the scope of this dissertation, I wish to be explicit about the boundaries of my work. Like Ferguson's *The Anti-Politics Machine* (1994), my dissertation is more vivisection than evaluation. Of this vivisection, Ferguson writes that for him, the question is not "how closely do these ideas approximate the truth", but "what effects do these ideas (which may or may not happen to be true) bring about?" (1994, xi). Similarly, I do not endeavour to evaluate whether or not watersheds are accurate portrayals of hydrologic or ecological phenomena. Rather, I examine watersheds with a view to identifying why they have become so popular, and what the implications of their uptake are. This approach is reflected in the three precise sub-questions, each of which forms the basis for the research chapters of this dissertation.

There are three tasks that, although important, are not undertaken here. First, this dissertation does not identify causal relationships between governance change and water quality or availability. I do not carry out an assessment of watersheds' environmental effectiveness both because of my particular research questions (which exclude issues of effectiveness), as well as because of the recent nature of water governance reforms in three out of the four case study provinces. Moreover, Sabatier et al. (2005) convincingly argue that the relationships between these factors are so fraught with confounding variables that it is virtually impossible to draw strong causal relationships between them.[4]

Secondly, this dissertation does not seek to classify particular watersheds or jurisdictions as having met or not met their goals. In other words, this is not a 'report

[4] The notable exception here is the recent doctoral work of Jennifer Biddle (2011), whose work in the United States identifies positive relationships between elements of collaborative governance and improved environmental outcomes.

card' on the state of watershed governance in Canada or elsewhere. I have chosen not to carry out such an analysis primarily because the question of whether or not watersheds have been effective is entirely dependent on the reason why the policy change has taken place. As this dissertation shows, the answer to this question is not always obvious, which makes an analysis of effectiveness nearly impossible.

Finally, this is not a prescriptive dissertation: it does not develop a blueprint for how water (or watershed) governance 'ought' to be done. The concluding chapter highlights a number of issues brought about by re-scaled water governance – and I encourage interested policy makers to explore and build on these discussions – but the findings in this dissertation should not be interpreted as a recipe for future policy design. Nevertheless the dissertation (and the concluding chapter in particular) does highlight a number of key points for policy-makers, most notably the disconnect between the reasons for the scale's popularity and its associated governance implications.

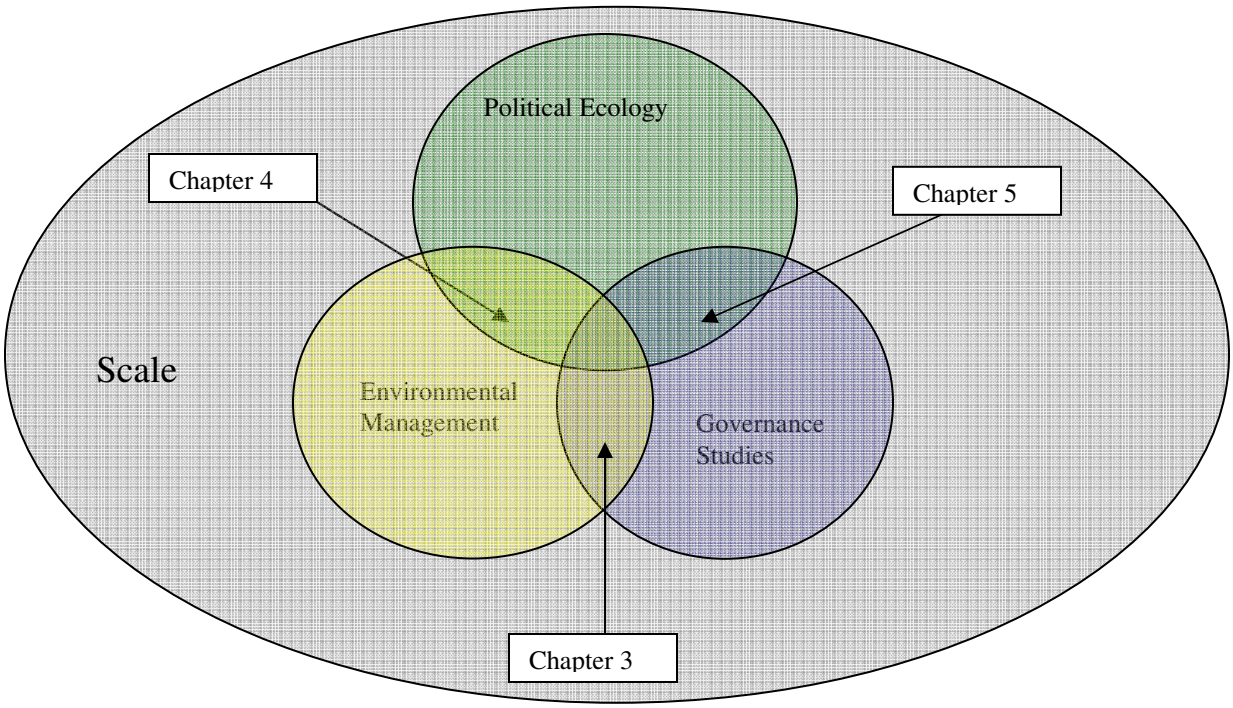
1.3. Theoretical framing

Starting from a practical issue (i.e., the popularity of watersheds), I identified and drew on those conceptual tools that best equipped me to address my research questions. That is, I sought to identify conceptual tools that could be usefully marshaled to carry out the analysis of my research data, rather than starting from theory and applying it to my case study. This approach is consistent with practical interdisciplinary research that aims to address concrete, 'real world' issues.[5]

[5] Two things are worthy of further note here. First, starting from a 'real world' issue or problem is a cornerstone of research at the Institute for Resources, Environment, and Sustainability – the departmental home of this dissertation. Second, I note that the term 'real world' is problematic in the sense that issues in

The theoretical framework of the dissertation engages with recent debates about scale, governance, political ecology, and environmental management. These themes are represented schematically in Figure 1, and are explained in further detail below. Note that 'scale' is the large grey circle encompassing the three other subfields; as discussed below, scholarship on scale (and rescaling) is the conceptual linchpin of the dissertation as a whole and underlies the way in which I engage with the three other subfields.

Figure 1: Conceptual framework: scale and three subfields



all disciplines relate to it; what is meant by the term in my case is a timely and relevant environmental governance issue, which the recent switch to watersheds in Canada certainly is.

1.3.1. Scale

> *Scalar configurations, whether ecological or in terms of regulatory order(s), as well as their discursive and theoretical representation, are always already a result of an outcome of the perpetual movement of the flux of sociospatial and environmental dynamics. The theoretical and political priority, therefore, resides never in a particular geographical scale, but rather in the processes through which particular scales become constituted and subsequently transformed* (Swyngedouw 2004a, 132-3).

1.3.1.1 The concept of scale

My primary conceptual tool is the geographic concept of scale (the large grey oval in Figure 1). This concept appears in each of the three research chapters, and is the conceptual linchpin of the dissertation as a whole. The centrality of scale in my research is appropriate, given that changes in the political level and physical size of decision-making units are questions of scale, both politically and physically.

In the context of geographic research, scale can be defined as "one or more levels of representation, experience and organization of geographical events and processes" (Johnston 2000, 724), or, more precisely, as the "spatial, temporal, quantitative, or analytical dimensions used to measure and study any phenomenon" (Gibson et al. 2000, 219). Johnston (2000, 724-5) notes that scale has three discernible meanings. Two of these meanings are not directly related to my research: cartographic scale (i.e., "the level of abstraction at which a map is constructed") and methodological scale (the scalar choice "made by a researcher in the attempt to gather information aimed at answering a research problem") are related but distinct uses of the term. The third meaning of scale – geographic scale – is central to this dissertation. The geographic definition of scale refers to the "dimensions of specific landscapes" (Johnson 2000, 725) that combine the conceptual, spatial, and political, such as cities, nations, or regions. Cash et al. (2006)

unpack this geographic definition of scale even further, teasing apart distinctions between spatial, temporal, jurisdictional, institutional, and management scales.

The particular strand of scalar scholarship upon which I draw dates to the 1980s, which saw critical analysis of scale emerge as an "important but hitherto neglected analytical topic" (Jessop 2009, 88). There has since been an "explosion of writing" (Herod 2011, 1) on scale: on scales' ontological and epistemic groundings (e.g. Jonas 2006; Marston et al. 2005) on issues that jump between scales (Cox 1998; Herod and Wright 2002), and on the politics of scale – a notoriously nebulous term that Brenner (2001) defines as the "*process of scaling* through which multiple spatial units are established, differentiated, hierarchized and, under certain conditions, rejigged, reorganized and recalibrated in relation to one another" (2001, 600, emphasis in original). From this perspective, scales are socially constructed – through discourse, social contestations and power structures (Delaney and Leitner 1997; Swyngedouw 1997a, 2004a, 2004b).

Examples of scalar construction include the building of inter-urban networks in the European Union (Leitner et al. 2002), the evocation of particular regional identities in the construction of political parties in Italy (Agnew 1997), or the building of new scales through the development of telecommunication infrastructure allowing physically disparate groups to work together across space (Adams 1996). Scalar construction also includes the application of scalar labels to particular forms of social organization. From a constructivist perspective, the terms 'local', or 'global' can be seen as "a way of representing the goals and desires of different actors" (Sneddon 2003, 2234). This is particularly relevant when the terms are not bound to territorially defined units (e.g.,

'national', or 'provincial'). Examples of this phenomenon appear in Chapter 4 of this dissertation, where I show how the size of watersheds taken up in the case study areas are frequently framed as being 'local', even though from a municipal perspective they are a scaling up.

Attempts to conceptualize scales and their interrelationships have resulted in myriad metaphors. Scale has been conceived of as, *inter alia*, rungs on a ladder, concentric circles, nesting dolls, tree roots, a web, and stacked boxes (Herod 2011; Robbins 2008). Others – most notably Marston et al. (2005) argue that the entire concept of scale is problematic due to the role it plays in reinforcing hierarchies, and should be abandoned in favour of a non-hierarchical 'flat ontology' wherein scales do not exist in any material sense (Herod 2011, 33). While recognizing the problems that Marston et al. (2005) point out, the geographic concept of scale nevertheless offers key insights into my research – most notably, it offers a body of work that looks explicitly at the linkages between physical space and social-political relationships. The constructivist approach used in this dissertation is thus aware of the social costruction of scales, but escapes the quagmire of debate over their ontological status by turning to Kaiser and Nikiforova's (2008) argument that scales – socially produced as they may be – exist in a material sense if, through citational and iterative practicies, we act as though they do. This is certainly true of watersheds, around which an increasing number of policies and regulations are being formed.

Such an approachto scale enables the type of critical analysis of scale that I undertake in this dissertation. Indeed, as Delaney and Leitner write, "once our conception of scale is freed from the fixed categories inherited from the past and our conception of politics is

similarly expanded and enlivened, the questions multiply and the analytic or interpretive problems involved in relating scale to politics become more obvious" (Delaney and Leitner 1997, 95). Relevant to my research, recent scholarship has critically explored the role of politics in spatializing environmental issues; that is, querying the role that states play in framing nature.[6]

Given that my research question centres on the dynamics related to re-structuring of spatial relationships (i.e., the shift towards an increasingly important hydrologic boundary), the scalar literature provides an apt conceptual foundation for my work. From this large and growing body of work, the conceptual insights central to my dissertation are the following: scales are fluid rather than fixed; constructed rather than pregiven; and political in both construction and function.[7]

1.3.1.2 Rescaling

Rescaling – changes in the scales and levels at which particular processes take place – is a sub-focus of critical scalar studies. Of course, scalar change is hardly new, but viewing scalar changes through a lens of scalar constructivism (as above) is a relatively recent development, and one that is of crucial relevance to the work presented throughout this dissertation. Following the constructivist approach to scale, scholars have emphasized that rescaling is a highly political act. The political nature of rescaling is often framed in terms of the mobility of capital through constructed scales and networks of hierarchy and power. Swyngedouw (2000), for example, focuses on the role of mobile capital in shaping and re-shaping particular spaces. Gibbs and Jonas (2001) argue that

[6] Note that I like many others (e.g. Whitehead et al 2007), reject a state/nature dichotomy. In this statement about states' roles in framing nature (and indeed in the dissertation as a whole) I emphasize that states and nature are in what Whitehead et al. (2007) call a 'mutual co-evolution' rather than a one way exchange.
[7] For an in-depth genealogy of debates in scalar scholarship, see Herod 2011.

governmental agencies (in their case, the UK's Regional Development Agencies) are imbued with and shaped (physically and thematically) by the power struggles that underlie their creation. With respect to environmental and water governance, Perrault (2005) asserts that rescaling is a "highly contested and compromised" (2005, 266) process since, as, as Whitehead et al. (2007) maintain, states frame nature in part through the territorialization of state spaces. Rescaling to watersheds, then, can be seen not as a straightforward exercise in emphasizing some boundaries over others, but as a political act in which particular actors with particular ideologies have an interest. Combining the notion that watersheds – like all scales – are socially constructed with scholarship showing the highly political nature of rescaling initiatives allows me to critically examine the processes associated with the watershed approach.

For my purposes, rescaling is most usefully thought of as comprising at least one of three elements: a scaling downwards from countries and provinces (or states) to more local levels of government, a scaling upwards from local, provincial, and national governments, and a scaling outwards from centralized to more inclusive forms of decision-making (Gibbs and Jonas 2000; Reed and Bruyneel 2010). These forms of rescaling are explored below, followed by a discussion about how they inform my work.

Scaling down refers to a transfer of decision-making processes, power, responsibility, or authority (or any combination thereof) from one level of governance to another, physically smaller, one. As such, it is applied to moves from national to provincial or state governments (Rabe 2006; Sigman 2005), as well as to shifts of responsibility from national or provincial governments to local-level groups (Agrawal and Ribot 1999; Batterbury and Fernando 2006; Grindle 2007a; Wilder and Lankao 2006). Scaling down

is a widely studied phenomenon, and the topic of much debate in the development, economic, political science, and geographical literatures, having been variously framed as a component of neoliberal reforms (e.g. Brenner and Theodore 2002; Jessop 2002), an expression of subsidiarity (e.g. Kemper et al. 2007; Plummer and Fitzgibbon 2004), [8] a form of local empowerment (e.g. Brooks 2002), or a combination thereof (Cohen forthcoming; Bakker 2007b). For my purposes, I engage with decentralization inasmuch as implementation of the watershed approach constitutes a form of scaling down from provinces (which have the primary – but not sole – jurisdictional responsibility for water in Canada) to watershed organizations. As explored in Chapter 4, arguments in favour of decentralization (namely, that decentralized arrangements better represent local knowledge, are more democratic and empowering, and are more flexible to local conditions) are frequently used as rationales for a rescaling to watersheds.

A second element of rescaling is 'scaling up', which typically refers to a move towards increasingly polycentric governance systems and international (or transnational) institutions. Most commonly, this is framed as subnational actors "bypassing state institutions" (Pierre 2000, 1) and moving into international arenas and networks. Examples include the development of the European Cities Initiative (a transnational network of cities and regions within the EU – see Leitner et. al. 2002), and the international anti-dam movement of which many local organizations are a part (Rothman and Oliver 1999). The phenomenon of scaling up is often associated with "scale

[8] The principle of subsidiarity directs that "powers or tasks should rest with the lower-level sub-units of that order unless allocating them to a higher-level central unit would ensure higher comparative efficiency or effectiveness in achieving them" (Føllesdal 1998, 190). Latterly, the principle has been applied in the context of the European Union applied (van Hecke 2003; van Kersbergen and Verbeek 2004), where the principle of subsidiarity pertains to many policy areas – including environmental and water policy (Golub 1996; Jordan and Jeppesen 2000).

jumping" (e.g. Cox 1998), wherein actors "produce new scales of economic and political organization for themselves" (Herod and Wright 2002, 10), often as part of particular strategic plans to gain international attention or support for local causes. In this dissertation, I employ scaling up in a slightly different way. I am interested in the scaling up that occurs when, because of a provincial decision to make govern or manage along watershed boundaries, regions and municipalities that may have operated autonomously are launched into programs wherein they must coordinate with neighbouring cities or regions. This is particularly true in cases where the defined boundaries of a watershed demarcate a physically large area. To be sure, the international trend towards the uptake of watersheds (see Chapter 2) has had influence in the case study areas, but there is no international watershed organization to which Canada's sub-provincial watersheds subscribe. Rather, I marshal the concept of scaling up to capture those research findings that relate to the physically expanded policy sphere that watersheds represent to actors at municipal or regional scales.

'Scaling out' refers to the inclusion of extra-governmental networks and actors in decision-making processes. Governance scholarship emphasizes that the last three decades have seen a proliferation of decision-making processes incorporating public or stakeholder participation (and in some cases, more than participation) (Eckerberg and Joas 2004; Pierre 2000). While in theory this means devolution of responsibility or authority to extra-governmental groups, in practice this has not always occurred and recent research points to the tendency for centralized governments to retain final decision-making authority in participatory decision-making processes (Harrington et al. 2008; Norman and Bakker 2008; Ribot 2004). I engage with the scaling out of

environmental governance throughout this dissertation by emphasizing its conflation with scaling down (Chapter 3), its role in bringing together actors who might not otherwise agree on the question of rescaling (Chapter 4), and its infusion into many of the implications of rescaled governance initiatives (Chapter 5).

The move towards watersheds thus demonstrates all three forms of rescaling: a scaling up from municipalities, a scaling down from provinces, and a scaling out from government. Moreover, this three-pronged rescaling is often infused with a fourth dimension: the idea that rescaling to watersheds is a shift from political boundaries to natural ones – an idea explored in greater depth in Chapter 4.

In light of the above, my primary research question may be refined as follows: If watersheds are just as constructed as any other political scale, and if the shaping and re-shaping of political boundaries are political acts, then why has rescaling to watersheds occurred, and what are its governance implications? I outline below, three additional literatures that have equipped me with the conceptual tools used in the subsequent chapters in answering this question. Specifically, I weave together this scalar grounding with key concepts from environmental management, governance, and political ecology in order to interpret my research data and address my research questions.

1.3.2. Environmental management: watersheds as natural ecological units

Grounded in the natural sciences, environmental management seeks to improve the way that resources are managed (rather than governed, i.e., a focus primarily on operations and outcomes rather than primarily on process). For my analysis, the primary conceptual utility of this field lies in its focus on ecosystem-based management; a concept premised on the argument that "the environment ought to be managed in whole

ecological or landscape units based on integrative biological, physical, and/or socioeconomic assessments" (Slocombe 1993, 612). In the context of water governance, watersheds are often framed as ecosystems (e.g. Mitchell 2005); as such, the move away from jurisdictional boundaries and towards hydrologic ones can be framed as a move towards ecosystem-based management.

Ecosystem-based management holds as central principles that effective environmental management requires working at appropriate ecological scales, the importance of interagency coordination within those ecological scales, and the concomitant necessity of organizational changes in the way that environmental agencies operate (Grumbine 1994). Ecosystem-based management has become an increasingly popular paradigm (Bonnell and Koontz 2007; Butler and Koontz 2005), and although watersheds and ecosystems are not one and the same (Omernik and Bailey 1997), themes from this turn in environmental management are reflected in the uptake of watersheds (e.g. Lotspeich 1980; Montgomery et al. 1995).

The familiar refrain that watersheds are effective governance units because they are nature's boundaries echoes ecosystem-based management's emphasis on the importance of ecological scales. Assertions about the importance of ecological scales continue to be made in the watershed context despite frequent disagreement in ecology communities about what constitutes a natural boundary. Meyer and Swank (1996), for example, cite conflicting suggestions for ecologically-defined boundaries within the same area: one uses the boundaries associated with benthic (i.e. invertebrate) communities inhabiting a particular set of stream habitats while the other uses the boundaries of particular vegetation communities. Scientific disagreement can arise within a singular level of

government, too: the United States Geological Service (USGS) notes that "while watershed boundaries identify surface-water runoff divides, they often do not represent ground-water flow divides" (USGS (United States Geological Survey) 2008) – an observation at odds with the United States Environmental Protection Agency's description of a watershed as a "bounded hydrologic system" (US EPA 2008b). Indeed, as Griffin notes, "the use of watersheds erroneously assumes that all biotic and abiotic factors are similarly organized" (1999, 509).

1.3.3 Governance: watersheds as governance units

For the purposes of this dissertation, I follow Bakker and Nowlan's lead in defining governance as "the range of political, organizational, and administrative processes through which communities articulate their interests, their input is absorbed, decisions are made and implemented, and decision makers are held accountable"(2010, 7). This definition emphasizes the procedural elements of governance, which are of concern to my analysis insofar as they relate to the processes associated with rescaling.

Governance scholarship is relevant to this dissertation for two reasons. First, the scaling out of decision-making is often associated with the putative shift from government to governance. The shift from government to governance, observed through the 1990s, implies a proliferation of actors involved in decision-making processes and service delivery schemes that were once the exclusive purview of centralized governments (Kettl 2000; Peters and Pierre 1998; Rhodes 1996; Salamon and Elliott 2002). This shift from government to governance is closely linked to the scaling out component of rescaled water governance: expanded sets of decision-makers and new scales of decision-making are taken are hallmarks of the watershed approach.

A second way in which governance scholarship informs the work presented here is through the lens of 'good governance'. The relationship between water issues and governance issues is often framed as one of good governance, with attention often paid to good governance within water-related institutions, or changes in water-related institutions undertaken in the name of better governance (Allan and Wouters 2004; Bakker 2003; Grindle 2007b). What constitutes good governance has been extensively debated, with an emerging consensus that good governance holds as principles, *inter alia*, participation, inclusiveness, gender equity, fairness, rule of law, transparency, accountability, legitimacy, consensus orientation, responsiveness, resilience, connectivity, effectiveness, efficiency, strategic vision, direction, performance (Batterbury and Fernando 2006; European Commission 2003; Lockwood 2010). Principles of good governance are most often applied in the context international development, particularly in relation to lending conditions from International Financial Institutions (see Andrews 2008; Doornbos 2001; Grindle 2004; Nanda 2006), but have been used in relation to water-related questions, both internationally and in Canada (Bakker 2003; Rogers and Hall 2003; Turton et al. 2007) – especially with respect to the importance of stakeholder engagement and transparency. Importantly, many of these good governance principles resurface as policy rationales for the watershed approach.

Indeed, as explored in Chapters 3 and 4, governance reforms are often at the heart of environmental rescaling initiatives since, as Batterbury and Fernando note, "governance reforms have frequently involved changing the scale at which institutions operate" (2006, 1854).

1.3.4. Political ecology: power and environmental relations

The shift in power relations (perceived or real) associated with rescaled governance processes articulates well with political ecology. Political ecology entails "empirical, research-based explorations to explain linkages in the condition and change of social / environmental systems, with explicit consideration of relations of power" (Robbins 2004, 12) or, more generally, the "assessment of political linkages between society and environmental change" (Forsyth 2003, xiii).

It is impossible to document the full scope of all political ecological research here, but I emphasize a number of key foci in the field: its geographic grounding the in Global South (e.g. Bryant and Bailey 1997; Peet and Watts 2004), its first principles grounding in chains of explanation (e.g. Blaikie and Brookfield 1987), and its explicit attention to social and political inequality and injustice (e.g. Peet and Watts 2004) as well as to competing legitimacies and social hierarchies (e.g. Paulson and Gezon 2005). Additionally, three more recent developments in political ecology make it particularly relevant to my research.

The first is its (relatively) recent shift from the Global South to the Global North. Early political ecological research was grounded in the Global South. Indeed, as Schroeder notes, Bryant and Bailey's influential work in the late 1990s highlighted "the ongoing effects of colonial rule and persistent conditions of widespread poverty in the Third World as grounds for pursuing "a political ecology that is focused on the Third World and which is distinct from research on other areas"(Bryant and Bailey 1997, 8, in Schroeder 2005, 1045). Recent political ecological research has expanded the geographic scope of the subfield beyond the Global South, applying political ecological insights and tools to the so-called First World (McCarthy 2002) and emphasizing many processes –

e.g. production and consumption regimes, migration, indigenous claims to resources – relevant to the First World that can be "usefully understood via a political ecology perspective" (Schroeder et al. 2006, 163).The work presented in this dissertation builds on this growing First World political ecology; the field's expanded analysis to the First World allows me to mobilize political ecological arguments in the Canadian context.

Second, political ecology's shift away from the local as an *a priori* ideal governance scale and analytic unit allows me to interrogate both local and supra-local scales – as well as the relationships between these – without defaulting to preferential treatment of the local. Robbins' 2002 piece on 'looking up' in political ecology, for example, notes the political ecological turn toward the study of "central institutions of power as ethnographic objects on par with local communities and organizations" (Scheper-Hughes 1995 in Robbins 2002).

The third reason political ecology provides useful conceptual tools with which to address my research questions is because of an emerging consensus that engagement between political ecology and critical conceptualizations of scale represent a fruitful avenue for future political ecological research (e.g. Neumann 2008; Rangan and Kull 2008; Zimmerer and Bassett 2003). Indeed, my study (and Chapter 5 in particular) engages with both political ecology and scalar literatures by applying political ecological analytics to rescaling processes. This approach aligns well with calls for greater engagement between the two subfields. Robbins, for example, suggests political ecological research might "proceed as a kind of study of scalar politics, exploring how various political boxes get stacked the way they do in scalar hierarchy through historical and economic processes" (Robbins 2008, 216), and Brown and Purcell (2005) posit scalar

approaches to political ecological questions as a theoretical way out of political ecology's local trap.[9] Calls for a political ecology of scale emphasize the utility of attention to the processes with which both subfields are concerned; Rangan and Kull (2008), for example, call for greater attention to the ways in which scale is produced through power, measurement and control, and discourses of simplification.

To this end, I marshal political ecological notions of social-environmental linkages in my work by explicitly exploring the ideological and epistemic influences of scalar change. Among these are two ideologies that have been the subject of much investigation in critical geography: neoliberalism and participation of extra-governmental actors in environmental decision-making. As explored in greater detail in Chapter 4, the former refers to a series of economic reforms beginning in the 1970s that include, among other things, privatization, deregulation, localization, decentralization, and "the state-led encouragement of civil society groups to provide services that interventionist states did, or could potentially, provide for citizens"(Castree 2008a, 142; McCarthy and Prudham 2004; Peck and Tickell 2002). The development of these "flanking mechanisms", as Noel Castree calls them, is linked to literature focusing on the practical benefits and normative desirability of public participation in environmental decision-making, in part grounded in a vast literature on co-management of environmental resources (Berkes 2009; Dietz et al. 2003) .

[9] Brown and Purcell (2005) define political ecology's 'local trap' as : "the idea that local-scale arrangements, while not always perfect, are inherently more emancipatory and environmentally sensitive" (2005, 620) than their state, national, or international counterparts.

1.4 Dissertation structure and outline

This dissertation is made up of six chapters. Chapters 3, 4, and 5 were originally written as stand-alone papers, but have been modified to fit with the dissertation as a whole. Table 1 briefly summarizes the central argument from each chapter.

Table 1: Chapter outline

Chapter	Chapter title	Purpose / Argument
1	Introduction	-
2	Background and Context	**Purpose:** To situate the Canadian case within international water governance trends more generally; to explain why Canada is an apt location in which to study the uptake of watersheds; to contextualize the conceptual framework; to provide background information on the case study sites.
3	The Watershed Approach: Challenges, Antecedents, and the Transition from Technical Tool to Governance Unit	**Argument:** The challenges associated with watersheds are a symptom of their transition from technical tool to governance unit, which has resulted in a conflation of 'watershed' with 'participation', 'integration', and other governance concepts. As a result, in the case study provinces we would expect to see conceptual slippage around the question of why watersheds have been taken up, as well as a series of governance challenges associated with their implementation.
4	Watersheds as boundary objects: constructing scale at the intersection of competing ideologies	**Argument:** Watersheds have increased in popularity because of their status as boundary objects; that is, a common concept interpreted differently by different groups (in this case, the scientific, neoliberal, and participatory engagement communities)
5	Governance implications: exploring a political ecology of scale in Canada's watersheds	**Argument:** The governance implications of the uptake of watersheds can be used to advance current understandings of rescaling, in particular by incorporating a) the possibility that not all local organizations would prefer regulatory authority, and b) more nuanced views of scale in political ecological work.
6	Conclusion	**Purpose:** To summarize key insights and findings; to identify the contributions of the research; to asses the strengths and weaknesses of the dissertation as a whole; to identify future research projects.

Chapter 2 serves as a bridge between the conceptual framework presented in this introduction and the research chapters. Its purpose is to situate the Canadian case within international water governance trends more generally, as well as to explain why Canada is an apt location in which to study the watershed approach (i.e., provincial autonomy, rapid and widespread uptake, and a research gap with respect to critical analyses of rescaled water governance in Canada). Additionally, it contextualizes the conceptual framework by exploring the extent to which the theories I employ have been mobilized to understand environmental governance in Canada more broadly. Chapter 2 also outlines the research methods used to collect the data used in the remainder of the dissertation.

Chapter 3 collects and analyzes the well-known challenges associated with the watershed approach, shows that these are governance (as opposed to management or operational) challenges, and lends analytic clarity to the remainder of the dissertation by distinguishing watersheds as separate from the suite of governance tools with which they have become conflated. Moreover, the findings in this chapter lay a foundation for Chapters 4 and 5 by drawing on existing policy and academic literature to outline what might be expected in the case studie provinces: namely conceptual slippage around the idea of watersheds and a number of governance challenges associated with the implementation of the watershed approach.

Chapter 4 uses interview data to examine the issue of conceptual slippage in more depth. Specifically, the chapter explores the different meanings associated with particular elements of the watershed approach in order to understand its widespread appeal. The chapter argues that watersheds, as particular forms of re-scaled environmental governance, have increased in popularity because of their status as

boundary objects. Following Star and Griesemer's usage (1989), this term refers to a common concept interpreted differently by different groups. I show how particular features of the watershed approach – namely their physical size and the shared discursive framings they employ (i.e., participation, integration) – reflect and are shaped by three different and occasionally competing social worlds: the scientific, neoliberal, and participatory engagement communities.

Chapter 5 engages with debates about the rescaling of environmental governance, focusing on recent work in political ecology. In this chapter, I use case study data to identify five governance implications of rescaled governance initiatives. I then mobilize these findings to advance current understandings of rescaling, particularly from a political ecology perspective. I show how the implications identified through the research can be marshaled to move forward relevant debates about the degree of rescaling that has occurred or is indeed desirable; I also respond to calls for greater engagement between political ecology and scale by exploring the application of a constructivist view of scale to political ecological accounts of rescaling.

Chapter 6 is the concluding chapter. It summarizes key insights and findings, identifies the empirical and conceptual contributions of the research, and assesses the strengths and limitations of the dissertation as a whole. It closes by outlining directions for future research, including further investigation into the pathways and effects of naturalization, as well as deeper engagement with the political and financial factors related to environmental rescaling.

2. BACKGROUND AND CONTEXT

2.1 Introduction

In this chapter I undertake four tasks. First, I situate the Canadian case within current trends in international water governance. Next, I provide a brief international history of watersheds, showing where and when they have been taken up and studied. Third, I show that Canada is an appropriate location in which to answer my research question because of the high degree of provincial autonomy, the rapid and widespread uptake of the watershed approach in Canadian provinces, and the need for critical analysis of this phenomenon in the Canadian context. In this section, I also situate the theories introduced in Chapter 1 within the Canadian context in order to demonstrate what can be gained from looking at the watershed approach through a Canadian lens. Finally, I outline the research methods used to collect data for the paper, and in so doing provide background and context on the four case study sites. Together, these tasks emphasize the utility of undertaking research on rescaled water governance in Canada, and contextualize the research contributions outlined in Chapter 6.

2.2 Trends in international water governance

Changes in water governance – in Canada and elsewhere – have been precipitated by recognition that water crises often stem from governance rather than technical issues, that the impacts of climate change will be felt through water systems, and that more efficient and effective means of managing water are needed (Pahl-Wostl et al. 2008, 2). I review these transformations here with a view to contextualizing the shift towards watersheds with respect to these broader trends.

One recent significant transformation in water governance is the incorporation of ecosystem function into water regimes. Proponents of the paradigm often framed as ecosystem management (see section 1.3.2) have sought to manage resources on ecologically meaningful scales rather than political boundaries(Butler and Koontz 2005; Christensen et al. 1996; Grumbine 1994; Slocombe 1993). Since, in this view, watersheds can be seen either as ecosystems unto themselves (e.g. Montgomery et al. 1995) or as central to ecosystem function, this shift towards more ecologically sensitive environmental governance regimes has had profound impacts for rescaled water governance initiatives. As Al-Yayyousi and Bergkamp (2008, 105) explain, "Policy interventions and investments for sustainable water management have to be considered from at least two angles": the perspective of water resources development, and the perspective of ecosystem services. The European Water Framework Directive, for example, enshrines "good ecological status" as an explicit aim of the Directive (1 (a) (iii)), and the 2005 Millennium Ecosystem Assessment identifies integrated river basin management as central to ecosystem management (Millennium Ecosystem Assessment 2005 in; Roy et al. 2011). Additionally, there has been increasing attention on the "intuitively attractive notion" (Collins and Ison 2010, 671) of conducting science at ecosystem scales, which watersheds are considered to be (despite some disagreement – see Omernik and Bailey 1997).

This focus on environmental management and ecosystem services speaks to a second trend in water governance: a focus on sustainability. As principles of sustainability have emerged and been debated, actors at all scales have "come under intense pressure to take environmental considerations seriously" (Conca 2006, 10). Often this focus on

sustainability has led to work with an emphasis on the economic and social dimensions of water governance (Pahl-Wostl 2002; Pahl-Wostl et al. 2008; Rogers et al. 2002). At the international level in particular, good water governance has often been framed as fitting into a broader project of sustainability. Organizations like the World Bank, the Global Water Partnership, and the United Nations (Conca 2006; Rogers and Hall 2003; United Nations 2009) frame their water programs as being under the umbrella of sustainability, in part due to the rise of Integrated Water Resources Management – a notoriously nebulous terminology whose various definitions almost always include a sustainability component.

The popularity of Integrated Water Resources Management (herein IWRM) constitutes a third trend in international water governance. IWRM is a water management paradigm that "aims to ensure the coordinated development and management of water, land, and related resources by maximizing economic and social welfare without compromising the sustainability of vital environmental systems" (Rogers and Hall 2003), and is based on principles of coordination, stakeholder participation, and multiple levels of decision-making (Mitchell 1990). Its various definitions and interpretations have been the subject of much debate elsewhere (see Biswas 2004a, 2004b; Medema and Jeffrey 2005; Mitchell 2004, 2007; Warner 2007) where it is perhaps most heavily critiqued for its imprecision. Conca critiques IWRM as follows:

> Everything is connected to everything else; everyone is a stakeholder; and all aspects must be considered. At times, the resulting framing of the problem can sound abstract and depoliticized to the point of vacuity (2006, 161).

IWRM nevertheless retains its privileged position in the water governance landscape and has become a dominant framework under which water-related development projects have occurred through the United Nations Environment and Development Programs, the

World Bank, the Asian Development Bank, and the Global Water Partnership (Mukhtarov 2008).

There are a number of critical distinctions between IWRM and watersheds. First and foremost, a watershed represents a geographic boundary (albeit infused with social construction and framing), whereas IWRM is a management paradigm. The two are often conflated because IWRM is idealized as taking place at a watershed scale, but they are not the same. As its name implies, IWRM is focused on integrating water-related issues; watersheds are a geographic area including land and water. To some scholars, this latter point is the key distinction: watershed management "*is inclusive of land use*, so that all factors and events that impact on water resources are taken into consideration (Pollard 2002, 943 emphasis in original), whereas IWRM is not. Indeed, the question of including land in water management schemes is a knotty one – complex enough that, as Savenije and van de Zaag (2000) note in the case of international transboundary relations, the UN Convention on the Law of Non-navigational uses of International Watercourses (1997) chose not to adopt the land-inclusive language in the Helsinki Rules (1966) (which defines watercourses as inclusive of land) because

> Most states prefer to use the term watercourse rather than river basin, since the latter concept comprises land areas which are also governed by administrative, land use and other laws. Letting land areas be governed by a water law might lead to legal complexities (2000, 23)

As discussed in Chapters 5 and 6, the question "letting land use be governed by a water law" becomes critical when looking at the scope of watershed organizations' mandates.

A fourth trend in international water governance is the increased participation of non-governmental actors in water-related decision-making processes. This trend is related to, but distinct from, IWRM, as water governance can be integrated but not participatory,

and vice versa. Public participation in environmental decision-making has increased since the 1960s and has been promoted and debated since its inception (see Beierle and Cayford 2002; Bulkeley and Mol 2003; Charnley and Engelbert 2005; Dietz and Stern 2008; Fischer 2000; Irvin and Stansbury 2004). The trend of public participation applies to many areas of environmental decision-making, most notably forestry (see Baker and Kusel 2003; Buchy and Hoverman 2000; Pagdee et al. 2006), mining (see Pring 2001) and water (see Griffin 1999; Imperial 2005; Nowlan and Bakker 2007, 2010; Pahl-Wostl et al. 2008). As detailed in Chapter 4, public participation in environmental decision-making is typically predicated on normative and pragmatic beliefs that the incorporation of local (however defined) extra-governmental input will lead to better decision-making, and is often linked to more participatory and deliberative forms of democratic legitimacy. This trend is relevant to the research presented in the dissertation because increased public participation is a central component of the appeal of the watershed approach (Chapter 4), even when advocates are not necessarily clear on what the term means (Chapter 4) or when it presents significant challenges (Chapter 3).

It should also be noted that in the Canadian case, First Nations fall outside of this participatory framework. The 1997 Delgamuukw case (*Delgammukw v. British Columbia*) clarified the duty of government to consult with potentially affected Aboriginal Peoples in matters relating to environmental issues. Indeed, as the *Delgammukw* judgement reads:

> The right to choose to what uses land can be put, subject to the ultimate limit that those uses cannot destroy the ability of the land to sustain future generations of Aboriginal peoples, suggests that the fiduciary relationship between the Crown and Aboriginal peoples may be satisfied by the involvement of Aboriginal peoples in decisions taken with respect to their lands. *There is always a duty of consultation and, in most cases, the duty will be significantly deeper than mere consultation* (Delgamuukw v. British Columbia, (1997) 3 S.C.R. 1010, emphasis added).

The *Delgamuukw* decision emphasises that Canada's Aboriginal Peoples are "not just another stakeholder" (NAFA 2000) in decision-making processes, and do not fit into debates about public participation in the same way as environmental organizations, community groups, and individual or commercial water users. As such, the important issues and questions arising from Aboriginal relationships with the water governance landscape of the case study jurisdictions (see Baker and McLelland 2003; von der Porten and De Loë 2010) are not examined in this dissertation, which focuses on voluntary participation and collaboration rather than on regimes wherein there a legal duty to consult.[10]

A fifth trend in international water governance is the move towards decentralization. Decentralization can be framed as a shift in responsibilities from federal governments to their constituent states or provinces (Hill et al. 2008; Rabe 2006; Sigman 2005), as well as to denote a shift down from national or subnational governance levels to administrative or jurisdictional units operating at physically smaller scales. The decentralization of environmental (and, indeed, of water) decision-making is often linked to neoliberal arguments about economic efficiencies and democratic arguments about more locally appropriate forms of governance (Larson and Ribot 2004; Prud'homme 1995). The use of watershed boundaries has been widespread, promoted in large part through international (and international development) organizations (Batterbury and Fernando 2006). Critiques of decentralized governance arrangements – particularly in the Global South – have highlighted the problematic effects and limited benefits of decentralization (Perreault 2005; Wilder and Lankao 2006).

[10] As discussed later in this chapter, a small number of jurisdictions have implemented policy or legislation stipulating participation, but this is entirely different from the fiduciary duty to consult with Aboriginal Peoples.

Two elements of the decentralization discussion are particularly relevant for the research presented here. First, decentralization is most often framed as a move towards greater participation at more local governance scales. This framing is problematic for my research as it is a conflation of two separate processes: (1) a scaling down to lower administrative levels and smaller geographic scales, and (2) a scaling out of decision-making and greater inclusion of extra-governmental actors in environmental decision-making processes. I emphasize here and throughout the dissertation that these processes are related, but they are not the same. Indeed, the case study data in Chapter 5 show that there are instances of governments making decisions based on smaller geographic units but without the elements of public participation that are almost always associated with the decentralization terminology. A second way in which decentralization relates to my research is that the shift towards watersheds is almost always framed as an example of decentralization (Kemper et al. 2007; Robins 2007; Wilder and Lankao 2006). Yet in the research, I found that from a local or municipal perspective, watersheds represent a scaling up: to some, watersheds are a centralization of authority rather than a decentralization that allows for local flexibility. The scaling up components of the shift toward watersheds are explored in greater depth in Chapter 4, but I raise them here to emphasize that decentralization has had a significant impact on the way that water is governed, managed, and studied.

The trends of including ecosystem function, emphases on sustainability, and the rise of IWRM, public participation, and decentralization have all influenced – directly or indirectly – the scales at which water-related decision-making occur, internationally as well as within Canada. Most importantly for my research, they have all facilitated (or

outright led to the recommendation of) the uptake of watersheds as governance scales. Below, I explore implementation of the watershed approach in the international context before explaining why Canada provides an apt location to study this phenomenon.

2.3 A brief international history of watersheds

Although the idea of watersheds is by no means a new one – indeed, there is evidence of their use as early as the third century B.C.E. in China (Molle 2009) – its use as a pervasive governance scale is, by and large, limited to latter half of the twentieth century.

The last two decades, in particular, have seen a dramatic increase in the number of jurisdictions that have undertaken to carry out some form of decision-making along hydrologic lines (see GWP and INBO 2009; Imperial 2005; Kemper et al. 2007; Pyle et al. 2001; Sabatier et al. 2005; Thiel 2010; Thiel and Egerton 2011; Warner 2007; Woolley and McGinnis 1999). Many examples illustrate this point. Hydrologic boundaries form the basis for water governance in South Africa (as of 1998) and the European Water Framework Directive (adopted in 2000) (Kaika and Page 2003) as well as much of Australia (Johnson et al. 1996; Mitchell and Hollick 1993), New Zealand (Pyle et al. 2001), and the Global South through reforms promoted by International Financial Institutions (e.g. GWP and INBO 2009; Kemper et al. 2007). Watershed-scale governance models are incorporated in the World Bank's Water Resources Sector Strategy (2004), they are a foundation of the United Nations Environment Program's Water Policy (2007), and are part of the OECD's environment program (2010).

In North America, the concept of watersheds as units for resource governance and management dates back to 1890 when John Wesley Powell (then head of the United

States Geological Survey) suggested the American West be organized in accordance with watershed boundaries rather than political ones (McGinnis 1999; Worster 2003). Powell's idea was dismissed at the time (McGinnis 1999). The first half of the twentieth century saw some uptake of hydrologically-based governance (e.g. the Tennessee Valley Authority) as part of what Worster refers to as 'modern hydraulic society' based on the intensive, large-scale manipulation of water and its end products, particularly in arid settings (1985, 7), but watershed-scale governance as I examine it is something quite different and emerged over fifty years later. The watershed approach, as I examine it, focuses on smaller-scale basins (typically smaller than a single province or state, although often straddling its boundaries) and is frequently associated with stewardship and collaboration rather than engineering and state-led planning.

Advocates of the watershed approach suggest that its uptake can lead to better management because of the scale's naturalness (Mitchell 1990; Parkes et al. 2010), a characteristic reinforced repeatedly through assorted governmental policies and documents (e.g. Hoover et al. 2007; OMNR 2009). Additionally, watersheds are seen as more conducive to public participation than their jurisdictional counterparts (e.g. IJC 1997; Korfmacher 2001) and are promoted as a scale that can promote the integration of the many factors influencing (and influenced by) water resources: ecosystems, social systems, data collection and reporting, and health (Adler and Straube 2000; Collins and Ison 2010; IJC 1997; Korfmacher 2001; Mitchell 1990; Parkes et al. 2010).

Although proponents have touted the advantages of using watershed boundaries over their jurisdictional predecessors, a number of more recent papers have questioned the benefits of this approach to water governance and have identified significant challenges

with its implementation (Blomquist and Schlager 2005; Cohen and Davidson 2011; Fischhendler and Feitelson 2005; Ferreyra and Kreutzwiser 2007; Griffin 1999; Warner et al. 2008; Wester and Warner 2002). These ongoing challenges suggest that watersheds can be usefully thought of as what Molle (2008) refers to as a 'nirvana concept': a "photo-negative of the real world" embodying an ideal image of what the real world ought to do (Molle 2008, 132).

Nevertheless, the uptake of the watershed approach continues apace. In the United States, it has been taken up in Washington (initiated in 1998), Oregon (initiated in 1995), California (initiated in 1995), and many other states. In Canada, the geographic focus of this dissertation, six of the country's thirteen provinces and territories have switched over to watershed-based planning models since 2001.[11] This sea-change in the Canadian context is the focus of the remainder of this chapter.

2.4. Why study watersheds in Canada?

Canada is an apt location in which to study watersheds for three reasons related to policy structure, timing, and research gaps. First, Canada's decentralized system of environmental governance affords a high degree of autonomy to the provinces, making them more like nation states than sub-national units; this enhances the applicability of the theories marshalled in my conceptual framework because most of them focus on national-level governments. Second, Canada is a country in which a rapid and widespread uptake of watersheds has recently occurred, making my examination of this phenomenon here

[11] These provinces are (from west to east): Alberta, Saskatchewan, Manitoba, Ontario, Québec, New Brunswick, and Prince Edward Island. The Northwest Territories have also recently undertaken this switch, but because of the Territories' federal jurisdiction and the recentness of this uptake (December 2010), it was not included in this analysis.

particularly timely and relevant. And third, critical analyses of rescaled water governance present a significant gap in the study of water in Canada. Each of these three factors is explored here.

2.4.1 Provincial autonomy

Canada is a federal state whose ten provinces have significant jurisdiction over environmental issues by way of the country's 1867 constitution.[12] The theoretical framework and conceptual tools discussed above focus mostly on nation states; I argue that they also hold for sub-national governments with significant jurisdiction over particular issue-areas – as is the case with provincial jurisdiction over water governance in Canada.

The high degree of Canadian provincial autonomy with respect to environmental issues has been the subject of previous analyses. Recent work on fragmentation in the Canadian case highlights this point by emphasizing that "Canada is the only Organization for Economic Co-operation and Development (OECD) country not to have legally enforceable federal standards" (Bakker and Cook 2011, 276), and that despite the fact that more than 10 million Canadians rely on groundwater, groundwater reserves remain unmapped (Christensen et al. 2010; Council of Canadian Academies 2009; Hoover et al. 2007). This fragmentation is true beyond drinking water, as well: work on environmental water quality indicators shows that no central repository exists for fresh water-related indicators and their associated data (Dunn and Bakker 2011). Instead, a complicated web of federal and provincial initiatives has resulted in numerous indicators being housed in

[12] Canada's three territories – Yukon, Northwest Territories, and Nunavut – are administered differently, and operate under the jurisdiction of the Federal government.

diverse formats, accessible in a myriad of reports and various agency websites (Dunn and Bakker 2011, 137). As De Loë and Kreutzwiser note, Canada's provinces and territories are each conducting their own "largely independent, experiment in water governance" (2007, 91).

The current fragmented state of Canada's water governance systems, described in uncharacteristically strong language by the Canadian Senate as "shocking" and "unacceptable" (Senate of Canada 2005, 5), is, for many, attributable to Canada's decentralized system of environmental policy-making. Inger Weibust (2009), for example, points to decentralization as "the main cause of Canada's poor environmental performance" (Weibust 2009, 120). Kathryn Harrison argues that the effects of this decentralization are exacerbated by political factors, namely the federal government's "narrow view of its own [constitutional] powers" (Harrison 1996, 54), or, as Parson states it, the government of Canada "has often avoided exercising environmental authority it so clearly does possess"(Parson 2001, 6). This lack of federal action is arguably related to the federal government's wariness of "offending the provinces, which jealously guard all their areas of jurisdiction" (Weibust 2009, 120).[13] Exacerbating this federal/provincial dynamic are a number of other factors, including the political reality of policy coordination with the United States, the ongoing shift from government to governance, and unresolved Aboriginal and treaty rights (Bakker and Cook 2011).

Indeed, the lack of coordination and data sharing displayed between Canadian provinces (and between the provinces and the federal government) (Bakker and Cook

[13] Assertions like these are reflected in recent water crises, one of which saw federal and provincial governments 'passing the buck' of responsibility between one another while an increasing number of residents of the Kashechewan first nation became ill after drinking water infected with e-coli (and, subsequently, from drinking extremely high levels of chlorine applied in an effort to disinfect the water).

2011; Boyd 2003; Hill et al. 2008; Morris et al. 2007), together with the high degree of autonomy held by Canadian provinces with respect to environmental issues, has been likened to a group of independent states with a supra-national coordinating body more akin to the European Union (Lagacé 2011) than a state with singular or centralized authority.[14]

This highly decentralized arrangement has three implications for my research. First, it allows me to interpret Canadian provinces as national states for the purpose of my analysis, reinforcing the applicability of many theories within my conceptual framework. Second, it adds policy heterogeneity to the physical and economic diversity displayed across Canada's provinces. Although the intent of my dissertation is not to compare provinces with one another, the fact that significant differences between provinces do exist allows me to capture a broader spectrum of data than might otherwise be possible within a single country. Finally, in response to this decentralization and fragmentation, a number of provinces have developed provincial water strategies. As discussed below, many of these strategies include the transition to watersheds as a mechanism through which the disorganization wrought by fragmentation can be mitigated.

In the context of this uncoordinated water landscape, a number of Canadian provinces have undertaken reforms to address lack of coordination, mitigate its negative effects, and proactively address future potential conflicts, water shortages, and pollution concerns. Examples of these kinds of reforms include the development of water rights markets in Alberta, Ontario's legislative support for technological innovation (*Water Opportunities*

[14] There are some water-related areas in which the Canadian Federal Govenrment plays a more significant role. Under the Constitution Act, the Federal Govenrment has jurisdiction over First Nations territory, transboundary water, federal lands (e.g., national parks and h istoric sites), and fisheries. Each of the case study provinces had a number of federal areas within their territories, but I focus on provincial policy because it is the primay driver of rescaled water governance in Canada.

Act S.O. 2010, c 19, ch 1), the establishment of a Ministry of Water Stewardship in Manitoba, and the development of Québec's watershed organizations (Bakker and Cook 2011).

Perhaps most significantly, many Canadian provinces have undertaken the task of developing provincial water strategies. Though the scope and authority of these strategies vary from jurisdiction to jurisdiction, they often (but not always) include such things as promoting efficiency in the municipal, industrial, and agricultural water sectors, encouraging public participation, and including ecosystem functions as an important use of water. Most importantly for my research, many of these plans promote a watershed-based approach to governance, often bundling the aforementioned functions together under the umbrella of a watershed approach. Table 2 shows which provinces have undertaken the development of a provincial water strategy.

Table 2: Province-wide water strategies (as of June 2011)

Province/Territory	**Official jurisdiction-wide Water Strategy?**	**Strategy Name**
British Columbia	Yes	*Living Water Smart* (2008)
Alberta	Yes	*Water for Life* (2003) [15]
Saskatchewan	No	
Manitoba	Yes	*The Manitoba Water Strategy* (2003)
Ontario	No	
Québec	Yes	*Water. Our Life. Our Future. Québec Water Policy* (2003)
New Brunswick	No	
Nova Scotia	Yes	*Water for Life: Nova Scotia's Water Resource Management Strategy* (2010)[16]
Prince Edward Island	No	
Newfoundland & Labrador	No	

[15] Renewed 2008

[16] Note that this strategy was introduced in December 2010, which is four months after fieldwork in that province occurred.

Province/Territory	Official jurisdiction-wide Water Strategy?	Strategy Name
Yukon	No	
Northwest Territories	Yes	*Northern Voices, Northern Waters* (2010)
Nunavut	No	

It is important to note that there is an imperfect alignment between provinces that have developed a water strategy and provinces that have undertaken a rescaling to the watershed. In other words, the presence of a provincial or territorial policy is neither a prerequisite for nor a product of a transition to watershed-scale governance. Indeed, there are six jurisdictions with water strategies and eight jurisdictions that have undertaken the switch towards watershed-scale governance models, but only four that have undertaken both.

2.4.2 Rapid and widespread uptake

A second reason to study watersheds in Canada is that this form of rescaling is recent, rapid, and widespread. Although Ontario's watershed-scale Conservation Authorities were established in 1946, other provinces did not undertake this rescaling until over fifty years later. To be sure, there were a number of 'one-off' cases of particular watersheds initiating and carrying out activities at the watershed scale (the Okanagan Basin Water Board was established in 1970, for example), but today's situation of entire provinces or territories dedicated to a jurisdiction-wide approach to watersheds is relatively recent. Table 3 details the provinces that have undergone this change.

Table 3: Provinces and territories using the watershed approach

Province/Territory	Jurisdiction-wide watershed-scale governance?	Year
British Columbia	No	X
Alberta*	Yes	2003
Saskatchewan	Yes	2005
Manitoba	Yes	2003
Ontario*	Yes	1946
Quebec	Yes	2002
New Brunswick*	Yes	2001
Nova Scotia*	No	X
Prince Edward Island	Yes	2002
Newfoundland & Labrador	No	X
Yukon	No	X
Northwest Territories	Yes	2010
Nunavut	No	X

Note: * denotes a case study province

2.4.3 The need for critical analysis in the Canadian case

A third reason highlighting the relevance of watershed study in Canada is that the topic remains largely understudied in the Canadian context. As detailed below, there has been significant work carried out on water (and, more recently, on water governance) and on rescaling questions with respect to other issues, but a critical study of rescaling to watersheds remains absent.

It is well known that water is a central component of the Canadian imagination (Bakker 2007a; Biro 2007; Sproule-Jones et al. 2008). Yet work on watersheds in Canada has focused on their more technical or operational elements, such as detailed explorations of watershed organizations' capacities to implement IWRM (Cervoni et al.

2008; Robins 2007) or the role of indicator-based assessment reports in integrated watershed management (Veale 2010).

The conceptual tools leveraged in this dissertation have been applied to the Canadian context, but not always with respect to water. The scaling down and out of environmental governance more generally, for example, has been a focus of environmental study in Canada. In particular, the move towards increasingly decentralized and participatory forms of environmental governance in Canada (e.g. Nowlan and Bakker 2007, 2010) has been assessed and characterized as having significant potential to be ecologically and socially beneficial, particularly when actors work across scales to achieve particular ends (Berkes 2002). Those more critical of this scaling down and out in the Canadian case criticize this shift as constituting "excessive decentralization"(Paehlke 2001, 166), raising concerns about the associated possibility of establishing highly uneven management practices given variability in local engagement and capacity (Reed 2007). The question of scaling up has received less attention within Canada, with the notable exception of Boudreau et al.'s study (2007) examining Canada's new state spaces resulting from regional amalgamations in Montreal and Toronto.

Studies in political ecology in Canada are relatively recent, reflecting the expanded focus from the Global South to the Global North (see McCarthy 2002). Political ecological studies in Canada have tended to fall into one of two categories. The first relates to Canada's Aboriginal Peoples. A comprehensive examination of the power dynamics surrounding First Nations and environmental governance is far beyond the scope of this dissertation,[17] but I emphasize here that much of the study surrounding power dynamics as they relate to environmental decision-making has focused on First

[17] For a useful introduction to this topic, see Doyle-Bedwell et al. (2001).

Nations People: lack of access to safe drinking water (Phare 2009) environmental justice (Draper and Mitchell 2001), health (Richmond et al. 2005) and the role of First Nations communities in managing or co-managing resource development, particularly forestry and fisheries (Huber 2009; King 2004; Stevenson et al. 2003; Wyatt 2008).[18] A second body of political ecology work in Canada relates to urban political ecology. Building on urban political ecology more generally (Keil 2005; Swyngedouw and Heynen 2003), urban political ecological studies in Canada have addressed such topics as the competing narratives with respect to transportation infrastructure in Hamilton (Oddie 2010), the tensions between industrial capitalist societies and ecological restoration in Toronto (Desfor and Keil 2004), and, most relevant to the work presented in this dissertation, Kathryn Furlong's investigation of the competing narratives around restructured water supply governance in Ontario (2007) exploring the socio-political ramifications of restructuring in the context of neoliberal reforms.

Despite this related and ongoing research, a number of important avenues remain unexamined in the case of rescaled water governance in Canada: a careful unpacking of the basket of reforms collectively referred to as the much-vaunted watershed approach, an examination of the social and political forces shaping the scaling up, down, and out of water governance in Canada, and engagement between questions of good governance and power relations in the Canadian context. It is these gaps that this dissertation addresses.

The work presented in this dissertation can thus be usefully thought of as a two-way street. As much as the research is about shedding a Canadian light on a globally relevant research question, it is also about shedding a new perspective on a Canadian issue. The

[18] Note that, as discussed in Chapter 1, the engagement of Canada's Aboriginal Peoples in environmental governance is entirely different than public participation more generally.

specific contributions of this dissertation are outlined in greater detail in Chapter 6, after the three research chapters that follow.

2.5 Research methods

The analysis presented in the dissertation employs primary data derived from legislative and policy reviews and forty-nine in-depth interviews with representatives from provincial governments, watershed-scale organizations, non-governmental organizations in the four case study provinces between June and September 2010. On the basis of the findings from this review, I chose four case study provinces in which to carry out my research. Within each province, experts were interviewed with respect to the specific research questions. Each of these research steps is outlined below.

2.5.1 Policy and legislative review

The first step in the research process was to conduct a comprehensive review of the relevant policy and legislation in each Canadian province and territory. This took place in early 2010. The purpose of this review was two-fold: (1) to identify arguments in favour of watersheds as expressed through public documents, and (2) to select (and procure background information on) provincial case study sites. To carry out this review, I searched legal databases and government websites to answer the following questions:

> 1. Is there a province-wide water policy or strategy in this province? What ministry is responsible?
>
> 2. What are the key pieces of watershed-related legislation in this province?
>
> 3. What is the organizational structure of watershed organizations in this province, and how do these organizations relate to other branches of government?

4. Is there a legal requirement for participation in water-related decision-making in this province?

5. How are watershed organizations funded in this province?

Based on the findings of this review, I selected four Canadian provinces in which to carry out interviews. The case study selection process is documented below, followed by background information on the four cites that were chosen.

2.5.2 Case study selection

Case studies are useful for 'how' or 'why' research questions focusing on contemporary events that do not require control over behaviour or events (Yin 2009, 8). These stipulations describe my research accurately. Moreover, a small number of case studies (as per below) within the Canadian example provide for a cross section, or 'snapshot' of current rescaling processes in Canada.

Within Canada are a number of provincial examples of watershed use. For the purposes of my analysis, two variables are of particular relevance, given how they affect the way in which the watershed approach is implemented. The first variable is the form that rescaling has taken (i.e., policy or legislation), and the second is whether or not participation is mandated.

The question of whether rescaling has taken place through policy or legislation is relevant because the latter is legally binding and; the former is not. Table 4, below, shows the variability across provinces with respect to the way in which the watershed approach has been implemented.

Table 4: Watersheds: policy or legislation?

Jurisdiction	Policy	Legislation
Alberta	Water for Life (2003)	
Saskatchewan		*Saskatchewan Watershed Authority Act* (2005)
Manitoba	The Manitoba Water Strategy (2003)	*Water Protection Act* (2006)
Ontario		*Clean Water Act* (2006)
Québec	Water. Our Life. Our Future. Québec Water Policy (2003)	*An Act to Affirm the Collective Nature of Water Resources and Provide for Increased Water Resource Protection* (2009)
New Brunswick		*Clean Water Act* (1989)
Prince Edward Island (PEI)	PEI Watershed Alliance[19]	
Northwest Territories	Northern Voices, Northern Waters (2010)	

As Table 4 shows, Saskatchewan, Manitoba, Ontario, Québec, and New Brunswick have all passed legislation mandating the creation of watershed-scale authorities; Alberta and Prince Edward Island (PEI) have not. Conversely, Alberta and PEI have set out clear provincial water policies (including specifications around watersheds), but these are not formalized through legislation or regulation. It should also be noted that of the five provinces with legislative Acts, some also have subsequent regulations. Regulations in Ontario detail the make-up of Source Protection Committees, and New Brunswick has specific regulations with respect to permitted and banned activities in the province's protected watersheds and wellfields.

[19] Although the PEI Watershed Alliance is not a formal policy, the Province is working with the alliance to develop one, and has committed $850,000 in support of the Province's 27 watershed groups.

The second variable relates to participation. As discussed at greater length in Chapters 3 and 4, participation is closely linked to watershed-scale governance initiatives. Indeed, increased participation of non-governmental actors – and the benefits associated with such expertise - is a frequently used rationale for a watershed-based approach, and extra-governmental involvement is often described as being part of a watershed-based governance model. The legislative and policy review demonstrates a high degree of variability embedded within the broad categorization of participation. In some cases, participation was mandated through legislation; in others, participation was encouraged, but not formalized. Table 5, below, shows how different provinces have incorporated participation into their watershed-scale governance models.

Table 5: Provincial variability on watershed participation

Province	Participation mentioned?	Participation legislated?
Alberta	Yes: in WPAC mandates[20]	
Saskatchewan	Yes: in Provincial Planning Model[21]	
Manitoba		Yes. The *Water Protection* Act stipulates that Water Planning Authorities must consult with relevant municipalities, Conservation Districts, and First Nations, and must hold one or more public meetings[22]
Ontario		In the case of Source Water Protection Committees, Yes. SWPCs must be split evenly between municipal representatives, commercial and industrial sectors, and 'other'.[23]
Québec	Yes. According to the province's	

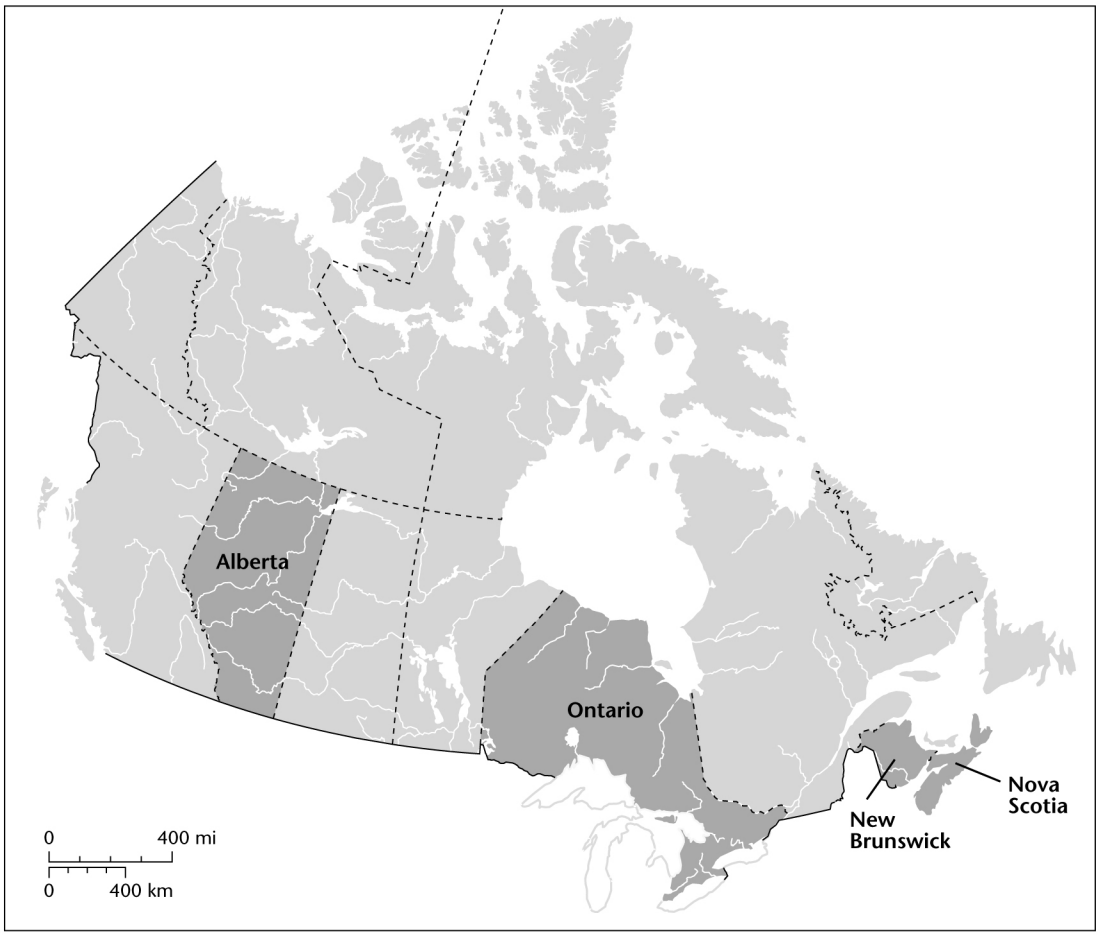
[20] See *Water for Life* Strategy (2003).
[21] See Government of Saskatchewan (2003).
[22] See the *Water Protection Act*, s. 17(1)(2).
[23] See s. 2 of Regulation 288/07 under the *Clean Water Act.*

Province	Participation mentioned?	Participation legislated?
	2003 water policy, watershed organizations should include elected municipal officials, as well as representatives from community and industrial groups. No one group can have a majority status.[24]	
New Brunswick	None	None
PEI	N/A	N/A
Northwest Territories	N/A[25]	N/A

I selected my four case study provinces based on the information above. The four case study provinces chosen were Ontario, Alberta, and New Brunswick, and Nova Scotia. These provinces are highlighted in Figure 2.

[24] See *Water. Our Life. Our Future.* Chapter 3, section 3.2.
[25] There was significant participation in the crafting of the strategy, but specific watershed organizations have yet to be established.

Figure 2: Case study sites



Map credit: Eric Leiburger

This combination of case studies offers two advantages. Empirically, it covers three major areas of Canada (central Canada, Atlantic Canada, and the Prairies), thus providing a representative 'snapshot' of water governance regimes across Canada. This snapshot also extends to the variety of water uses and economic circumstances displayed in Canada. Alberta, for example, is a dry province with significant agricultural activity (particularly in the south). The province is also home to the oil sands – a major source of water abstraction and political tension. Ontario presents an interesting case in that it is one of the longest-standing examples of watershed planning and management. Moreover,

Ontario's rapidly-growing municipalities are a significant source of water use. New Brunswick is a significantly smaller province – both in size and population, which makes it both politically 'nimble' and economically vulnerable. Nova Scotia presents a case of a province wrestling with the question of whether or not to rescale to watersheds (more below), as well as a diverse economy drawing on water for the purposes of agriculture, municipal growth, and tourism.

Second, this mix of study sites allowed me to look at a number of different factors impacting upon the ways in which water is governed. Table 6 summarizes these factors, which I then discuss in greater detail.

Table 6: Case study sites

Jurisdiction (uptake year)	**Early uptake**	**Recent uptake**	**Watersheds covering whole province**	**Legislative Basis**	**Participation**
Ontario (1946)	√		√	√	Legislative
Alberta (2003)		√	√		Policy
New Brunswick (2001)		√		√	N/A
Nova Scotia (not yet)			Under discussion		N/A

2.5.3 Study sites: background information

Ontario was one of the first jurisdictions in North America to implement watershed-scale governance. In 1946, the province introduced watershed-based Conservation

Authorities (CAs) under the *Conservation Authorities Act*. Ontario's CAs have a mandate to "ensure the conservation, restoration and responsible management of Ontario's water, land and natural habitats through programs that balance human, environmental and economic needs"(Conservation Ontario 2009a). They are funded through self-generated revenue as well as from both provincial and municipal governments; the balance between these sources of funding is continuously shifting. In 2007 the Conservation Authorities' boundaries were repurposed when the 36 CA boundaries were amalgamated into 19 Source Water Protection Areas with a different mandate (to protect drinking water) and different organizational structure (including regulations about the makeup of Source Water Protection Committees). CAs now have two roles: they retain their original structure and mandate, and are also part of larger organizations that use a larger watershed boundary definition for a different purpose.

The early use of watershed boundaries in Ontario shapes my research in several ways. On one hand, I was able to look at a wide array of challenges that extend far beyond the 'teething problems' of other jurisdictions, allowing for a better understanding of the implications of watershed-scale governance models. The province also has a rich policy literature on which I could draw to bolster my interview findings. On the other hand, the size and complexity of Ontario's governmental structure made it impossible to interview all relevant experts. Additionally, I could not draw on interviews to better understand the rationales for rescaling to watersheds, since the decision was made in 1946.

Alberta filled in some of the empirical gaps left by Ontario. Alberta's much newer *Water for Life* strategy (2003) divides the province's 650,000 km^2 into a dozen watersheds, each of which are charged with developing water management plans. These

plans can become law if they are approved by the provincial cabinet. Given the relatively recent uptake of their watershed model, I was able to speak with a number of individuals who were instrumental in the development and subsequent implementation of the province's *Water for Life* policy, under which watershed-based governance bodies were (and are still being) developed. Alberta's watershed organizations are called Watershed Planning and Advisory Councils (WPACs), and are described by the government of Alberta as follows:

> WPACs are important stewards of Alberta's major watersheds. They are independent, non-profit organizations that are designated by Alberta Environment to assess the condition of their watershed and prepare plans to address watershed issues. They also conduct education and stewardship activities throughout their watershed. WPACs typically include representatives of key stakeholders in the watershed, including provincial, municipal and federal governments, important industrial sectors, conservation groups, and Aboriginal communities. They engage watershed residents in their work and seek consensus on solutions to watershed issues (Government of Alberta 2011).

Like Ontario, the Alberta interviews were backed up by a rich policy literature; *Water for Life* has been the subject of extensive study in the grey and policy literatures.

Watershed activities in **New Brunswick** operate through two parallel processes. The first process is grounded in a pair of regulations designed to protect drinking water intake zones, which cover 4% of the Province's land area and include 21 municipalities and over 300,000 residents. These two regulations are the Watershed Protected Area Designation Order (which applies to surface water) and the Wellfield Protected Area Designation Order (which applies to groundwater). Under these orders, each protected area is subject to the same list of permitted and banned activities within specified distances of the watercourse in question. Both regulations are provincially managed, monitored, and enforced. The second process is a provincially-funded initiative that

works on a somewhat informal and ad-hoc basis to support the creation and maintenance of 30 Community Based Watershed Organizations (CBWOs), responsible for stewardship-related activities and stream classification.[26] Additionally, the New Brunswick case offers insight into the multi-scalar uptake of watersheds, as the federal government has been involved in the transition towards watershed-based governance in the St. Croix River Watershed, shared between New Brunswick and Maine.

At the time of research, **Nova Scotia** was undergoing a review of its water policy and was weighing the possibility of switching over to a watershed-based model for the province. As such, I was able to speak with decision-makers within the provincial government as well as with those working in the province's existing – but not yet formalized – watershed-based planning organizations. The Nova Scotia portion of the study thus represents a living example of how these decisions are made, as opposed to the other cases which present a retrospective on decisions that were made in the past.

2.5.4. Interviews

After identifying case study sites, I selected a number of experts to interview in each jurisdiction.[27] The initial contact list was expanded using snowball sampling methods in two phases: through an initial email contact, and then again in person, when an interviewee would identify a colleague or expert with whom they felt I should speak. In-person interviews were conducted in May, June, and September, 2010, and a small

[26] Interestingly, the province's environmental trust fund (ETF) is funded by revenues generated from the recycling of cans and bottles, as legislated under section 19 New Brunswick's *Beverage Containers Act.*

[27] I also interviewed a small number of federal-level experts, mostly with respect to the International Joint Commission's International Watershed Initiative (IWI), which involves a re-scaling of water governance along the Canada-US border; this was especially pertinent given that one of my case study sites (New Brunswick) hosts the IWI's first pilot project (the International St. Croix River Watershed Board).

number of telephone interviews with those who were not able to meet in person were carried out in this time period as well. In total, I conducted forty-nine interviews in five Canadian jurisdictions. Table 7, below, shows an anonymized tally of interviewee jurisdictions and organizations.

Table 7: Interviewee numbers, location, and expertise

	Government rep.	**Watershed rep.**	**NGO or Industry rep.**	**Independent / other**	**TOTAL**
AB	6	7	4	3	**17**
ON	6*	3	3	1	**13**
NB	3	2	1	2	**8**
NS	3	2	0	2	**7**
Fed	4	0	0	0	**4**
TOTAL	**22**	**14**	**5**	**8**	**49**

*This number includes staff at the Ontario Ministries as well as at Conservation Ontario

Interview questions varied depending on the jurisdiction and expertise of interviewees, but all focused on identifying the drivers (practical and ideological) of re-scaled water governance in their jurisdiction, exploring how this had played out on the ground, and identifying the governance implications this governance change had had (see Appendix A). Interviews typically lasted between 45 and 90 minutes, and took place in interviewees' offices or in public places. Interviews were digitally recorded, transcribed for content, and analyzed between September 2010 and February 2011. All contact with interviewees (including initial letter of contact) was conducted according to the University of British Columbia's Behavioural Ethics Research Board (see preface).

Together, the legislative, policy, and interview data from the four case study sites equipped me with the information necessary to answer my research questions. The range

of time frames, political environments, and economic conditions exemplified by the study sites, as well as the wide range of expertise of interviewees provided a rich body of data on which to draw. Chapter 3 draws primarily on the pan-Canadian legislative and policy review, and Chapters 4 and 5 draw primarily on interview data to address the central research questions.

3. AN EXAMINATION OF THE WATERSHED APPROACH: CHALLENGES, ANTECEDENTS, AND A CALL FOR FURTHER ANALYSIS

3.1 Introduction

This chapter addresses the first research question: "In light of past experience and existing (policy and academic) literature, what might we expect to find as the reasons for, and governance implications of, rescaled water governance in Canada"?[28] To answer this question, the chapter collects and analyzes policy and academic literature on the challenges and history of the watershed approach. In so doing, the chapter makes three assertions that lay the foundation for the next two chapters. First, it emphasizes that the challenges typically associated with watersheds are governance (as opposed to technical or management) challenges. Second, it argues that these challenges are symptoms of an important conceptual slippage: that watersheds were developed as a technical tool (i.e., topographically defined hydrologic drainage areas) but have been taken up as a governance framework. And third, on this basis, the chapter suggests that in the case study provinces we might expect to find conceptual fuzziness about why the transition to the watershed approach has occurred, and governance challenges associated with its implementation. The chapter also broadens debate over the utility of the watershed approach and lends analytic clarity to Chapters 4 and 5 by untangling watersheds from the governance concepts with which they are frequently conflated.

Within the conceptual framework for this dissertation, this chapter brings together insights from governance and environmental management, bridging the two subfields by bringing concepts and insights from governance and scale (i.e., scalar construction, the

[28] A version of this chapter appears as a co-authored paper in *Water Alternatives*. The citation for this paper is Cohen A, Davidson S, 2011, "The watershed approach: challenges, antecedents, and the transition from technical tool to governance unit" *Water Alternatives* 4(1) 521-534.

distinction between governance and management) to bear on questions of environmental management (i.e. the challenges associated with the watershed approach).

The chapter is outlined as follows. First, it outlines five recognized challenges associated with the watershed approach: the challenges of boundary choice, accountability, public participation, and asymmetries with what this chapter calls 'problem-sheds' and 'policy-sheds'. It then traces the development and evolution of the watershed concept – a trajectory that highlights a key disjuncture between the development of the watershed as a technical tool and its uptake as a governance unit. The chapter suggests that the effects of the conceptual jump from technical tool to governance unit are the challenges that have arisen with the increasingly popular watershed approach (i.e., those identified in the first part of the chapter). Finally, the third section speaks to the implications of this argument by calling for an analysis of watersheds in and of themselves. Examining watersheds as separate from IWRM and as separate from the suite of governance tools they have come to represent allows for inquiry into questions that speak to some of the challenges. When, for example, are watersheds useful or appropriate scales to use, and when might other scales (e.g. municipalities or regions) be a better fit? What kinds of decisions are best made at the watershed scale and what kinds of decisions are best made elsewhere? Inquiry into these kinds of questions would be helpful to water managers and environmental scholars seeking to better understand the implications of this popular governance scale. The chapter concludes by outlining what might be expected in the case study provinces in light of the findings in the chapter.

3.2 Watershed governance: implementation challenges

3.2.1 Boundary choice

A first challenge pertaining to watershed governance relates to the complex nature of boundary definition: even when the surface hydrology is clear (which is not always the case), the choice about which boundary to use is often not. Although the commonly used definition of a watershed as "an area of land draining into a common body of water" is clear and hydrologically based, it does not offer any guidance with respect to which watershed boundary is most useful for the purposes of governance or management. Using this basic definition, a watershed could be as small as a sidewalk puddle or as large as the Great Lakes – St. Lawrence basin. These infinitely nested watershed boundaries are often incongruent with other natural systems boundaries (Griffin 1999), such as ecosystems (Mollinga et al. 2007; Omernik and Bailey 1997), airsheds (Jaworski et al. 1997; Paerl et al. 2002) , and groundwater flow (Winter et al. 2003). Moreover, mapped hydrologic boundaries are constantly shifting as our understanding of surface water and groundwater flow and GIS technology become increasingly sophisticated. As a result of these hydrologic choices and changing information, choosing *which* watershed boundary to use is often a political act as much as it is a scientific one (Blomquist and Schlager 2005). Indeed, the nested nature of watersheds (and sub-watersheds and tributaries) lends itself to a number of different boundary options, and decisions about which hydrologic boundary (or boundaries) to use for the purposes of governance or management can be based on a combination of natural and social factors. Reflecting on this challenge, Collins and Ison note that "even where there is agreement on technical definitions, hydrological boundaries and functioning between, for example, surface and groundwaters are rarely clearly determined or fully understood" (2010, 7). Bonnell and Koontz (2007), for

example, discuss the practical factors that played into the way in which decision-makers demarcated the boundaries of the Little Miami River Partnership in Ohio, dividing it into four sub-watersheds in order to tackle the logistical challenges presented by the large geographic size of the watershed in question.

The province of Québec, Canada, provides another example of the complicated nature of boundary drawing. Québec's 2009 *Act to Affirm the Collective Nature of Water Resources and Provide for Increased Water Resource Protection* (R.S.Q. c. C-6.2) outlines the parameters for the province's creation of watershed-based governance entities. The *Act* states,

> the Minister of Sustainable Development, Environment and Parks may identify and describe hydrologic units, including watersheds, sub watersheds, and groups of watersheds... on the basis of such criteria as a) the area of hydrologic units, b) the territorial limits of Québec, the administrative regions or the regional county municipalities, as the case may be, c) the population density, d) the past cooperation, cohesion and harmony between the various users and stakeholders; and e) the environmental, social and economic homogeneity of development activities (s. 14(2)).

The Québec example shows how hydrologic and other factors (e.g. groundwater and surface water flows, political boundaries, population density) can complicate a seemingly straightforward mapping exercise. The existence of these kinds of choices complicates a decision that is purported to be a simple and purely scientific one.

3.2.2 Accountability

Ensuring the accountability of watershed-scale decisions and decision-making bodies is a second implementation challenge. Because watersheds are generally not aligned with conventional electoral boundaries – for example, municipal, provincial, state, or national boundaries – the usual pathways of electoral accountability do not necessarily apply, giving rise to concerns that watershed-scale organizations may not display answerability

or responsiveness to those living and working within the watershed (Blomquist and Schlager, 2005). Indeed, governmental participants in watershed-scale initiatives are ultimately responsible for, and accountable to, the jurisdictions in which they were elected or for which they are responsible (Salles and Zelem 1998); more often than not, this latter scale does not align with watershed boundaries. Sneddon (2002), for example, discusses the tensions between local and state actors engaged in the co-management of the Nam Phong basin in Thailand, arguing that government participants in such processes respond primarily to those scales with which they most relate; in this case, their jurisdictionally defined electorate, rather than the watershed.

Outside of elected officials, the challenges surrounding accountability speak to the question of delegating decision-making authority to non-elected parties, as a watershed approach typically includes extra-governmental participation. Accountability concerns – particularly with respect to extra- governmental participation in decision-making processes – are often related to the broader question of legitimacy. The conceptual shift from legitimacy as representation to legitimacy as participation was prompted in response to a community of scholars who, in the early 1970s, "launched a frontal attack on the dominant conceptions of liberal democratic theory", arguing that democracy had not only failed to live up to its promise, but has "led to elitist policies that have benefits for only the few" (Fischer 1993, 166). True democracy, so went the argument, must include decisions made not by government officials or technical experts, but by the citizens affected by those decisions (i.e. the public). This conceptual shift prompted the relabeling of legitimate decisions as those that were made by the people (Scharpf 1999) through participatory processes, rather than those made through traditional decision-making

channels by elected representatives.

In the case of the watershed approach, the accountability challenge can be seen as a function of the process through, and the degree to which, participants and stakeholders have been involved in the decision-making process. The boundary asymmetries between watersheds and municipal, provincial, state, and national electoral scales compound the challenges associated with the multi-stakeholder, participatory styles of decision-making that are, increasingly, seen as prerequisites for legitimacy and accountability.

3.2.3 Public participation and empowerment

Public participation presents a third implementation challenge. Arguments about the benefits of the inclusion and empowerment of local actors in environmental decision-making are often promulgated through arguments in favour of decentralised decision-making. The watershed approach represents both a scaling up from municipalities and a scaling down from nations, states and provinces, but the move has largely been framed as one of decentralization (e.g. Iza and Stein 2009; Kemper et al. 2007). Frequently-cited benefits of decentralization include: increased proximity between decision-makers and those affected by governance decisions, an increase in sub-national level democratic participation, greater access to local knowledge and expertise, heightened responsiveness to citizen needs and concerns, and empowerment of local communities (Gibbins 2001; Hill et al. 2008; Lemos and Agrawal 2006; Paehlke 2001).

The benefits of increased extra-governmental involvement and lower governance levels' potential to harness local expertise have gained particular traction in government and have been the subject of much research (Duram and Brown 1999; Sabatier et al. 2005). Rescaling initiatives, however, may fail to meet participation and empowerment

expectations. Norman and Bakker (2008), for example, show that despite significant rescaling of Canada-US transboundary water governance, higher orders of government have not loosened their grip on their decision-making power and local groups have not been empowered through the devolution process. This phenomenon is characteristic of what Fischer (2000) describes as the "discrepancy between the responsibilities people are given and the rights and powers they have, including the power to act on their responsibilities." Indeed, Warner (2007, 12) notes with respect to the case of participatory watershed governance:

> One important political reality is that states do not much like sharing power. For all the sea changes in public management in response to state overload and policy failures – working with societal actors, network management in which the state is a *primus inter paris* – many states are still not relinquishing much of their power primacy.[29]

Rescaling to the watershed then, does not in and of itself empower local or non-governmental actors, and there does not appear to be anything inherently participatory or empowering about rescaling.

3.2.4 Asymmetry between watersheds and 'problem-sheds'

A problem-shed, defined as a "geographic area that is large enough to encompass the issues but small enough to make implementation feasible" (Griffin, 1999) introduces a fourth implementation challenge: watersheds frequently impact – and are impacted by – factors outside of their boundaries. In other words, watershed boundaries (or, for that matter, any other boundaries) rarely encompass all of the physical, social, or economic factors impacting upon the area within its borders.

[29] Although governments keeping control may well be a function of their dislike for shared power, it may also be a function of the legal impossibility of abdicating their constitutionally prescribed roles. The point here is that while governments may be inclined to devolve responsibility, they are often either unable or unwilling to undertake a concomitant devolution of authority.

Physically, a watershed may be impacted by a number of factors, many of which may originate outside of the watershed (Mitchell 2005). For example, zebra mussels, introduced through ship ballast water to the Great Lakes, are an invasive species estimated to have cost the North American economy more than $100 million. They have also wreaked havoc on the natural ecosystem, causing the near death of some food webs, and encouraging others to grow out of control (Strayer 2009).

The problem-shed challenge applies to social issues as well. For example, individuals may not relate to or identify with a watershed boundary (Brun and Lasserre 2006). Grigg (2008) argues that the watershed approach presents false boundaries for decision-making since watersheds are essentially non-economic or social units. Similarly, Ferreyra et al. (2008) demonstrate a disjointed and potentially incompatible relationship between rural farming and source water protection efforts in rural Ontario, Canada. In this case, source water protection activities required farmers to associate and plan their activities based on the needs of their watershed, but farmers were more often drawn to the needs of the economic commodity chain related to their farming business.

These examples of asymmetries show that watersheds affect – and are affected by – physical, economic and social phenomena that extend beyond their boundaries. As Christensen et al note, "ecosystem management would be greatly simplified if management jurisdictions were spatially congruent with the behavior of ecosystem processes" (1996, 682), but, of course, they are not. Moreover, recent research into these boundary asymmetries suggests that the partitioning of watersheds from their surrounding physical, social, and economic milieus may generate new challenges (Cumming et al. 2006) – an issue that is revisited in Chapters 5 and 6 of the dissertation.

3.2.5 Asymmetry between watersheds and 'policy-sheds'

Unless all policy is made at a watershed scale (which is unrealistic, given international relations, transit within and between countries and regions, etc.), no single set of policies will ever wholly encompass the watershed. This is problematic in two ways. First, the asymmetry can lead to gaps and overlaps in legislation to be implemented by the watersheds' municipalities and regional governments. Second, it is hydrologically problematic: if policy cannot be made at a watershed scale, the hydrologic arguments for watersheds seem moot. Or, if policy *can* be made at a watershed scale (i.e. if there is legislation empowering them to do so), it can be stymied by the accountability challenge or by the administrative obstacles posed by coordinating with the other jurisdictions within its purview.

In this chapter, policy-shed is defined as a geographic area over which a governmental entity has legislative authority, such as a nation, state, province, county, or municipality. Like the accountability challenge, this challenge results from asymmetries between watershed boundaries and conventional administrative scales (i.e. policy-sheds). These asymmetries can be compounded by policy gaps and overlaps between the different policy-sheds themselves. In some cases, multiple policy programs will exist both within (frequently in a piecemeal fashion) and beyond the watershed such that "regional, provincial, federal, and international bodies may have different authorities in a given watershed" (Hoover et al., 2007). In the Canadian case, an additional mismatch relates to First Nations, whose concerns have often been excluded from watershed planning processes. In Ontario, for example, initial versions of the Source Water Protection Planning Processes made "no mention whatsoever" of Ontario's First Nations (Wilson 2004, 77), and only a small percentage of Ontario's First Nations (28 of 133)

have reserve land within a Source Water Protection Area (Halpin 2009).

In addition to the difficulties associated with the implementation of overlapping and potentially competing legislation, asymmetries between watersheds and policy-sheds can complicate data collection and monitoring. A plurality of jurisdictional boundaries provides ample opportunity for turf-wars or, conversely, buck-passing, both of which can hinder the ability of a watershed-scale authority (if such a group exists) to collect data effectively and monitor on a watershed basis.

Examples of the boundary asymmetries between watersheds and policy-sheds abound, particularly in fragmented, federated states like Canada. Environmental protection north of Toronto, Canada, provides an example of this phenomenon. In this case, the provincial government of Ontario moved to protect areas north of Canada's largest city through three pieces of legislation, the geographical scope of which overlap considerably. At present, three different pieces of legislation exist on a common geography: *The Oak Ridges Moraine Conservation plan* (2002, O. Reg 140/02), the *Greenbelt Act* (2005, S.O. 2005, c. 1), and, most recently, the *Lake Simcoe Protection Act* (2008, S.O. 2008, c. 23). Together, these pieces of legislation create a fragmented and patchwork policy landscape to which municipal and provincial governments must try to adhere.

3.3 Lost in translation: watersheds as tools and frameworks

The challenges noted above present significant obstacles for water governance. Efforts to tackle these challenges would involve altering boundaries for each problem in an attempt to obtain an accountable, participatory system that integrates the factors within and outside of a given watershed's boundaries and coordinating these with existing

governmental and non-governmental institutional boundaries. Governance at any scale – including the watershed – involves trade-offs between these factors. To assume that watersheds are somehow exempt from these trade-offs is perhaps unrealistic; as Lane et al. (2009) note, "rescaling governance and management is no panacea for the 'wicked' problems of institutional complexity and fragmentation". Or, as Brun (2009) notes, "management on a watershed basis is not a miracle solution".[30] Moreover, the challenges described above are some of the very problems that watershed-based governance models were designed to solve, but instead have perpetuated. This is not to say there is no use for the watershed boundary; there are many situations where watersheds can be extremely useful tools. However, the challenges do prompt interesting questions about how and when to use a watershed boundary. For example, what decisions are best made at the watershed scale and what kinds of decisions might best be made elsewhere? What are the relationships between watersheds and the tools and frameworks with which they have become conflated? This chapter does not attempt to provide a full resolution to these questions, but puts forth some potential paths of analysis that may prove fruitful.

3.3.1 Development and evolution of the watershed concept

Addressing the above questions requires inquiry beyond current water governance debates and into the development and evolution of watershed boundaries. This line of investigation is a nonlinear one, because the concept of watershed boundaries veers in, out, and across multiple water dialogues.[31] While the use of the watershed as a governance unit is a relatively new phenomenon, recognition of the utility of the

[30] Translation by Alice Cohen. Original in French reads "La gestion par bassin n'est cependant pas une solution miracle".

[31] An extensive history of the concept and implementation of watersheds is beyond the scope of this document. For a richer discussion, see Mitchell (2005); Molle (2009); Rahaman and Varis (2005); White (1998).

hydrologic boundary is not. Some evidence exists of watershed mapping extending as far back as the third century BCE China (Molle, 2009) and drainage areas were mapped in Spain and France in the mid-1800s (Blomquist and Schlager, 2005; Molle, 2009). By the twentieth century, managing water within hydrologic boundaries had become increasingly common.[32] Up to this point, the use of hydrologic boundaries was primarily driven by expertise in hydrology and engineering, with an emphasis on efforts towards flood control, irrigation and drainage, and power (Cervoni et al., 2008). In the 1950s, the incorporation of human use and the distribution of costs and benefits into this hydrologic model (Molle, 2009) led to a reframing of the dominant water management paradigm, which was coined as Integrated Water Resources Management (IWRM) in the 1950s (White 1957). The reinvention and re-emergence of IWRM in the early 1990s[33] included a broadened scope to include both natural and human components (Jønch-Clausen and Fugl 2001), largely due to the increasing recognition of the need to integrate economic, social, and natural resources under a single framework.

Some scholars have argued that the focus on IWRM in the 1990s did not introduce a new concept, but was rather "the rediscovery of a basically more than 60 year old concept" (Biswas 2004a, 249). Nevertheless, the 1990s saw the 'new'IWRM become increasingly mainstream through its adoption into international water dialogues (Rahaman and Varis 2005) and government planning (Leach and Pelkey 2001; McGinnis 1999). IWRM reached such widespread acceptance that it was suggested it had become the "orthodoxy of water resources management" (Jeffrey and Gearey 2006), part of the

[32] The Tennessee Valley Authority in the 1930s and the establishment of Conservation Authorities in Ontario (Canada) in 1946 are examples of the early use of hydrologic boundaries

[33] This re-emergence stemmed, in large part, from international dialogues at Mar del Plata (1977), Bonn (2001), and Johannesburg (2002) (Iza and Stein, 2009).

"holy trinity of water governance" (Warner et al., 2008) (which also includes river basin planning and multi-stakeholder platforms), and that it "enjoyed a 'near hegemony' as the language of international water policy" (Conca, 2006).[34] Through all of these transitions, proponents of IWRM maintained that watershed boundaries were the scale at which IWRM should ideally be implemented (Cervoni et al., 2008; Jønch-Clausen and Fugl, 2001; Jeffrey and Gearey, 2006). The 'old' watershed idea was thus reinvigorated through its suffusion into IWRM (Molle, 2009) as IWRM became increasingly popular.

3.3.2 Between science and policy: from watersheds as tools to watersheds as governance frameworks

At this point, the watershed narrative takes a twist: watersheds went from being a mapping and planning tool to a governance framework. The adoption of international IWRM water dialogues by regional, national, and sub-national government agencies and water policy planners appears to have been fixated on watershed boundaries. Rather than as an arm of IWRM or a technical tool (as framed by IWRM's antecedents), watersheds were recast as frameworks; the watershed approach became an umbrella under which other features of IWRM, such as participation and integration, fell. The United States Environmental Protection Agency (USEPA), for example, defines a watershed approach as one that is hydrologically defined, includes all stakeholders, and "strategically addresses priority water resource goals" (US EPA 2008b).[35] The USEPA framing exemplifies the chasm that formed between the way in which watersheds were framed by IWRM and its antecedents and the way(s) they were reframed by implementing

[34] For a more detailed discussion of the rise of IWRM through expert networks, see Chapter 5 of Ken Conca's *Governing Water: Contentious Transnational Politics and Global Institution Building* (2006).
[35] The USEPA is only one of many examples of this phenomenon. Borre et al. (2001), for example conceptualise a 'watershed approach' as one that includes citizen and stakeholder involvement, is focused on the geographic area of the watershed, and "promotes cooperation among different jurisdictions and organizations within the watershed".

organizations as watersheds moved from their conceptualization as a technical or planning tool to being conceptualized as a policy framework in the form of the new watershed approach.

One particular element of watersheds' uptake bears particular mention here. The concept of watersheds as tools emerged in the context of 19th century scientism (Molle 2009; Saravanan et al. 2009), during the rise of hydrological sciences (Linton 2008) and the triumphs of hydraulic regimes and high modernism. These technical origins and focus may have obscured, or at least drawn attention away from, the procedural or governance components of this 'new' watershed approach. It is thus perhaps more than coincidental that the foundations of the watershed approach are technical and its core challenges are not.

In other words, the challenges identified here can be seen as symptoms of watersheds' jump from a predominantly technical tool to a governance framework within the water landscape. As the concept of watershed boundaries was adopted into water governance efforts, this technical tool – which was not designed to address the broader components of water governance – became a governance unit, but without an attendant focus on the governance or procedural elements of the new watershed approach. The effects of this slip from technical tool to governance framework can be seen in the commonalities between the challenges identified in the first part of the chapter.

The challenges of boundary choice, accountability, participation, and the asymmetries between watersheds, problem-sheds and policy-sheds are challenges of governance; they are not scientific or technical challenges relating to issues such as the need for more data or better instrumentation. Though not unwelcome, enhanced monitoring, mapping, or

data do not address the roots of the challenges associated with watershed-based governance approaches, all of which relate to social, political, and economic decision-making, but have come to be associated with a hydrologic boundary. Air-sheds' influence on watersheds, for instance, can be framed as a challenge with the watershed approach, but might be usefully re-framed as a governance challenge resulting from affording primacy to one governance unit over another.

This chapter contends that the challenges associated with watersheds are perhaps not watershed-specific, but rather that they come to be associated with watersheds because the hydrologic boundaries of watersheds have come to be bundled (and therefore conflated) with a suite of governance tools under the rubric of the watershed approach. A brief example may help to illustrate this point. There is nothing inherently participatory about the use of a hydrologic boundary instead of a municipal boundary: one can easily imagine a scenario in which autocratic decisions are made at the watershed scale, or one in which there is rich public discussion at the municipal scale. Yet stakeholder participation has become an axiomatic component of watershed-based governance frameworks (Curtis et al. 2002), to the point where watersheds are almost synonymous with participation (e.g. Borre et al. 2001) and the challenges associated with public participation in decision-making are seen as problems associated with a watershed itself (e.g. Johnson et al. 2002). The conflation of watersheds with other governance tools is problematic because it complicates an analysis of the watershed itself – an analysis that cannot be undertaken without disentangling the watershed from its associated characteristics.

Discussions of scale in the geography literature can help to inform this disentangling. A central insight of the scalar literature is that scales of governance – e.g. nations, provinces, and municipalities – are socially and politically constructed through discourse, social contestations, and power structures (Delaney and Leitner 1997; Swyngedouw 1997a, 2004a). This constructivist perspective on scale sees scales not as predetermined administrative units, but as products of boundaries drawn through processes rooted in social power structures. Applied to watersheds, the scalar literature denaturalizes the watershed by refuting the dominant discourse of watersheds as nature's boundaries (Norman and Bakker, 2008) and therefore as an obvious, indisputable scale at which to undertake governance activities. The uptake of watershed boundaries can then be re-framed as a policy choice, rather than as an unquestionable scale at which good water governance must take place; watershed boundaries are recast as tools that can be selected, rather than de facto starting points for water governance initiatives.

3.4 Call for an analysis of watersheds as tools: some possible starting points

Re-framing the uptake of a watershed boundary as a tool to be selected rather than as an unquestioned starting point allows for a closer examination of watersheds. To date, such an analysis has proven impractical due to the conflation of watersheds with other governance tools, such as participation and integration, as well as the entanglement of watersheds with IWRM. Yet, as this chapter suggests, watersheds can, in fact, be disentangled from these other tools, thereby permitting an analysis of the purpose, utility, advantages, and disadvantages of watershed boundaries. Such analysis begets a number of questions. These include: when are watersheds appropriate or useful? What kinds of

decisions should be made at the watershed scale, and what kinds of decisions are best made elsewhere? How do IWRM and watersheds relate to one another; can you have one without the other? These possible starting points for analysis are discussed here.

3.4.1 When are watersheds appropriate or useful?

A first line of inquiry into an analysis of watersheds is the question of when watersheds are appropriate or useful. An analogous debate is already underway in the form of a rich discussion on citizen engagement, which has grappled with questions of when, and what kinds of, public participation are best suited to different types of policy decisions (Irvin and Stansbury 2004; Koontz and Johnson 2004). A similar discussion on the topic of when watersheds are and are not useful could be similarly rich, and is long overdue (Warner et al. 2008; Wester and Warner 2002). As a starting point for discussion, two examples of scenarios where rescaling to the watershed might be appropriate are identified below. The first is the case in which there is an issue that is specific to a particular size of watershed. One example here is the case of Ontario, Canada, in the 1940s, where erosion and flooding were having adverse impacts on property values and agricultural production (Conservation Ontario 2009b). In this case, watershed boundary delineation was informed by flood mapping. Although these boundaries are not ideal for every challenge the province faces (the conservation authorities in the Great Lakes Basin, for example, are governed separately despite the fact that they are all in the same basin), the initial process of boundary drawing was guided by problem definition. In cases where there is a similarly bounded challenge, clarity about why a particular set of boundaries were chosen may help to avert the challenges of boundary delineation and watershed asymmetries with problem-sheds.

Another scenario in which watershed boundaries may be appropriate is in the case of a jurisdiction-wide policy of re-scaled water governance. Literature on water privatization shows that reforms brought in to address particular governance failures are most effective when strong governance mechanisms, such as defined property rights, community involvement, or the capacity for monitoring and enforcement, are already in existence (Bakker 2007b,c; Challen 2000). In other words, good governance may be a prerequisite for – rather than an outcome of – governance reform. In the case of watersheds, rescaling is less likely to run up against the challenges identified here if a) the mandates of watershed organizations are clearly defined (thereby clarifying the scope of its policy-shed), b) the scope of their powers and subsequent governance structure are clearly delineated (thus clarifying actors' roles and mitigating some of the accountability challenges), and c) they are properly resourced (e.g. with expertise, equipment, human resources, and money) (Brun, 2009; Nowlan and Bakker, 2010). As such, watersheds may *not* be appropriate in cases where rescaling is being undertaken to address persistent governance challenges, such as lack of monitoring and enforcement, without concomitant attention to the underlying sources of the problem; such cases may perpetuate rather than solve governance failures. In sum, the above examples suggest that watersheds might be most appropriate in cases where there is an issue that is clearly best dealt with at a watershed scale (as opposed to watersheds being the panacea to all that plagues water governance), as well as in cases where the foundations of good water governance are in place in advance of rescaling.

3.4.2 Scaling decision-making

A second potential line of inquiry concerns what kinds of decisions should be made at

the watershed scale, and what kinds of decisions are best made at other governance scales. A comparable discussion can be found in the environmental governance literature on harmonization and subsidiarity, where debate has taken place with respect to questions about what kinds of environmental decisions might be best suited to which levels of government (e.g. Paehlke, 2001; Rabe, 2006; Hill et al., 2008).[36] Debate on scaling governance that includes an examination of watersheds as governance scales could prove particularly helpful. Two examples may be useful in illustrating this point. In Canada, drinking water guidelines set by the federal government are non-binding because of the separation of powers under the *Constitution Act* (1867, c.3), meaning that each province in Canada is responsible for setting its own binding drinking water standards. This approach, and the subsequent inconsistency of drinking water quality across the country, have been the subject of some critique (De Loë 2008; Eggertson 2008; Hill et al. 2008; Hill and Harrison 2006). These critiques suggest that in matters of public health, inconsistency is problematic and thus watersheds are perhaps not the place to make such decisions (they could, however, be tasked with identifying scale-appropriate means to meet a standardized set of ends). The same might be said for environmental water quality, where delegation to lower levels of government in the United States has led to measurable declines in water quality (Sigman 2005). These two cases suggest that setting quality standards is perhaps best left to higher orders of government.

A second example is the case of Lake Simcoe, in Ontario, Canada, where urgent action was needed in a watershed that was suffering from severe eutrophication due to phosphorus loading. Although the area did have a watershed organization, the scope of its

[36] In 2008, the tensions between the principle of subsidiarity and the benefits of policy harmonization were explored in the Canadian context, where the argument was made that "while *variation* [between Canadian provinces] may be appropriate, *fragmentation* is not" (see Hill et al. 2008, 315).

powers did not extend to legislating a reduction in phosphorus emissions. To address this issue, the province of Ontario passed the *Lake Simcoe Protection Act* (2008, S.O. 2008, c. 23), which requires that the various governments with jurisdiction within the Lake Simcoe watershed harmonize their management of land and water in accordance with the *Act* in order to reduce phosphorous runoff and emissions. Notably, the *Act* includes some subsidiarity, as some governance activities were delegated to sub-provincial governmental authorities; it mandates public participation in specific decision-making processes. This, then, is an example of a specific action taken at one level of government (i.e. the province), but targeted for another (i.e. the watershed). It suggests that not all watershed-scale issues need be resolved by watershed organizations alone; at times, it may be more appropriate to legislate at other governance scales, depending on the scope of powers for each level of government. This speculation ties back in with earlier comments about the necessity for clarity of roles within a re-scaled governance model. Thus, in answer to the question of what decisions are best made at a watershed scale and what decisions are best made elsewhere, this chapter offers two broad suggestions. First, standard-setting might be best done at other regulatory scales, and second, policy implemented at a watershed scale need not necessarily be created by a watershed-scale organization.

3.4.3 Disentangling watersheds and IWRM

A third possible analysis speaks to the question about the relationship(s) between IWRM and watersheds. As discussed in the introduction, one central difference is that IWRM is a management paradigm for water management whereas watersheds are geographic units encompassing both land and water. Yet the two are consistently

conflated, and the relationship between them is far from agreed upon. Saravanan et al. (2009), for example, see watersheds as a management instrument of IWRM; Molle (2008) takes a more critical approach in his exploration of narratives in water policy, seeing IWRM as an unattainable "nirvana concept" that provides justification for river basin – (or watershed) scale governance models.

Future analyses could look at, for example, what scales best facilitate integration of different water governance components (land and water, surface water and groundwater, different branches of government, and so on), or how participation and integration may or may not work together. Teasing apart IWRM's components could lead to a richer analysis than our current understanding allows. In fact, the Global Water Partnership, a leading body on IWRM, advocates for the context-driven application of IWRM principles and strategies, specifying that "there is not one correct administrative model. The art of IWRM lies in selecting, adjusting and applying the right mix of these tools for a given situation" (GWP 2010).

If existing governance frameworks are weak and watershed-scale capacity is low, there is no reason to believe that rescaling integration will be met with any greater success than integration at existing scales; indeed, it may compound problems by delegating challenges to new institutions with low capacities. If, however, the watershed(s) in question have the capacity to take on a new, more integrative model, there is no reason why they are less eligible to do so than their jurisdictional counterparts. In essence, watersheds are one possible element of integration, but need not be their foundation. Moreover, particular components of the IWRM package may be more or less palatable in different locales. Chess and Gibson (2001), for example, note that public

appetite for watershed-scale participation is uneven, and that in some cases, the desire to participate in such initiatives is minimal. To implement a watershed-scale governance model in these locales is unlikely to succeed in its aims.

While the use of IWRM, watersheds, or any other number of water governance reforms may be most tempting in situations where existing water governance regimes are inadequate or are failing to meet basic needs, these are the cases where such reforms are most likely to be met with significant challenges. Breaking out the component parts of IWRM and querying how the different component parts of IWRM may or may not be appropriate on a case-by- case basis is a more fruitful line of inquiry than a panacea approach to the application of the IWRM package. As such, watersheds may be useful to include in IWRM in some cases, and in other cases, not. As such, watersheds might be most usefully thought of as a negotiable component of IWRM, and may be better suited to some applications of IWRM than others.

3.5 Conclusion: what might we expect in the case study provinces?

This chapter sought to answer the research question about what we might expect to find as the drivers and implications of rescaled governance in the case study sites. In answer to this question, the chapter suggests that we would expect to find conceptual slippage around the idea of watersheds and a number of governance challenges associated with the implementation of the watershed approach.

In Canada and elsewhere, the use of watershed boundaries was tied to efforts to address environmental issues more effectively, yet challenges associated with the unit's use continue to beset its implementation. Through an examination of these challenges in

light of the emergence and development of the concept of watersheds, this chapter has argued that the jump from watersheds as technical tools to watersheds as governance frameworks has been problematic. In particular, the chapter suggests that governance challenges may be symptoms of the lack of attention to governance issues in the transition from tool to framework. As such, the challenges might not necessarily lie with watersheds *per se*, but with the governance tools and paradigms with which watersheds have been conflated under the rubric of the watershed approach.

By untangling watersheds from other concepts with which they have been conflated, watersheds can be re-framed as tools, or choices, that can be marshaled in support of particular policy goals, rather than as mandatory, unquestionable starting points for effective water governance. Teasing apart watersheds in this way facilitates a foray into an analysis of watersheds in and of themselves. The next two chapters of this dissertation undertake this kind of examination and explore how the case study sites line up (or not) with what might be expected.

4. WATERSHEDS AS BOUNDARY OBJECTS: SCALE AT THE INTERSECTION OF COMPETING IDEOLOGIES

4.1 Introduction

This chapter addresses the second research question: "Why have watersheds become so popular in Canada, and what epistemic communities are reflected in their uptake"? [37] Building on the analysis in Chapter 3 (and on the 'conceptual slippage' piece in particular), this chapter argues that watersheds, as specific forms of re-scaled environmental governance, have increased in popularity in the case study areas because of their status as boundary objects; that is, a common concept interpreted differently by different groups. More specifically, in this chapter I show how particular features of the watershed approach – namely their physical size and the discursive framings they are associated with – reflect and are shaped by three different and occasionally competing social worlds: the scientific, neoliberal, and participatory engagement communities.

In the course of interviewing participants, it quickly became clear that policy documents and interviewees frequently used 'watershed' and its associated governance tools (i.e. 'stakeholder participation', 'integration') in very different ways – ways so different, that it soon became apparent that these variations were a reason – or even perhaps *the* reason – that watersheds held such widespread appeal. In other words, it seemed that the conflation of watersheds with stakeholder participation and integration, together with the plural understandings of these cognate terms, was perhaps one of the reasons why watersheds had become so popular.

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[37] A version of this chapter has been accepted for publication in *Environment and Planning A*.

The research presented in this chapter draws primarily on original interview data from the case study context to explore the plasticity of watersheds and their associated concepts. Using this data, I argue that this conceptual flexibility has allowed watersheds to become boundary objects (a term coined by Star and Griesemer in 1989): something that is interpreted differently by different groups. In this case, the groups (adherents to neoliberalism, scientism, and participatory engagement) represent different 'social worlds' (to use Star and Griesemer's language) espousing different ideologies about the way that relationships between nature, citizens, and government ought to be structured. The chapter shows how the three distinct communities have converged around the desirability of the watershed approach – although each for very different reasons. To neoliberal adherents, watersheds are non-governmental, decentralized scales; to those concerned with science, watersheds are scientific, apolitical, natural scales; to those concerned with citizen involvement in environmental decision-making, watersheds are scales that can encourage and enhance citizen participation. Conceptually, the chapter is situated at the intersection of debates in environmental management and critical geography (see Figure 1, p. 7).

The chapter is organized as follows. First, I provide background and context, explaining why a scalar framework is useful for the arguments I make in this chapter and outlining the key findings from the legislative and policy review with respect to the policy rationales for rescaled environmental governance in the case study areas. Next, I introduce Star and Griesemer's concept of boundary objects – in particular their characteristics as interpretively flexible, and simultaneously vague and specific. This is followed by a brief outline of three social worlds – scientific, neoliberal, and

participatory engagement – that converge around the concept of watersheds. I then identify two features of the watershed approach that facilitate watersheds' uptake as boundary objects: physical size and shared discursive framings. Finally, the conclusion explores the implications of the research findings for ongoing and future research on the rescaling of environmental governance and state-nature relations.

4.2 Background and context: watersheds as rescaling

Building on the discussion developed in Chapter 3, I adopt a denaturalized view of watersheds, framing them as constructed through socio-ecological processes rather than as pre-determined natural units. This approach is consistent with a scalar geographic analysis, which sees political units as the expression of ongoing discourses, power structures, and social struggles (Cox 1996; Delaney and Leitner 1997; Smith 1992; Swyngedouw 1997b) rather than as predetermined administrative boundaries divorced from their social and political contexts.

Although considerable debate continues with respect to the utility of the concept of scale (Jonas 2006; Marston et al. 2005), a scalar approach is useful for the research presented in this chapter for two reasons. First, a constructivist approach allows for a critical analysis of the factors facilitating the transition to a new governance scale. In other words, given that hydrologic understanding dates back to at least the third Century B.C.E (Molle 2009) and that members of the scientific community have been advocating a watershed-based approach for over a century, why is it that the watershed approach has only been taken up relatively recently? And second, a scalar approach applies critical analytics to the relationships between space, power, and social relations. In so doing, it

rejects the notion that larger geographic areas are more powerful than smaller ones, and seeks to understand the relationships between actors and the scales at which they interact (i.e. household, community, municipality, region, province, nation and so on), and to identify and analyze the networks between and across these spatially bounded units.

Together, these features of a scalar approach enable me to look beyond naturalization in seeking out an explanation for the increasingly popular use of watershed boundaries for the purposes of water governance. Indeed, as Whitehead et al. (2007) note, states frame nature in part through the territorialization (and re-territorialization) of space (i.e., through boundary-drawing and rescaling governance processes), and I suggest here that the case study provinces are influenced by, and indeed are part of, the ideologies and epistemic communities that have shaped the move towards watersheds.

Rescaling entails a move from one level to one or more others, most commonly framed as a 'hollowing out' from the national (Batterbury and Fernando 2006; Himley 2008; Leitner 2004; Swyngedouw 2004b). Critiques of the 'hollowed out state' rescaling narrative (e.g. Jessop 2004) are quick to point out that this prototypical rescaling incorrectly casts this move as simple and homogeneous (Mansfield 2005; Perreault 2005). Moreover, even when some governance functions are moved away from national capitals, in many cases authority still resides with higher orders of government (Norman and Bakker 2008; Ribot et al. 2006; Warner 2007).[38] Rescaling has received particular attention in the context of neoliberalism (e.g. Harris 2005; McCarthy 2005; McCarthy

[38] In addition to these studies of power relations between local (or regional) scales and national and provincial capitals, a number of works have studied the power relations within watershed-scale organizations (e.g. Sneddon 2002). Almost invariably, this body of work concludes 'real' authority is rarely delegated through the process of rescaling. I am fully cognizant that scale and power are deeply intertwined and although the interplay between these factors surely influences the phenomena under examination here, a comprehensive examination of power relationships is unfortunately beyond the scope of this paper.

and Prudham 2004), which often emphasizes the importance of physically smaller scales of government – and of municipalities in particular – in carrying out state functions in what has come to be known as the 'new localism' (Brenner and Theodore 2002; Jessop 2002).

Watersheds present a rather unusual case of rescaling in two ways.[39] First, rescaling to the watershed is not a case of one level of government delegating to another: it is one level of government delegating to a new, quasi-governmental authority. Second, a watershed's boundaries are determined in large part by hydrologic mapping rather than by jurisdictional lines, thereby endowing them with a label of naturalness that helps boost their popularity. These two factors mean that watersheds represent a unique kind of rescaling: delegation to a (so-called) natural scale without a pre-existing government.

I undertake to explore the way that watersheds are constructed, shaped, and reinforced as scales by tracing the ways various ideological and epistemic communities (or 'social worlds') have shaped the uptake of these governance scales. I recognize, of course, that individuals and organizations work at multiple scales and that social worlds are dynamic, evolving dialogues. As such, I do not draw causal relationships between particular sociopolitical events and rescaling to watersheds, (e.g. Thiel and Egerton 2011). Instead, I focus on the plausibility of a plural explanation that sees watersheds as a point of convergence between the three different social worlds (to borrow Star and Griesemer's language) of scientism, neoliberalism, and participatory engagement communities. I am concerned with the various ways in which these social worlds have shaped the

[39] The "boom" of parks, preserves, and protected areas in Latin America and the Caribbean (Zimmerer 2002) is somewhat analogous to the watershed case. However, it is not entirely transferrable because of water's flow characteristics (Bakker 2004) that form the upstream/downstream dynamic so central to many advocates of the watershed approach.

construction of watersheds as governance scales, supported their uptake in a variety of different jurisdictions and geopolitical contexts, and framed watersheds in a way that was consistent with their beliefs. Ultimately, I argue that watersheds' conceptual malleability – that is, their ability to bridge three divergent communities – has driven their widespread popularity.

Before proceeding, I provide a summary of the findings of a comprehensive legislative and policy review carried out before the fieldwork. The purpose of the review was to identify arguments in favour of watersheds as expressed through public documents; I enumerate these here to ground the comments that follow in the next section.

In Canada, many policy documents at both federal and provincial levels (e.g. Borre et al. 2001; Morin 2009) simply state that watersheds are widely recognized as the best scale at which to govern water, or, equally common, dive headlong into recommendations for doing watershed governance better (e.g. Ontario and des Chaleurs 2003) without stopping to explain (let alone query) *why* the watershed approach is taken up in the first place. Among those that did elaborate, three dominant rationales could be discerned.

By far the most prevalent argument found in the Canadian (and indeed international) policy literature is that watersheds are a natural scale for decision-making – a claim echoed in much of the policy literature in Canada (e.g. Government of Nova Scotia 2010; Hoover et al. 2007; OMNR 2009; Ontario and des Chaleurs 2003) despite ongoing dispute in the ecologic and hydrogeologic communities about the definition and utility of watershed boundaries (Meyer and Swank 1996; Omernik and Bailey 1997; USGS 2008). These arguments reflect trends in environmental governance more generally, which has

sought to establish governance regimes that align more closely with natural ecological systems (Grumbine 1994; Slocombe 1993).

A second policy rationale is related to IWRM and argues that watersheds are the best scale at which to integrate the multiplicity of factors that influence (and are influenced by) watersheds. In this view, watersheds are the cure to the myriad problems plaguing water governance: jurisdictional and departmental fragmentation, poorly integrated land and water management programs, the exclusion of economic incentives for water conservation, and so on. Morin (2009), for example, contends that watershed-based IWRM is "widely recognized as the preferred way to deal with water challenges and provide[s] a necessary compliment to high-level regulatory directives" (2009, 1). Given recent attention to fragmented water governance both in Canada (Bakker and Cook 2011) and internationally (e.g. Edelenbos and Teisman 2011), the appeal of an integrative approach is hardly surprising.

A third policy rational is participatory, and is premised on the idea that watershed boundaries are more conducive to participation than their jurisdictional counterparts, and, as such, that a rescaling to watersheds will lead to more participatory decision-making. This rationale is by no means unique to Canada, but is certainly leveraged in the Canadian case. In Manitoba, for example, the province's guiding water policy (*the Manitoba Water Strategy*) states that "Watershed planning allows residents, landowners and others with an interest in the future of the watershed to make their own decisions on how to manage the watershed for the future" (Government of Manitoba 2009), and the province of Alberta notes that "Because the people who are immediately affected by specific water issues can also more directly and effectively find solutions to address them,

the focus of Water for Life is to adopt a watershed approach to management" (Government of Alberta 2003, 15).

With these rationales in mind, I present below the argument that watersheds hold the widespread appeal they do because – at least in part – these rationales speak to diverse and occasionally competing broader socio-political themes.

4.3 Watersheds as boundary objects

4.3.1 Boundary object as analytic framework

Star and Griesemer (1989) describe boundary objects as "both adaptable to different viewpoints and robust enough to maintain identity across them" (1989, 387). Note that the concept of *boundary objects* is quite distinct from the concept of *boundary work* (Gieryn 1983), which is grounded in sociology and focused on the "objectified forms of social differences" (Lamont and Molnár 2002, 168) through analyses of socially constructed demarcations between social groups, often focusing on gender, race, class, or profession. In contrast, the study of *boundary objects* focuses on concrete or abstract objects around which different 'social worlds' (Star and Griesemer 1989) can converge because these objects are interpreted differently by different groups ("interpretive flexibility").

Boundary objects also serve different roles in different contexts: in broad contexts with a heterogeneous audience they are vague, but when the object is taken back to a particular, homogeneous group for further work it becomes interpreted in a particular,

specific way. Star and Griesemer (1989) describe boundary objects in more detail as follows:

> Boundary objects are objects which are both plastic enough to adapt to local needs and the constraints of the several parties employing them, yet robust enough to maintain a common identity across sites. They are weakly structured in their common use, and become strongly structured in individual-site use. These objects may be abstract or concrete. They have different meanings in different social worlds but their structure is common enough to more than one world to make them recognizable, a means of translation. The creation and management of boundary objects is a key process in developing and maintaining coherence across intersecting social worlds" (1989, 393).

Analogously, Brosius et al. (1998) write about the "traveling concepts" of community, territory, and indigeneity in their work on Community-Based Natural Resource Management, which was widely taken up in the Global South in the late nineties through joint efforts between conservationists and development organizations. In the work presented here, I focus on particular concepts associated with watersheds and how these have been used in different ways by different groups.

The research findings below demonstrate how the move from jurisdictional to hydrologic boundaries for the purposes of water governance is a policy shift supported by actors in three different communities because of the interpretive flexibility of the terminologies associated with this particular form of rescaling.

Like Löwy (1992), I group Star and Griesemer's four types of boundary objects into the categories of concrete and abstract boundary objects for the purposes of this chapter.[40]

[40] Löwy (1992) describes these concrete and abstract categories as 'boundary objects' and 'boundary concepts'

The two concrete types are:

1. **Repositories**: ordered collections of objects indexed in a standardized fashion and built to deal with problems of heterogeneity caused by differences in unit of analysis.

2. **Standardized forms**: a method of common communication – standardized indexes - across dispersed work groups.

The two abstract types are:

3. **Coincident boundaries**: objects with the same boundaries but different internal contents arising in the presence of different kinds of work distributed over a common, large-scale geographic area.

4. **Ideal types**: diagrams, atlases, or other descriptions which do not accurately describe the details of any one locality or thing, and that are adaptable to a local site precisely because they are fairly vague.

This chapter is concerned with abstract boundary objects and presents below different features of the watershed approach that serve as 'coincident boundaries' and 'ideal types'. I do this in two ways.

First, I explore the coincident boundaries of watersheds by highlighting the interpretive flexibility of the particular size of watershed under investigation. In other words, I examine how the same physical boundary reflects ideas, methods, and interpretations from three somewhat distinct social worlds.

Second, I employ Star and Griesemer's notion of ideal types to my investigation of particular terminologies associated with watersheds. In so doing, I also address what Star (2010) calls the "tacking back and forth" (2010, 604-5) of ideal type concepts between their vague use in heterogeneous collaborative groups and specific interpretations within homogenous disciplines or epistemic communities. In response to Star's recent lament that scholarly analysis of boundary objects has tended to focus on their interpretive

flexibility alone (2010), my analysis of ideal types focuses on the use of shared discursive framings – that is, the prevalent association of watersheds with particular terminologies that can be (and indeed, are) interpreted differently by different groups.

4.3.2 Watersheds at the intersection of three social worlds: scientism, neoliberalism, and participatory engagement

I discuss below the three communities, or 'social worlds', that are reflected in watersheds. Star and Griesemer's social worlds terminology can be likened to the idea of epistemic communities, which accurately describe the groups I explore below. The most widely accepted definition of an epistemic community comes from Peter Haas, who provides the following definition: "a network of professionals with recognized expertise and competence in a particular domain and an authoritative claim to policy-relevant knowledge within that domain or issue-area" (Haas 1992, 3). Moreover, Haas contends, epistemic communities share a set of normative and principled beliefs, a set of causal beliefs (i.e., a shared interpretation of linkages), shared notions of validity (i.e. internally defined criteria for validating knowledge), and a common policy enterprise. In other words, these social worlds or epistemic communities represent groups of like-minded experts working toward common goals.

The three communities presented did not all emerge at once, but their co-existence in the latter half of the twentieth century has, I suggest, facilitated the uptake of watersheds as governance scales, offering insight into the question of why watersheds have only been taken up relatively recently. Specifically, the interview data suggest there are particular components of the watershed approach that appear to resonate simultaneously with various elements of these three 'social worlds'.

Before proceeding, I present two caveats. First, I am not proposing a direct causal relationship between the development of these communities and the uptake of watersheds. Rather, I am suggesting that the development of these communities facilitated the switch from jurisdictional to watershed boundaries in a variety of indirect ways: by introducing citizens to particular ideas, generating and using discursive tools (i.e., comanagement), increasing public appetite for public engagement, privileging some planning and governance regimes over others, encouraging government employees to be more responsive to some ideas than others, and so on. Second, I highlight here that the social worlds are presented below in a rather simplified, essentialized fashion. Nevertheless, they are presented here for the purpose of argument characterization, and represent the kinds of logics that have helped to shape watersheds' uptake.

4.3.2.1 Scientism

'Scientism' is commonly used to denote the centuries-old belief that science is the most valuable part of human knowledge because it provides authoritative information by way of its special access to objective truths (Sorell 1994). Of course, these truth claims have been subject to scrutiny, most notably through Science and Technology Studies, which, among other things, highlights the subjectivities and constructions within scientific communities (e.g. Hess 1997; Jasanoff 1990; Shapin 1994). Debates about the role of science in society are relevant here because watersheds have been taken up as governance scales in large part because of their supposed 'naturalness' (Blomquist and Schlager 2005). The claim that watersheds' naturalness exempts them from the political messiness of jurisdictional boundaries draws heavily on the idea of science's objectivity and, consequently, its privileged position in policy making. It is also worth noting here

that, of course, there are fault lines within the scientific community. Wester and Warner (2002), for example, note that hydrologists, geographers, and ecologists all have different reasons for asserting that watersheds are natural.

4.3.2.2 Neoliberalism

A second social world, neoliberalism, refers to trends in political and economic restructuring since the 1970s involving, *inter alia*, privatization, deregulation, localization, decentralization, and "the state-led encouragement of civil society groups to provide services that interventionist states did, or could potentially, provide for citizens" (Castree 2008b, 142; Peck and Tickell 2002). Theorists often pay specific attention to the relationship between environmental rescaling and neoliberalism. As detailed in Chapter 1, many geographers contend the rescaling of environmental governance is a politically charged act, often reflecting particular pieces of neoliberal ideologies. Indeed, McCarthy and Prudham (2004) note, "Neoliberalism entails the construction of new scales ('the global market'), shifting relationships between scales ('glocalization,' the alleged hollowing out of the nation-state), and engagement with many scale-specific dynamics, all of which take shape and become tangible in the context of particular cultural, political and institutional settings" (2004, 279). Relationships between particular components of neoliberalism and certain environmental issues – most notably water service delivery and community forestry – have been addressed in previous studies highlighting the "strange bedfellows" (Bakker 2007c, 446) relationship between decentralized, community-based arrangements and some aspects of neoliberal agendas.

4.3.2.3 Participatory engagement communities

A third social world – what I call here the participatory engagement community – stems from the evolving conceptualizations of legitimacy in the latter half of the twentieth century. Conceptualizations of legitimacy have evolved in recent decades to include not only output, but input legitimacy. Output legitimacy refers to the outcome of a particular policy or program: Do programs perform and deliver the promised results? Are the program's outcomes fair? Do they promote the common welfare of the political community (Bäckstrand 2006; Scharpf 1999; Skogstad 2003)? Input legitimacy focuses on the legitimacy of decision-making processes, rather than their outcomes. Input legitimacy is concerned with questions about what kinds of processes can best incorporate citizen concerns, facilitate buy-in, and ensure participants' genuine consent (Beierle and Cayford 2002; Fischer 2000; Sabatier et al. 2005). In part because of the pragmatic benefits, but also in part because of increasing normative concern with doing what is right with respect to process, attention to input legitimacy has led to increased citizen participation in watershed-scale decision-making (Bulkeley and Mol 2003). Indeed, as Sabatier et al. write, "If produced by a dictator's fiat or coercion of policymakers, few would regard [watershed policy] as legitimate, even if it were effective" (2005, 55). Accordingly, the legitimacy of environmental (and watershed) policies has been re-focused on the processes and procedures used to define and meet particular goals.

4.4 Constructing watersheds: physical size and shared discursive framings

As James McCarthy (2005) notes, place-based initiatives (in the case of his research, community-based forestry; here, watersheds) arise out of a complex amalgam of

governance, political agendas, history, and geography, reflecting multiple ideologies and communities. I present below the results of case study research showing how ideologies of particular epistemic communities are reflected in the support for watersheds in Canada.

The findings below draw on case study data from research in the four case study provinces. Interviewees were not classified as belonging to one or more of the social worlds identified above, but I show below how their insights and opinions reflect these various ideologies and epistemic communities.

4.4.1 Coincident boundaries: physical size

Star and Griesemer define coincident boundaries as "objects with the same boundaries but different internal contents" arising in the presence of different kinds of work "distributed over a common, large-scale geographic area" (1989, 410-411). The physical size of watersheds offers an example of Star and Griesemer's coincident boundary. The particular size of watersheds taken up in the four case study areas represents a singular, agreed-upon boundary within which different kinds of work - and indeed different interpretations of that work - occur.

Watershed-scale governance initiatives typically occupy a physical space bigger than a municipality and smaller than a province or state, while occasionally crossing municipal, state, or international boundaries. Importantly, watersheds constitute an entirely different size of hydrologic boundary than large-scale river basin projects, such as the Tennessee Valley Authority or the Mekong River Commission, both of which encompass significantly larger physical areas and address a broader suite of issues, often including issues like hydropower or agricultural planning.

The particular size of watershed under investigation here can be conceived flexibly: it appeals to a number of seemingly conflicting groups. Namely, watersheds' size appeals to the scientific community through its use of hydrologic boundaries, and satisfies both sides of the harmonization versus subsidiarity debate (Hill et al. 2008; Rabe 2006) by constituting both a decentralization (down from states or provinces) and centralization (up from municipalities).

Members of the scientific social world have been long-standing supporters of watershed-scale governance initiatives on the premise that watershed boundaries are topographically-defined and that, by extension, using these boundaries for water governance internalizes many of the externalities complicating water governance along jurisdictional lines. Summing up this concept, one interviewee described the situation in Ontario: "You're sitting in the middle of a lake going 'what are we going to do about these dead-zones?' You have to go upstream and look at the land use activities and then be able to do something about it. So even though it's more complex, if you don't do it you won't be able to get at the problem."

The argument that watersheds represent nature's boundaries came up repeatedly in interviews, with statements such as "They're natural features", "it is the rational way to manage water resources", and "nature doesn't observe political boundaries" used frequently to emphasize the perceived natural, apolitical nature of hydrologic boundaries. In policy work, too, this naturalness is emphasized. The Conference Board of Canada's 2007 report, *Navigating the Shoals*, states "A watershed is the *natural unit* for governing and managing water resources" (Hoover et al., 2007, 8, emphasis added). Ontario's Ministry of Natural Resources describes how watersheds offer "natural limits" for

managing interconnections between land and water (OMNR, 2009), and Nova Scotia's 2010 water policy highlights the utility of the watershed as a unit of analysis for understanding cumulative effects (Government of Nova Scotia, 2010).

The uptake of watersheds as so-called natural governance scales highlights a number of key points about watersheds as boundary objects. First, naturalized watersheds obscure the fact that watersheds are but one kind of natural boundary (Griffin, 1999), a category that also includes airsheds (Paerl et al., 2002), ecosystems (Omernik and Bailey, 1997), biomes, groundwater flow, and so on (e.g. Winter et al. 2003).

Second, the naturalization of watersheds masks the connection between humans and nature. The claim that watersheds are nature's boundaries can obscure the role humans play in determining a watershed's boundaries, by either altering the physical landscape with, for example, irrigation infrastructure and forestry practices (Wilcox 2010), or by making decisions about *which* hydrologic boundary to use (Blomquist and Schlager, 2005) by, for example, grouping together or teasing apart a number of smaller watersheds. For instance, the Toronto Region Conservation Authority (TRCA) has nine sub-watersheds within its boundaries, and drafts watershed plans for each.

The naturalization of watersheds has important consequences when considering the construction of watersheds as governance scales. Framing watersheds as natural can prematurely cut off meaningful debate on appropriate institutional arrangements for water governance. By presenting watershed boundaries as natural, "they acquire a supernatural, untouchable, legitimacy" (Warner et al. 2008, 123-4) such that a queston of rescaling becomes uncontroversial and apolitical if watersheds are framed as the only option (Wester and Warner 2002). The questions posed at the end of Chapter 3 about when

watersheds are appropriate or useful are important, yet fall by the wayside when rescaling is framed as a simple, straightforward, logical and scientific choice driven by watersheds' naturalness. Additionally, the naturalization of watersheds prioritizes and gives legitimacy to certain biophysical features over others. If the hydrologic flows defining watersheds are "nature's boundaries" (and I emphasize that even within the scope of hydrologic flow there is human intervention), then what of other biophysical demarcations, such as groundwater flow, air movement, species migration, forest growth patterns, and so on? There is nothing inherently better or worse about prioritizing any of these, but by defining one as preeminently natural, other features of the biophysical landscape are diminished.

Additionally, watersheds are typically framed as local. They are a scale to decentralize *to*. As such, the arguments in support of decentralized governance – i.e. proximity of decision-making to implementation, more appropriate regulation, heightened responsiveness to local needs, and increased non-governmental involvement – are often leveraged in support of the switch towards watershed boundaries. This is particularly interesting given that, from a municipal perspective, watersheds are anything but decentralized. As one interviewee noted: "The watershed is the regional scale; to me, local is municipal. To suggest that these major basins are somehow local is - whoa".

Physical size thus presents an interpretively flexible feature of watersheds. The decentralized, smaller-than-a-province size and its association with public engagement appeals to participatory engagement groups concerned with input legitimacy, community involvement, and public participation. Watersheds' physical size can also reflect elements of neoliberalism, where the smaller-than-a-province size aligns with particular

ideas about decentralization. A watershed's boundaries also appeal to members of the scientific community who see these boundaries as natural. We thus see three distinct communities converging, in the latter part of the twentieth century, on the desirability of a particular size of hydrologically defined watersheds at the sub-provincial scale – although for very different reasons.

4.4.2. Ideal types: shared discursive framings

Star and Griesemer (1989) define an ideal type as objects such as "diagrams, atlases, or other descriptions which do not accurately describe the details of any one locality or thing. It is abstracted from all domains, and may be fairly vague…it serves as a means of communicating and cooperating symbolically - a 'good enough' road map for all parties" (1989, 410). I contend that the discursive framings associated with watersheds are a prime example of this: particular framings mean different things to different actors precisely because they are "fairly vague". I present below two governance features commonly associated with watersheds (see Chapter 3) that, I argue here, have helped facilitate their uptake.

In their review of decentralization, Larson and Soto note that "One of the interesting features of decentralization is precisely the interest it has earned from both conservative and progressive actors, which suggests a certain lack of conceptual clarity" (2008, 214). As a result, Larson and Soto suggest, decentralization has become like 'sustainable development' in that it "shifts in meaning depending on the speaker" (2008, 214). In the case of the research presented here, the terminologies of 'stakeholder' and 'integration' serve simultaneously as vague placeholders in heterogeneous cooperative groups, and as more specific definitions in more defined, homogeneous groups. These terminologies

provide an example of the ideal types leading double lives between vagueness and specificity.

4.4.2.1 Stakeholders

One example of this shared framing is the differentiated connotations of stakeholders in watershed policy-making. Stakeholder involvement in environmental policy-making can offer the pragmatic advantages of greater access to local knowledge and expertise, is seen as normatively superior to its 'top-down' predecessors in that it increases democratic participation, has a heightened responsiveness to citizen needs and environmental concerns, and empowers local communities (Gibbins 2001; Hill et al. 2008; Lemos and Agrawal 2006; Paehlke 2001).

Compiling various definitions of stakeholder, Warner (Warner 2007, 11) offers a broad definition of "individuals, groups, or institutions that are concerned with, or have an interest in the water resources and their management", including "all those who affect and/or are affected by the policies, decisions, and actions of the system." Other fields have seen lively debate about the question of who, precisely, 'counts' as a stakeholder on a particular issue. Climate change scholars, for example, often grapple with questions about stakeholder definition, particularly for potential stakeholders separated either by space (e.g. European concern for the Brazilian Amazon) or time (i.e. future generations) (see, for example, Gardiner 2004; Ott 2004; Partridge 2003; Shue 1999). Yet there is surprisingly little debate with respect to what constitutes a stakeholder in the context of watershed governance. The conversation rarely happens in the field of water governance, where there appears to be a general and implicit agreement that a watershed stakeholder is a person or group living or working in a particular watershed (e.g. Korfmacher 2001).

A handful of interviewees, however, did highlight this question, particularly in oil-rich northern Alberta, which is drawing increasing attention from international actors with an interest in oil extraction (and its consequences). As one interviewee reflected, "there's a part of Alberta that has an influence that extends well beyond Alberta and is influenced by those well beyond Alberta." In such a context, who counts as a watershed stakeholder? Despite these questions, extra-governmental participation in watershed governance continues to enjoy widespread support. Broadly, this support was articulated using two different lines of argumentation, reflecting the participatory engagement and neoliberal communities respectively, as well as their intersection.

From a participatory engagement or 'input legitimacy' perspective, there is plenty to recommend the participatory aspects of the watershed approach. That watersheds are associated with participation (Cohen and Davidson 2011) lends a level of democratic legitimacy to the watershed scale. Indeed, one interviewee stated that "Philosophically, the thinking was that it would lead to better decisions because local communities … were deciding what to do." Another phrased the argument as a cumulative benefit: "The bottom line is that you really need to work at the lowest scale possible, in the smallest communities. And as you work on the tiny little issues all over the place it all adds up." Interviewees also highlighted the buy-in benefits of the watershed approach:

> Before, the province would set up the planning process and consult with the public at various points and then build a plan based on that information. But now, the new approach is that [people] participate in it. So when you're developing a plan, you have everybody around the table building it. So there's a greater level of commitment to the plan because you helped shape it.

Interestingly, a number of interviewees expressed their support for extra-governmental involvement for reasons that align more closely with elements of neoliberalism: business-friendly decision-making and government retreat. One interviewee noted, the "vested

interest[s] did not want decision making happening in [the provincial capital] alone…industry, and [irrigators]...They did not want decisions being made in any centralized way […] they wanted a say in the process. And so the government came up with the notion of watershed [groups]."

The hands-on involvement of individuals in monitoring and data collection provides an example of what are referred to as "flanking mechanisms in civil society" to provide services that interventionist states did, or could potentially, provide for citizens (Castree 2008b, 142). As one interviewee noted with respect to community-based watershed groups:

> They do a lot of our fieldwork for us. We've trained them, and they do the sample collection…So we get very good value, we get local knowledge, and we know about water and water quality from all around the province…. which is why we continue to support and develop capacity in the community-based watershed groups…we couldn't do alone what they provide us with in our partnership.

Another interviewee's response highlights the commercial elements of stakeholder participation: "the reason why we want stakeholders is because it's the only way to know what those sectors' interests are".

Moreover, the various terminologies used to describe stakeholders also reflect particular meanings. In the forty-nine interviews conducted, 'stakeholder' was used in many ways: interviewees described individual stakeholders as a person impacted by the consequence of a decision, as a taxpayer, a customer, a citizen, and a water user. Interviewees also identified group stakeholders such as ENGOs, commercial operations, and municipalities. 'Citizen' 'customer', or 'source of water abstraction and pollution' were thus all used to denote stakeholders by those concerned with citizen engagement,

market-based approaches, and hydrology, respectively.[41] Importantly, these accounts often describe the same person or entity using different terminology.

These varied connotations reflect differing assumptions and associations. Their uniting under the watershed rubric may represent not a shared understanding, but rather a papering over of deep divides. In the heterogeneous world of policy making and watershed institution-building, the vague term "stakeholder" allows actors from the neoliberal, scientific, and participatory engagement communities to come to consensus on the importance of stakeholder involvement without grappling with their different meanings. At the same time, more specific and arguably more normative terminologies are used within the smaller, homogeneous institutions and communities represented within the watershed group more generally.

4.4.2.2 Integration

Integration provides another example of an ideal type (as Star and Griesemer use the term) employed through shared discursive framing. The central idea is that the factors influencing (and influenced by) water resources can – and indeed, should – be governed at a single scale: the watershed (e.g. Adler and Straube 2000). Often, these factors are physical, such as the integration of land and water management or the integration of surface water and coastal zone protection. Other times, they are social. In New Zealand, for example, the move towards watersheds as governance units "stemmed from a desire to make the array of agencies more coherent" (Pyle et al. 2001, 785). Or, as one interviewee in Ontario reflected:

[41] Note that Bakker 2007 also makes a distinction between the ways water users are framed. In reference to debate over water privatization and the human right to water, Bakker notes: "One important distinction is the role of the consumer: a citizen, a customer, or a community member. Each role implies different rights, responsibilities, and accountability mechanisms" (Bakker 2007c, 444).

> For me, [the watershed approach] seems just the logical way for integrating the environmental piece in with the other planning pieces. The way to do this is through a watershed basis and watershed planning. And then that is the backdrop to the schools, roads, hospitals. You need to have the baseline information that is best gotten through a watershed plan on a watershed basis.

The centrality of integration within the watershed approach is fixed to Integrated Water Resource Management (IWRM), a paradigm advocating the integration of land use, water quality, groundwater, surface water, extra-governmental participation, and adaptive management plans – ideally at the watershed scale (Adler and Straube 2000; GWP and INBO 2009; OECD (Organization for Economic Development and Cooperation) 2010). Or, as Iza and Stein write, "IWRM deems the river basin as the most appropriate management scale, recognizing that it is integrated in terms of surface water and ground water, fresh water and land issues, fresh water and coastal zone issues, quantity versus quality issues" (2009, 83).

The IWRM paradigm enjoys a near hegemony as the language of international water policy (Conca, 2006). IWRM has become a central tenet of policy recommendations across regions and sectors (Cervoni et al., 2008), and is the *raison d'être* for the Global Water Partnership, an influential player in the water policy sector. With the exception of a few discordant voices (Biswas 2004a, 2004b; Conca 2006), the water management community accords a primacy to IWRM, making it a principal influence of changing water governance models in many parts of the world. Yet the IWRM paradigm is silent on the question on whether it is possible (or indeed even desirable) to integrate the social, ecological, and political at any scale – let alone the watershed. If groundwater flow, airsheds, government and non-government agencies, migratory patterns, commodity chains, electoral units, and an almost infinite other number of social and ecological units

will never be coterminous with watershed boundaries (and indeed this seems like a virtual impossibility), the question of *what* to integrate (much less *how* this integration is to occur) will continue to challenge the IWRM paradigm (Biswas 2004a, 2004b; Cardwell et al. 2006; Veale 2010).

The desire to integrate at the watershed scale is pronounced in the Canadian case. Policies and interviewees displayed considerable variation on the question of what to integrate. Québec's water policy (2002), for example, emphasizes the role of watersheds in promoting comprehensive integration across various actors, sectors, and ecological features:

> Integrated watershed-based management of water, which offers the best alternative to sectoral management of water, constitutes a major course of action in this Policy on Water. This type of management is characterized first by a territorial approach, i.e. the watershed associated with the watercourses, lakes, or bays. It also strives to ensure that all the players involved (municipalities or RCMs, citizen groups, watershed users, government departments and agencies) take a comprehensive view of water and its uses as well as ecosystems in general, in order to develop more effective policies, programs, and projects of various kinds (Gouvernement du Québec 2002, 17).

Focusing on the integration of government agencies and departments, one interviewee described the IWRM-style of integration as "putting a staple through" the various water-related silos of governmental departments, advocating instead for a more structural approach to institutional integration:

> When you read provincial documents, every one of those procedural guidelines, will, at the front end, they will all say "this stuff is best done on a watershed basis", but the funny thing is that the provinces don't structure [their] ministries that way – their organizational units. Personally, I think that part of what needs to happen for integration – the integration of key ministries – you have to do something to structure them within a watershed framework. But they don't talk about what legislation could be changed to do things.

Others focused on the more technical aspects of integration, highlighting the difficulties, within a single governmental unit, of integrating the various factors within a watershed's

boundaries. One interviewee, for example, referred to the challenges of integrating "upstream and downstream, and land practices, and atmospheric deposition" within a single framework; others talked about the "integration of water quality and water quantity", and the challenge of getting municipalities to "integrate the environmental into the economic and the social" in their community planning processes. Another interviewee commented that the provincial government was in support of the watershed approach "because it encourages cooperation among municipalities, whereas if you have municipalities adjacent to each other then the cross-boundary watershed issues might not be adequately dealt with." These insights highlight the wide range of perspectives grouped together under the 'integration' umbrella, but, when unpacked by smaller, more homogeneous groups are imbued with very different meanings.

These diverse views on integration exemplify the tacking back and forth between vagueness and specificity that Star (2010) describes. Integration, as a broad, vague concept, is something virtually everyone agrees on; what to integrate is not. Yet this inconsistency poses little trouble, because is no active disagreement on the question of what needs integrating exists. Rather, the conversation is simply not happening – perhaps because of the veneer of agreement the shared discursive framing of 'integration' provides.

4.5 Conclusions: watersheds as everything to everyone?

In this chapter, I have used interview data to explore the different meanings associated with particular elements of the watershed approach. On this basis, I argued that watersheds are increasingly popular because of their status as boundary objects. Although the scientific community has advocated the use of watersheds for over a

century, the scale's popularity has coincided with the emergence of two other social worlds – neoliberalism and participatory engagement. Findings from forty-nine interviews in four Canadian provinces suggest that the way(s) in which watersheds have been supported and operationalized reflects these diverse social worlds. These findings speak back to the question of what might be expected in the Canadian case (Chapter 3), by providing empirical examples of conceptual slippage between watersheds and other governance tools.

I also suggest that this finding can be useful for advancing scalar analyses of territorialized space. Specifically, the diversity of communities supporting watersheds suggests almost the opposite of Brown and Purcell's (2005) contention that "there is nothing inherent about scale" – i.e., that no single scale of analysis or authority is inherently superior to any other scale. The research presented here suggests that, for many actors, there is *everything* inherent about scale: scales are deeply imbued with the ideologies of those communities advocating their use. Especially when they can be viewed as natural (and therefore apolitical), scales have projected onto them the hopes, expectations, and meanings of different groups. Re-territorialization in the form of watershed uptake has had the effect of drawing together the scientific, neoliberal, and participatory engagement communities under a single scalar umbrella. To neoliberal adherents, watersheds are non-governmental, decentralized scales; to those concerned with scientism, watersheds are a scientific, apolitical, natural scale; to those concerned with citizen involvement in environmental decision-making watersheds are scales that can encourage and enhance citizen participation and, by extension, policy legitimacy.

With respect to the question of state-nature relations, the above findings build on

Whitehead et al.'s (2007) contention that states and states and nature are deeply complex, constructed, and engaged in a "complex system of mutual co-evolution" (Whitehead et al. 2007, 14). If we accept this co-evolution, and if we accept that scales are socially constructed expressions of social relations (Delaney and Leitner 1997, 1997; Herod 2011; Swyngedouw 1997b, 2004a), then it follows that the rescaling of environmental governance and the re-territorialization of the water landscape will reflect the ideologies of the disciplinary and epistemic communities supporting it. Recognizing rescaling as reflective of broader ideologies is important because it presents a different logic for environmental rescaling (including the shift towards watersheds) than the simplified narrative of governance changes driven by scientific advances and policy rationality. Watersheds, in particular, are prone to this oversimplification because of the scale's basis in hydrology and the projection of watersheds as natural (and, by extension, apolitical).

Expanding current conceptualizations of the bases on which rescaling decisions are made opens up new questions about what kinds of scalar decisions get made by whom, for what reasons, and with what implications. As shown in this chapter, the reasons for scalar change can be enmeshed with myriad social and political factors, many of which are not accounted for in the scientifically rational narrative of watersheds as natural, and therefore better than their jurisdictional counterparts.

Within the dissertation, the arguments presented in this chapter builds on the insights from Chapter 3, namely that the conflations identified there are supported by the research data presented here. Moreover, the varied buy-in to watersheds begs questions about its implementation on the ground. Has the vagueness identified in this chapter translated into vague or ambiguous implementation? The next chapter looks at the implementation

of rescaled water governance in the four case study provinces in order to explore what the conceptual confusion identified here has meant in practice.

5. GOVERNANCE IMPLICATIONS: EXPLORING A POLITICAL ECOLOGY OF SCALE IN CANADA'S WATERSHEDS

5.1. Introduction

This chapter addresses the third research question: "What have been the governance implications of rescaling in the case study sites, and how might these inform current understandings of rescaled environmental governance"? To answer this question, I undertake two tasks. First, I use case study data to identify five implications of rescaled governance in the selected study sites. Second, I reflect on these implications in light of recent conceptual debates over the political ecology of scale. As such, this chapter articulates with scholarship in political ecology and contributes to contemporary debates over scale and rescaling.

The chapter is organized as follows. First, I present the case study data identifying five governance implications of rescaled governance initiatives in Canada. This data is derived from legislative reviews and expert interviews. Next, I contextualize these implications by drawing on key concepts from relevant debates on the political ecology of rescaled environmental governance. In particular, I identify two (of the five) governance implications as unexpected, on the basis that they do not fit with the challenges outlined in Chapter 3. In the latter part of the paper, I show how these two unexpected implications query and move forward relevant debates about the degree of rescaling that has occurred or is indeed desirable, and respond to calls for more constructivist perspectives of scale in political ecology.

5.2 Governance implications

I am concerned with the kinds of institutional questions, organizational (re)structuring, and governance issues raised by the watershed approach in the four case study areas. As such, I use implication in reference to "the condition of being involved, entangled, twisted together, intimately connected, or combined" (OED (Oxford English Dictionary) 2011). This usage is distinct from implication as effect, which connotes a causal relationship (one that I am not claiming) between the act of rescaling and specific outcomes. I also note that these are related to, but distinct from, the challenges identified in Chapter 3. Whereas the challenges presented there focused on the practical difficulties associated with the implementation of watershed-scale governance arrangements, these implications bring up broader questions and issues that can then be related back to the conceptual slippages identified in Chapter 3 and the ambiguous terminologies discussed in Chapter 4.

The research findings revealed five implications of rescaling to the watershed – these are detailed in turn below.

5.2.1 Rescaling 'real' authority

> Decentralization of natural resource management…is especially intricate because it is not only about providing services efficiently, but it also requires the devolution of *real powers*…. (Agrawal and Ribot 1999, 474, emphasis added)

As detailed in Chapter 3, the decision to rescale to the watershed is often predicated on the underlying assumption that a rescaling down and out of decision-making powers will lead to decisions that are normatively better. As one participant summed up: "Philosophically, the thinking was that it would lead to better decisions because local

communities (and these were small watersheds so you can call them local) were deciding what to do."

Yet interviewee perspectives query the degree of the scaling down and out that has occurred, often maintaining that real rescaling (as defined by interviewees) has not yet happened and that governments have retained too much power to claim that a meaningful scaling out to extra-governmental actors has actually occurred. The findings thus identify an important implication of rescaled water initiatives in the case study areas: that the uptake of the watershed approach does not necessarily correspond with increased delegation of responsibility or authority.

The degree of scaling down and out varied from province to province, partly in relation to whether or not watersheds had been implemented through policy or legislation (see Table 5) and whether or not participation was mandated (Table 6). In Alberta's South Saskatchewan River Basin, for example, the Watershed Planning and Advisory Council (WPAC) developed a water management plan that subsequently became law. Similarly, many of the actors I interviewed were involved with Ontario's Source Water Protection Planning process, some components of which will be legally enforceable once approved by the province. [42] Conversely, I also spoke with individuals who had been involved in less binding processes: stewardship projects, public outreach campaigns, stream cleanups, open planning processes, and so on.

Yet no matter the scope of activity, there seemed to be ongoing dissatisfaction with respect to the ways in which local involvement occurred and, perhaps more importantly, the power inequities (real or perceived) between governmental actors and other participants in watershed-scale initiatives. Indeed, many interviewees questioned the

[42] See section 39 of Ontario's *Clean Water Act* (2006).

degree of scaling out that had actually occurred – often expressed as frustration on the part of extra-governmental actors at the feeling that government-led consultations were insincere. Expressions of this frustration included remarks such as: "provinces won't want to give up their authority over stuff", or "they tell us they're listening to us, but they're probably not. They have their own agendas." One watershed-scale organization's director reflected, "We're very mindful of the occasional propensity for the province to want to shift responsibility but hang on to authority."

On a more organizational level, a number of critiques were related to the non-regulatory mandates of the watershed-scale organizations, expressed in comments such as:

> The [watershed councils] are a [ ] farce - they don't do anything….Watershed councils don't have any power…they sit around and make recommendations. In some cases that works, but most of the time it doesn't.
>
> It's kind of rinky-dink, the other stuff they can do – there's not many things they can do and some might have a better bang for the buck in certain locales, but it doesn't have any force to it.
>
> Right now, watershed planning…..there's no mandatory guidance. We have a lot of work that we would call guidance, but it's just that … [it] has no status, no authority. It can say what should happen, but nobody has to pay any attention.

This finding is not particularly surprising, given its identification as a challenge with respect to water governance in other locales (see Chapter 3).

5.2.2: Uneven capacity, uneven protection?

On the other end of the spectrum, a number of experts interviewed expressed concern with the prospect of scaling down by moving governance processes from provincial capitals to watershed organizations. This concern related primarily to (real or perceived) uneven institutional capacities of watershed-scale organizations, thus prompting a second

implication: that the uptake of the watershed approach raises questions about possible tradeoffs between scaling down and the desirability of consistent standards or practices.

A number of interviewees expressed the view that scaling down and out can lead to uneven water protection and management due to the uneven capacity of watershed groups. That is, the heterogeneity of the groups' financial, human, and technical capacities was seen as problematic to the extent that the heterogeneity would lead to uneven water protection and management. This concern is supported in the literature and speaks to evidence suggesting that the success of efforts to scale down and out can be tied to organizational development, financial support, and adaptive capacity (Armitage 2005; Kellert et al. 2000).

The differences in capacity between watershed organizations within a single case study jurisdiction were considerable. Generally, watershed organizations with a major municipality within their boundaries had access to a larger tax base (a significant factor in cases where municipalities contributed funding to watershed groups), access to more experts and professionals, and greater technical capacity (the ability to test samples on-site, for example) than watershed organizations based in rural or remote areas. These differences in capacity proved to be a challenge in places like northern Alberta, which has a relatively small population but is home to environmentally significant activities – in this case, oil and gas extraction. Reflecting on diverse capacities in Ontario, one provincial authority remarked "From a provincial governance perspective, you're looking for uniform, or consistent, implementation for a program. And so this huge diversity in size, capacity, in approaches, is problematic." Again reflecting on Ontario, another expert noted that "in Northern Ontario, for example, the level of dollars available is not

the same, and the level of sophistication is not the same." This implication is accounted for and reflected in political ecological work problematizing the scaling down and out of decision-making on the basis that it can lead to "uneven environmental management practices" and "reinforced social inequalities" (Reed 2007, 320). Indeed, as one expert noted,

> The original vision was that the communities would [do] a fair amount of modifying to adapt to local circumstances in deciding what measures would be appropriate (land use planning, risk management planning). And then at the same time, the province is very concerned about not allowing a lot of discretion so as to maintain consistency and protection.

Moreover, organizational capacity is closely tied to financial stability and resources. As such, watershed groups have tended to vary the scope and focus of their activities according to funding availability and specificity. As one interviewee noted, "Often, the programs that we run with are those where there is some money available." In New Brunswick, for example, Community-Based Watershed Organizations (CBWOs) were first initiated in order to carry out stream classification – an activity paid for by a re-allocation of resources in the province's Environmental Trust Fund. In Ontario's case, the province's thirty-six Conservation authorities were amalgamated into nineteen Source Water Protection Areas, funded through a provincial commitment of $12.8 Million, annually, and, not coincidentally, work related to source water protection makes up a significant portion of Conservation Authorities' current activities.

Financial support for watershed-scale groups can increase capacity at the watershed scale. In the case of Ontario, for example, the result of the province's financial commitment is not only the vulnerability maps and Source Water Protection plans emerging from the process (although these are a laudable results in and of themselves),

but also a dramatic increase in capacity. One interviewee describes the process and its consequences as follows:

> They started resourcing [the Source Water Protection Committees] with money and staff and technical capabilities, and engineers. And they did that in order to do a short-term program. But in doing so, they created capacity in these organizations and they fundamentally changed them.

On the other hand, absence of provincial funding can have the opposite effect: it can incapacitate or dramatically alter the scope of a group's activities. In Ontario's case, significant cuts at the Provincial level in the 1990s led to a realignment of CA priorities. With provincial funding no longer an influential driver of CA activities, CAs became financially dependent on their other governmental partners: the municipalities. An interviewee described the transition as follows:

> CAs will do what there is funding for. So right now, Source protection is the big thing, and that's where the provincial money is... If you go back to the 1990s when [ ] money was withdrawn, [the province] lost their influence. And so, without that influence…that was interesting. CAs started to focus on what the municipalities wanted to them to do.

5.2.3 The value of non-regulatory mandates

In addition to capacity, interviewees indicated that the mandates of watershed-scale organizations were another factor in the groups' ability to be effective, although not in the way that might be expected. Interview findings suggested a third implication: the importance of querying the appropriate policy or legislative strength of watershed-scale organizations, including the possibility that watershed-groups might be more effective in explicitly non-regulatory roles. Note that this is somewhat oppositional to the implication identified in 5.2.1, and that there is disagreement among experts on the question of what kinds of responsibilities ought to be accorded to watershed-scale organizations.

In contrast with much of the literature (e.g. Robins 2007), a number of watershed-scale groups indicated that they did not want regulatory or legislative authority. The primary reason for this was because participants felt that their organizations' non-legislative mandates enabled them to be more effective at garnering public support, which, in turn, led to the types of improved decision-making associated with the scaling out of environmental governance. In other words, a handful of interviewees expressed the view that watershed groups' ability to work effectively might be a function of how *in*formal and power*less* these watershed groups are. I am at pains to emphasize that watershed groups do need stable funding, clear mandates, and sufficient human resources (Gunningham 2009). What experts were referring to are the potential benefits associated with non-regulatory mandates, which, some interviewees maintain, enable watershed-scale groups to reach out to community members and, as a result, to be more effective in meeting their mandates of participation and public input.

As interviewees explain, regulatory authority could hinder watershed groups' environmental effectiveness by reducing organizational flexibility, alienating stakeholders, and politicizing good faith negotiations:

> There are advantages to that [non authoritative] model: when you don't have constraints or rules, then you've got an opportunity to be a lot more creative about matching the plan to the issues.
>
> We've been quite careful to ask our community groups to not be the regulator. [We say] "Don't try to be the regulator, because it will compromise your availability to engage the broader community."
>
> If you take a voluntary and aspirational group, and turn them into a decision-making body, you immediately do to them what you've spent five years trying to undo, because they immediately become politicized.

In some of the interviews (and I emphasize that this was not universally the case), watershed-scale experts actively did not want regulatory, legislative, or any other kind of decision-making authority because they felt that that particular form of authority would hinder their ability to be effective at pulling together the kind of diverse expertise necessary to come up with relevant and insightful recommendations. Indeed, in reference to the tension between the potential benefits and drawbacks of mandatory versus voluntary approaches, one participant reflected, "you get a better plan with a voluntary approach, but better implementation with a mandatory approach."

5.2.4: Scaling out: democratically problematic?

Although (as detailed above) many interviewees lamented governments' (apparent) reticence to scale out authority, there was also a significant voice from the other end of the spectrum: a number of experts expressed deep concerns with the prospect of according authority to an expanded extra-governmental set of decision-makers (i.e., scaling out). A fourth implication is thus that the uptake of the watershed approach raises important questions regarding accountability and legitimacy.

This is, of course, related to the accountability challenge discussed in Chapter 3. Given the apparent pervasiveness of this issue (Blomquist and Schlager 2005; Bonnell and Koontz 2007; Cohen and Davidson 2011; Griffin 1999), it was not surprising to hear many experts expressing concern with the scaling out (i.e., increasingly participatory) elements of rescaling initiatives. One participant, for example, noted that watershed organizations "shouldn't be given the power to impact people's lives without any elected authority." Fleshing out these concerns, another participant explained,

> I really worry about non-elected people making a significant policy. They are non accountable, they are not necessarily experts, and the whole stakeholder group mentality is something that is not considered ....you just have what's minimally acceptable to everyone, and to me that's not the way policy development should work. So moving these plans into government-approved policy is problematic.

It is important to note that the dynamic between governments, stakeholders, and watershed-scale groups changes and evolves over time. As exemplified in the quote below, what starts out as a voluntary, advisory initiative can quickly develop into something more, with expectations for devolved authority rising in step with the scope of issues tackled by the group in question:

> The experience that we've had here is that the whole idea [ ] was that it was going to be voluntary. But as you get these groups up and running, they feel they need some authority to achieve what they've been tasked to do. So that is a significant challenge…You might set water quality objectives, for example. And if you identify some land use activities that affect the ability to meet those objectives, [ ] a watershed might be challenged to put things in place to get some change. You can work with education, for example, but in something like an incentive program, where dollars change hands? I don't know. They're not there yet.

Additionally, uptake of the watershed approach entails not only an expanded set of decision-makers, but also a re-territorialization of decision-making along non-electoral lines. This re-territorialization compounds questions of accountability and legitimacy because it introduces decision-making at scales for which no elected body exists.[43] Combined, these elements make up an accountability challenge that has been well-documented in the water literature.

Moreover, as a number of interviewees noted, even if a watershed-scale decision-making participant is democratically accountable in some way – if, for example, they are

[43] Exceptions include elected watershed boards, such as the Okanagan Basin Water Board, and electoral units that happen to coincide with watershed boundaries – small islands, for example. In Canada, however, both of these cases are rare.

an elected official from a municipality – they are not accountable to citizens in the rest of the watershed. Perhaps more problematic, municipal governments are notoriously vulnerable to regulatory 'capture';[44] a phenomenon that Lisa Robins (2007) describes in the watershed context as municipal representatives acting as 'watchdogs' for their municipalities.

5.2.5 Watershed mandates and policy coherence

A fifth implication of rescaled water governance points to the importance of policy coherence – that is, reflecting on how watershed-scale initiatives fit into the water (and indeed the environmental) governance landscape of a particular province. The principle of policy coherence is often framed as a component of 'good governance' (e.g. Batterbury and Fernando 2006), and is especially relevant to the work presented here given the prominence of integration in policy rationales for rescaled environmental governance (as identified in Chapter 4). The findings here indicate that the question cannot yet be 'has there been integration or not?', because the answers vary depending on what the speaker feels ought to be integrated.

The integration argument, grounded in (and often conflated with) IWRM, holds that the factors influencing water resources (and which water resources influence) can – and indeed, should – be managed at a single scale: the watershed. Moreover, it suggests that watersheds are the ideal scale at which to integrate these factors (GWP and INBO 2009; OECD 2010). The province of Québec, for example, expands on its expectations for

[44] The concept of regulatory capture refers to the notion that "regulators become beholden to those they attempt to regulate" due to monetary considerations, job retention and future career aspirations, or the desire for tranquility between entities (Pautz 2010, 249).

integration at the watershed scale in the following excerpt from their provincial water policy:

> Integrated watershed-based management of water, which offers the best alternative to sectoral management of water, constitutes a major course of action in this Policy on Water. This type of management is characterized first by a territorial approach, i.e. the watershed associated with the watercourses, lakes, or bays. It also strives to ensure that all the players involved (municipalities or RCMs, citizen groups, watershed users, government departments and agencies) take a comprehensive view of water and its uses as well as ecosystems in general, in order to develop more effective policies, programs, and projects of various kinds (Gouvernement du Québec 2002, 17).

Statements like these speak to the idea of policy coherence – the notion that policies and practices at various governance scales should align well with one another (Batterbury and Fernando 2006; European Commission 2003). Yet the question of how to integrate watersheds with other features of the political and ecological landscape remains rather elusive, as the 'asymmetry between watersheds, policy-sheds, and problemsheds' challenges in Chapter 3 identify. Research data from the case studies reinforced the existence and importance of scalar mismatches between watersheds and the social, political, and ecological landscapes of which they are part.

Speaking to the relationship between watershed-scale organizations, municipalities, and provincial ministries in Ontario, interviewees noted the following:

> The Conservation Authorities are a very odd thing, because they don't fit into anybody's box, and that creates challenges. They are agencies created under provincial legislation, but they are governed and funded by the municipalities within the watershed, so they are neither municipal nor provincial. They're in between. They're not a layer, in the sense that they don't have authority over the municipalities.
>
> There are times when the Conservation Authority is at odds with the municipality if the municipality wants a development to go ahead for economic reasons and a Conservation Authority sees a lot of environmental negatives.... And the municipality actually funds the Conservation Authority, too, so that can be tricky….
>
> Conservation Authorities can't push management decision upwards - [they] can't tell the province what do to on their land. The big areas in Northern Ontario that have no

> Conservation Authorities are mostly crown land – that's the main impediment – lack of municipalities and predominance of crown land.

Other examples show how these governance scales can be at odds not only with other geographic, ecological, or political scales, but also with other planning processes.

In Alberta, for example, two processes were underway at the time of research. One, initiated through the province's provincial water strategy (*Living Water Smart*) and managed by Alberta Environment, focuses on collaborative planning and management within the province's twelve major watersheds. The other, carried out under the *Alberta Land Stewardship Act* and managed by Sustainable Resource Development, consists of top-down, closed-door negotiations that will determine land use functions in seven land use regions (loosely, but not precisely aligned with watershed boundaries) based on a mix of social, economic, and environmental criteria. The question of how (or indeed, if) to align land use frameworks with watershed planning processes – especially considering the different governance processes for each initiative and the clearly overlapping responsibilities for land and water – is not yet resolved. This example shows the feasibility of scaling down without scaling out: the province has moved land use planning decision-making to less centralized locations (i.e., the seven land use planning regions rather than the province), but the process is neither participatory nor transparent.[45] It also shows that asymmetries need not be scalar; they can also be process-based.

Conversely, New Brunswick has undertaken measures with the aim of streamlining activities and enhancing coordination between ministries. One of these is a structural shift wherein the *Community Planning Act* – the legislation under which municipalities

[45] Alberta is not the only Canadian jurisdiction grappling with the coordination of watershed planning and land use planning (see Ferreyra and Kreutzwiser 2007 for an Ontario example).

and regional governments draft community plans – is now managed by the Department of Environment. As a result, applications for re-zoning or development go through the same department that is responsible for drinking water protection and watershed planning. A number of New Brunswick interviewees pointed out that the situation of these two initiatives within the same department has led to improved coordination and reduced instances of conflicting approvals and plans.

The case of Lake Simcoe in Ontario provides another example relevant to policy coherence. The Government of Ontario passed the *Lake Simcoe Protection Act* in 2008 in order to "protect and restore the ecological health of the Lake Simcoe watershed" (c. 23, s. 1). The introduction of the *Act* represents the only case of location-specific water protection legislation in the province, and, as one interviewee stated "the first watershed based protection plan with any real teeth to it". The *Act* is relevant to the question of policy coherence for two reasons. First, a central component of the *Act* is a reduction in the discharge of phosphorus into the lake in order to better support the coldwater fishery. This phosphorus reduction is complicated by the fact that much of the phosphorus arriving in the lake comes from dust originating in quarries located outside of the watershed's boundaries (but, notably, within the same airshed). Speaking to this issue, one interviewee stated that "airsheds would be a much bigger boundary. And that's why the party responsible for implementation is the province, not the Conservation Authority, because the Conservation Authority can't do that. They could never be given that kind of authority." Second, the area covered under the *Act* does not align with the Lake Simcoe Region Conservation Authority but is designed to reflect development areas (in this case, the Greater Golden Horseshoe) under the *Places to Grow Act* (2005). The case of Lake

Simcoe in Ontario thus shows how making binding watershed policy does not necessarily reflect an alignment with pollutants of concern or with recognized watershed boundaries.

The policy coherence implication prompts thoughtful reflection of the uptake of watersheds in the first place: if the approach's major draw is its situation outside the frames of conventional decision-making practices and jurisdictional boundaries, then the question of precisely how it will interact with the conventional (and other environmental) features of the political and environmental landscape merit careful consideration. These considerations are expanded upon in the concluding chapter.

5.3. Mobilizing implications: enriching political ecology of scale

How might the implications identified in the first part of this chapter be mobilized to strengthen and usefully inform the emerging synergies at the intersection of political ecology and scale? Specifically, I am interested in those implications that were not expected (i.e., not identified as challenges in Chapter 3) – namely that some representatives from watershed-scale organizations did not want regulatory mandates, and that the question of policy coherence extends beyond boundary symmetry to include procedural and planning coherence as well. On these points, I suggest two avenues of fruitful engagement: a) applying the finding that not all watershed-scale agencies would like more regulatory authority to current debates about the extent and desirability of rescaling, and b) using the policy coherence implication to better understand and unpack a 'scalar paradox' – i.e., the notion that boundary asymmetry between watersheds, 'problemsheds', and 'policy-sheds' is problematic, and, at the same time, that watersheds present a better way of doing water governance because they are outside current

frameworks unable to deal with complex problems transcending jurisdictional boundaries. Both of these explorations can be usefully framed as advancing a political ecology of scale, which considers "how ecological scale interacts with socially constructed scales" (Zimmerer and Bassett 2003, 289).

The idea that scales are socially and politically constructed through discourse, social contestations, and power structures is central to the question of rescaling, which is most fundamentally about a conscious alteration of the territorial scope and political level at which decision-making processes occur. Scalar study has been concerned with de-bunking scalar fixity (i.e., the notion that scales are pre-given) in favour of an emphasis on the dynamic social processes through which various scales of governance are shaped and re-shaped in response to evolving power structures (Keil and Mahon 2009). This constructivist literature calls on geographers to reflect critically on the social and power relations within, across, and between scales, with an emphasis on the importance of "how scales come to be defined and institutionalized" (Jessop 2009, 96). Although the constructivist literature focuses on peeling back the assumptions surrounding the notion of particular scales as pre-given (e.g. nations or municipalities), it is also useful for analyzing new governance scales. As detailed in Chapter 1, this dissertation is concerned with rescaling to watersheds and sees this policy shift as a three-pronged rescaling: up from municipalities, down from provinces (in the Canadian example) and, to varying degrees, a scaling out from command-and-control style regulatory regimes to more inclusive forms of decision-making.

The shift in power relations (perceived or real) associated with rescaled governance processes has drawn increasing attention in the political ecological literature, which, as

discussed in 1.3.4, focuses on human-environment interaction with explicit consideration of power and social relationships. As discussed, three turns in political ecological research make it particularly relevant to my research: its (relatively) recent inclusion of the Global North (McCarthy 2002; Schroeder 2005; Schroeder et al. 2006; Walker 2003), its expansion from a local-focus (and its various interpretations) as an idealized analytic scale and governance unit (Brown and Purcell 2005; Robbins 2002), and – perhaps most relevant to the research presented in this chapter – an emerging consensus that engagement between political ecology and critical conceptualizations of scale represent a fruitful avenue for future political ecological research (Neumann 2008; Rangan and Kull 2008; Robbins 2008; Zimmerer and Bassett 2003).

On this last point, I highlight recent calls for greater engagement between political ecological analytics and rescaling processes. Robbins (2008), for example, suggests that political ecological research might "proceed as a kind of study of scalar politics, exploring how various political boxes get stacked the way they do in scalar hierarchy through historical and economic processes" (Robbins 2008, 216), and Brown and Purcell (2005) posit scalar approaches to political ecological questions as a theoretical way out of political ecology's putative 'local trap.' Moreover, political ecological attention to power relations makes scale more than a unit or object of analysis; it becomes a tool – "a *resource* and not just a hierarchy down which forces cascade and ultimately affect people in particular places" (Bebbington and Batterbury 2001, 374, emphasis added).

5.3.1 Rescaling: too much, or too little? Expanding the debate

Many political ecological forays into the question of rescaling have focused on the question of how much rescaling has actually occurred, as well as the question of whether

or not rescaling is desirable or appropriate. The finding that representatives from a number of watershed-scale organizations expressed the view that these organizations might be better served by non-regulatory roles and mandates expands the basis of these analyses and brings up new questions for future research on political ecology and scale.

Within political ecological accounts of rescaling initiatives, two dominant descriptions have emerged. The first of these descriptions problematizes the scaling out (and, to a lesser degree, the scaling down) of decision-making on that basis that it can (and does) exacerbate existing social and economic inequalities. This line of argumentation is loosely connected to Rhodes' (1996) assertions about the 'hollowing out' of state activity by linking together rescaling, a weakened nation state, and particular elements of neoliberalism. Fletcher's comment that "neoliberalization is problematized most fundamentally for its creation or exacerbation of social, political, economic inequality" (Fletcher 2010, 172) speaks to fundamental concerns with the so-called retreat of government from environmental decision-making. In other words, the argument is that shifting the loci of decision-making (i.e., scaling down) and the actors involved in decision-making processes (i.e., scaling out) can result in disorganization, disempowerment, and, perhaps most troublingly, the exacerbation of existing inequalities (Brown 2011; Marcus 2007; Reed 2007; Wilder and Lankao 2006). Nelson and Agrawal (2008) posit that these effects happen because rescaling processes are most politically possible in cases where the stakes are lowest: where resource values are low, or when ownership and responsibility are already unclear – an argument echoed in Chapter 3 of this dissertation. To be sure, the framing of this retreat is problematic for many, both because it casts the move as simple and homogenous (Mansfield 2005, Perrault 2005) and

because it erroneously assumes state control is given up through the creation of new governance structures (Norman and Bakker 2008) whereas in fact these may be new means of political control (Lundqvist 2001, 334).

Conversely, a second political ecological description of rescaling speaks to what Jesse Ribot (1994) calls the 'charade' of rescaling. That is, that despite what appears to be scaling down and out, power remains situated with government-led processes in provincial or national capitals. Summing up the issue rather bluntly, Warner notes: "one important political reality is that states do not much like sharing power" (2007, 12), and indeed there exist many examples of precisely this phenomenon (Castro and Nielsen 2001; Charnley and Poe 2007; Harrington et al. 2008; Norman and Bakker 2008; Ribot et al. 2006; Wunsch 2001). Norman and Bakker's (2008) study of transboundary water showing that national capitals retain power despite the localization of Canada-US transboundary resources, Ribot et al.'s (2006) work on central governments' retention of control in six different cases of decentralized forestry initiatives, and Castro and Nielson's argument (2001) that co-management can strengthen state control over resource policy show this phenomenon at work. In reference to the Canadian context, De Loë and Kreutzwiser note that the success of scaling out initiatives (what they call distributed governance) "will depend on a true letting go of authority" (2007, 99).

There are, of course, many examples of overlap between these descriptions. Chapter 4 of this dissertation provides an example in the form of alignment between divergent social worlds, as do other works identifying alliances between advocates of bottom-up governance approaches and some components of neoliberalism (Bakker 2007c; McCarthy 2005). Additionally, recent scholarship has emphasized that redistribution of

power is most effective when backed by substantial governmental support (e.g. Gunningham 2009), emphasizing that government control and meaningful rescaling are not necessarily mutually exclusive. Nevertheless, distinguishing between the two descriptions is useful for understanding how rescaling has been variously conceptualized in the vast, "polyglot landscape" (Watts 2000, 592) of political ecological scholarship.

The implications identified in the first part of this chapter can be mobilized to inform these ongoing discussions. I note in particular that of the five implications identified above, two fit well with the political ecological conversations identified here. Specifically, the finding that many experts expressed their frustration at what they perceived as governmental reluctance to share meaningful decision-making authority, and the finding that participants expressed concern about uneven protection stemming from uneven capacities mirror the 'charade' and 'inequalities' conversations, respectively, and are not particularly surprising.

The finding that, in some cases, watershed-scale organizations would prefer to retain their non-regulatory roles, however, falls largely outside of current political ecological conceptualizations of rescaled environmental governance. This finding brings up important questions for political ecology, where arguments problematizing incomplete rescaling are often predicated on the underlying assumption that, given sufficient funding and resources, local organizations (however defined) are not only better environmental stewards, but would prefer to take on greater regulatory powers. This preference for the local in political ecology often derives from work that "seeks to highlight the positive qualities of local resistance to marginalization by oppressive political economic processes at wider scales" (Brown and Purcell 2005, 612). In this view, local scales are

normatively superior to their national counterparts, and Ribot's charade argument reinforces narratives about state power overriding local interests. It is in the context of these arguments that the finding that not all watershed organizations desire regulatory authority can intercede. The charade arguments are often predicated on a rationale that more extra-governmental participation and localized decision-making is both normatively and substantively better, but does the critique still hold in cases where 'local' organizations do not want a regulatory role?

A second issue that this implication brings up is the question of empowerment. In light of this finding, could it be argued that, in some cases, is it more empowering to *not* have decision-making authority? And how might that align with ideas about subsidiarity (i.e. the idea that decisions are best made at the lowest possible level) and the utility of localized expertise? With these types of questions in mind, future political ecological work could proceed with an expanded normative basis for what constitutes 'good', 'fair', or 'empowering' modes of decision-making, as well as calling into question the complexities of rescaling processes, including how they are unevenly implemented, or differentially received by various actors on the ground.

5.3.2 The paradox of scalar mismatch

A second way in which the implications identified in the first part of this chapter contribute to a political ecology of scale is through deeper investigation into the policy coherence implication. With relationships between power, scale, and rescaling in mind, I point in particular to a paradox that might usefully inform a developing political ecology of scale. The paradox is the following. On one hand, watersheds are taken up (at least in part) in order to address the myriad water governance problems that cannot be resolved

along conventional jurisdictional boundaries; on the other hand, practitioners and scholars alike bemoan the scalar mismatches associated with watersheds. Moss (2004) addresses precisely this issue in the context of river basin management in Germany undertaken through the European Water Framework Directive. Speaking to the question of river basin management (which are different from watersheds, but nevertheless embody the issue of boundary asymmetries), he writes that:

> River basin management is designed to address the interdependencies between, in particular, upstream and downstream effects, water quality and water quantity, and water and adjacent land-use resources … Experiences with the many practical applications of river basin management demonstrate, however, serious limitations to the logic of overcoming problems of spatial fit by reorganising water management around natural boundaries. The expectation that natural scientific knowledge could provide a template for the spatial organisation of water management has been only partially met. … *the replacement of existing institutional units by institutions oriented around biophysical systems will inevitably create new boundary problems and fresh mismatches* (2004, 87, emphasis added).

These 'fresh mismatches' in the EU are precisely the kinds of issues raised by rescaling to watersheds in Canada. Below, I bring these insights from the literature and research to bear on the emergent political ecology of scale.

Zimmerer and Bassett (2003) are among those geographers calling for greater engagement between political ecology and scale. In particular, they call on political ecologists to "consider how ecological scale interacts with socially constructed scales to produce distinctive environmental geographies" and suggest four proposed avenues for future research: "(1) the scales of ecological dynamics; (2) functional conservation areas; (3) mismatches between ecological and social scales; and (4) fragmented scales" (2003, 289). Of relevance for my contribution here is point 3 (mismatches between ecological and social scales), which speaks to the policy coherence implication identified in the first part of the chapter. On this topic, Zimmerer and Basset (2003) contend that "scale

mismatches occur where the spatial requirements of a species or ecosystem do not correspond with administrative levels of management" (2003, 290). Adding precision to the concept, Cumming et al. define scalar mismatch as occurring when "the scale of environmental variation and the scale of the social organization responsible for management are aligned in such a way that one or more functions of the social-ecological system are disrupted, inefficiencies occur, and/or important components of the system are lost" (2006, 3).

Yet these mismatch discussions tend to treat scales as fixed; something with which a number of political ecologists have taken issue. Brown and Purcell (2005), for example, contend that recent work in political ecology "tends to treat scale as pregiven and inherent rather than socially produced through political struggle" (2005, 612). Rangan and Kull echo this argument in stating that "most political ecologists (and critical geographers) fail to recognize or pay attention to the ways in which scale is produced, articulated, and used to interpret the outcomes of ecological change and spatiotemporal difference in socialized landscapes" and, as such, that "the mismatch of ecological and social scales is a basic recognition from which political ecology analysis should begin, not end" (2008, 35-36). Indeed, Robbins (2004) points to the utility of constructivist perspectives in other areas that political ecology addresses, such as 'wilderness' (Cronon 1996), environmental refugees (Saunders 2000), or the 'problems' created through particular representations of crises (Jeanrenaud 2002), yet stops short of addressing the utility of *scalar* constructivism in particular. Swyngedouw's work on the production of the Spanish waterscape in the late 1800s and early 1990s (see Swyngedouw 2003, 1999) provides an example of how scalar construction can be marshaled to understand political

ecological processes. Swyngedouw's work addresses the political and economic forces behind the re-making of Spain's waterscape, which focused on the provision of irrigation infrastructure through hydrologic engineering in efforts to 'modernize' the social and agricultural landscape of the country.

The research presented in this chapter and others underscores and reinforces Rangan and Kull's point about the mismatch between ecological and social scales being a starting point (rather than an end) by pointing to a way out of the 'mismatch' paradox (i.e., that watersheds are taken up to address water issues that cannot be resolved along conventional jurisdictional boundaries, yet their mis-alignment with jurisdictional boundaries appears to cause new problems). The policy coherence implication provides a way out by shedding light on a key disjuncture: that the mismatches in question are not only of scale, but of motivation. As discussed in Chapter 4, vague terminologies associated with watersheds paper over divergent motivations and ideologies that support rescaled governance – i.e., different actors hold different rationales for their support of the adoption of the watershed approach. Actors are perhaps more concerned with the alignment of watersheds with their own particular goals and interests than with other components of the water governance landscape, such that a scalar mismatch from one perspective might be a scalar alignment from another. For example, what a hydrologist sees as scalar alignment between natural and social phenomena (i.e., the use of watersheds) might look like a scalar mismatch to a municipal politician who must now coordinate their activities with those of the neighbouring municipality. Likewise, the development of provincial water policy within Alberta may signal a resolution of scales to some, while representing a mismatch with land use planning units to others.

The construction of any scale thus inherently implies a better alignment with some factors and a mismatch with others; what makes the relationship between particular scales appear to be aligned or mismatched may therefore be more a function of perspective than an objective asymmetry as it is often framed. As such, I suggest that explorations of the linkages between the influences of scalar change and perceptions of scalar mismatch can usefully insert a constructivist perspective of scale into the emergent political ecology of scale. Explorations of this kind also have the potential to do a great deal to uncover key political dynamics and tensions – one of the central issues in political ecology, but one that has not as yet been forcefully pursued through attention to scalar mismatches of this type.

5.4 Conclusions

This chapter has sought to identify the governance implications of rescaled water initiatives, and to mobilize these findings to contribute to recent debates over the political ecology of scale. In this chapter, I used interview data from the case study provinces to identify five governance implications of rescaled water initiatives. The implications are the following. First, the research findings suggest that implementation of the watershed approach does not necessarily respond to the normative rationales for the scaling out of environmental governance. In other words, many interviewees maintained that 'real' rescaling had not occurred, and remained skeptical that the provincial government had any intention of devolving a meaningful amount of decision-making authority. Second, the research found that rescaled governance can lead to uneven water protection and management due to the uneven capacity of watershed groups. Third, interview data suggested that rescaling can be democratically problematic to the extent that it constitutes

decision-making by non-elected actors. Fourth, that organizational capacities and mandates become increasingly important in rescaled governance situations because of their ability to shape environmental effectiveness. A fifth implication identified through the research is that rescaling to watersheds requires a significant realignment of existing policy in order to achieve the policy coherence (or integration) often sought through rescaling initiatives.

Second, this chapter sought to mobilize the implications to inform and advance an emergent political ecology of scale. To this end, the second half of this chapter explored how the two unexpected implications (i.e., that not all watershed organizations would like more regulatory authority, and the importance of policy and procedural coherence) can shed new light on the relationship between the (re) territorialization of state space and the governance systems operating within them. More specifically, I emphasized the utility of expanding current political ecological notions of scale by a) including greater heterogeneity in current political ecological understandings of organizational receptiveness to environmental rescaling, and b) moving beyond the idea of a scalar mismatch to also include richer analyses of what constitutes an alignment or a mismatch – a point that can provide entrees into the social ecological tensions which are so central to political ecological work. These contributions run parallel to Wainwright's (2005) call to think critically about the spaces in which environmental conflicts unfold as these relate to particular spaces, nature, and power.

Before closing the chapter, two additional points bear mentioning. First, I do not intend to suggest that the implications raised in the first section of the chapter are unique to rescaling or to political ecology; the environmental governance literature is replete

with examples of, for example, the relationship among democracy, participation, and environmental decision-making. Asymmetries between different types of boundaries and challenges of environmental governance are not unique to rescaling, but I contend that rescaling exposes and accentuates the issues in a way that is particularly informative to the emergent political ecology of scale.

Second, it should be noted that the findings here display only partial alignment with the governance challenges identified in Chapter 3. Importantly, the two 'unexpected' implications did not align with the Chapter 3 governance challenges and provide the richest opportunity for critical reflection on how rescaling is conceptualized in existing literatures. This lack of alignment is revisited in the concluding chapter.

6. CONCLUSIONS

This dissertation provides such a critical assessment of the watershed approach by answering the following research question: Why has rescaling to watersheds occurred, and what are its governance implications? This broad question is broken down into three more precise questions:

> 1. In light of past experience and existing literature, what might we expect to find as the drivers and implications of rescaled water governance in the case study provinces?
>
> 2. Why have watersheds become so popular in the case study provinces, and what epistemic commitments might be reflected in their uptake?
>
> 3. What have been the governance implications of this rescaling in the case study provinces, and how might these usefully inform current understandings of rescaled environmental governance?

To answer these questions, I carried out a comprehensive policy and legislative review in all Canadian jurisdictions and interviewed forty-nine experts in four provinces: Ontario, Alberta, New Brunswick, and Nova Scotia. Although each of these questions is valuable in and of itself, the value of the whole dissertation is greater than the sum of its parts: by exploring the reasons for and implications of these rescaling initiatives, the dissertation is able to draw some preliminary connections between the two – a task I undertake in section 6.1.

In addition, each of the three chapters presented data and arguments themselves. Chapter 3 argued that the challenges associated with implementation of the watershed approach (boundary choice, accountability, public participation and empowerment, asymmetries between watersheds, problem-sheds, and policy-sheds) are symptoms of conceptual slippage between the development of watersheds a technical tool and their

uptake as a governance unit. The chapter showed how these governance challenges had typically been framed in the water management literature as being inherent to the watershed scale, and suggested that it is perhaps more accurate to characterize the challenges as being associated with particular governance tools rather than with watersheds themselves. On this basis, the chapter suggested that we might usefully think of re-drawing water management boundaries (i.e., the uptake of watersheds) as one of many water management tools – as something to be consciously selected for a specific purpose rather than as a requisite starting point for water governance initiatives. Additionally, the chapter suggested that in the case study areas we would expect to find conceptual slippage between watersheds and the governance tools with which they have become conflated, as well as governance challenges associated with the watershed approach in the case study areas.

Chapter 4 sought to answer the second research question: What are the rationales for the uptake of the watershed approach in the case study sites, and what ideologies or epistemic commitments might they represent? The chapter argued that watersheds have increased in popularity because of their status as 'boundary objects' (shared, common concepts interpreted differently by different groups). This chapter built on the analytic precision outlined in Chapter 3 by using new empirical data to explore how particular components of the so-called watershed approach appealed to different social worlds. As such, Chapter 4 showed how part of watersheds' appeal derives from the conflations identified in Chapter 3. The corollary to the argument presented in Chapter 4 is a rejection of the scientific rationale about nature's boundaries in favour of the

development of a more nuanced framework for explaining rescaled environmental governance.

Chapter 5 moved forward from the 'why' question about popularity to explore the governance implications of rescaling to watersheds by answering the third research question: What have been the governance implications of this rescaling in the case study sites, and how might these inform current understandings of rescaled environmental governance? The chapter outlined the implications identified through interview data, and showed how these implications – especially the unexpected ones (i.e., those not identified in Chapter 3) – can help to expand and enrich current accounts of rescaling.

6.1 Key research findings: an analysis of rescaled water governance in Canada

Arguments in the three chapters speak back to the central research question: why has rescaling to watersheds occurred, and what are its governance implications?

The dissertation argued that the popularity of watersheds in the case study areas was influenced by arguments situated at the intersection of three social worlds: scientism, neoliberalism, and participatory engagement. Indeed, the policy and legislative review showed that support for watersheds tended to fall into one of three categories: watersheds are natural, watersheds are integrative, and watersheds are participatory. Alternately, in some cases, the statement was simply made that watersheds are widely recognized as the best scale at which to govern water. This work sheds new light on a widely-held assumption, and points to conceptual fuzziness around what constitutes 'local', 'integration' and 'participation'. This conceptual fuzziness is not particularly surprising, given the conflation of watersheds and governance tools identified in Chapter 3.

On the question of governance implications, the dissertation draws on case study data to identify five key issues affected by rescaled governance initiatives. Below, I reiterate these and loop them back to the 'conceptual fuzziness' and argumentation identified in Chapters 3 and 4.

The first implication is that the watershed approach does not necessarily respond to the normative rationales for the 'scaling out' of rescaled water governance. That is, that despite the increased involvement of extra-governmental actors in water-related decision-making processes, their participation remains nominal due to governmental retention of decision-making powers. This implication brings into question the veracity of scaling out that has occurred, as well as the fit of the watershed approach with the participatory rationale for the implementation of this rescaled approach.

The second implication is that the uptake of a watershed approach raises questions about possible tradeoffs between scaling down and the desirability of consistent standards or practices. Uneven institutional capacities of watershed organizations mean that shifting responsibility out (to watershed organizations), down (from provinces), and up (from municipalities) often entails a diversification of environmental practices, management strategies, and standards. In light of this diversity, it is worth considering to what extent rescaling is socially or environmentally beneficial inasmuch as it entails a move away from centralized standards. The relative benefits and drawbacks of harmonization (e.g. standardization and centralization) and subsidiarity (the principle of resolving issues at the lowest possible scale) have been examined in the case of the relationship between the federal and provincial governments in Canada (Hill et al. 2008), but not within the provinces themselves. The federal / provincial analysis argued that a number of issues

(drinking water and source protection, water exports) would indeed benefit from greater harmonization. A thorough review of which issues are best managed at the provincial, regional, municipal, and watershed scales is outside the scope of this dissertation but warrants future consideration.

A third implication relates to the importance of querying the appropriate policy or legislative strength of watershed-scale organizations, including the possibility that watershed-groups might be more effective in explicitly non-regulatory roles. The data showed that some – but importantly, not all – representatives of watershed organizations felt that they were able to act more effectively if they maintained their non-regulatory roles. This implication is particularly interesting in light of the dominant characterization in the literature of local organizations (however defined) as desirous of greater regulatory authority in order to effectively implement and enforce the policies and plans they have been charged with developing.

The fourth implication is that the uptake of the watershed approach raises important questions about what is meant by 'democratic legitimacy' and how this aligns (or not) with that meaning. That is, that, as outlined in detail in Chapters 3 and 4, the uptake of a watershed approach often reflects public appetite for more inclusive forms of environmental decision making. Indeed, policy scholars and actors in the latter half of the twentieth century were instrumental in helping expand definitions of democratic accountability from the democratic election of a representative and fair decision-making outcomes to broader conceptualizations that included not only the outcome of a particular decision, but also how that decision was made. The implication that watersheds might be democratically problematic raises interesting questions, because it directly contradicts

one of the primary reasons for undertaking this particular form of rescaling in the first place. The fact that watersheds do not align with electoral boundaries, that what some see as real rescaling involves shifting decision-making responsibility to non-elected decision-makers, and that democratically elected representatives sitting on watershed boards are responsible to constituents at other scales and levels (i.e., municipalities, provinces) seems to contradict the notion that an inclusive watershed approach is more democratic than its jurisdictional predecessors. Moreover, the 'local is best' argument – even with all its flaws – is a tenuous fit with rationales for watersheds, which, as discussed in Chapter 4, are as much of a scaling up as they are a scaling down.

The fifth implication identified through interviews highlights the importance of policy coherence – that is, the importance of thinking through the ways in which watershed-scale initiatives fit into the water (and indeed the environmental) governance landscape of a particular province. Ongoing difficulties on the ground with respect to how watershed organizations (and the plans and policies they draft) align with existing departments and ministries, policies, legislation, and planning processes at both provincial and municipal scales demonstrate this point. This implication is particularly interesting in light of some one of the central ideological drivers of rescaled water governance in the first place: as discussed in Chapter 4, the prospect of integration at the watersheds scale is not only central to the popularity of IWRM which helped to catapult the watershed approach into popularity, but has also served as a rallying point around which differing – and occasionally competing – social worlds have been able to gather.

Indeed, as detailed in Chapters 3 and 4, the question of integration has been central to watersheds' popularity, although there appears to be a distinct lack of clarity about what

it is, exactly, that governance at this new scale is going to integrate: land and water, human and environmental health, inter-departmental policies and planning processes, municipal planning and development, and a myriad of social, economic, and environmental factors have all been framed as the beneficiaries of a more integrated approach to water governance.

Additionally, fuzziness about precisely *what* is to be integrated speaks back to the issue of naturalization. Since watersheds are frequently framed as natural governance scales, it follows that boundary selection is obvious: one simply needs to look at a topographic map to identify where the natural watershed boundaries are located. But, of course, the boundary selection process is far more complex than that. Canadian provinces provide a number of examples of the complicated nature of boundary drawing. Québec's water policy, for example, stipulates the inclusion of hydrologic factors, political boundaries, population density, existing agreements, and environmental, social, and economic factors in watershed boundary determination (see *Act to Affirm the Collective Nature of Water Resources and Provide for Increased Water Resource Protection).* In another example, Ontario's determination of thirty-six Conservation Authority boundaries followed by their selective amalgamation into nineteen Source Water Protection Areas, and the existence of New Brunswick's thirty watershed organizations (nearly three times as many as Alberta in an area about one tenth the size) are clear examples of the subjectivity of boundary selection.

Indeed, the most significant contribution of this dissertation is arguably that it not only explicates these influences and implications, but, more importantly, that it begins to put the two into conversation. It is particularly noteworthy that rationales about

watersheds' naturalness and their participatory and integrative qualities do not cleanly align with the governance implications identified in the latter part of the dissertation, suggesting that governance rationales for rescaling to watersheds are unmeasured, unmeasurable, or demonstrably incorrect. Watersheds' naturalness, for example, has been repeatedly demonstrated to be contested, either because there are other interpretations of natural boundaries that are equally important, or because humans have had a great deal of direct influence in altering water courses and flow (through, for example, irrigation infrastructure and hydrologic engineering). The questions of integration and participation are difficult to quantitatively measure under the best of circumstances; this measurement becomes virtually impossible when one considers that the terms mean different things to different actors. I emphasize that their lack of measurability does not mean that they are not valid goals, but rather that the findings of this dissertation suggest that they fall short of the kinds of clear and measurable goals so central to what is understood as good governance.

6.2 Contributions to our understanding of water governance in Canada

The arguments presented in the dissertation contribute to the study of water governance in Canada by documenting and analyzing the switch from jurisdictional to watershed boundaries in four provinces.

A first contribution speaks to lack of understanding about why rescaling has taken place in Canada, where the reasons for this policy change are poorly understood. The research undertaken in this dissertation sought to unpack the assumption that watersheds are the best scale at which to conduct water governance by making explicit the ideologies,

communities, and rationales embedded in this common assertion. As the interview data presented in Chapter 4 show, arguments in favour of watersheds do not exist in isolation from their socio-political contexts. When decision-makers contemplate a rescaling of water governance, they do so in the context of a myriad of competing interests and heterogeneous values and norms – both within the general populations of their jurisdictions, but also among the decision-makers themselves. In Chapter 4, I showed how arguments in favour of watersheds reflect and are – at least in part – shaped by diverse ideologies and dynamic political, economic, and social trends.

A second contribution to current understandings of watersheds in Canada speaks to a gap in current understandings about the implications of taking up rescaled water governance. Although the challenges associated with the watershed approach are well documented in the United States and elsewhere (e.g. Blomquist and Schlager 2005; Griffin 1999), they remain understudied in Canada. Moreover, despite existing work documenting the obstacles associated with rescaling initiatives in other locales, a more nuanced examination of the questions and issues raised by their uptake has thus far remained under-theorized, both in Canada and elsewhere. In other words, although the challenges may be well-known, the internal inconsistencies and unexamined contradictions embedded within watershed-scale initiatives are less well-known. In Chapter 5 of the dissertation, I respond to this gap by identifying five implications of rescaled governance in Canada. The implications identified in that chapter are not necessarily challenges associated with rescaling to watersheds (although they are, of course, related), but rather, highlight a number of critical questions that the uptake of watersheds raises. In the latter part of Chapter 5 I mobilize these implications to explore

the development and advancement of a political ecology of scale, and in the opening section of this conclusion (section 6.1) I relate these implications back to the practical and ideological drivers identified in Chapters 3 and 4. The contributions of this integration are discussed below.

6.3 Contributions advancing the theoretical framework

The dissertation also contributes to debates that extend beyond the Canadian context. In particular, the key findings of this dissertation contribute to debates framed by the conceptual framework of the dissertation – i.e., at the intersection of political ecology, scale, water governance, and environmental management.

First, the research findings point to a new approach to the study of watersheds. To date, research on watersheds has typically fallen into one of three categories. The first focuses on identifying challenges associated with a watershed approach (e.g. Blomquist and Schlager, 2005; Griffin, 1999). The second is concerned with the approach's utility as a means to particular policy ends, such as transboundary cooperation or increased extra-governmental participation (e.g. Cervoni et al., 2008; Fischhendler and Feitelson, 2005), and has convincingly documented the methodological impossibility of quantitatively measuring the effectiveness of this approach on water quality (see Sabatier et al., 2005). The third type of work traces watersheds' use across space and time (e.g. Molle 2009; Wolley and McGinnis, 1999). The research presented in this dissertation emphasizes the utility of moving forward with research that explores why watershed uptake happens in particular times and locales, the implications of the approach's implementation, and, perhaps most importantly, the relationship between the two. Moreover, as explored in section 6.4, this new approach has direct policy relevance:

making explicit the policy rationales for scalar change provides a 'yardstick' against which outcomes can be measured. The utility of such a tool is highlighted in recent work that emphasizes the uncoordinated and disconnected metrics currently used to measure water quality (Dunn and Bakker 2011) and watershed performance (Veale 2010).

A second theoretical contribution relates to the so-called naturalness of watersheds as governance units. The field of environmental management, both in Canada and internationally, has a strong emphasis on the identification of natural systems and the subsequently inherent desirability of (re) aligning administrative structures to reflect these (Grumbine 1994; Slocombe 1993). The work presented in this dissertation speaks to the understudied questions around the relationship between this perceived naturalness and rescaled governance. As Chapter 4 shows, the (often implicit) argument about watersheds' naturalness is a central ideological driver of rescaled environmental governance, but, as the data in Chapter 5 show, this putative naturalness is unable to overcome pervasive governance challenges – i.e., power struggles – that appear to exist at all scales, whether or not they are promoted as natural. The second contribution is therefore the insight that although drawing on watersheds' naturalness may be a convincing rationale for rescaling, naturalness does not necessarily facilitate the creation of governance systems that are more participatory or integrative than their political predecessors. In fact, I tentatively suggest that watersheds' perceived naturalness may exacerbate, rather than resolve, the question of integration. Their situation outside of conventional governance scales may make them attractive alternatives to governance arrangements unable to respond to complex problems on a jurisdictional basis. But, as explicated in Chapters 3 and 5, this same characteristic of asymmetry with jurisdictional

boundary can complicate conventional lines of democratic accountability and constrain watershed organizations' ability to act on issues affecting them, but outside of their physical boundaries and water-specific mandates.

Related to this, the arguments in this dissertation make a third conceptual contribution by providing empirical data and analysis that helps to develop and advance a political ecology of scale. Questions of power, authority, and decision-making inherent to this three-pronged rescaling fit well with calls for engagement between political ecology and scale (e.g. Neumann 2008; Rangan and Kull 2008; Robbins 2008; Zimmerer and Bassett 2003). The work presented in this dissertation adopts the perspective of – and builds on – work rejecting watersheds' naturalization (Biro 2007; Norman and Bakker 2008; Warner et al. 2008; Wester and Warner 2002) by exploring how the implications identified through case study data can be mobilized to advance political ecological accounts of rescaling, in particular through expanding the bases upon which the question of whether or not 'real' rescaling has occurred, as well as by emphasizing the utility of scalar constructivism of political ecologies.

The arguments in this dissertation also build on arguments that watersheds' naturalization has led to their depoliticization - i.e., their argument that framing watersheds as natural preemptively closes down democratic debate on appropriate governance scales (Warner et al. 2008; Wester and Warner 2002). By making explicit the drivers and implications of rescaled water governance, this dissertation contributes to the re-politicization of watersheds. In other words, unpacking the rationales, ideologies, and epistemologies underlying rescaled water (and, indeed, environmental) governance provides a toehold into a new kind of conversation – both conceptual and applied – about

rescaled governance. Such a conversation could, for example, analyze particular pathways of naturalization and explore its effects, as is suggested in section 6.5, below.

6.4 The future of watershed governance in Canada: policy implications

In addition to its conceptual contributions, the work in this dissertation points to a number of policy-relevant findings. By shining a spotlight on what is often an unquestioned assumption – that watersheds are the best scale for water governance because they are obvious and natural – the dissertation sought to unpack and understand the motivations for and implications of this significant policy change. In particular, I suggest that jurisdictions considering a rescaling of water (or environmental) governance might do well to consider and make explicit their rationales for this policy change. This explicit consideration would yield two benefits.

First, it would provide a yardstick against which to measure whether or not rescaling initiatives had been successful. (Indeed, this was the initial research idea for the dissertation but proved impossible due to lack of policy clarity about why rescaling had taken place.) The dissertation demonstrates that there is a significant disjuncture between the drivers and implications of rescaled water governance, and I would suggest that this might derive – at least in part – from a lack of policy clarity about reasons for rescaling. Making explicit the reasons for rescaling – more participation, better policy integration, improved environmental outcomes, inclusion of land and water uses, integrated management of cumulative effects, or cost saving and reduced government roles – seems like an obvious first step to measurably effective policy (e.g., effective at what?).

Second, making explicit the rationales for rescaling may lead to thoughtful consideration of whether or not rescaling is the most effective means to particular ends. If, for example, a move towards watersheds is being considered in order to incorporate upstream and downstream users, or land use planning with water governance arrangements, then the inclusion of upstream and downstream waters in the same 'policy-shed' (to borrow the term from Chapter 2) makes sense. On the other hand, if rescaled water governance is being undertaken for the sole purpose of policy integration between governmental ministries or between different branches of a single ministry, one might consider whether this particular goal might be met without a re-drawing of boundaries. Given the challenging governance implications of rescaled environmental governance highlighted in this dissertation, careful consideration of alternate means to particular ends might be warranted. Indeed, as suggested in Chapter 2, good governance may be a prerequisite for – rather than an outcome of – governance reforms.

Policy-makers may also wish to consider the explicit recognition of other biological scales into watershed-scale decision-making frameworks. As demonstrated throughout this dissertation, watersheds are but one kind of natural boundary and the asymmetries between watershed boundaries and other biophysical boundaries are complex and at times unclear. In the Lake Simcoe case, for example, explicit recognition of the relationship between the watershed and airshed has led to policy insights. This is not to say that a watershed boundary is not useful, but rather that explicit recognition of other ecosystem units could enrich policy-making at the waterhed scale.

6.5 Limitations and future research directions

Like any body of academic work, this dissertation has particular strengths and limitations. The core strengths of the dissertation lie in the empirical and conceptual contributions as outlined above. The dissertation also works to build bridges across subfields (particularly in Chapters 3 and 5), and is innovative in its study of water governance from an interdisciplinary social sciences perspective – bringing concepts from environmental management, political ecology, and governance to bear on a timely topic (watersheds) with real world applications.

The integrative and interdisciplinary strengths of the dissertation, however, are also a limitation of the work, and readers might be left unsatisfied with my limited treatment of water management or the selective use of rich theoretical literatures in political ecology, governance, neoliberalism, or science and technology studies. Additionally, the data presented Chapters 4 and 5 are subject to the usual weaknesses of case study and interview work: they have limited (but useful) generalizability, there is a relatively small number of sample sites, and analysis is subject to the challenges associated with researcher subjectivity (Creswell 2006; Yin 2008). Despite challenges associated with case study methods, it was nevertheless appropriate for my work because it allowed me to assess a particular issue in a number of sites and using a variety of sources, with the result that I was able to access information and expertise in that allowed me to effectively answer my research question.

Through the course of this research, three projects emerged as potential areas of future research. One would be to explore the question of naturalization through discourse analysis in order to better understand the specific pathways of the naturalization of

watersheds. Hollander (2005), for example, explores the discursive and material configuration of Everglades restoration in Florida, and Sneddon and Fox (2006) explore how particular framings simplify complex hydrologic units like the Mekong Basin. I suspect that an analogous investigation into the discursive use of naturalized watersheds in Canada might yield interesting findings about systematic fragmentation between governance systems for health and environment, land and water, and nature and society.

A second project could consider casting an even wider disciplinary net by incorporating water quality data into inquiry on rescaled water initiatives. Such a project could respond to calls for greater attention to ecological factors in political ecological studies (e.g. Vayda and Walters 1999), and could meaningfully engage with work exploring the linkages between ecological and governance scales (Cash et al. 2006; Cumming et al. 2006; Sayre 2005).

A third project could be to expand the analysis carried out in this dissertation to other political jurisdictions. Are the drivers and implications identified in this dissertation unique to Canada, or might they be relevant elsewhere? Or, in the Canadian case, how might the presence of sovereign First Nations fit into the scalar puzzle of rescaled environmental governance? As outlined in Chapter 2, one of the unique aspects of the Canadian case is the relatively minimal role of the federal government in matters relating to environmental governance. How might the findings change in locales where a federal government has more presence? These questions are part of my future research agenda. Most notably, I plan to carry out postdoctoral research at Clark University, where I will look at how actors at federal scales play into the frameworks developed here. I intend to

do this by carrying out research on Chesapeake Bay, in the United States, which has seen significant and ongoing involvement of federal actors for a number of decades.

More generally, each of these three projects could be undertaken with a view to exploring the relationship between rationales and implications in greater depth. Such explorations have the potential to usefully inform meaningful policy change, as well as to contribute to current understandings of environmental decision-making, political ecology, and, most centrally, scalar scholarship.

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LEGISLATION, REGULATION, AND CASE LAW

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Wellfield Protected Area Designation Order, NB Reg 2000-47

Appendix A: Sample Interview Questionnaire

1. What is your job description?

2. Can you tell me why people in [province name] decided to adopt a watershed-based approach?

3. Do you have a sense of why those arguments were compelling to you/your colleagues/your predecessors?
   -Ontario: Do you think the reasons that applied in 1946 still apply today? Why or why not?)
   -Alberta: how have these changed with the 2008 review of *Living Water Smart*?
   -Nova Scotia: What do you see as the 'pros and cons' of a watershed-based approach?

4. Can you tell me a bit about how you see the reasons for the switch to a watershed approach (above) playing out on the ground? How do these look in practice?

5. How do you think your current watershed system compares to the system in place before?

6. What has worked well with a watershed based approach, and why do you think it has worked so well? What aspects have been more of a challenge?

7. What do you see as the implications of this change in governance approach?
   -Nova Scotia: What works well about the current water governance regime in NS? Why do you think it works well? Do you face challenges with respect to water governance? What are they? How do you think that switching to a watershed-based approach might change these?

8. Can you tell me a bit about the relationship between the provincial or municipal governments and stakeholders or local interest groups?

9. (Alberta and New Brunswick) Do you think that that relationship has changed at all since the switch to watershed-based governance? If so, how?
   -Nova Scotia: How do you anticipate that the relationship between the NS government and stakeholders or local interest groups might change if you decide to switch to a watershed-based approach?

10. Is there any other relevant information you'd like to share?

Appendix B: Anonymized List of Interviewees

1. NGO, Ontario
2. NGO, Ontario
3. NGO, Ontario
4. Provincial government, Ontario
5. Provincial government, Ontario
6. Watershed organization, Ontario
7. Watershed organization, Ontario
8. Provincial government, Ontario
9. Watershed organization, Ontario
10. Federal government
11. Independent expert, Alberta
12. Federal government
13. Watershed organization, Ontario
14. Watershed organization, Ontario
15. Watershed organization, Ontario
16. Federal government
17. Federal government
18. Federal government
19. Independent expert, Alberta
20. Provincial government, Alberta
21. Watershed organization, Alberta
22. Provincial government, Alberta
23. Independent expert, Alberta
24. Watershed organization, Alberta
25. Provincial government, Alberta
26. Provincial government, Alberta
27. Federal government
28. Provincial government, Alberta
29. Academic, Alberta
30. Irrigator, Alberta
31. NGO, Alberta
32. Watershed organization, Alberta
33. Watershed organization, Alberta
34. NGO, New Brunswick
35. Provincial government, New Brunswick
36. Independent expert, New Brunswick
37. Independent expert, New Brunswick
38. Watershed organization, New Brunswick
39. Provincial government, New Brunswick
40. Provincial government, New Brunswick
41. Provincial government, New Brunswick
42. Federal government

43. Academic, Nova Scotia
44. Watershed organization, Nova Scotia
45. Watershed organization, Nova Scotia
46. Provincial government, Nova Scotia
47. Provincial government, Nova Scotia
48. Academic, Nova Scotia
49. Provincial government, Nova Scotia