Transformations in Water Governance: An Examination of the Lake Simcoe Watershed

by

Seanna Lee Davidson

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AUTHOR'S DECLARATION

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

ABSTRACT

Individuals, communities, non-government organizations and governments are in constant pursuit of intelligent responses to the complex socio-environmental challenges they encounter. The capacity to respond effectively to these contemporary challenges is deeply dependent on the presence of effective governance processes. Governance scholarship has typically been limited to individual elements such as frameworks (hierarchical or market or network), tools (e.g., regulation) or actors (e.g., government). The goal of this thesis is to characterize and explain transformations in water governance in order to offer insight into how more effective governance processes can be created. Transformations in governance speak to the dynamic nature of governing, and highlight the consistent push and pull between, and amongst, the various components at play. Components include actors, formal and informal structures, and the social, economic and environmental contexts in which governance is embedded. Critically each of these components also exists and has influence at multiple levels, adding to the complex and dynamic nature of governance. This research argues that the core elements (frameworks, tools, actors) should be examined individually, as well as collectively, and within context of the various components in order to obtain a holistic perspective on governance process. This holistic perspective is necessary if we are to garner a true understanding of how governance is ultimately designed, contested and transformed.

The research focuses on a large-scale water governance case in southern Ontario that is governed by its own provincial legislation – the first of its kind in Canada. The research examines governance frameworks as situated within the broader architecture, tools, and actor dynamics in the Lake Simcoe watershed and how they evolved over a 30-year period. Interviews, archival research, surveys and social network analyses were utilized in a mixed methods approach. The first governance element examined in this thesis is the architecture of the entire system over the 30 year time period. Rather than conduct a narrow analysis of an individual governance framework in a select period of time, the research takes a high level perspective to identify the transitions between governance frameworks, and the social, economic, and environmental tensions and drivers that initiated change. Particular value is offered by the use of social network analysis to visually identify the structure and statistically evaluate the governance framework at multiple phases in the research period. The second element of governance, tools, is then assessed. Specifically, the utility of a watershed boundary for water governance is examined. The thesis argues that the watershed boundary has value, but should be applied in limited and focus ways, and greater attention should be given to governance processes that transcend the watershed boundary. The final element examined is actors. Early in the thesis, focus is given to the role of government, but in the final section particular attention is given to the role of non-government actors. The research describes how the role and activities of non-government actors has advanced beyond late 20th century approaches, where recent trends display more innovative and entrepreneurial characteristics.

The research offers nine important insights for theory and practice in water governance. (1) Governance processes have the potential to be flexible, adaptive and responsive. (2) A reduced presence of government does not always hold back processes of governance. (3) Existing tools can be re-imagined for new processes. (4) Non-government actors have agency (5) Give attention

to individual knowledge and capacity through a distributed governance approach (6) Give attention to time and the building of scientific knowledge (7) Give attention to need for effectively facilitated processes (8) Give attention to emerging opportunity (9) Permits space for creative destruction. Collectively, the findings from this research further develop scholarship on the individual elements of governance, as well as speak to the transformations in water governance as a whole.

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LIST OF ACRONYMS

ED	Environmental Defence
ENGO	Environmental Non-governmental Organization
MOE	Ministry of the Environment
MNR	Ministry of Natural Resources
LSEMS	Lake Simcoe Environmental Management Strategy
LSCRC	Lake Simcoe-Couchiching Report Committee
RLSC	Rescue Lake Simcoe Coalition
LofL	Ladies of the Lake
ON	Ontario Nature
CLS	Campaign Lake Simcoe
SNA	Social Network Analysis
LSCRA	Lake Simcoe Region Conservation Authority
LSSAC	Lake Simcoe Science Advisory Committee
LSPP	Lake Simcoe Protection Plan
LSPA	Lake Simcoe Protection Act
NGO	Non-governmental Organization

Chapter 1

Introduction

1.1 Introduction

As individuals and communities, organizations and governments, we are in constant pursuit of intelligent responses to the complex socio-environmental challenges we encounter (Folke, *et al.* 2005). Our capacity to respond is deeply dependent on the decision-making processes that are engaged (Reed and Bruyneel 2010). The selection of which actors will be involved, which styles of dialogue and debate, collaboration or conflict resolution are utilized and how, or if, consensus will be formed collectively construct the possible outcomes and therefore success or failure of the response.

Governance can be defined as "the structures and processes by which people in societies make decisions and share power" (Young 1992, 160).Governance theory has a basis in policy studies and administrative sciences. Governance scholars typically have focused on the actions of governments, government-driven policy change, and how governments choose to engage with the public and private sectors (Klijn and Teisman 2000; Kooiman 1993; Poulsen 2009). Government, in this discussion, is not limited to federal or national governments, but instead refers to government agencies across various scales (regional, state/provincial, and federal) and most generally, governments in the western world. Changes in social, economic and environmental realities, such as severe weather events (droughts, flooding), economic downturns and increasing gaps between rich and poor, have influenced government actions and processes, and in turn shifted the focus of governance theory (Armitage, *et al.* 2012). As governments increasingly provided or permitted a broader role for markets to offer social services, scholarship in turn begun to investigate the resulting restructuring of roles and relationships between government and the private sector (e.g., Agrawal and Lemos 2007). When a focus on market mechanisms showed weakness in dealing with complexities of governing across a broad range of social and environmental issues, a second major shift in governance practice took place. Through this second shift, the governance literature moved towards examining how networks amongst a variety of actors beyond government were influencing and undertaking governance (Gibbs 2008; Holley, *et al.* 2012).

Yet with each of these governance systems (hierarchy, market, network), scholarly study has typically been limited to an element of the system, rather than taking a holistic perspective (e.g., Bakker 2003; Crona, *et al.* 2011; Kooiman 1993). Exceptions to this pattern include Holley *et al.* (2012) and Moss and Newig (2010) who consider the interactions amongst multiple governance systems, and governance across scale. There is now greater acknowledgement within governance scholarship for the need to examine governance from a holistic perspective, i.e., the dynamic and interacting nature of multiple governance systems within, and across scale and time, in order to obtain a more accurate understanding of governance in practice and to inform theory (Newig and Kvarda 2012). Lowndes and Skelcher (1998, 331) have noted that a more nuanced view of the complexity of governance in practice is necessary, because failure to do so would result in a "crude periodization" of governance. This phrasing can be understood to refer to how practices of governance have been lumped into large phases, or periods of governance systems,

i.e., hierarchy or markets. Theirs is an effort to avoid the position that single governance systems exist in tidy, isolated and compartmentalized formats where there are only hierarchies, or only markets or networks.

Transformations in governance speak to the dynamic nature of governing, and highlight the consistent push and pull between, and amongst, the various components at play. Components include actors, formal and informal structures, and the social, economic and environmental contexts in which governance is embedded. Critically each of these components also exists and has influence at multiple levels, adding to the complex and dynamic nature of governance. This research argues that the core elements (frameworks as situated in a broader architecture, tools, actors) should be examined individually, as well as collectively, and within context of the various components in order to obtain a holistic perspective on governance process. This holistic perspective is necessary if we are to garner a true understanding of how governance is ultimately designed, contested and transformed. This dissertation argues that there are three elements that should be examined in order to construct a holistic perspective on governance. These include (1) governance architectures, (2) tools, and (3) actor dynamics. Examining governance architectures goes beyond identification of an individual framework and provides insight on what types of governance systems are in place, and potentially how they interact and change over time. Given that governance is largely a social process (Bogason and Musso 2006; Kanie, *et al.* 2012) and is therefore subject to changes in contexts, influences and externally imposed events, it is unlikely that changes in governance over time will follow a common or linear path. Tools are related to the actualization of governance and include elements such as participation, idea generation, and implementation. These elements define governance in practice. Actor dynamics provide critical insights into the relationships and interactions among those engaged in governance. There has been a long focus on the actions of government, but with the acknowledgement of market and network governance systems, it is clear that non-government actors are engaged in some capacity. With such shifts underway, it is necessary to give value and attention to the diverse array of actors engaged in governance (Compas 2012; Fagan and Sircar 2010).

These three elements draw out important research questions regarding governance. What types of transformations are taking place within governance architectures? What types of tools are available to permit greater flexibility and adaptiveness in response to constantly shifting governance contexts? Who is engaged in governance and how? Together, the examination of governance relative to these three elements has the potential to offer a comprehensive, holistic perspective on the complex dynamics regarding current governance practice, and can deeply inform governance theory.

Water governance is a particularly useful setting within which to examine these governance elements. In its third *World Water Assessment Report*, the United Nations stated that the earth is on the brink of a global water crisis, and that avoiding this crisis rests largely on achieving effective governance processes (United Nations World Water Assessment Programme 2009). While governance challenges that exist in the realm of water resources hold their own unique characteristics (i.e., trans-boundary, non-stationary) several also mirror those faced in other public policy arenas. These challenges include divided and fragmented authority among governing bodies, questions relating to the appropriate mechanisms for governance, and the form and extent of engagement and leadership for different governance actors (Moss and Newig 2010).

This research provides an examination of governance in a large-scale watershed case in southern Ontario, Canada over a 30 year period. The research applies a case study method and includes multiple forms of governance systems over time. The long period of assessment is useful for highlighting the influence of social, economic and environmental influences on governance and resulting changes in architecture, tools and actor dynamics. The geographic area in Ontario under examination is a complex system where economics, social and environmental challenges and needs are often in conflict, suggesting that a defined set of tools may not always be appropriate for a case that requires flexible and adaptive responses to emerging and shifting challenges. The case study includes a dynamic range of actors who have changed over time in influence and engagement, and have demonstrated that government is not a sole decision maker. Finally, the case study location includes multiple levels of contrasting jurisdictional authority and responsibilities, adding further complexity to governance architectures, processes and actor dynamics.

1.1.1 Research Objectives

The purpose of this doctoral research is to characterize and explain transformations in water governance. The research explores a water governance case over a 30 year period of time to evaluate how and why the water governance system was transformed. Building on this evidence, the research explores the broader issues of governance change and inter-related dynamics of actor relationships, tools and architectures. Within the broader purpose stated above, there are four specific study objectives:

- To evaluate changes in governance architecture over time;
- To identify and assess governance tools;
- To examine the changing role of NGOs in governance
- To offer insight and theoretical contributions on how more effective governance processes can be created

The holistic perspective on governance is an important step towards deciphering and understanding the true complexities and interconnected relationships that exist within social and environmental interactions. Collectively, the architecture, tools and actor dynamics of a governance system generate an interactive space through which policy, actions and environmental changes reverberate. An examination that is too narrowly focused has the potential to miss the indirect effects of such reverberations in a system, and therefore misinterpret how and why changes are taking place.

This dissertation has been prepared in the academic journal manuscript style. Therefore, it contains this introductory chapter, which is followed by three standalone articles intended for publication in peer-reviewed journals, and then a final conclusion chapter that ties the findings of the individual manuscripts together in response to the research framework presented here. This chapter articulates the research objectives and presents the overall research methodology and data analysis. Additionally, it provides grounding for the context of the research and case study description. It should be noted that while the research methodology outlined in this chapter is relevant to the whole research project, there is variability in the focus, aim and objectives, and methodologies within the three chapters that present the results. The Conclusion (Chapter Five)

therefore ties the findings of the individual manuscripts back to the main research objectives to offer a cohesive response to the research purpose.

1.2 Governance Theory

1.2.1 Governance Architectures

Governance as a concept suggests that society utilizes a number of structures and processes to identify challenges, create solutions, and successfully implement responses to overcome common social problems (Borrás and Radaelli 2011). More precisely it can be understood as "the structures and processes by which people in societies make decisions and share power" (Young 1992) . Yet given that governance practice deals with complex social arrangements, it is necessary to examine the depth and complexity of the multitude of structures and processes at play. Investigations of governance practice must examine the full range of elements involved in order to decipher, describe and gain knowledge of the true construction and interactions of governance. Social-organizational features of governance include particular classes of designated agents, their roles and relations of power/authority, and procedures for making collective decisions. Normative-cognitive features include the definition of problems, the goals or priorities relating to the problems and the conceptualization of sources of the problems, the causal linkages, and strategies and methods to solve problems or deal with issues (Burns and Stöhr 2011). Therefore it is necessary to examine both the social organization and normative-cognitive features of governance.

The concept of *architecture* provides a useful analytical framework for governance. Gunningham (2009a) asserts that the metaphor of architecture enables investigators to distance themselves from the details, and permits an evaluation of the underlying foundation of the governance system, while also acknowledging the individual parts that form the whole. In addition to providing a holistic perspective, the governance architecture construct also permits comparative analysis among governance systems. Biermann, *et al.* (2009) suggest that by applying the construct of architecture, the synergy and conflict between governance systems can be identified, compared and assessed. Approaching governance through an architectural lens also provides for a multi-level and temporal assessment. Clarke (2004; in Kuhlmann and Allsop 2008, 174) calls for a more "'conjunctural analysis' in order to explore the 'unsettled formations' of governance". These references suggest that the transitions between governance systems over time, and the push and pull effects of governance between levels, can impact the architecture of a governance system in a particular space and time.

Biermann, *et al.* (2009) have identified the analytical problem of governance architectures as one of five major future challenges in the emerging field of earth system governance research. This same priority applies to regional and local governance systems, where whole system research and analysis is only beginning to emerge. Burns and Stöhr (2011), Gunningham (2009a) and Biermann, *et al.* (2009), are scholars applying governance architecture as an analytical framework. Each offers particular insight as to how to apply this approach. Biermann, *et al.* (2009, 18) recognize the frequently serendipitous nature of governance architecture when they state, "we assume neither an a priori existing state of universal order nor a universal trend towards order… architectures are likely to result from incremental processes of

institutionalization… In other words, the concept of architecture does not assume the existence of an "architect." This speaks to the need to identify each of the contributing factors, but to assess the system as a whole that is responding to a confluence of events. Burns and Stöhr (2011, 180) add that descriptions of governance architectures must also examine the "key drives of how governance systems are established, maintained or changed through power, knowledge, and contestation/conflict processes" in order to draw out the relationship between and amongst governance elements. They identify four drivers for shifts in governance including 1) dominant power and a shift in the agent's cognitive-normative framework, 2) power shifts, 3) a new governance order is established through multi-agent negotiation, 4) governance shift through diffusion and emulation (organic transformation) (Burns and Stöhr 2011).

This point is echoed by Gunningham (2009a) who states that the relationship between elements and actors "enables the development of a more sophisticated and nuanced account of how and why environmental architectures have shifted in particular directions, [and] the consequences of those shifts." These statements suggest that in many ways, the most critical aspects of governance systems are the informal cultures, institutions and dynamics between elements that operate within a given space. Therefore investigations must focus on these possibly less tangible, but highly influential, elements in order to triangulate the data and form the most accurate construction of the system.

By understanding the architecture of governance, it may then also be possible to shift it towards a more favorable future design. Kanie *et al.* (2012), in discussion of governance architecture for sustainable development, recognize that changing social, economic, environmental and political contexts require parallel shifts in governance architecture and pose the question – "what alternative architecture would make sense, and how can we get there?" Their commentary liberates future governance from current constraints (i.e., how or if a selected process or set of tools can achieve a desired outcome) by acknowledging the actor agency role in governance, and the potential to create a communally constructed future. Young (2008) states that there is a need to seek a change in governance architecture if actors are going to be able to respond to the large scale and complex social and environmental challenges present today. As in so many cases many institutions are charged with responding to environmental challenges that did not exist when they were initially created (Newell, *et al.* 2012).

1.2.2 Tools for Governance

The notion that the watershed provides an ideal boundary has been common for some time. The use of watershed boundaries was noted in the third century China (Molle 2009). Drainage areas were mapped in Spain and France in the mid-1800s (Blomquist and Schlager 2005; Molle 2009). Several rationales for the appropriateness of watershed boundaries have been advanced. First is the apparent naturalness of the boundary (Commission of the European Communities 2007; Parkes, *et al.* 2010; Saravanan, *et al.* 2009; Warner, *et al.* 2008; White 1957). Watersheds are defined by hydrological processes. Thus, they are "distinct, easily mapped and stable" (Barrow 1998) and "define basic, ecologically and geomorphologically relevant management units" (Montgomery, *et al.* 1995). These properties, it has been suggested, make them a tangible and manageable unit for water governance (Kenny 1999).

With the acceptance of the boundary as natural, it is often asserted that watersheds are the most appropriate scale for defining the jurisdiction of water-related organizations. From this

perspective, considerations such as social, political, economic and environmental functions relevant to water governance should be organized and integrated at this scale (Huitema, *et al.* 2009; Leach 2006; Schmidt and Morrison 2012). This perspective is evident in the European Union, where watersheds (or catchments) are a defining feature of governance under the Water Directorate Framework (Commission of the European Communities 2007). The appeal of the watershed boundary as an organizing principle is the assumption that organizing activities around this spatial unit will permit systematic integration of issues, participation of relevant stakeholders, and more effective resource management (Montgomery, *et al.* 1995; Schmidt and Morrison 2012; Woolley and McGinnis 1999). Veal (2010) outlines several additional purported strengths of the use of the watershed boundary. These include the capacity for the state of the ecosystem to be reflected in the state of the water flowing through the system; the ability for water systems to demonstrate the cumulative effect of environmental stresses; the role that watersheds can play as bridging tools for agencies; and finally, the fact that human communities can relate to their landscapes, making it an appropriate boundary for engagement.

A growing body of literature is arguing that watershed boundaries are useful in limited applications and that the utility of the watershed boundaries relates primarily to whether it is being used for water management or governance purposes (Cohen and Davidson 2011). It is therefore important to make the distinction clear between governance and management. Management is defined as "the operational, on-the-ground activity to regulate a resource and conditions of its use" (Nowlan and Bakker 2007, 5); designing allocation plans, flooding, and day-to-day water quality testing are examples of water management activities. Governance can be defined as "the structures and processes by which people in societies make decisions and share power" (Young 1992, 160). This paper is concerned with the use of boundaries for water governance, and consequently the use of watershed boundaries for water governance. Most recently Cohen and Davidson (2011) have synthesized five distinct challenges that exist including boundary selection, accountability, public participation, problemsheds and policysheds.

1.2.3 Non-Government Governance Actors

Advancements in scholarly governance literature illustrate the dynamic and complex nature of governing. These advancements include empirical research on the changing role of the state in the last quarter century. This has been an important contemporary concern for policy makers, scholars and the public (Gouldson 2009; Hysing 2009). There is increasing recognition among governance scholars that non-government governance actors are exerting influence over governance systems and contributing in novel ways to governance process (Newell, *et al.* 2012). The roles of non-government actors such as non-governmental organizations (NGOs) are particularly pertinent to water governance as these groups are very active within water governance processes. NGO actors have long played an important role in the governance process through advocacy, protests, awareness campaigns and citizen movements (Pross 1986). Classical governance arrangements, whereby the state exerts hierarchical control and dominance in governing society (Treib, *et al.* 2007), have proved unsuitable and unresponsive to current social, cultural and environmental complexities (Lemos and Agrawal 2006). As a result, NGO actors have become more involved in governance beyond the role of advocacy and stakeholders. NGO actors are generating opportunities for, and sometimes directing, governance processes (Auer

2000a; Bugdahn 2008; Dombrowski 2010). In this way they are exerting greater agency and authority (Benecke 2011).

Some scholars suggest non-government actors are not simply being invited to participate in governance activities by government (Edelenbos, *et al.* 2010; Gouldson 2009; Gunningham 2009b). Instead, they are actively pursuing their own governance agendas (Crow 2008; Gouldson 2009) and thus are becoming important actors in shaping environmental solutions (Auer 2000a; Wapner 1995). These authors suggest that non-government actors are creating their own distinct roles in governance processes that go well beyond simply being subjects for consultation. As a result, they are further altering the governance frameworks in which they operate. While Legler (2012) states that unless non-government actors are able to obtain authority, their efforts to govern are meaningless, other authors contend that contributions by non-government actors are creating a more resilient and democratic environment by revitalizing the governance process (Kapaciauskaite 2011; Kim 2009). That non-government actors are modifying governance process and influencing policy and cultural norms in their own unique ways highlight a need to further assess how this is impacting governance architecture as a whole.

1.3 Historical Governance in the Lake Simcoe Watershed

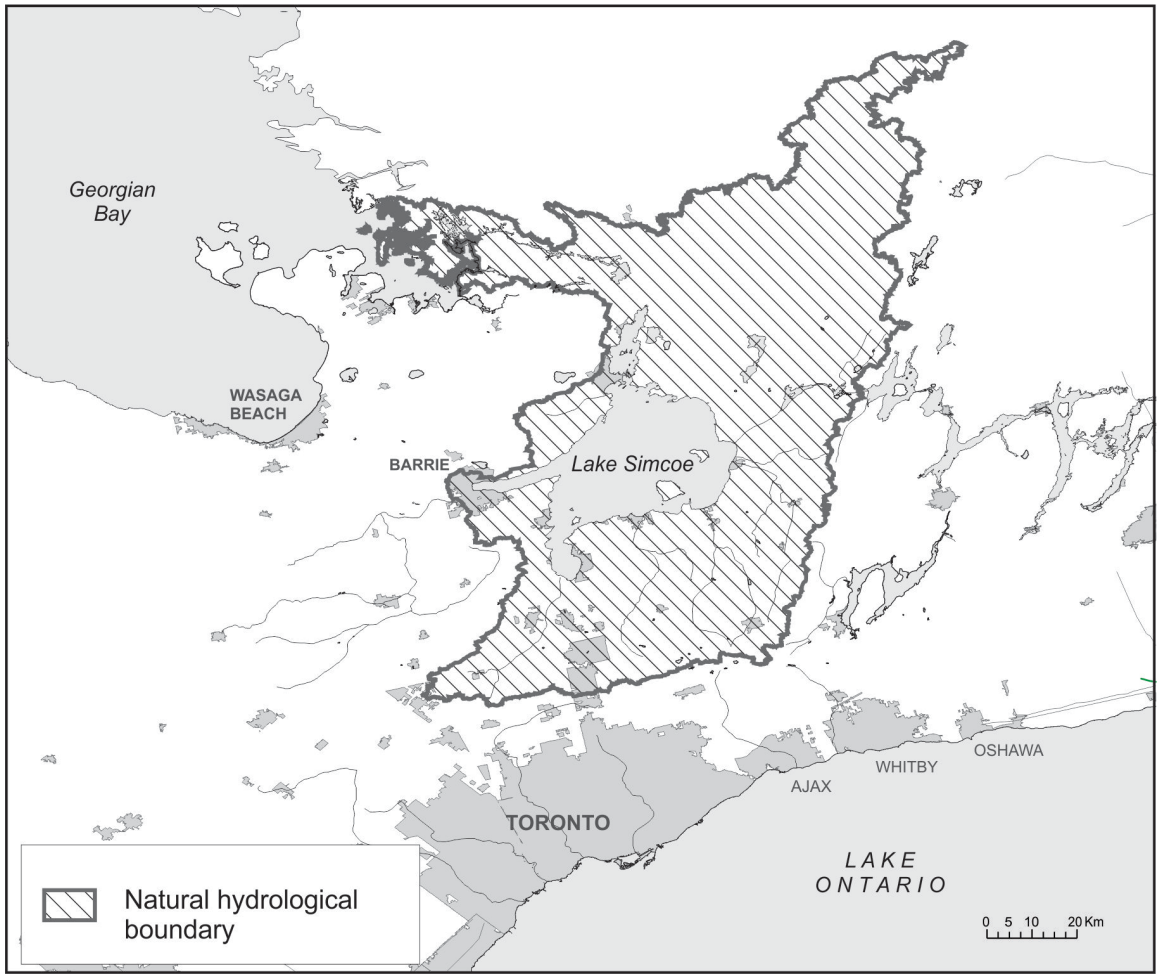
Lake Simcoe is a one hour drive north of Toronto, Canada's largest metropolitan area. The Lake Simcoe watershed (Figure 1) has a total land and water surface area of 3,303 sq. km., of which the lake itself occupies approximately 22% or 722 sq. km. It contains significant natural, urban and agricultural systems and is a source of drinking water for five municipalities. It is southern Ontario's largest inland lake, excluding the Great Lakes (Government of Ontario 2009). The watershed provides significant economic value to the region and the province, bringing in an estimated $200 million dollars annually through recreational activities (Government of Ontario 2009). Primary recreational activities include fishing, boating and cottaging (Ontario Ministry of Environment, *et al.* 2009).

Water quality problems in Lake Simcoe have been documented since the 1970s and instigated the collaboration of three provincial ministries and the watershed's Lake Simcoe Region Conservation Authority (LSRCA). Beginning in the early 1970's the Ontario Ministry of the Environment (MOE) conducted water quality studies on the lake and found that the lake was being impacted by human activity (LSCRC 1979). During this same time the Ontario Ministry of Natural Resources (MNR) was conducting fishery studies and established that the cold water fish were in significant decline (LSCRC 1979). Also at this time the communities across the watershed were vocalizing concern over visible signs of water quality degradation along the shoreline (LSCRC 1979). These events and committees were important because they initiated the collaboration amongst these government agencies, and serve as the founding point for multi-actor governance in the watershed.

Joint recognition of these efforts led to the Keswick Conference in 1975, and a resolution calling for a coordinated program for pollution control for the basin (LSCRC 1979). In response to the resolution, the provincial government established the Lake Simcoe-Couchiching Basin Report Committee (LSCRC), to conduct research, and report on the status of the problem and suggest management solutions (LSCRC 1979). The resulting report, the *Lake Simcoe Couchiching Basin Environmental Study*, outlined that the primary environmental concern in the basin was high levels of phosphorus which promoted algae blooms and shoreline weed growth,

leading to decreased levels of dissolved oxygen (required to support aquatic life). Levels of dissolved oxygen were below recommended levels, and further led to the decline of cold water fish (lake whitefish and lake trout) (LSCRC 1979). The collaborative effort put forth for this report and further studies led to the creation of the Lake Simcoe Environmental Management Strategy (LSEMS), a partnership of the government ministries and conservation authority whose aim was to conduct further monitoring and management of the Lake Simcoe watershed (LSEMS 1995). In 1986, the LSEMS partnership made a submission to the Ontario Provincial Cabinet for political and financial support of further efforts. Cabinet approved the submission, and the program was formally announced on July 27 1990 (LSEMS 1995).

Figure 1 The Lake Simcoe Watershed



The LSEMS completed three phases (1990-1995, 1996-2000, 2001-2007) of monitoring and management, and achieved phosphorus reductions in each stage. However, over this same period, environmental challenges in the basin continued to grow and become more complex. Changes in population and land-use provide effective illustrations of this change. In 1979 population in the basin was estimated at 190,000 (LSCRC 1979), by 1995 it reached 271,410 (LSEMS 1995), and by 2003 it was 382,887 (LSEMS 2003). The change in land use mirrors the

population growth. Agricultural land cover in 1985 was 65% and dropped to 45% by 1995 (LSEMS 1995), and further still to 40% in 2003 (LSEMS 2003). During this same time urban land cover grew from 65 km^2 in 1985 to 87km^2 in 1995 (LSEMS 1995), and was 285km^2 by 2003 (LSEMS 2003). Additionally, invasive species had been introduced to the lake (such as zebra mussels), the cold water fisheries were no longer naturally reproducing, high levels of *e. Coli* were resulting in regular beach closures and intense flooding events were demonstrating the effects of climate change within the watershed (LSSAC2008).

Towards the end of the LSEMS Phase 3, the capacity of the collaborative program to effectively address the rising complexity of environmental challenges was lessening and new civil society groups were emerging and seeking opportunities to engage in governance activities. In 2005, attention to issues regarding water quality in Lake Simcoe became prominent among the public and ratepayers associations in the watershed. An umbrella organization called Rescue Lake Simcoe Coalition (RLSC) was formed in 2003 to bring together multiple small community groups working to advocate for improvement in the management of the Lake. A second organization, Ladies of the Lake (LofL), was also created in 2005 and focused on innovative public engagement strategies to raise awareness. The Coalition later joined forces with Environmental Defense (ED) (a Canadian national environmental advocacy organization) and Ontario Nature (ON) (a provincial scientific and environmental advocacy organization) to form Campaign Lake Simcoe (CLS). Due largely to the combined efforts of the RLSC, Ladies of the Lake, the Campaign and the LSEMS program, in 2007 the Ontario provincial government announced its intent to introduce the *Lake Simcoe Protection Act* (R.S.O. 2008, c. 23) which came into effect on June 2, 2009. The *Act* is the first in Canada to provide legislation to protect a specific watershed. The *Act* was implemented through the Lake Simcoe Protection Plan (LSPP) (Government of Ontario 2009). The plan outlines the environmental management approach and policies for the watershed, and identifies responsible authorities for each action. The LSPP marks an important advancement in environmental policy for the province by clearly defining and incorporating the precautionary principle, adaptive management, sustainable development and shared responsibility. It also provides regulations that harmonize multiple levels of governing within the watershed boundary.

The watershed is a large scale, long term complex system under stress. The governance challenges in the watershed present significant hurdles to efficient and harmonious decision making processes. The system is challenged by its geography, economic significance, environmental stressors, and jurisdictional fragmentation. A recent environmental report summarized eight categories of stressors that affect the ecological health of Lake Simcoe and its watershed: nutrients, primarily phosphorus; contaminants including pharmaceuticals and other organics, metals and sediments; pathogens, primarily bacteria; introduced species; climate change and other physical stressors; land use change; water extraction; and other human pressures such as fishing and boating (LSSCA 2008). The watershed has 14 municipal sewage treatment plants discharging to the lake, and it is a source of drinking water for five municipalities. Hence, the watershed is under immense stress from human impact which threatens its capacity to continue to provide social, environmental and economic value. Finally, the watershed presents a typical example of jurisdictional fragmentation. There are 23 different municipal governments within the watershed – each with its own municipal land use plans, as well as five provincial pieces of legislation that direct land use planning. Additionally, Ontario's environmental management strategy includes Conservation Authorities, arms-length government agencies that have legislated

responsibility for environmental management within the watersheds of southern Ontario. Therefore in addition to municipal and provincial planning, the Lake Simcoe Region Conservation Authority (LSRCA) also creates and implements environmental management plans for the watershed. An immensely complicated regulatory planning landscape exists in this region.

Despite these challenges, the governance system has been able to achieve a number of important accomplishments. First among these is the durability of a largely self-directed governance system for almost 30 years. This collaboration evolved through four major planning phases, with larger contextual issues directly impacting the structure and process of the system in each phase, demonstrating critical responsiveness to change. Second, is the achievement of significant environmental improvements in the watershed's ecosystem, marked by the 25 tonne reduction of phosphorus over a 15 year period. Third, actions by governance actors resulted in the landmark *Lake Simcoe Protection Act,* (R.S.O. 2008, c. 23) which was the first piece of provincial legislation in Canada to provide comprehensive integrated protection and planning for an individual watershed. In summary, the governance system in Lake Simcoe provides an example of a large scale governance system whose architecture has changed dramatically over time. It has experienced both stress as well as success, and has proved durable over a long period of time while being situated within a complex and intricate multi-level governing environment.

1.4 Methodology

1.4.1 Introduction

In order to explore the transformations in water governance, this research involved a long term analysis of a water governance system. The Lake Simcoe governance system has experienced disruptions, alterations and changes in the nature, form and direction of governance. Additionally, variations in actor engagement and leadership, as well as distinct shifts in tools and processes permit an opportunity to examine how and why changes in a governance system took place.

In order to access both the individual shifts in the elements of governance, and to apply a holistic perspective on the governance system, several research methods were used in combination. Research methods included interviews, document collections, a survey and a historical document review (meeting minute notes). A mixed methodology permitted a multi-level analysis of the governance system, ranging from the individual experience, to the organizational and regional levels. Additionally, a mixed methodology permitted both qualitative and quantitative assessments of the systems to be integrated for more comprehensive insights. The qualitative research involved key informant interviews with governance actors from a variety of sectors, including both those who have been involved over several years, and those engaged more recently. Actor interviews provided insights into the development, negotiations and evolution of the system and spoke to its relevance and strengths, as well as its weaknesses and ability to address the challenges in the watershed. Organizational perspectives were obtained from reports and media releases. Document reviews were critical for identifying baseline characteristics of the governing context. A regional perspective was obtained through formal legislation and policy documentation. The quantitative research involved an in-depth survey of governance actors focusing on their engagement in governance, their relationships with other governance actors and their perspectives on how the system has changed over time. Other

quantitative data were collected from historical meeting minutes. The quantitative data were used to create Social Network Analysis maps of the governance system, thereby permitting a structural perspective. The value and rationale for using Social Network Analysis (SNA) is described in greater detail below (Section 1.4.2).

It is important to note that while the research project as a whole incorporated several research methods, not all research methods were utilized for each of the standalone manuscript papers. Chapter Two utilizes the historical meeting minutes and survey data to evaluate the structural elements of the governance system. This analysis is supported by qualitative data from the document collection and interviews that gives perspective and context to the structural changes taking place. Chapter Three draws on the formal legislation and policy documentation to shed light on the formal governance shifts at a regional watershed scale to identify and to evaluate the specific tools and processes that were engaged most recently in the governance system. Chapter Four engages primarily with the interviews and firsthand accounts of actor engagement in the governance system, but is also supported by qualitative data from the survey and documentation to corroborate actor experiences. Thus, while each research methodology plays a primary role in one of the manuscripts, it is most important that they are considered as a collective within Chapter Five, where their combination illuminates the changes in the governance architecture. Table 1 indicates the primary and secondary data sources for each of the papers.

Table 1 Primary and Supporting Research Methods

Chapter	Primary Methods	Supporting Methods
Two	Social Network Analysis based on data from the historical meeting minutes and survey data	Interviews, document collections
Three	Document collections	Interviews
Four	Interviews	Survey, document collections

Collectively, the research seeks to address the whole system of governance. The combination of qualitative and quantitative research methods was critical to this study as their synthesis provides a deep and rich understanding of the case, as well as visual and statistical evidence of structure, processes and actors within the system. This combination permitted effective triangulation of the data, and accounted for the biases and weakness in each of the methods used.

This research examines governance in a watershed context over a 30-year period. Three criteria were used to select the case study location including; the presence of a long term governance system, quantitative data regarding the governance system throughout time and that the consequences of the governance system's actions carry significant impact on an economic, social, or environmental system. The governance system in Lake Simcoe as described in the previous section met each of these criteria. Accordingly, the case provides a valuable instance of a large scale governance system under stress that has been responsive to externalities and resulted in dramatic shifts in governance approaches over a long period of time. Governance in the Lake

Simcoe watershed occurred in five distinct phases: 1986-1989, 1990-1994, 1995-2000, 2001-2007, and 2008-2010. The phases are defined by formalized partnerships or legislation. Phases one through four were defined by a formal Memorandum of Understanding for the LSEMS program. The last phase is defined by actor's participation in formal committees established by the *Lake Simcoe Protection Act.*

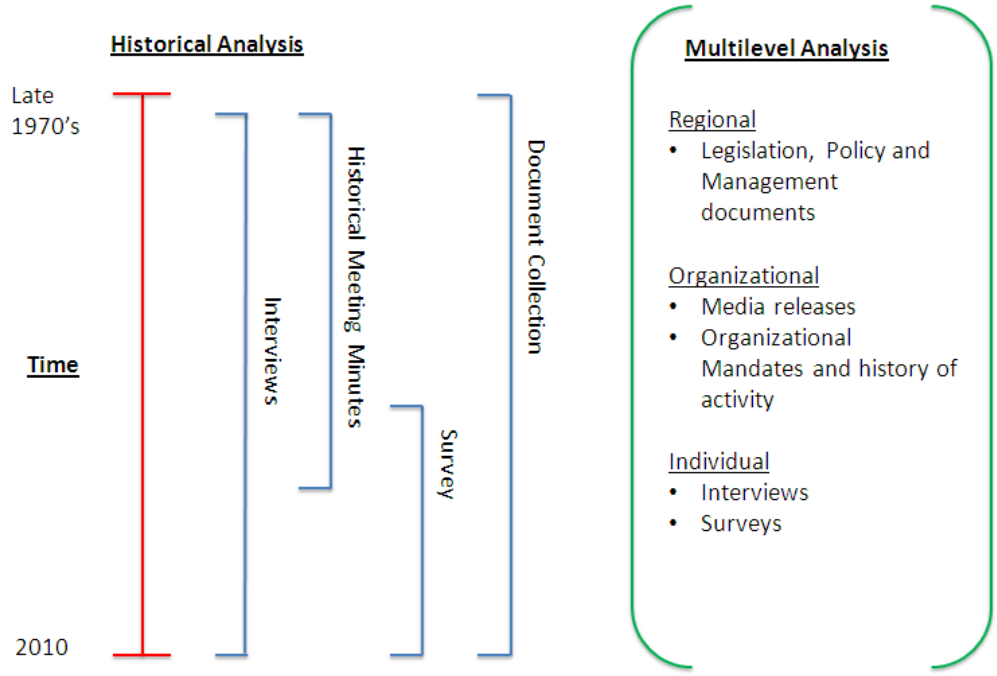
Case study methods are useful for examining why a set of decisions or processes was undertaken and how they were implemented (Yin 2009, 17). They are also appropriate for research where surveys or experiments would not obtain the desired information, because of the complexity of the context (Bloor and Wood 2006, 25). Baxter and Jack (2008) note that case studies are also valuable as they enable the research to consider the phenomenon through a variety of data sources, enabling multiple facets of the phenomenon to be explored.

The boundaries of the case were bounded in both time and space (Creswell 2003). Geographically, the study focuses on activities having impact within a watershed (Lake Simcoe watershed as noted in section 1.3). The time span of the research covers approximately a 30 year period, beginning in the late 1970s and continuing until the end of the research period in 2007. For clarity, in Chapter 2, phases of the whole governance system over a 30 year time are compared. In Chapter 3, the focus is on the multi-level and integrated governance system currently in place within the watershed. Finally, Chapter 4 also assesses change in the governance system over time, but with a focus on the changing role of ENGO actors. This chapter examines the last 10 years of the governance system. The focus on the last 10 years is intended to privilege the time period when ENGO's were deeply engaged in governance in a way that had demonstrated impact on the decision making processes and outcomes.

1.4.2 Data Collection and Analysis

The data collection took place over a year, and each data collection effort was informed by the preceding effort. Document collection was the initial step, which permitted a timeline of events to be developed, as well as highlighted major activities and key actors. Following this was the historical meeting minutes and further document collection from the LSRCA. Attendance records derived from the meeting minutes served as data for the historical social network analysis. The next step was interviews with key informants; document collection continued during this stage as resources were provided by key informants. Based on connections made with key informants at the Ontario Ministry of Environment, access was provided to attendance data for the consultation processes for the LSPA and LSPP. This data was added to the historical social network analysis. The final data collection was the survey. The sample for the survey was based on key actors identified in the document collections, key informants, and actors identified by key informants. Figure 2 highlights the two analytical perspectives on the governance case permitted by the diversity of data collected. This historical analysis was strengthened by several overlaps in time periods for the data. Data was also collected that represented various levels in the governance case including the individual level (interviews and surveys), the organizational level (media releases, organizational mandates and history of activity) and finally at the regional level (legislation, policy and management documents).

Figure 2 Triangulated Analysis



1.4.2.1 Quantitative Data for Social Network Analysis

Social network analysis (SNA) provides a structural analysis of a network (Crona and Bodin 2006; Schiffer 2008). SNA involves quantitative delineation and analysis of the network to identify the structure of interactions between actors and the network properties (Adam and Kriesi 2007). Comparing and contrasting the network structures and statistics between phases of the network provides evidence of network change. A SNA also helps to tease out power, influence, and connectivity among network actors (Prell, *et al.* 2009).

This research draws on two separate data sets for the SNA. Data from the historical network cover the five phases of the governance system, while the second set of data encompasses the latter half of the fourth phases and the entire fifth phase. The first set of data is entirely drawn from formal meeting interactions, while the second data set is based on survey data from governance actors based on communication patterns. The combination of these two data sets provides for a more holistic perspective on the most recent phases of the network.

1.4.2.1.1 Historical Meeting Minutes

Data for the historical network was obtained from the Lake Simcoe Region Conservation Authority (LSRCA), an arm's length provincial government agency responsible for environmental management of the Lake Simcoe watershed. During the first four phases of governance in the watershed, the LSRCA maintained administrative responsibility for the program. The data were collected from the records of meeting minutes and comprises the attendance of the actors at these meetings. The data were obtained from hard copies stored in the library at the LSRCA and were entered into an excel spreadsheet.

Meeting attendance from all meetings was recorded and included. As noted, the last phase of the network is drawn from the formal committees established under the *Lake Simcoe*

Protection Act. Actual meeting attendance data was not available for the first two committees, the Lake Simcoe Science Committee and the Lake Simcoe Stakeholder Committee. However, names of committee members were made available. As a result, it was assumed that all members attended all meetings for these committees. This assumption is supported by the fact that the committees were formally appointed by the provincial government and members had a mandate to participate. Additionally, actors who participated and were interviewed noted an extremely high level of participation from all members. Finally, video conferencing was made available for physically absent actors to participate. For the second set of committees created by the *Lake Simcoe Protection Act,* meeting attendance was made available, but was only recorded until the time of research data processing, which included two meetings.

Data processing involved several steps. First, for the initial four governance phases, any actor who was completely absent from all sets of meetings was removed, leaving only actors who actually attended a meeting. Therefore, only actors who were physically present at meetings and had face-to-face interactions with other actors are included in the network. Second, all attendance from all committees for the entire five phases were merged into one table. Meeting attendances for individuals who were involved in multiple committees were condensed into one line item. Next, individual networks were isolated based on identified phases (1986 – 1989, 1990- 1994, 1995 – 2000, 2001 – 2007, 2008- 2010). Next the attendance of individuals from the same agency was collapsed into one actor, and the data was converted to binary values (to remove weighting from multiple actors). This data was then imported into UCINET, a software for social network analysis. Further processing produced weighted values that represented how many meetings the same people attended, indicating a high level of face-to-face interaction.

1.4.2.1.2 Survey

Survey Gizmo, an online survey tool was used in this research. The survey was conducted after the initial phase of research, which focused on key informant interviews. Conducting the survey post-interview enabled better response rates to the survey because a relationship between researcher and the respondents had already been established (Bodin, *et al.* 2006; Borras and Zolner 2007). The survey sample was generated through both a purposive and snowball method. The survey sample included all key informants who had previously been interviewed, additional key actors identified in the document collection, as well as actors who had been identified as a key actor by at least two other actors in the network and for whom contact information was available. Survey respondents were able to save the survey and complete the information over time. The survey also included an option to be included in a cash prize draw. The survey was circulated to 78 people, and completed by 43, for a response rate of 52%. Of those who responded, 21 had also been interviewed. The survey instrument is included in Appendix A.

The survey served to collect two sets of information. The first set related to their engagement and perspectives on governance in the watershed. These closed questions asked respondents to rate their response regarding the presence of good governance principles in the watershed, the roles of other actors in the watershed, if they shared resources (human, financial or data) with other actors in the watershed, why they became involved in Lake Simcoe governance activities, and general character identification questions. Data analysis involved tabulations of responses for each of the questions.

The second set of questions related more specifically to the actor's relationship with other actors in the governance system for the purpose of building a data set for social network analysis (SNA). This time period was identified based on the data from the historical analysis that demonstrated a significant expansion in size and increase in diversity of actors in the network. The survey provided a list of individual actors listed in alphabetical order, and also provided space for the respondent to provide up to five additional names. The list of names was based on highly active actors in the historical network data set, as well as any additional key actors that had been identified in the interviews. These data were downloaded from the Survey Gizmo website and imported into Excel. Primary processing activities included creating a symmetric matrix. Data were then imported into UCINET.

The data were analyzed using tools from UCINET, while visual depictions of the network were created in NETdraw. Statistical tools include density, and degree, closeness and betweenness centrality and homophily E-I index. The analysis of this data is described in more depth in the following sections.

1.4.2.2 Qualitative Data

A key weakness of SNA is its inability to discern motivations behind actions. This reflects the fact that SNA neither addresses individual behaviors, attitudes and beliefs (Rowley 1997), nor provides answers to such questions as:

- How and why are networks formed and institutionalized?
- How and why do they function over time?
- How and why are they governed by hierarchical networks?
- How do they contribute to effective policy? (Torfing 2007)

Given the limitations of SNA, a qualitative approach to networks – largely understood as a policy network, or network governance approach – has been used to analyze actors, network characteristics and processes (Bogason and Zolner 2007; Klijn and Koppenjan 2000; Nyholm and Haveri 2009; O'Toole 1997; van Bueren, *et al.* 2003). Network analyses that focus on social processes require holistic and humanistic approaches (Coviello 2005). A qualitative analysis permits researchers to explore the complex interactions among actors to uncover institutional rules governing the network, beliefs and motivations as well as longitudinal patterns in the network (Provan and Kenis 2008; Torfing 2007). Multiple qualitative research methods such as document analysis, interviews, focus groups, and observation permit the creation of network narratives that can address the kinds of questions posed in this research (Berg 2007; Borras and Zolner 2007; Human and Provan 2000).

Since networks encompass both qualitative and quantitative dimensions, Coviello (2005) argues that network research methods should accommodate both "hard" (quantitative, structural analysis) and "soft" (qualitative network analysis) data. Accordingly, this research supplemented the social network analysis with qualitative research to further triangulate the data and to contribute insight to network structure. Qualitative data was derived from key informant interviews, document analysis, and meeting attendance.

1.4.2.2.1 Interviews

Purposive sampling (Bradshaw and Stratford 2005, 72) was used to identify participants for interviews. The actors were selected through a multi-stage process. First, a review of news releases, reports, studies from actors and organizations in the watershed was completed. Based on these documents, a timeline of major events was developed and this provided insight to the relationships and interactions amongst actors in the watershed. From this, a list of key actors was derived and formed the first set of interviewees. To be considered for an interview, actors must have been directly engaged in formal governance in the Lake Simcoe watershed.

The interview list was expanded based on the snowball technique of referrals from initial interviews and key informants (Bradshaw and Stratford 2005, 72; Hennink, *et al.* 2011, 100). This was conducted until saturation (no new names were provided) was reached (Hennink, *et al.* 2011, 105). Interview requests were sent to 59 actors, with 34 actors accepting. The interviews used semi-structured questions and were based on an interview guide that used a pyramid approach, wherein questioning moved from basic opening questions to more complex exploratory questions toward the end (Dunn 2005, 82; Hennink, *et al.* 2011, 113). The core questions asked actors to comment on the governance process in the Lake Simcoe watershed. The interviews questions evolved over time because an inductive approach was applied. Data from initial interviews were used in future interviews to probe more deeply into the issues (Hennink, *et al.* 2011, 42). The interviews were conducted with 17 people representing Provincial government agencies, four people employed by the Lake Simcoe Region Conservation Authority, one land developer, five municipal government staff people, and seven representatives of NGO's. Interviews typically lasted about an hour, with a few running closer to 45 minutes, or as long as 90 minutes.

It is important to note a number of qualifiers on the interview data. First, interviewees participated in governance activities in the watershed at different points of time and were not engaged in all aspects of the governing process. Therefore insights generated from interview data are not widely comparable across time. Second, because of the snowball technique used to identify key informants, interview questions that were generated as a result of later discussions were not asked of earlier key informants. Third, because of the scale of the watershed and scope of governing, often key informants would be engaged in different aspects of the governance process. Consequently, not all interview data can be compared based on experience in the process. It is the cumulative insight from multiple research methods that is valuable to this research given the long term time scale.

The approach to data analysis was grounded in the principles presented by Liamputtang and Ezzy (2005) and supported by Hennink *et al.*(2011, 206) and Yin (2011, 95) who stated that "theory building occurs in an ongoing dialogue between pre-existing theory and new insights generated as a consequence of empirical observation" (Liamputtong and Ezzy 2005, 266). Interviews were transcribed verbatim and then coded using Nvivo 8 software. Interview data were validated with each participant. Copies of the interview transcript were emailed to key informants who were permitted to clarify statements, or to identify text with which they were not comfortable.

A coding casebook, which is a tool used for the purpose of setting standards for qualitative data analysis, was built using both an inductive and deductive approach. In the first round of coding, new nodes were developed as free nodes, and the code book was built successively as

additional interviews were completed. Once the entire set of interviews was coded, a second round of coding was conducted to ensure that all nodes were consistently applied across the data. Then, data for each node was reviewed and considered in light of the other nodes that were developed (Berg 2009, 362). After this review, the nodes were converted to tree nodes and restructured into a relational hierarchy in the process of categorizing to derive meaningful categories (Hennink, *et al.* 2011, 245). Next, each tree node was reviewed and analyzed for insight and understanding regarding the node theme, through the process of conceptualizing, in order to find relationships and meaning between and among categories and codes (Berg 2009, 356; Hennink, *et al.* 2011, 245). Additionally, data analysis was conducted on nodes by way of text and compound queries to identify concepts, and to explore patterns, themes and meanings in the data. In order to draw out contrasting or supporting positions amongst actors, separate analyses were conducted and contrasted based on the characteristics of the respondent. During the entire data collection and analysis, constant 'memoing' of emergent ideas and code development was employed. Therefore, quality of coding was established through: verbatim transcription, codebook, memoing and coding saturation (Hennink, *et al.* 2011, 230).

1.4.2.2.2 Documents

Document collection focused on news releases, reports, studies, legislation and regulations from the governance actors in the watershed. Based on these documents, a timeline of major events was developed. Of particular value was the historical record collection of the LSEMS program maintained by the LSRCA. Documents were reviewed to obtain information regarding governance efforts, scientific and technical data regarding the state of the lake, and formal evidence of governance actor collaboration and engagement.

1.5 Organization of Dissertation

This dissertation follows the academic journal manuscript style. It includes this introductory chapter, followed by three stand-alone manuscripts that will be submitted to peer review journals for publication following successful defense, and closes with a concluding chapter.

- Chapter Two presents the manuscript entitled: *Shifting Architectures of a Water Governance System Over 30 Years.* This manuscript is based in governance scholarship that describes governance transitions, primarily the hierarchy to market to network narrative. The empirical research in this study confirms emerging research literature that argues against a linear transition between these types of governance systems, and instead suggests that governance in a multi-level, embedded system that includes several iterations and structures, each having influence on the other. The empirical data are used to construct several social network analysis maps of the governance system in the case study over time, and highlights the various changes that take place.
- Chapter Three presents the manuscript entitled: *Transcending the Watershed Boundary.* This manuscript is based in water governance scholarship that focuses on the use of a watershed boundary for water governance. The manuscript argues that a watershed boundary is not appropriate, nor useful for all water governance applications, and that instead, several mechanisms that are adaptive, flexible and process-based can prove useful in place of a dependence on a watershed boundary. Indeed, the manuscript argues that a move towards these new mechanisms is necessary for successful water governance. The

data for the manuscript are based on a document review of introduced legislation, regulations and policy in the watershed under examination.

- Chapter Four presents the manuscript entitled: *Environmental Non-governmental Organizations in Water Governance: Mechanisms, Relationships and Roles*. This manuscript examines the specific actions of a set of non-government actors, and their contributions to the changes in water governance in the watershed. Specifically, the articles describes how the role and activities of non-government actors has advanced beyond late 20^{th} century approaches to recent trends which display more innovative and entrepreneurial characteristics. The manuscript also examines the embedded nature of non-government actors within a formal network of government actors to find a more collaborative and supportive governance environment. Data for this manuscript was drawn from first and secondary research sources concerning the actions of the NGO's as well as a survey taken amongst both government and non-government actors in the watershed.
- Chapter Five brings together the major research findings from each of the preceding three chapters to identify how more effective governance processes can be created. This chapter also identifies further areas of study.

The manuscripts do not follow a linear order. Instead each manuscript focuses on one of the core research objectives. Collectively, the dissertation highlights governance transformations within the case study watershed.

Chapter 2

Shifting Architectures of a Water Governance System Over 30 Years

2.1 Introduction

Governance as a concept suggests that society utilizes a number of structures and processes to identify challenges, create solutions, and successfully implement responses to overcome common social problems (Borrás and Radaelli 2011). More precisely it can be understood as "the structures and processes by which people in societies make decisions and share power" (Young 1992) . Given that governance practice deals with complex social arrangements, it is necessary to examine the depth and complexity of the multitude of structures and processes at play. Investigations of governance practice must examine the full range of elements involved in order to decipher, describe and gain knowledge of the true construction and interactions of governance.

The concept of *architecture* provides a useful analytical framework for governance. Gunningham (2009a) asserts that the metaphor of architecture enables investigators to distance themselves from the details, and permits an evaluation of the underlying foundation of the governance system, while also acknowledging the individual parts that form the whole. In addition to providing a holistic perspective, the governance architecture concept also permits comparative analysis among governance systems. Biermann, *et al.* (2009) suggest that by applying the construct of architecture, the synergy and conflict between governance systems can be identified, compared and assessed. Approaching governance through an architecture lens also provides for a multi-level and temporal assessment. Clarke (2004; in Kuhlmann and Allsop 2008, 174) calls for a more "'conjunctural analysis' in order to explore the 'unsettled formations' of governance". These references suggest that the transitions between governance systems over time, and the push and pull effects of governance between levels, can impact the architecture of a governance system in a particular space and time.

Biermann, *et al.* (2009, 18) recognize the frequently serendipitous nature of governance architecture when they state, "we assume neither an a priori existing state of universal order nor a universal trend towards order… architectures are likely to result from incremental processes of institutionalization… In other words, the concept of architecture does not assume the existence of an "architect." This speaks to the need to identify each of the contributing factors, but to assess the system as a whole that is responding to a confluence of events. Burns and Stöhr (2011, 180) add that descriptions of governance architectures must also examine the "key drives of how governance systems are established, maintained or changed through power, knowledge, and contestation/conflict processes" in order to draw out the relationship between and amongst governance elements. They identify four drivers for shifts in governance including 1) dominant power and a shift in the agent's cognitive-normative framework, 2) power shifts, 3) a new governance order is established through multi-agent negotiation, 4) governance shift through diffusion and emulation (organic transformation) (Burns and Stöhr 2011).

This point is echoed by Gunningham (2009a) who states that the relationship between elements and actors "enables the development of a more sophisticated and nuanced account of how and why environmental architectures have shifted in particular directions, [and] the consequences of those shifts." These statements suggest that in many ways, the most critical

aspects of governance systems are the informal cultures, institutions and dynamics between elements that operate within a given space.

By understanding the architecture of governance, it may then also be possible to shift it towards a more favorable future design. Kanie *et al.* (2012), in discussion of governance architecture for sustainable development, recognize that changing social, economic, environmental and political contexts require parallel shifts in governance architecture and pose the question "what alternative architecture would make sense, and how can we get there?" Their commentary liberates future governance from current constraints (i.e., how or if a selected process or set of tools can achieve a desired outcome) by acknowledging the actor agency role in governance, and the potential to create a communally constructed future. Young (2008) states that there is a need to seek a change in governance architecture if actors are going to be able to respond to the large scale and complex social and environmental challenges present today. As in so many cases many institutions are charged with responding to environmental challenges that did not exist when they were initially created (Newell, *et al.* 2012).

Two important themes characterize contemporary governance literature pertaining to shifts in governance architectures. First, the popular narrative that suggests that governance systems transition in a linear fashion from hierarchy to market to networks is being challenged (Bell and Hindmoor 2009; Hill and Lynn 2005). Second, and related to recent writing on the first theme, a more nuanced perspective on the role of governments is emerging. Where once it was widely accepted that the state is in decline, (e.g., Kooiman 1993; Rhodes 1994), governance researchers increasingly are arguing that in many contexts the state is actually taking on new and more active roles (Hysing 2009). Thus, contemporary research on governance in a host of settings is providing new insights on the complex ways in which governance actually takes place. In that context, governance researchers are calling for a better understanding of the roles of governments relative to non-government actors, and the ways in which new ways of governing through markets and networks interact with traditional hierarchical modes of governance. Howlett, *et al.*(2009, 390) suggest that "careful multi-dimensional analysis is required to see exactly how governance in a sector is actually occurring and to understand in which of many possible directions it is moving."

This paper uses the example of water governance to provide insights into the ways in which governance is being transformed in the western world. The objective of this research is to examine architectural shifts in water governance over time. The paper begins with a review of the governance literature to provide a foundation for the conceptual understanding of governance, and to establish current understanding in the literature regarding shifts in governance architectures. A case study of water governance in a large and complex system, the Lake Simcoe watershed, located in the Province of Ontario, Canada, provides an empirical foundation for the research. Following an overview of the case and a review of the methodology, results from a Social Network Analysis, supplemented with data from key informant interviews and document analyses, provide an empirical basis for evaluating the shifts in governance architecture that took place, and continues to take place, in the Lake Simcoe watershed.

2.2 The Governance Narrative and its Critics

Significant attention has been given to how governance systems change over time, and specifically the transition from government to governance. The definition of "governance" as

distinct from "government" permitted the "hierarchy to market to governance" narrative to emerge. Within this narrative it is suggested that recognition of the shortcomings of hierarchical government has led to a growing role for governance by markets, and then governance by networks. Where hierarchical governing is characterized by unilateral decision making and heavy-handed implementation of laws, taxes and regulations, markets are intended to allocate resources through price mechanisms. Conversely, networks are understood to exist as a third governing mode whereby actors operate in a cooperative capacity for decision making with autonomy from the state (Bell and Hindmoor 2009; Goodwin and Grix 2011; Weber, *et al.* 2011). In networked governance, actors from all sectors engage with each other to govern collectively. Hence, the focus is on the collective decision making power of the network as a whole, as opposed to a focus on the power of elected politicians or the private sector (Brugue and Valles 2005).

As Termeer (2009, 300) states, "these narratives have not only become very popular in analyzing complex interactions around policy making, but also in thinking up and proposing alternative strategies for policy making, such as network management, interactive governance, collaboration, deliberative policy making, inclusive management or partnerships among other things." Bell and Hindmoor (2009) suggest that the notion that governing was transitioning from one distinct mode to another became the primary focus of the political sciences and public administration governance literature during the mid to late 1990's. Early proponents of the "governance narrative" include Kooiman (1993), Rhodes (1994) and Stoker (1998). Their focus was on the changes taking place in the UK governing system during 1990's that included the shifts between governance systems from a Westminster model towards a New Public Management model. This led Stoker (1998, 18) to state that "governance is about a change in the long-standing balance between state and society." In parallel, Rhodes (1997) suggested that governance was ultimately a 'new' way to govern society, and highlighted market and network approaches as something separate from hierarchical governing, where one could be selected over the other to optimize governing.

Numerous authors are now arguing that the linear and isolated nature of the governance narrative is an overly simplistic perspective on a highly sophisticated system of interactions (Grix and Phillpots 2011; Howlett, *et al.* 2009; Hysing 2009). Others have noted that empirical evidence to support the claim is largely absent (Hill and Lynn 2005; Howlett, *et al.* 2009). As such, the governance narrative rests on several assumptions. First, the narrative focuses primarily on emerging models of governing, and the roles and activities of 'new' governance actors. In these models, there has been an increase in participation by non-government actors, and in some cases, these actors have created self-governing opportunities outside of formal regulatory controls. As a result, proponents of the narrative have assumed that the role of the state has declined during this same time, due to the emergence of other actors and governance mechanisms. Rhode's (1994) thesis of the "hollowed state" brought much attention to this idea. He suggested that in the United Kingdom, government's role as a sovereign authority has been undermined, and that government's role in regulatory controls has been constrained by new governance approaches. From this perspective, governing is a zero sum game, where increased participation by new players must consequently result in a decline in the influence of other actors, namely the government.

In contrast to this perspective, others argue that a decline in involvement by *governments* in governance does not necessarily equal a decline in their importance or power (Newman and Paasi

1998; Norman and Bakker 2009). Indeed, recent research demonstrates that this is not an accurate depiction of what is taking place. Around the world, societies continue to expect governments to providing steering functions (Metze 2011; Waters Robichau 2011). In addition, governments are likely to have a continuing and important role in governance in many policy fields because of the state's monopoly on the legitimate use of force, and on the unique power of governments to create and enforce legislation and regulations (Grix and Phillpots 2011; Gunningham 2009b; Peters and Pierre 2000).

Two important activities have created the opportunity for a positive sum game. The first is the rise of citizen participation. Kim (2009, 874) suggests that positive sum governance is possible as a result of "mutual empowerment of state and society" where society has been empowered through its engagement in governance processes. Blakeley (2010) suggests this is a result of the "professionalization" of citizen participation. Citizens are no longer simply consulted for their ideas; instead, they are called upon for their expertise. That citizens are participating alongside government, and that they are recognized as having their own level of expertise, suggests that governance is in fact a positive-sum game where there are mutually beneficial gains for all actors involved (Bell and Hindmoor 2009; Blakeley 2010).

Second, the narrative ignores the potential for governance to exist at multiple levels, which could, for example, permit a market or network to be embedded within a hierarchical system. Recent research has found multiple forms of governance interacting within the same arena. In their study of watershed governance in the Netherlands, Kunindersma and Boonstra (2010) found regional partnerships existing along-side state policy, with each reacting and interacting with the other. Similarly, Metze (2011) found a synergy between a network coalition of non-government actors and the state's dairy policy institutions. Similar examples exist in a host of settings, leading authors such as Tenbensel (2011) and Swyndedouw (2005) to argue that new institutional forms of governing are complementing traditional hierarchical governance rather than replacing it. Therefore there is potential for positive-sum games within governance.

If the changes occurring in contemporary environmental governance are not captured satisfactorily through the governance narrative, then how should they be understood? Bell and Hindmoor (2009) argue that governments are learning how to govern better, not less. Hysing (2009, 314), in his study of forest certification schemes in Sweden, states that the role of the state is "transforming from a role based on constitutional powers towards a role as facilitator and co-operative power." This argument complements Hill and Lynn (2005, 189) who suggest that constitutional authority is the "structure within which relational and networked forms are enabled to flourish." Their argument echo's that made by Kim (2009) and Chhotray and Stoker (2009) who point out that by facilitating the existence of a diversity of governance mechanisms, governments continue to maintain hierarchical control. Thus governments are creating new forms of hierarchical controls, and, in essence, are drawing from a wider range of governing tools (Howlett, *et al.* 2009; Tenbensel, *et al.* 2011). This suggests that governments are becoming more conscious of, and adapting more effectively to, their socio-economic-environmental contexts (Jessop 1998). In summary, the role of the state has changed around the world during the past few decades – but the state has by no means been "hollowed out". Instead, governments appear to be reinforcing control, but through a wider range of mechanisms than previously utilized.

This research examines the case of a long-term water governance system in order to determine what, if any, changes to the governance architecture have taken place. It then evaluates

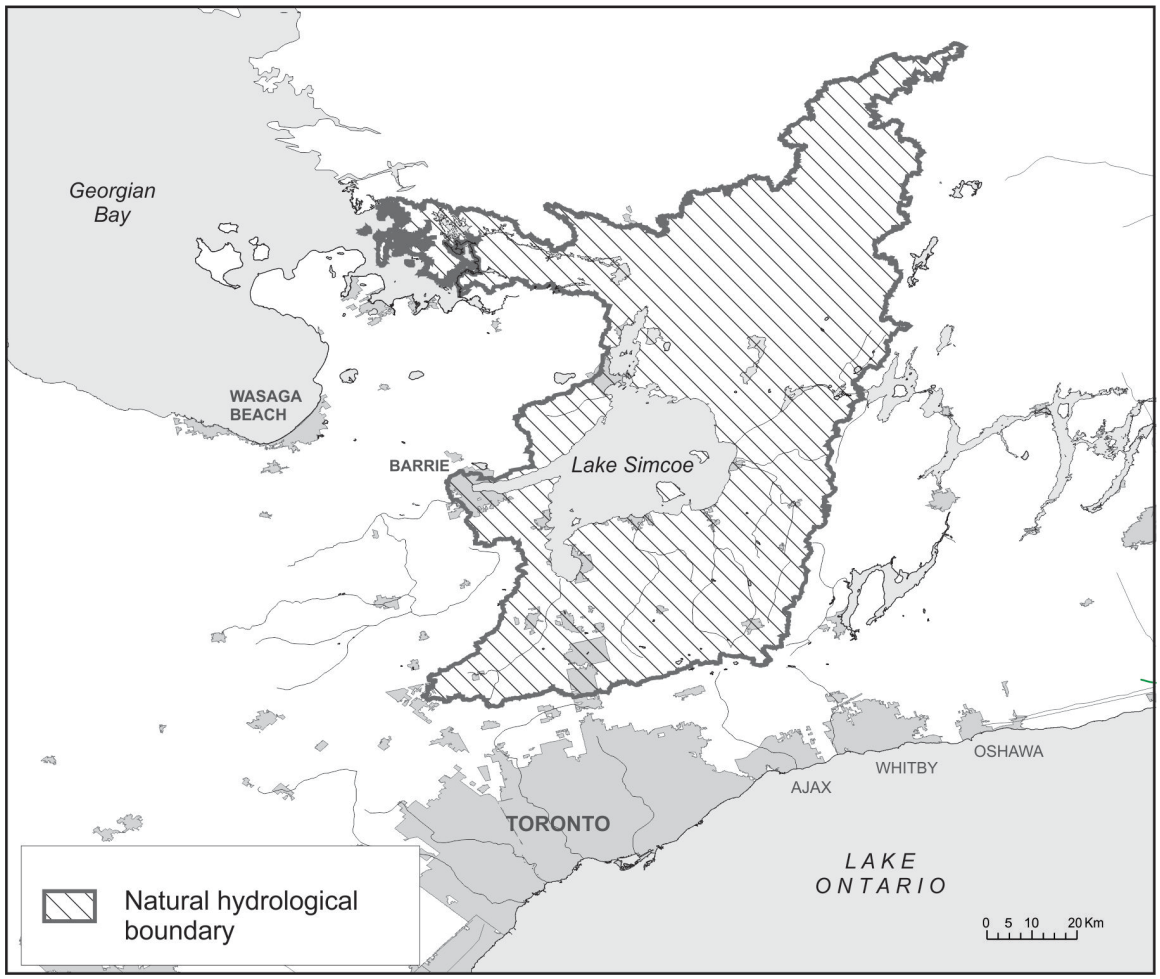
whether these changes fit with the widely held governance narrative or signal that a broader set of changes are taking place that are more accurate of the complex and diverse range of governance contexts that exist.

2.3 Lake Simcoe

Located in Ontario, Canada, the Lake Simcoe watershed governance system is an instance of a large scale, complex system under stress. The governance challenges in the watershed present significant hurdles to efficient and harmonious decision making processes. The system is challenged by its geography, economic value, environmental stressors, and jurisdictional fragmentation. The watershed has a total land and water surface area of 3,303 sq. km., of which the lake itself occupies approximately 22% or 722 sq. km (Ontario Ministry of Environment, *et al.* 2009) (Figure 3). Lake Simcoe is southern Ontario's largest inland lake, excluding the Great Lakes (Ontario Ministry of Environment, *et al.* 2009). Serious water quality problems in Lake Simcoe have been documented since the 1970s. Key problems include an overloading of phosphorus, invasive species, climate change, land use change, and water-related recreational water activities, such as boating and fishing (LSSAC 2008). Water management efforts were able to achieve significant environmental improvements in the watershed's ecosystem, marked by an annual 17 metric tonne reduction in phosphorus entering the lake between 1990 and 2001 (Wood 2008). Nonetheless, progress has widely been considered insufficient. Therefore, in 2008 the *Lake Simcoe Protection Act, (R.S.O. 2008, c. 23)* was passed. This statute is the first piece of provincial legislation in Canada to provide comprehensive integrated protection and planning for an individual watershed. As such, it is an important instance of a governance system in transition.

In Ontario, several agencies have formal roles in environmental management and governance. Within the provincial government, key agencies include the Ministry of Natural Resources (MNR), the Ministry of Environment (MOE), the Ministry of Agriculture, Food and Rural Affairs (OMAFRA), and the Ministry of Municipal Affairs and Housing (MMAH). At the federal level, the Department of Fisheries and Oceans are responsible for fisheries within inland waters. At the local level, municipal governments have important responsibilities for land use planning through the Official Plan process. Lastly, the Conservation Authorities exist in southern Ontario to manage water resources on a watershed basis as mandated by provincial legislation (Johns and Rasmussen 2008). Each Conservation Authority "consists of representatives of the provincial government, and of each municipality within the watershed…They may make regulations restricting and regulating the use of water in or from surface water bodies within their jurisdiction" (Johns and Rasmussen 2008).

Figure 3 The Lake Simcoe Watershed



Additionally, Conservation Authorities are critical actors at the local level. Conservation Authorities are arms-length agencies that have legislated responsibility for environmental management within the watersheds of southern Ontario. Therefore in addition to federal, municipal and provincial planning, the Lake Simcoe Region Conservation Authority (LSRCA) also creates and implements environmental management plans for the watershed.

Environmental governance in the Lake Simcoe watershed occurred in five distinct phases: 1986-1989, 1990-1994, 1995-2000, 2001-2007, and 2008-2010. These phases are defined by formal Memorandums of Agreement (in the case of the first four phases), and by the creation of a statute (in the case of the fifth and most recent phase). Prior to 1975, governance in the Lake Simcoe watershed was dominated by government agencies acting more-or-less independently of each other. In 1975, a closed network of actors became organized and involved in governance in the watershed. This original network has since evolved through five major phases. Initially this involved actors participating in the Lake Simcoe Environmental Management Strategy (LSEMS), and later was directed by the *Lake Simcoe Protection Act, (R.S.O. 2008, c. 23)*. Changes in the network were in response to a host of social, economic and environmental circumstances. In each phase of the network core members are defined by either Memorandums of Agreement that governed and financially supported the network (1986-2007) or through formal legislation that identified a lead government agency responsible for the implementation of the LSPA (2008-

present). Core network members formed the basis of the network, but would invite other actors to participate when deemed appropriate or necessary. Often this took place in the form of focused outreach for a specific purpose, and for a limited period of time.

The Lake Simcoe watershed is ideally suited to provide the kind of careful, multi-dimensional analyses needed to reveal the changing nature of contemporary environmental governance. The overall case study represents an instance of a long term governance system, where significant shifts in governance approaches have taken place. The consequences of governance actions in the watershed can have significant impact on the economic, social, and environmental system, signifying the relevancy of the case's social-environmental challenges.

2.4 Methodology

A mixed methodology combining both quantitative and qualitative perspectives was used to obtain a holistic and comprehensive perspective on the case study system. This methodology provides first-hand accounts of governance characteristics, challenges and context, along with visual and statistical interpretations of a governance system that may not be evident in formal documentation and actors recollections (Coviello 2005). The research draws primarily on Social Network Analysis (SNA) to analyze the governance networks in each of the five phases described above. Each phase includes data from both the SNA, as well the document collection and is complimented by interview data from key informant interviews where appropriate.

2.4.1 Data Collection and Analysis

Data collection took place over a year, and each data collection effort was informed by the preceding effort. The document collection was the initial step, which permitted a timeline of events to be developed, as well as highlighted major activities and key actors. Following this was the historical meeting minutes and further document collection from the LSRCA. Attendance records derived from the meeting minutes served as data for the historical social network analysis. The next step was interviews with key informants; document collection continued during this stage as resources were provided by key informants. Based on connections made with key informants at the Ontario Ministry of Environment, access was provided to attendance data for the consultation processes for the LSPA and LSPP. This data were added to the historical social network analysis.

This research utilized both qualitative and quantitative data. In the following sections, these data sets are described. The combination of both qualitative and quantitative data drawn from multiple sources responds to Howlett, *et al's.* (2009) call for a multi-dimensional analysis of governance change. Not only do these data provide a multi-level perspective – from the individual to the organizational level – but also they provide both a formal and informal perspective by drawing on both formal documentation and personal interpretations. In addition, the data permit an analysis of the structural change in a governance system overtime by contrasting separate phases of the same system. This combination of analyses signals the changes that are occurring, and provides insight into why changes are taking place.

2.4.1.1 Social Network Analysis

There has been a recent surge in the application of social network analysis (SNA) in environmental governance, particularly in the context of natural resource management (Bodin and

Crona 2009; Hahn, *et al.* 2006; Prell, *et al.* 2009; Raadgever, *et al.* 2008; van der Brugge and van Raak 2007). Social network analysis involves a quantitative delineation and analysis of a network to identify the structure of interactions between actors and network properties (Adam and Kriesi 2007). SNA has resonated within the environmental governance field due to its ability to measure quantitatively the influence of specific actors within a network. Analysts have suggested that SNA has the potential to uncover the distribution of power within the network, which, in turn, may account for the flow of resources and information through the network (Adam and Kriesi 2007; Bodin, *et al.* 2006). Recent research has used SNA to identify actors for participatory processes, to understand an ongoing collaborative resource governance process, and to explain why environmental governance initiatives have stalled (Crona, *et al.* 2011). SNA is also an extremely useful tool for comparing and contrasting the phases of the networks over time, and for providing evidence of network stability and/or change.

The data set for the SNA in this study was derived from records of meeting minutes and is based on meeting attendance. In SNA, density, centrality, diversity and homophily are key variables that can be used to study the structure of the network (Borgatti, *et al.* 2013). Density refers to the number of ties that exist in a network – the more ties, the more closely linked each actor is with other actors in the network (Bodin, *et al.* 2006). A perfect density, where all actors are connected to all other actors, is represented by 1.0. Centrality relates to an actor's position in a network relative to the position of other actors, and is more succinctly defined through three types of centrality: degree, closeness and betweenness (Bodin, *et al.* 2006).

Degree centrality is measured by the number of direct ties one actor has to another (Bodin, *et al.* 2006) with 1.0 reflecting a tie to all other actors in the network. Closeness centrality is measured by the actor's ability to access all other actors in the network, with a score of 100 reflecting access to all other actors in the network. Finally, betweenness centrality is measured by the control one actor can have over another actor because the first actor is the only one connecting the second actor to the rest of the network (Rowley 1997). The betweenness score, relative to the other actors, indicates the greatest capacity for control.

Homophily is a measured by the E-I Index (external-internal ties). Given a partition of a network into a number of mutually exclusive groups the E-I index is the number of ties external to the groups minus the number of ties that are internal to the group divided by the total number of ties. In this study, the partitions in the network are defined by sector. The sectors include municipal, provincial and federal government, conservation authorities, ENGOs, agriculture, naturalist groups, sports recreationalists, elected officials, development sector, aggregate sector, First Nations, university researchers and consultants. Federal, provincial and local government agencies were not amalgamated into one "government" because each level of government had significantly different roles. However, agencies at one level were grouped together (e.g., all the provincial government agencies were labeled "Provincial Government") in order to draw out the sectoral differences. The homophily value can range from +1.0 to -1.0 and can be seen as a measure of the extent to which the members of a group choose to interact with themselves. Thus a value of -1.0 shows homophily and a value of +1.0 shows heterophily. In this study, the homophily measure refers to how frequently actors attended meetings with actors from their same sector.

2.4.1.2 Qualitative Data

Network analyses that focus on social processes require holistic and humanistic approaches (Coviello 2005). A qualitative analysis permits researchers to explore the complex interactions among actors to uncover institutional rules governing the network, beliefs and motivations as well as longitudinal patterns in the network (Provan and Kenis 2008; Torfing 2007). Qualitative research methods such as document analysis and key informant interviews can permit the creation of network narratives that can address the kinds of questions posed in this research (Berg 2007; Borras and Zolner 2007; Human and Provan 2000). These narratives add richness and depth to findings generated through SNA.

Purposive sampling was used to identify participants for interviews. To be considered for an interview, actors had to have been directly engaged in formal governance in the Lake Simcoe watershed. Next, the interview list was expanded based on the snowball technique of referrals from initial interviews and key informants (Bradshaw and Stratford 2005, 72; Hennink, *et al.* 2011). This was conducted until saturation was reached (Hennink, *et al.* 2011). Interview requests were sent to 59 actors, with 34 accepting. The interviews used semi-structured questions and were based on an interview guide organized around a pyramid approach, wherein questions moved from basic to more complex exploratory questions towards the end (Dunn 2005, 82). The core questions asked actors to comment on the governance process in the Lake Simcoe watershed from the late 1970's. The interviews questions evolved over time because an inductive approach was applied. Data from initial interviews were used in future interviews to probe more deeply into the issues (Hennink, *et al.* 2011, 42). The 34 interviews were divided as follows: 17 with people representing provincial government agencies; four with people employed by the Lake Simcoe Region Conservation Authority; one with a land developer; five with municipal government staff people; and seven with representatives of NGO's. Interviews typically lasted about an hour, with a few as brief as 45 minutes or as long as 90 minutes.

Interviews were transcribed verbatim and then validated with the key informants. Once transcripts were approved, they were coded and analyzed using Nvivo 8 software. Analysis focused on the formal governance processes, as well as key triggers for change, socio-political-environmental context, relationships between organizations, and characteristics of actors involved as well as emerging themes. The coding casebook was built using both an inductive and deductive approach. During the entire data collection and analysis phase, constant 'memoing' of emergent ideas and code development was employed. Therefore, quality of coding was established through verbatim transcription, codebook, memoing and coding saturation (Hennink, *et al.* 2011).

It is important to note a number of qualifiers on the interview data. First, interviewees participated in governance activities in the watershed at different points of time and were not engaged in all aspects of the governing process. Therefore insights generated from interview data are not widely comparable across time. Second, because of the snowball technique used to identify key informants, interview questions that were generated as a result of later discussions were not asked of earlier key informants. Third, because of the scale of the watershed and scope of governing, often key informants would be engaged in different aspects of the governance process. Consequently, not all interview data can be compared based on experience in the process. It is the cumulative insight from multiple research methods that is valuable to this research given the long term time scale.

2.5 Results

Results in this section are presented based on the five phases of governance identified in Section 2.3. For each phase, the data are used to provide an overview of key aspects of the governance system that relate to the scope, size, diversity of the network, the connections amongst actors, and the identification of actors who are central in the network.

In reviewing the findings from the SNA, it is important to consider both the visual depictions of the relationships among actors, as well as the network statistics. The network diagrams presented below cannot be used on their own to explore the relationships and characteristics of the network. Rather, these diagrams present the actors by sector; this permits a focus on the sectoral interactions. In the diagrams the thicker lines denote higher levels of interaction between the actors connected by those lines during the phase. It is important to note that the location of actors in the figures is relative based on the data for each phase, and the relationships between actors. The location in and of itself does not hold special significance, with the exception of those located most centrally; this positioning indicates a high level of connection to most other actors in the network. The actual centrality of an actor in the network is defined by the network statistics. Statistics for each phase are summarized in Table 2, and will be discussed in the results for each phase.

Table 2 Statistical Analysis of Five Governance Phases

Variable	Phases of Governance				
	1986-1989	**1990-1994**	**1995-2000**	**2001-2007**	**2008-2010**
Size of Network (i.e. number of actors (by sector))	7	24	18	88	35
Number of Ties	36	242	166	2608	686
Network Diversity	4	10	6	13	12
Density	0.85	0.43	0.54	0.34	0.58
Degree Centrality	1.0 MOE, MNR, LSRCA	1.0 LSRCA	1.0 LSRCA	1.0 LSRCA	1.0 MOE
Closeness Centrality	100 MOE , MNR, LSRCA	100 LSRCA	100 LSRCA, MOE, MNR, OMAFRA	100 LSRCA	100 MOE

		88 MOE		94 MOE,MNR 77 MMAH	89 LSRCA
Betweenness Centrality	6.667 MOE, MNR, LSRCA	63.50 LSRCA	24.8 LSRCA	21 LSRCA 12 MOE, MNR	97 MOE
E-I Index	0.4706	0.2819	0.4211	0.1298	0.7068

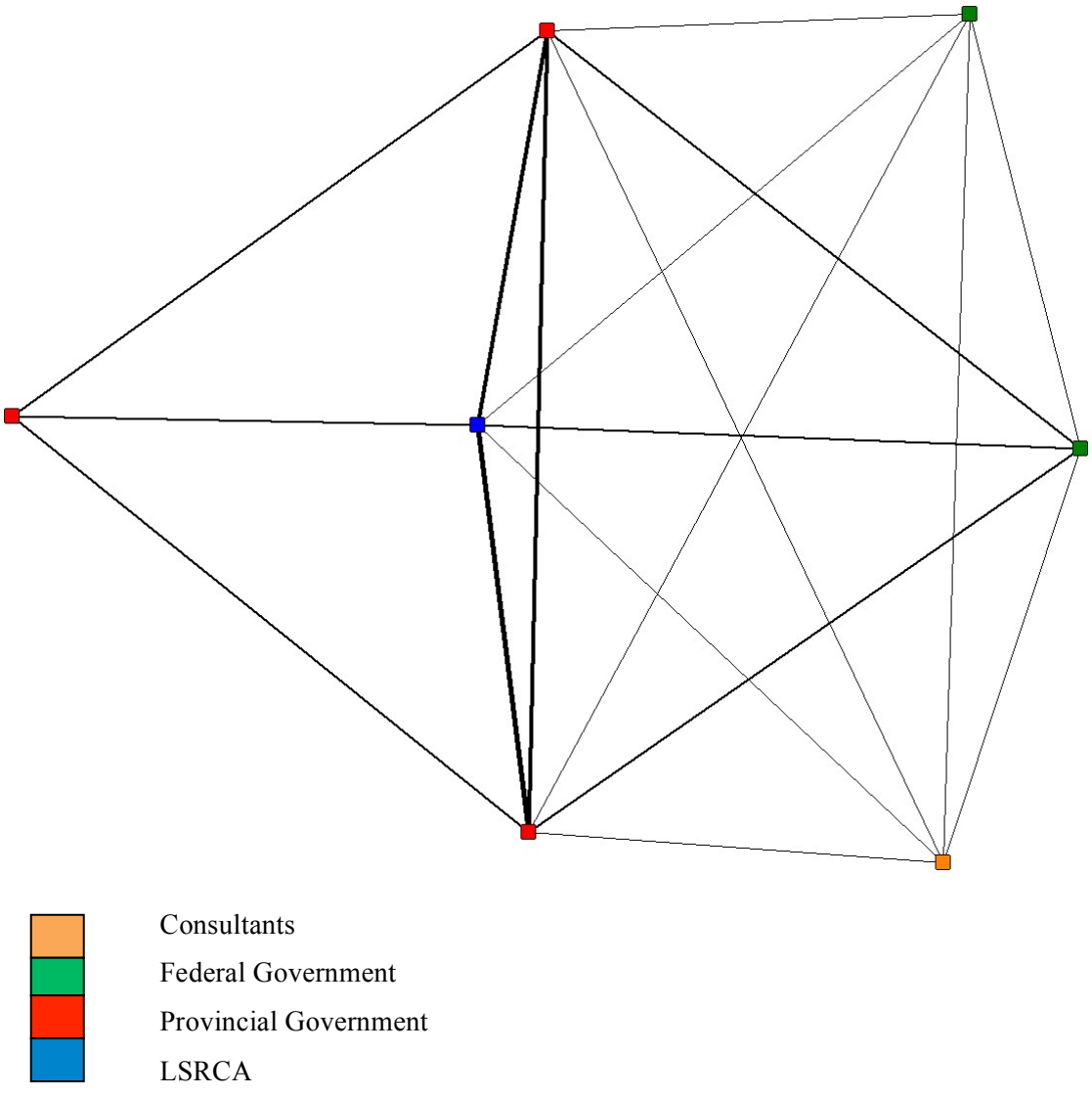
2.5.1 1986-1989

In Phase One (1986-1989) the governance system was driven and organized by government actors who formed a closed, voluntary, collaborative network to collect and share data. Three provincial agencies (MNR, MOE, OMAFRA) and the LSRCA initiated the network, and secured formal support and financial resources for the network from the provincial Cabinet (LSEMSC 1985). They also provided expert science and report contributions, in addition to fulfilling traditional hierarchical roles as regulators (LSEMSSC 1985). The network was formed due to the need to scope a problem which had been independently observed by each of the partner organizations. Each agency had separate, but related, regulatory responsibilities regarding the problem. In this sense, governance in the watershed during this phase occurred through a voluntary network of government agencies focused on scientific and technical information gathering for regulatory problem solving. Efforts of the network during this time focused on scoping the extent of the problem, and achieving some initial reductions (LSEMSSC 1985). Between 1985 and 1990 a 15 tonne/year reduction was achieved in the phosphorus entering the watershed largely through surface water runoff (LSEMS 1992). This was primarily a result of adopting the policy that no increases in total point source loadings from municipal or industrial waste water facilities would be permitted (LSEMS 1992). Triggers for change from this phrase included financial constraints and a need for deeper commitment to the governance process.

During this period, the network was quite small with only seven actors involved (Figure 4). The actors located on the right side of the network had stronger ties with each other than with the actor located on the left (i.e., OMAFRA). OMAFRA's role during this phase related primarily to information sharing. More frequent interactions between the LSRCA and two provincial government ministries, MOE and MNR, are visible. Also important to note is the presence of a consultant who participated in governance efforts during this time, and federal government agencies. Neither the consultant nor staff from federal agencies was formally included in the Cabinet submission for governance during this time, or in the agreement between the MOE, OMAFRA, MNR and the LSRCA. The consultant was engaged to provide scientific analysis and research to the network, while the federal agency was included due to their regulatory role regarding fisheries.

During this first phase, the network exhibits a high degree of density (0.85) due to its small size (7 actors) and the frequent interactions among these actors (Table 2). In other words, the network was closed and insular. Given the small size of the network and the high level of density, it is logical that the MOE, MNR and LSRCA each have the same value in the centrality measures (degree – 1.0, closeness 100, betweeness 6.667): they are the core actors and interact only with each other. Given that there are only 7 actors in this network, and 4 different sectors represented, the E-Index shows a medium to high level of heterophily amongst actors (0.4706) but is less instructive because of the small network size.

Figure 4 Social Network Analysis - Phase 1986-1989



2.5.2 1990-1994

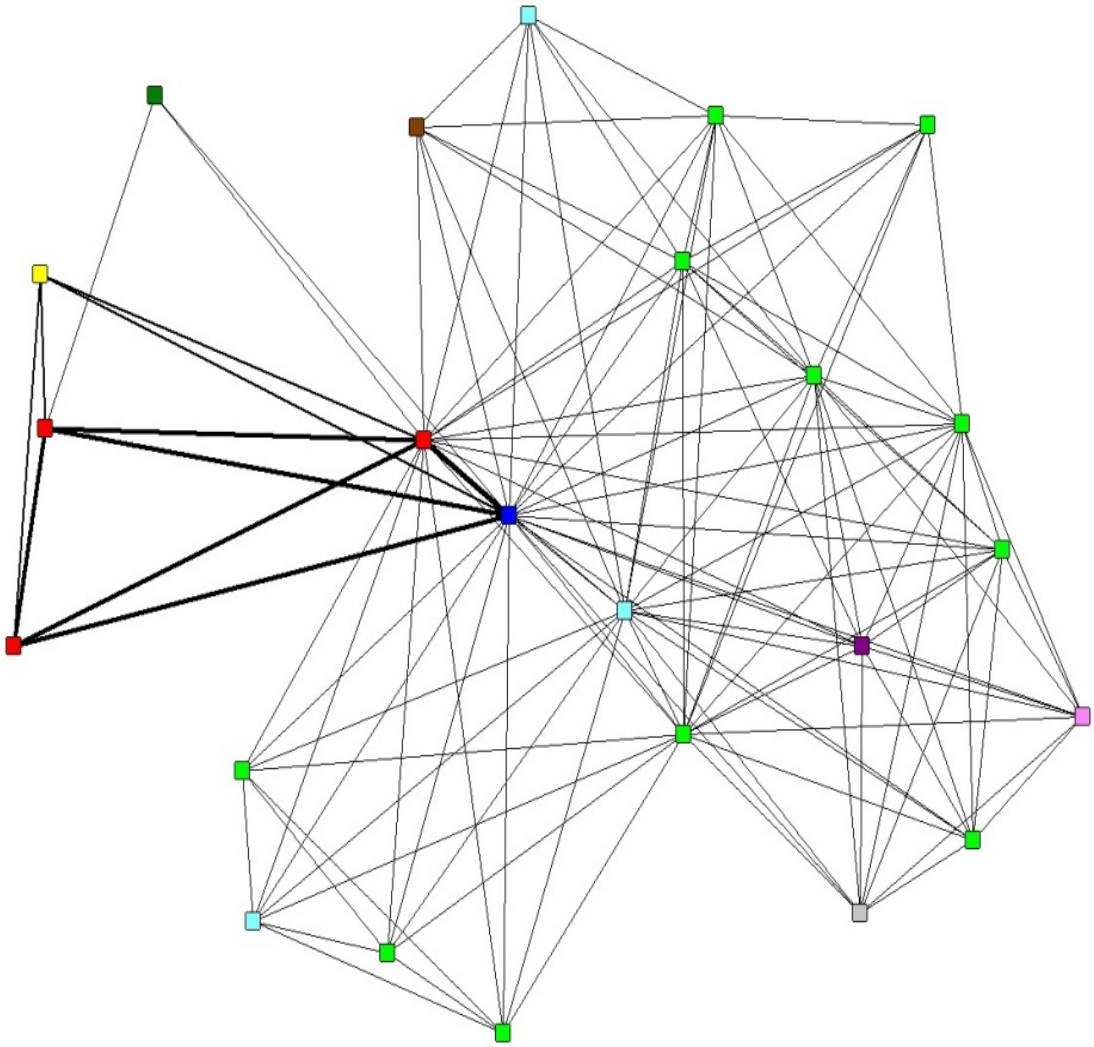
In Phase Two (1990-1994) the MOU for the LSEMS program continued to include the MNR, MOE, OMAFRA and the LSRCA. Administration of the voluntary network shifted to the LSRCA, which took the lead in organizing and implementing governance activities. During this phase, participation by government actors was reduced as a result of a provincial austerity program (LSEMS 1993). While the agencies continued to meet as part of the network, their in-kind contributions of monitoring and financial support to the network were reduced. Consequently, mid-phase, the provincial network agencies retreated to fulfill traditional hierarchical roles as regulators, thereby reducing their contributions to expert science, monitoring and reporting. The LSRCA attempted to fill the gaps of the network's needs in these areas.

The scope of efforts of the network changed in two ways during this phase. First, there was an effort to engage the public in the issues through traditional public consultation exercises (LSRCA 1992). Second, environmental management strategies moved beyond regulatory control to include agricultural stewardship and landowner improvement programs facilitated by the OMAFRA and the LSRCA. Thus, during this phase the scope and level of inclusion of actors broadened to include non-government actors through consultation and individual stewardship programs. Triggers for change from this phase were motivated by continued government budget cuts which forced a reassessment of fiscal support for the program.

Figure 5 demonstrates that the network grew in this phase to include more actors, and a greater diversity of actors. However, there remains a higher level of interaction amongst the LSRCA and the provincial government agencies, as demonstrated by the thicker lines between these agencies. This indicates that regular meetings continued to be conducted by the core agencies. In this phase several clusters are also evident, such as the provincial/university clusters to the left, the municipal/environmental non-governmental organization (ENGO) cluster to the bottom and the second larger municipal cluster to the right. These clusters reveal evidence of outreach during this phase.

In this phase, the network grew in size (24 actors), increased in diversity (10 types of actors) and had a lower density (0.43) value as compared with the last phase (Table 1). This indicates that while more actors were involved in the network, they interacted in smaller isolated groups, as opposed to in large forums. Key informant interviews explained this pattern: specialized groups were being formed, but they only provide input to the core network members, rather than participating in dialogue across the groups. This is confirmed by the lower E-I index score (0.2819). The LSRCA became the highly centralized actor in the network (degree centrality 1.0, closeness centrality 100, and betweeness centrality 63.5). These statistics accord with observations from interview subjects, who explained how the LSRCA took on the role of formal network manager.

Figure 5 Social Network Analysis - Phase 1990-1994



University Researchers
Municipal government
Provincial government
Federal government
Conservation authority
ENGO's
Naturalist groups
Elected Officials
Aggregate Industry
Resident Associations

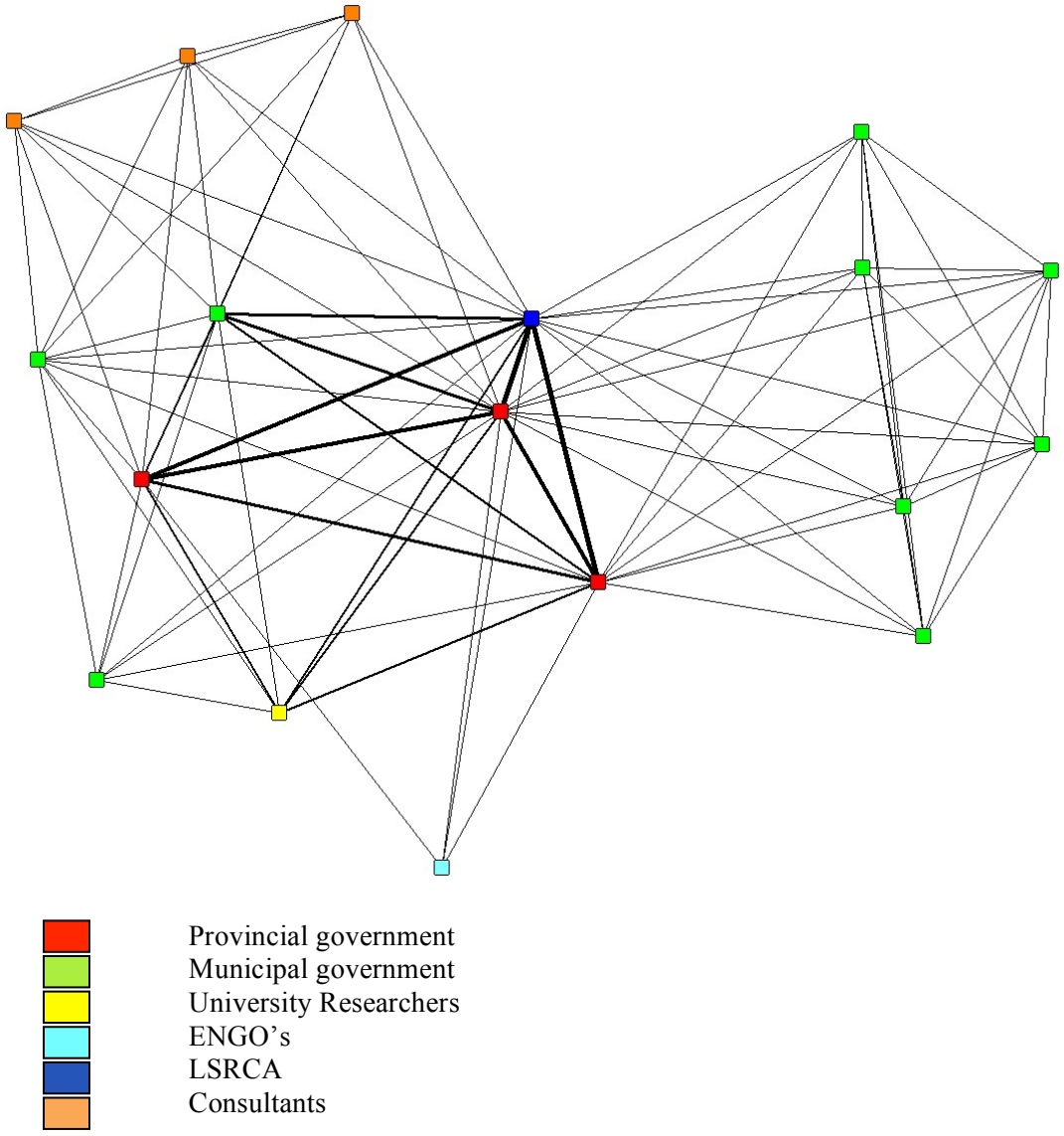
2.5.3 1995-2000

In Phase Three (1995-2000) the LSRCA continued to lead the network which remained a voluntary collaboration among the four core agencies (MNR, MOE, OMAFRA, LSRCA). LSEMS meeting minutes indicated that the participation of provincial government agencies in the network declined further as a result of deepened budgetary cuts to provincial environmental agencies. In 1995 a new provincial governing party was elected. Two major actions of this new government had significant impact on water resources management in the province. First, dramatic spending cuts led to reduced revenue transfers to municipalities and CA (de Loë and Kreutzwiser 2005; Prudham 2004). Second, the government instituted a radical shift in municipal and provincial responsibilities for water resources (de Loë and Kreutzwiser 2005; Prudham 2004). The capacity of LSEMS to conduct scientific monitoring and management activities was consequently reduced, as confirmed by two staff from the LSRCA and a staff person from the MOE. As a result, the LSRCA focused more on finding opportunities to financially sustain LSEMS. With increased growth pressures affecting the watershed, two new types of actors were introduced to the network. In Ontario, municipalities take two main forms: lower-tier municipalities (Towns, Cities) and upper-tier municipalities (Regions and Counties). Two regional municipalities (Durham and York) and Simcoe County joined the network as formal partners. At the same time, outreach and consultation with several lower tier municipalities took place. The upper-tier municipal governments were invited to join to the network for two main reasons. First, they played significant roles in planning and managing growth and development in the watershed, activities that directly affected the health of the watershed. Second, they were able to make financial contributions to support the LSEMS program, and to fill the gap left by the withdrawal of the provincial agencies.

In this phase there were three main triggers for change from the previous phase. First, network members recognized a need to reformulate the governance approach to obtain greater commitment to the governance process, as expressed by the CAO of the LSRCA. Second, since considerable data and monitoring had been completed in previous years, the problems of the watershed were now relatively well understood. The focus of the network thus shifted from data collection to comprehensive planning for the watershed (LSEMS1995). Third, in light of the reduced funding provided by the provincial agencies, there was a need to formulate a plan for sustainable long term financial support of the network governance system (Ministry of Agriculture, *et al.* 1999).

During Phase 3, the network's size was slightly reduced (Figure 6). This reflects the budget cuts at the provincial government level, which in turn led to a weaker capacity on the part of LSEMS to engage stakeholders. Ties between the LSRCA and provincial government agencies remained strong, but one of the upper-tier municipal governments joined this closely-knit group. In this phase the LSRCA and the MOE continue to play central roles in the network. Figure 6 shows a few clusters of actors with weak ties to the core network actors. This includes a group of municipal governments, an ENGO, and three consultants. New but weak ties between the core actors and these other actors indicate that the core network members were reaching out to a larger group of actors. Meeting data indicated that consultants were utilized for assistance with particular water quality monitoring and assessment report as demonstrated by their inclusion in he network.

Figure 6 Social Network Analysis - Phase 1995 - 2000



In this phase, there was a decrease in network size (18 actors) and diversity (6 types of actors), which also resulted in the density of the network increasing (0.54) (Table 2). The LSRCA remained the most central actor in this network (degree centrality 1.0, closeness centrality 100), but the MOE, MNR and OMAFRA played almost equal roles as reflected by their high centrality (closeness 100). A senior staff member from the LSRCA commented that while that the provincial ministries continued to attend meetings, their engagement during this time was as information brokers between the LSRCA and the provincial government. So while the SNA map indicates a high level of engagement, the contributions from government staff were actually quite limited.

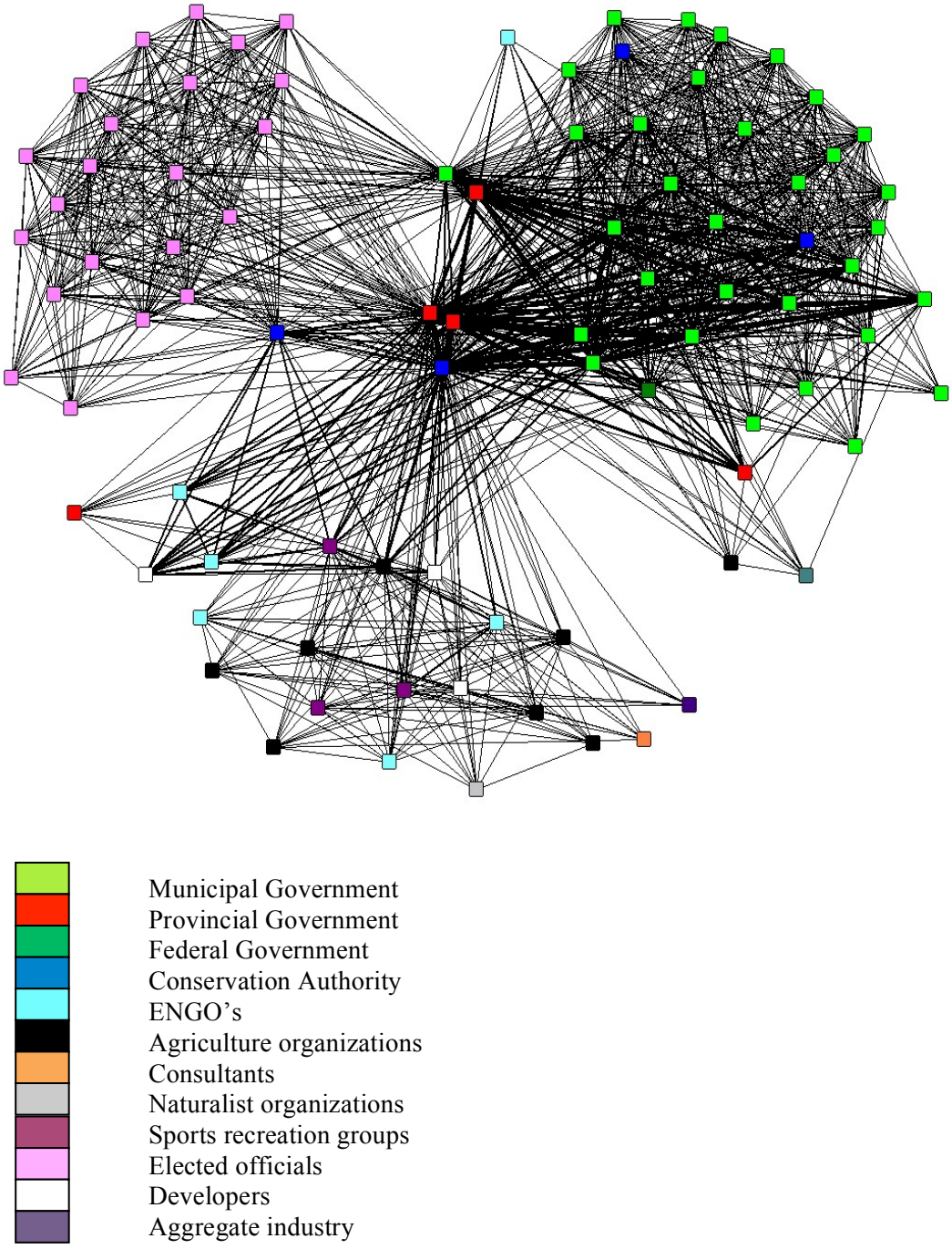
2.5.4 2001-2007

Phase Four (2001-2007) of the network was marked by extensive change. The Memorandum of Understanding was expanded from the original signatories (MNR, MOE, OMAFRA and the LSRCA) to include MMAH, three upper-tier municipal governments, and seven lower tier municipal governments. The LSRCA continued to lead the network, but this phase marked the return of the original provincial government actors participating in full capacity. Additionally, the inclusion of MMAH and the municipal governments in the watershed marks an important change in government support for the program. Where previously the provincial ministries most closely linked to the environment were the core financial partners of LSEMS, now MMAH and municipal governments became core financial partners. Key informants noted that this change was due in part to the fact that MMAH was responsible for growth and development in the province. The Lake Simcoe watershed had been identified as a high growth potential area by the provincial government under the *Places to Grow Act, 2005* (S.O. 2005, c. 13). Therefore the role of government in this phase was decreasing in one respect (environmental) and increasing in another (growth and development). Nonetheless, what remained consistent during this phase was the participation of government agencies as regulators in both respects. Two senior government staff clearly indicated that the regulatory role of the government never changed, and that during this phase, their exertion of power through planning processes was quite significant. The inclusion of municipal government actors as formal partners in the MOU also supports this shift in focus, as in Ontario they are responsible for local level growth planning and development.

During this phase, more than two thirds of the network's funding came from the provincial and municipal governments; the balance was provided by the LSRCA. Interview subjects reported that increased funding resulting from the growth in network membership permitted an expansion of activities, in particular an increased focus on community outreach and interaction activities. The CAO of the LSRCA noted, "We took a look at governance models for the future, we did a lot of community engagement work, workshops, gaining insights from the community in regards to what directions they wanted us to go and we provided recommendations to the government of the day." Outreach efforts were not limited to watershed residents. Instead, they also focused on elected officials at the municipal, provincial and federal level. However, more significant than increased outreach were the actions of local ENGOs during this phase. Every single participant interviewed commented that during this phase the most significant change to LSEMS was a result of efforts by ENGO groups. ENGOs called for direct participation in the closed network, and were successful. Due to their actions, a new stakeholder committee was established for LSEMS, meaning that for the first time non-government actors were formally and directly included in the network (LSRCA 2006).

At the mid-point of this phase, several triggers shifted the governance system. The LSRCA's capacity to lead the governance process decreased as the complexity of the scope and scale of the network increased. The LSRCA did not have authority to implement new regulations, and their programming was limited to voluntary control measures. Three interview subjects suggested that the capacity to reduce phosphorus loadings through voluntary measures had been reached, and that additional tools would be required to achieve further reductions. In addition, physical signs of the watershed's degradation were becoming evident at the shoreline and in near shore areas, which motivated shoreline residents to take actions such as create the Rescue Lake Simcoe Coalition and the Ladies of the Lake organization. In turn, several ENGOs demanded even greater roles in decision making.

Figure 7 Social Network Analysis - Phase 2001-2007



These circumstances led to two important drivers of change, one internal and one external to the network. Internally, a working group was created comprised of diverse actors that came together to formulate a proposal for a new governance model for the next phase of the network

(Lake Simcoe Working Group n.d.). Externally, ENGOs advocated for formal legislated protection for the resource and conducted specific activities such as the Lake Simcoe Summit (Campaign Lake Simcoe 2007b) and the Citizens Action Plan (Ladies of the Lake and Windfall Ecology Centre 2006). In response to the actions of ENGO actors and the work of LSEMS, the provincial government introduced the *Lake Simcoe Protection Act* (R.S.O. 2008, c.23) (Government of Ontario 2007). The announcement came shortly after the LSEMS working group completed its proposal for a new governance model for the watershed (LSEMSSC 2007). Importantly, creation of the LSPA was consistent with the re-emergence of government actors in roles beyond simply being a regulator. The provincial government became a key actor again through its support for, and facilitation of, the proposal to generate a new governance model for the Lake Simcoe Environmental Management Strategy (LSEMS). These efforts indicated that government was reasserting its role in governance as a funder, producer of scientific information, facilitator of stakeholder processes and regulator. The commitment of several government agencies, including those engaged in the network, to collaborate on development of an inter-governmental action plan for Lake Simcoe demonstrated that the watershed had become a provincial level priority concern, significant enough to warrant dedicated resources.

The SNA figure for this phase highlights the clustering of several groups engaged in the internal working group process. Figure 7 shows a clear clustering pattern of four distinct groups: the elected officials, the municipal governments with some additional conservation authorities, the stakeholder groups, comprised of several different ENGO's and sector organizations, with the remaining core cluster still structured by the three key provincial agencies and the LSRCA. Figure 7 also shows that the LSRCA and provincial agencies continue to play central roles in the network. However, while the network grew significantly since the previous phase, network actors did not formally engage in cross-sectoral dialogue beyond that taking place within the different stakeholder clusters.

Growth of this network (88 actors) also resulted in an increase in diversity (13 types of actors) due to the high number of new actors engaged in the network. In turn, this led to a decrease in density (0.34) and the E-I index (0.1298) as shown in Table 2. The low E-I index is visually demonstrated in Figure 7 which demonstrates dense clusters of actors from similar sectors indicating they are only interacting amongst themselves and the most central actors. During this phase, even with the emergence of a wide variety of actors, the LSRCA continued to be the most central actor (degree centrality 1.0 – Table 2). However, rather than the Ministry of Agriculture being the third most prominent government agency, the Ministry of Municipal Affairs and Housing emerged as an important player (closeness 77 Table 2)

2.5.5 2008 - 2010

The final phase of the network (2008-2010) began with the formalized hierarchical governance system established by the LSPA and implemented through the *Lake Simcoe Protection Plan* (henceforth referred to as the Plan) (Government of Ontario 2009). The MOE was designated the lead agency for implementing the Act and Plan and therefore became the core network actor. Consequently, during this time, the LSEMS program disbanded, with efforts of each of the individual actors being refocused on the Act and Plan.

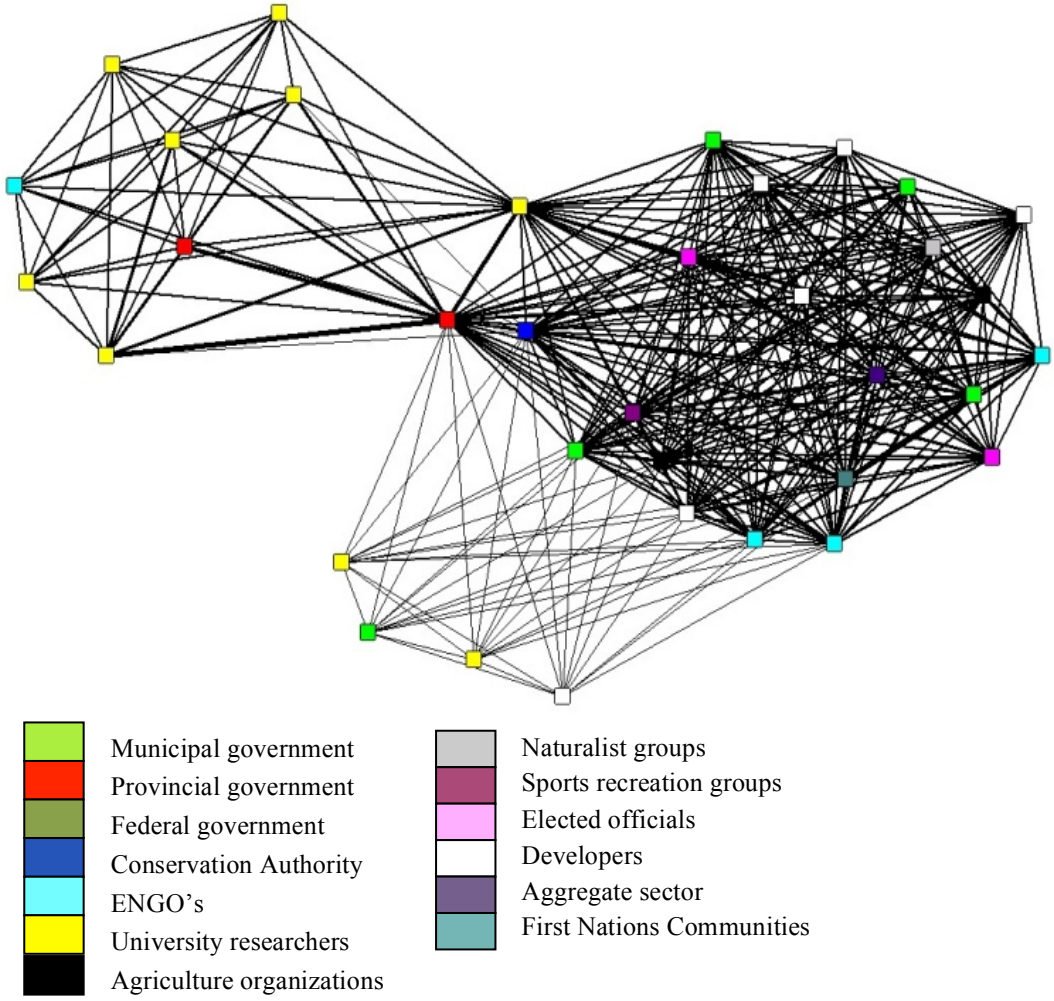
Activities during this phase indicate that while governance became top-down, with the government assuming its traditional formalized hierarchical control position, the role the

government played changed considerably. It must be remembered that the Act was a direct response to public advocacy from ENGOs, which called for legislative protection of the Lake Simcoe watershed. The formulation and implementation of the Act was, and continues to be at the time of writing, a highly participatory process. To illustrate, interview subjects emphasized that the government consulted extensively during each period of the Act and Plan's development. ENGO actors commented that during the consultation and committee processes, the government was highly responsive to their concerns and suggestions. Also, in response to comments from ENGO actors, the LSPA established a permanent citizen and science advisory committee that has direct oversight regarding the Plan's implementation. Both of these committees can submit concerns or suggestions regarding the Plan's evolution directly to government staff.

Importantly, despite this high level of stakeholder interaction, environmental governance during this phase is hierarchical because the LSPA and Plan ultimately were designed and directed by the provincial government. Formal hierarchical control also expanded beyond existing regulatory mechanisms. Where previously environmental decision making in the watershed took place primarily through provincial regulations and municipal planning instruments, the LSPA introduced one comprehensive piece of legislation focused on integrating previous controls and expanding provincial and municipal authority. This introduced a new approach for the provincial government. Specifically, the LSPA was the first piece of provincial legislation designed specifically to regulate planning and management in a watershed. Furthermore, the LSPA did not create a new watershed authority to implement the plan. Instead, it provided mechanisms to integrate efforts of existing actors and controls, and to give them expanded authority. The Plan also established the foundations for a more collaborative approach to governance through engaging the LSRCA, municipalities, provincial agencies and a non-governmental stewardship network in plan implementation activities (Government of Ontario 2009).

The changes in the form of the network that took place during this phase are evident in Figure 8, which shows three distinct clusters. These reflect two distinct sub-phases of the network. In 2009, science and stakeholder committees were created to contribute to the development of the Plan. The interactions of actors in these committees resulted in two of the clusters. Once the Plan was finalized, the permanent citizen committee (formally called the Coordinating Committee), and the Science Committee were established. The Science Committee membership remained largely the same, but the Stakeholder Committee introduced a few new actors, as demonstrated by the weaker network lines connecting the lower cluster to the cluster on the right in Figure 8. The permanent committees only met twice during 2009-2010. The MOE, and the LSRCA continue to play central roles, while university researchers served as a bridge between the science and stakeholder committees because they held positions on both committees.

Figure 8 Social Network Analysis - Phase 2008-2010



Several of the statistics in this phase counter the findings from previous phases (Table 2). Even though the network is smaller in this phase than in the previous phase (35 members), the diversity (12 types of actors) has remained high (Table 2). This relates to the fact that the committees were formal, and the Coordinating Committee had set numbers of members from a variety of sectors, as per the *Lake Simcoe Protection Act* (R.S.O. 2008, c. 23). The density (0.5765) and E-I Index (0.7068) were extremely high during this phase, indicating a strong level of interaction amongst all members of the network. A significant change during this phase was the replacement of the LSRCA by the MOE as the actor with the highest level of degree centrality (1.0), meaning that the MOE was connected to all actors in the network. This is not surprising given that this agency was the primary lead of the committees and governance in the watershed during this phase. The closeness centrality measure, demonstrates that the LSRCA (with a score of 89) was still highly central. This also is logical given that the Chief Administrative Officer of the LSRCA was one of the Chairs for the Stakeholder Committee created under the LSPA.

2.6 Discussion and Conclusion

2.6.1 Governance Change

Howlett, *et al.* (2009) called for multi-dimensional analyses of governance change. This research provided a multi-year (over a 30 year period), multi-scale analysis of a governance system. It evaluated the governance system from a statistical, social and formal documentation perspective in order to assess the changes in the governance architecture. Key findings are noted in Table 3 below.

Table 3 Key Governance Findings

Theoretical Discussion	Findings in Lake Simcoe
Government is in decline	- A strong trend towards increasing hierarchical control over time
Role of government is changing	- Within the context of an increase of hierarchical control was an increase in facilitating multi-actor governance
Hierarchy to market to network narrative	- This case demonstrated a complete reverse pattern, moving from network to hierarchy and did not include a role for markets - Current arrangement has a collaborative governance system nested within a hierarchical one
Role of non-government actors is changing	- Non-government actors played a significant role in influencing the direction of governance in the watershed - Obtained a legislated role in the implementation of water governance

Recent scholarship in the governance field rejects the notion that governments in the West are in decline (Bell and Hindmoor 2009; Hysing 2009). This research offers empirical evidence that demonstrates that the reality, at least in the context of water governance, is more nuanced. As evident in phases Two and Three, there was indeed a retreat of the government from participation in water governance in the Lake Simcoe region. The evidence indicates that this was a direct result of economic circumstances in the province, rather than a strategic decision on the part of the provincial government to move away from involvement in governance in the region. This finding is further supported by the fact that there was a re-emergence of the provincial government as a dominant actor in phases Four and Five despite the fact that governance during these periods still occurred through a network form. Importantly, the "retreat" of the government that did take place during phases Two and Three did not involve a reduction in the legal and constitutional responsibility or authority of governments. Instead, it was a shift from activities such as conducting expert science, monitoring and planning, to a more limited focus of regulatory control. During these phases, the government retained authority and control. Ultimately the role of government in the governance system at the end of this research period (2010) was very strong and hierarchical, as demonstrated by the introduction of legislation, regulatory controls and a top-down plan implementation process.

Despite the clear return to a hierarchical style of governing, the research also demonstrates that the roles governments play can change, but not in simplistic "advance" and "retreat" forms. As others have noted, governments can shift from strictly using command and control approach to relying on alternative governing mechanisms such as interactive governance, collaboration, deliberative policy making, inclusive management or partnerships (Howlett, *et al.* 2009; Hysing 2009; Tenbensel, *et al.* 2011; Termeer 2009). This phenomenon is apparent in Lake Simcoe. Attention to the public and scientific community's engagement in the Act and Plan provides a pertinent example. The development of the Act proceeded through traditional, although more expansive, consultative processes, i.e., public comment periods that permitted written submissions as well as community workshops. However, the creation of two public committees (Science and Stakeholder) that directly and frequently advised the government on the formulation of the Plan, were widely considered by government staff interviewed for this study to have provided significant contributions to the development of the Plan.

Additionally, two new permanent committees (Science and Coordinating Committees) were established by the Act, to oversee the implementation process, and to advise and make recommendations on the adaptation of the Plan. As a steering mechanism, these committees represent a strategic effort on the part of government to more effectively engage and broker professional relationships with non-government actors. This reinforces the argument that governance does not have to be a zero-sum game, there is room for multiple actors, engaging in multiple types of activities (Bell and Hindmoor 2009; Blakeley 2010). In this case, governance of the watershed changed as a result of several social, economic and environmental factors. In phases Two and Three government participation declined. In phases Four and Five, government slowly increased their level of participation; Phase Five concluded with the provincial government introducing strongly directive legislation.

In considering how governance changes over time, the contemporary governance literature indicates that the hierarchy to market to network narrative is too simplistic to capture the complex changes taking place within government-society relationships (Grix and Phillpots 2011; Howlett, *et al.* 2009; Hysing 2009). The hierarchy to market narrative fails to recognize the power of the government to organize and manage society as defined by its monopoly on the legitimate use of force, and on the power of governments to create and enforce legislation and regulations (Grix and Phillpots 2011; Gunningham 2009b; Peters and Pierre 2000). Additionally, it runs counter to the considerable evidence that demonstrates that societies continue to expect governments to provide steering functions (Metze 2011; Waters Robichau 2011). This research certainly supports this viewpoint: the LSPA was the direct outcome of intense lobbying by non-government actors for a strong regulatory framework.

In this research, the governance system began as a voluntary collaborative agreement between government agencies. It was initiated in order to support the existing programs within the government agencies where staff identified an opportunity for collaboration and cooperation in building a research capacity around the phosphorus loading issue taking place in the watershed. This indicates that it was driven by the opportunity to support mutually beneficial program objectives within the respective agencies, as opposed to being a provincially driven policy program. In later phases the LSEMS program moved from being led by provincial government actors, to being an arm's length agency that was voluntary and networked in its approach. The size and scope of the network waxed and waned in accordance with the economic climate of the province, until the fourth and fifth phases when the public and non-governmental organization

became more vocal and requested opportunities to participate in the governance process beyond consultation.

Greater inclusion of the public and a broader set of government agencies from multiple levels led to more diversity and engagement in the governance process. However, just as the LSEMS program arrived at a new model of governance for the watershed through an organic model of collaboration, governance of the watershed shifted again, this time to a hierarchical model under the direction of the provincial government. In this respect, the governance system in this watershed began with a network, which evolved through several phases, before concluding with a formal hierarchical system. This reinforces the fact that governance transitions can be non-linear and do not accord with the hierarchical to market to network narrative. Also, as is apparent in this case, the choice is not between governing through hierarchies or governing through networks. Instead, both forms can exist simultaneously.

This research found that the role of government is indeed changing and becoming more inclusive of alternative mechanisms of governing, and that governance does not transition in a clearly delineated linear fashion. The non-linear transition of governance highlighted two important findings. First, that governance changes as a result of the economic, social and environmental context in which it is embedded. Second, because governance systems are embedded within one another, the question is not about 'one' system tranforming, but the recognition of multiple systems existing and changing on multiple scales.

2.6.2 Social Network Analysis

The application of SNA to the governance system proved useful in several ways. Perhaps the most significant outcome is a measured and quantifiable example of a governance system. Applied over time, SNA visually and statistically evaluated the changes in governance. Supplementing qualitative data with quantitative data brings strength and weight to the arguments of governance change, or simply to identify the type of governance system in place. Visually, network diagrams made clear indications regarding actor's interactions, identifying central versus periphery actors. Network diagrams used in combination with network statistics were particularly valuable in identifying different types of engagement practices, as evidenced by the difference between phase Four and phase Five.

Specific SNA findings relating to the governance network cover issues of network evolution, and the use of particular analyses for environmental governance. Networks are dynamic structures that evolve over time in response to the context in which they are embedded (Daugbjerg and Marsh 1998; Hudson 2004). Evolutions include changes in scope and size of network (Doz 1996) as a result of critical events that are external to the network (Knoben, *et al.* 2006). The Lake Simcoe network experienced several expansions and contractions over time as a result of two primary factors; the economic context in which it was embedded, and the need for broader engagement on environmental issues. Changes in the economic context forced both expansions and contractions of the network, while the need for broader engagement resulted in expansions twice during the evolution of the network. Knoben (2006) commented that some evolutionary processes in networks can lead to path dependencies and result in network inertia. This was evident during the Fourth phase of the network, where the LRSCA had consistently been the most central actor in the network, but their capacity to further the network was limited. However, rather than remain in inertia, external forces created new opportunities for the network

to evolve, specifically campaigns and advocacy work of ENGOs forced the network into a formal hierarchical structure.

Results of the SNA also led to a number of additional findings. The combination of network diversity and the E-I index promoted more accurate depictions of cross-sectoral dialogue and engagement. This perspective was deepened by the visual depictions of the network which highlighted the clusters of sectors, such as in the 2001-2007 phase. Earlier phases show isolated engagement with different sectors, while later phases show greater frequency of direct interaction amongst a diversity of sectors. Using weighted data that represented several meetings over time also permitted clearer evidence of which actors were more active as compared with others. This is evident in the first three phases where networks sizes ranged from seven to 24, but high levels of interaction were only consistent between 4-5 actors.

Other valuable insight included the comparisons of most centralized actors across phases. The network's most centralized actors reached inertia when the fourth phase is considered against the fifth phase where a new centralized actor was identified. Lastly, the negative correlation between network diversity and the E-I index was shown in the last phase to not always be accurate. In this case, as network diversity remained high, the E-I index also increased. Therefore increased diversity does not always result in lower heterophily scores for a governance network.

Two future areas for research remain. First, deeper SNA analysis of governance networks through the use of additional statistics such as actor's roles, actor clustering, and reciprocity could prove insightful. Additionally, the contrast between multiple networks of the same system may reveal as much, or more data as a qualitative analysis would provide, i.e. one way directional ties of resources and communication, formal lines of authority versus informal lines of support. The opportunity for SNA for governance studies is only beginning. Also, a greater set of historical governance studies examining transition could reveal addition trends or sectoral differences. Overall, this research has demonstrated the unique contributions of a multi-method approach to governance studies.

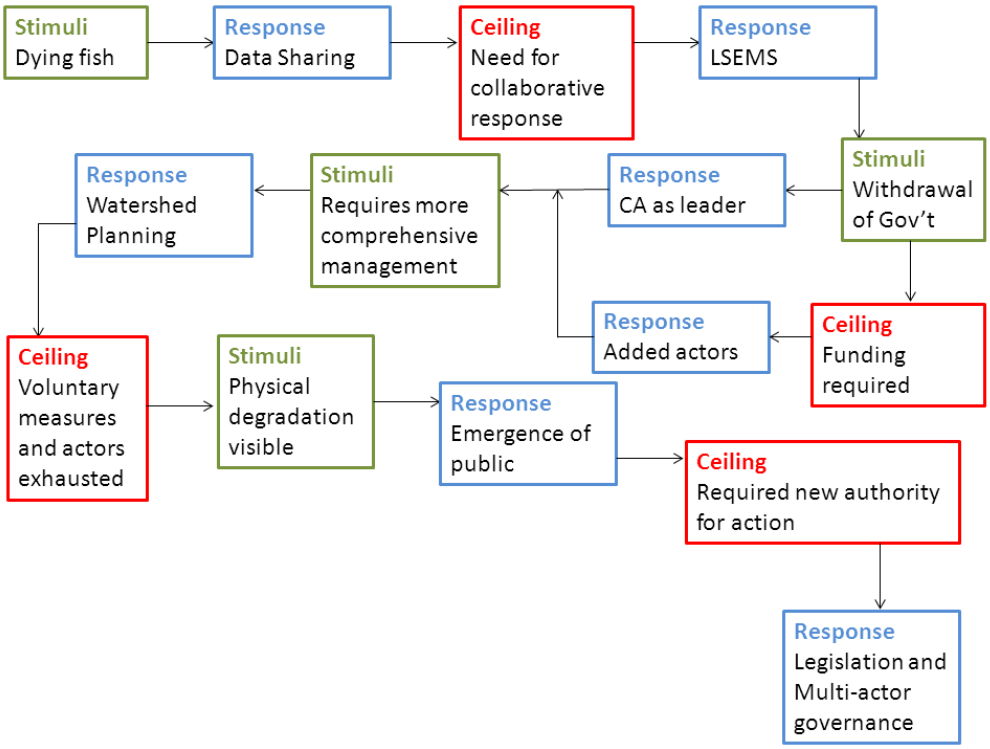
2.6.3 Lessons for Water Governance

This case demonstrates a number of important findings regarding water governance systems more broadly. First, the aspect of time cannot be undervalued, both from an analytical and planning perspective. A historical lens permits a reflective understanding of context, influence, and transformation because the broadest perspective can be applied and linkages between elements can be drawn and analyzed in the most holistic way. From a planning perspective, time permits various elements of a system to emerge, connect, conflict and transform. At the end of the research period, a wide range of actors, knowledge and resources are present in a collective way that had not previously been achieved. Governance actors from multiple levels of government, non-government organizations, stakeholders and scientists were all deeply engaged in the governance process. Long-term and comprehensive knowledge regarding the natural and social system had been collected, documented and understood (in light of the inherent complexity of the system). Resources, financial, technical and regulatory have been aligned in a new way. As a disclaimer, this is not to say that governance in the watershed is now completely effective. Rather the intent is to bring attention to the fact that three important components: actors, knowledge and resources, are well developed at the same time, in a way that the governance

system has not previously experienced. It was a 30+ year process to get to this stage, and one that is still continuing to develop and transform. Meaningful progress takes time.

Second, this case highlights the capacity of a system to respond to change and to what are identified here as 'ceilings' – instances where the governance system reached a point at which it was not feasible continue on the same path. Figure 9 highlights a simplified account of governance transformations in Lake Simcoe, including stimuli, responses and ceilings. The critical insight is how the system responded to these ceilings. Rather than reach a point of inertia when a ceiling was hit, a response was identified, and the trajectory of the system was re-negotiated. One key example is the limitations of siloed efforts of individual governance (government ministries and the CA) actors early on that resulted in the creation of the collaborative LSEMS program to respond to phosphorus loading problems in the lake. A second example was the withdrawal of government agencies as a main funder of LSEMS work. This led to an important introduction of municipal government partners, not only as funders, but as governance partners and implementers. A later and critical example occurred when voluntary phosphorus reduction strategies that could be initiated by the CA became exhausted and no further improvement could be achieved through these mechanisms. This ceiling, combined with the stimulus created by the physical degradation, ignited efforts by non-governmental organizations in the watershed who were able to interject and again change the trajectory of the system. This is not to say that these transformations in the system were simple, or without tension and conflict. At each ceiling, a governance actor considered available resources and relationships, and found ways to re-combine them to create new opportunities. It was this attention to system dynamics and opportunities that was utilized, and, importantly, it was not always the same governance actor who recognized and took advantage of opportunities.

Figure 9 Simplified Account of Governance Transformations in Lake Simcoe



Future design of water governance system needs to allow for time. Time is needed for the development of individual elements, and time is needed to allow new elements to emerge that may play valuable roles in the system. This inherently goes against much current effort, where water crises demand actionable effort now. Numerous cases from around the globe highlight the shortcomings of this approach; efforts to do everything all at once often are not feasible, and are likely to fail. What this case highlights is that efforts can be directed at individual elements at strategic moments in time. In this case, a (simplified) sequence of effort was initially driven by scientific knowledge generation, followed by a focus on collaborative actor relationships and then by the addition of several types resources. The skill and capacity for governance actors to 'read' and 'see' a system, and therefore to understand how, when and where to act, is an important opportunity for water governance to become more strategic and effective. This case indicates a number of areas for further research. Most broadly, do the transformation patterns identified here hold true for other locations? This includes the transitions between governance frameworks, and the role of government. Do they hold true for other kinds of governance systems (i.e. health)? Perhaps most interestingly, are there stages of maturity for governance systems? Further research on governance systems and how they transform over time should seek to elaborate on these questions.

Chapter 3

Transcending the Watershed Boundary

3.1 Introduction

Watershed boundaries are widely accepted by many water practitioners and researchers as the *de facto* ideal boundary for both water management and governance activities (e.g., European Commission 2001; Global Water Partnership 2003). In the context of governance, defined here as the structures and processes by which people in societies make decisions and share power (Young 1992), watershed boundaries are typically considered an effective way to integrate the social, political and environmental systems they encompass (Mitchell 1990). However, the utility and authenticity of the watershed boundary for water governance should not be assumed. Instead, both scholars and practitioners ought to carefully consider the circumstances under which watershed boundaries provide an appropriate frame for governance (Cohen and Davidson 2011).

The purpose of this paper is to identify how water governance can transcend the watershed boundary. The paper begins by briefly summarizes the literature supporting the 'watershed is best' argument before returning to the watershed boundary challenges identified by Cohen and Davidson (Cohen and Davidson 2011). This framework is then applied to an empirical water governance case where profound boundary-related challenges exist. The results are presented in two sections. First, the case is examined in light of the identified water boundary challenges to discuss how these are prevalent in the watershed. Second, the results highlight instances where alternative non-boundary dependent tools for water governance are applied or created. The discussion argues that the watershed boundary has utility when applied in a limited and focused manner, and then draws attention to opportunities for water governance that can transcend the watershed boundary.

3.2 Water Governance: In or Over the Boundary?

3.2.1 Governance through Watershed Boundaries

The notion that the watershed provides an ideal boundary has been common for some time. The use of watershed boundaries was noted in the third century China (Molle 2009). Drainage areas were mapped in Spain and France in the mid-1800s (Blomquist and Schlager 2005; Molle 2009). Several rationales for the appropriateness of watershed boundaries have been advanced. First is the apparent naturalness of the boundary (Commission of the European Communities 2007; Parkes, *et al.* 2010; Saravanan, *et al.* 2009; Warner, *et al.* 2008; White 1957). Watersheds are defined by hydrological processes. Thus, they are "distinct, easily mapped and stable" (Barrow 1998) and "define basic, ecologically and geomorphologically relevant management units" (Montgomery, *et al.* 1995). These properties, it has been suggested, make them a tangible and manageable unit for water governance (Kenny 1999).

With the acceptance of the boundary as natural, it is often asserted that watersheds are the most appropriate scale for defining the jurisdiction of water-related organizations. From this perspective, considerations such as social, political, economic and environmental functions relevant to water governance should be organized and integrated at this scale (Huitema, *et al.* 2009; Leach 2006; Schmidt and Morrison 2012). This perspective is evident in the European Union, where watersheds (or catchments) are a defining feature of governance under the Water Directorate Framework (Commission of the European Communities 2007). The appeal of the watershed boundary as an organizing principle is the assumption that organizing activities around this spatial unit will permit systematic integration of issues, participation of relevant stakeholders, and more effective resource management (Montgomery, *et al.* 1995; Schmidt and Morrison 2012; Woolley and McGinnis 1999). Veal (2010) outlines several additional purported strengths of the use of the watershed boundary. These include the capacity for the state of the ecosystem to be reflected in the state of the water flowing through the system; the ability for water systems to demonstrate the cumulative effect of environmental stresses; the role that watersheds can play as bridging tools for agencies; and finally, the fact that human communities can relate to their landscapes, making it an appropriate boundary for engagement.

3.2.2 Watershed Boundary Challenges

A growing body of literature is arguing that watershed boundaries are useful in limited applications and that the utility of the watershed boundaries relates primarily to whether it is being used for water *management* or governance *purposes* (Cohen and Davidson 2011). It is therefore important to make the distinction clear between governance and management. Management is defined as "the operational, on-the-ground activity to regulate a resource and conditions of its use" (Nowlan and Bakker 2007, 5); designing allocation plans, flooding, and day-to-day water quality testing are examples of water management activities. Governance can be defined as "the structures and processes by which people in societies make decisions and share power" (Young 1992, 160). This paper is concerned with the use of boundaries for water governance, and consequently the use of watershed boundaries for water governance. Most recently Cohen and Davidson (2011) have synthesized five distinct challenges that exist including boundary selection, accountability, public participation, problemsheds and policysheds.

Boundary Selection

The challenges associated with selecting which watershed boundary for water governance are diverse and extensive. Johns and Rasmussen (2008, 61) note that the "multi-jurisdictional scale and fugitive or transitory nature of water and its many interrelated uses make it hard to fit neatly within well defined categories" for governance. For instance, the catchment area of a tributary river may be nested within a larger watershed or basin. The nested nature of hydrological boundaries thus makes the selection of the boundary contestable (Fitzsimmons 1996). Additionally, watershed boundaries are rarely absolute in terms of time or space (Saravanan, *et al.* 2009; Warner, *et al.* 2008). Many water systems have been altered by human beings over time and therefore the naturalness of a watershed is often unclear (Fitzsimmons 1996; Warner, *et al.* 2008). Consequently, authors such as Blomquist and Schlager (2005) and Warner *et al.,* (2008) note that the selection of watershed boundaries is essentially a political choice, with Fitzsimmons (1998, 218) going so far as to suggest that the "system boundaries and internal elements may be chosen at will." To illustrate, in California the 'watershed' boundary used by an organization involved in the management of the Santa Ynes River was redrawn several times over

the lifespan of the organization to reflect changing priorities and interests (Woolley and McGinnis 1999).

Accountability and Participation

Watershed boundaries used for political organizations are also problematic. Often watershed organizations are not granted independent power or authority for their watershed (Huitema, *et al.* 2009). Thus, they do little more than advise (Barrow 1998). Without legislatively-defined authority and responsibility and/or financial support from governments, the accountability of watershed organizations can be reduced, and their legitimacy diminished. Tied to concerns of accountability are issues of public participation. Activities of a watershed organization often assume that citizens recognize and engage at the watershed scale. However, this is not necessarily the case (Ferreyra, *et al.* 2008; Reeve and Brunckhorst 2007; Saravanan, *et al.* 2009). Therefore, citizens may not hold their watershed organization accountable in cases where they are not involved (Reeve and Brunckhorst 2007; Wengert 1985, 303).

Problemsheds and Policysheds

The issues of problemsheds and policysheds both relate to the spatial misfits among the various social and ecological systems that exist in the area of any watershed. Problemsheds are generated when separate environmental problems operate within the same ecological boundaries. Unfortunately, this is not the case in most circumstances (Cohen and Davidson 2011). While some environmental problems experienced within a watershed are generated or created within its boundaries, this is by no means guaranteed (Griffith, *et al.* 1999). Common examples of problems that manifest within a watershed but are generated wholly or partly outside that watershed include climate change and atmospheric deposition (Fitzsimmons 1996). Policysheds are similar in concept to problemsheds. Policysheds represent a geography where multiple policies apply and have overlapping, but not identical geographical jursidictions (Molle 2007; Tiesman and Edelenbos 2011; Warner, *et al.* 2008). In the context of a watershed this could mean that a landuse policy applies in the northern portion of the watershed, but not in the southern. This variation in policy application across the watershed presents significant challenges for implementing cohesive and integrate planning and management within a watershed (Cohen and Davidson 2011; Galaz, *et al.* 2008).

3.3 The Lake Simcoe Watershed

The kinds of boundary issues discussed in this paper are starkly revealed in the Lake Simcoe watershed of southern Ontario, Canada (Figure 10). Lake Simcoe is located one hour's drive north of Toronto, Canada's largest metropolitan area. The Lake Simcoe watershed has a total land and water surface area of 3,303 sq. km., with the lake itself accounting for 722 sq. km. Land use planning in the watershed involves 23 different municipal governments, each with its own municipal land use plans, as well as five provincial pieces of legislation that direct land use planning for the watershed. Conservation authorities (CAs) are an important part of the environmental landscape in Ontario. CAs are watershed management bodies created under provincial legislation at the request of local municipalities. They have specific responsibilities for land and water management under their enabling legislation. Thus, the Lake Simcoe Region Conservation Authority (LSRCA) is an important actor in this watershed. In addition to the provincial government, municipalities and the local LSRCA, there also are several departments of the Canadian federal government with jurisdictional authority in the watershed. An important

example is the Department of Fisheries and Oceans, which has responsibilities relating to the management and protection of fish and fish habitat.

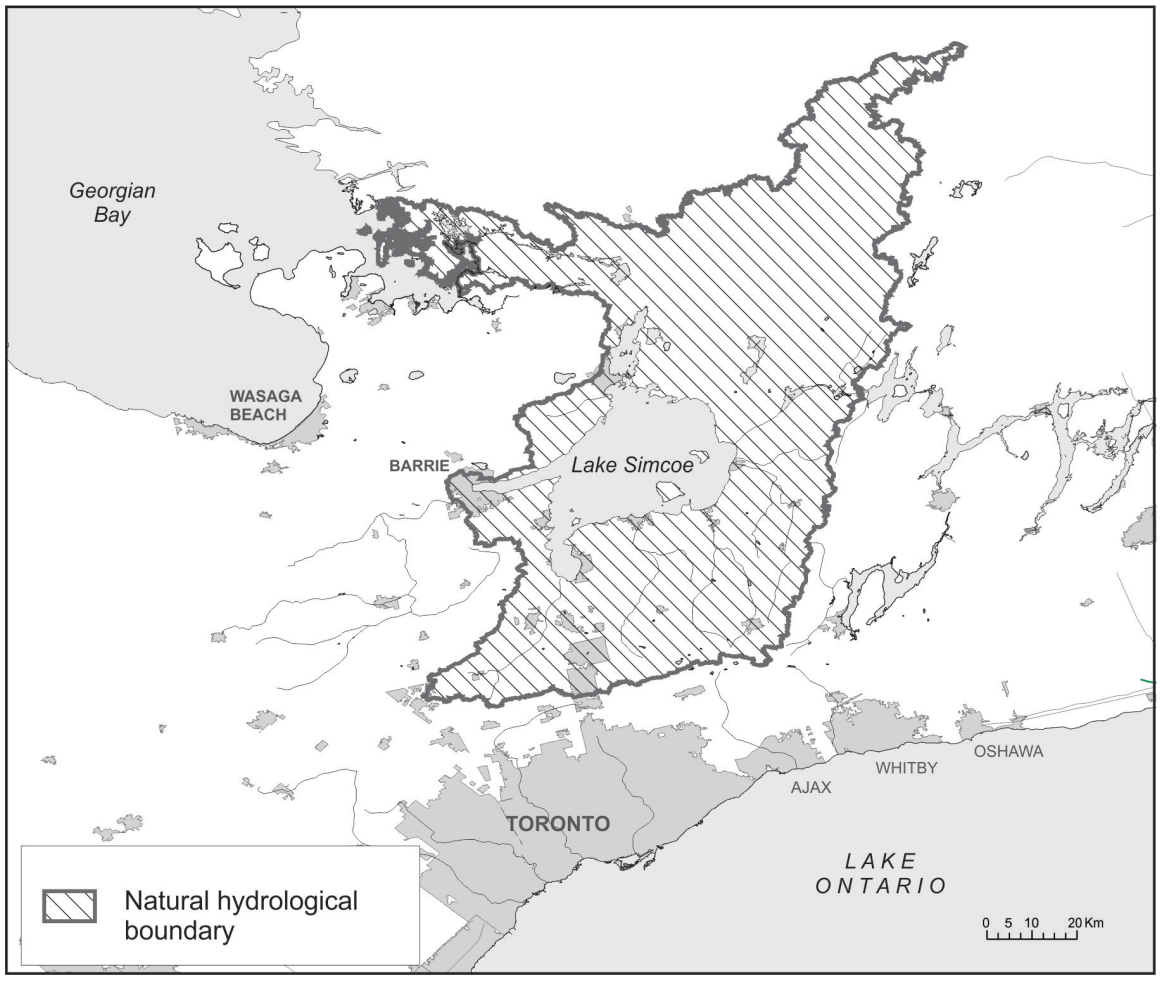
In 2009, the provincial government passed the *Lake Simcoe Protection Act* (LSPA) (R.S.O. 2008, c. 23). The LSPA is the first in Canada to provide coordinated protection and planning for an individual watershed. The Act is being implemented through the *Lake Simcoe Protection Plan* (LSPP) (Government of Ontario 2009). Boundary problems exist in almost every setting where water governance occurs. For the purposes of this paper, water governance in the Lake Simcoe watershed provides an excellent case for examining the boundary related issues highlighted in this paper. First, the LSPA institutionalizes a watershed boundary, which creates several of the boundary selection issues outlined above. Second, even though a watershed organization exists (the Lake Simcoe Region Conservation Authority), governance in this watershed occurs through the efforts of a number of organizations that do not have mandates or jurisdictions that are defined by the watershed. This introduces challenges related to accountability, engagement and empowerment. Third, the presence of multiple governments in the watershed creates a complex, multilevel, cross-scale setting that has the potential to introduce issues of policysheds and problemsheds. For these three reasons, the Lake Simcoe watershed case is an excellent vehicle for exploring how governance for water can transcend the watershed boundary.

3.4 Methods

The research utilized a single case study approach, and examined a case where tools and process for water governance have recently been significantly overhauled as a result of new legislation. The Lake Simcoe case involves a highly complex set of jurisdictional interactions, significant environmental governance challenges, and a diverse and inter-connected set of actors. The introduction of the *Lake Simcoe Protection Act* (LSPA) and the *Lake Simcoe Protection Plan* (LSPP) took place over a relatively short period of time (LSPA announced in 2007, LSPA legislation passed in 2008, and the LSPP finalized in 2009), with significant input from a wide range of actors who promoted a variety of emerging environmental concepts. As such, a single case method was ideally suited to examining why decisions were made and how they were implemented (Yin 2009).

Data relating to governance processes, structures and outcomes were gathered through analysis of key documents. Key documents include the *Lake Simcoe Protection Act* (LSPA) (R.S.O. 2008, c.23), the *Lake Simcoe Protection Plan* (LSPP) (Government of Ontario 2009) and *Regulation 219* (R.S.O. 219/09), and meeting minutes from LSEMS, and the multiple committees and meetings leading to the creation of the Act and Plan. This information was supplemented by a select number of key informants. Interviews were conducted for a larger study of which this research was one component. Interview data regarding the application of watershed boundaries was conducted with staff from the provincial government the conservation authority, and included six people. Questions asked how the watershed boundary had been developed and applied over time in the Lake Simcoe watershed.

Figure 10 Lake Simcoe



3.5 Results

3.5.1 Boundary Challenges

The notion that the watershed provides an ideal boundary has been common for some time. With the acceptance of the boundary as natural, it is often asserted that watersheds are the most appropriate scale for defining the jurisdiction of water-related organizations. However, a growing body of literature is arguing that watershed boundaries are useful in many applications and that the utility of the watershed boundaries relates primarily to whether it is being used for water *management* or governance *purposes* (Cohen and Davidson 2011). Concerning governance Cohen and Davidson (2011) synthesized five distinct challenges that exist when applying the watershed boundary to governance processes including boundary choice, accountability, public participation, problemsheds and policysheds. In this section, results highlight the prevalence of these boundary challenges in the Lake Simcoe watershed.

3.5.1.1 Boundary Selection

The selection of boundaries for environmental management is often a political exercise (Blomquist and Schlager 2005). In the case of Lake Simcoe, the selection of a boundary is certainly a political exercise, as the legally-defined boundary does not match the hydrological boundary of the watershed. From a hydrological perspective, the Lake Simcoe watershed is a part of a nested set of basins and watersheds. It is a secondary watershed of the Great Lakes Drainage Basin (Palmer, *et al.* 2011). At the same time, there are 18 sub-watersheds within the Lake Simcoe watershed (Lake Simcoe Region Conservation Authority 2009). Hence, choosing to focus on one level within this hierarchy (the watershed that drains into Lake Simcoe) is the first of many political and practical decisions in this case.

The boundary utilized for watershed management and governance in Lake Simcoe has historically been defined by the jurisdictional authority of the LSRCA. A senior staff member at the LSRCA described how the LSRCA authority boundary has changed multiple times over the course of its history. Initially the boundary for the LSRCA was limited to the southern portion of Lake Simcoe, since this was the greatest area of concern. The staff member commented, "There are maps in this office where there is a line going right across the middle of the lake." Next, the boundary was expanded as the LSRCA became responsible for more of the lake, but inclusion of more municipal members required negotiation between the municipality and the LSRCA, and some municipalities have chosen not to be a partner. Currently the LSRCA has jurisdiction over most of the hydrological watershed. A glaring exception is Lake Couchiching to the north of Lake Simcoe. Lake Couchiching is within the municipality of Orillia which has not joined the LSRCA, and thus was not included in the LSPA exercise (Figure 11).

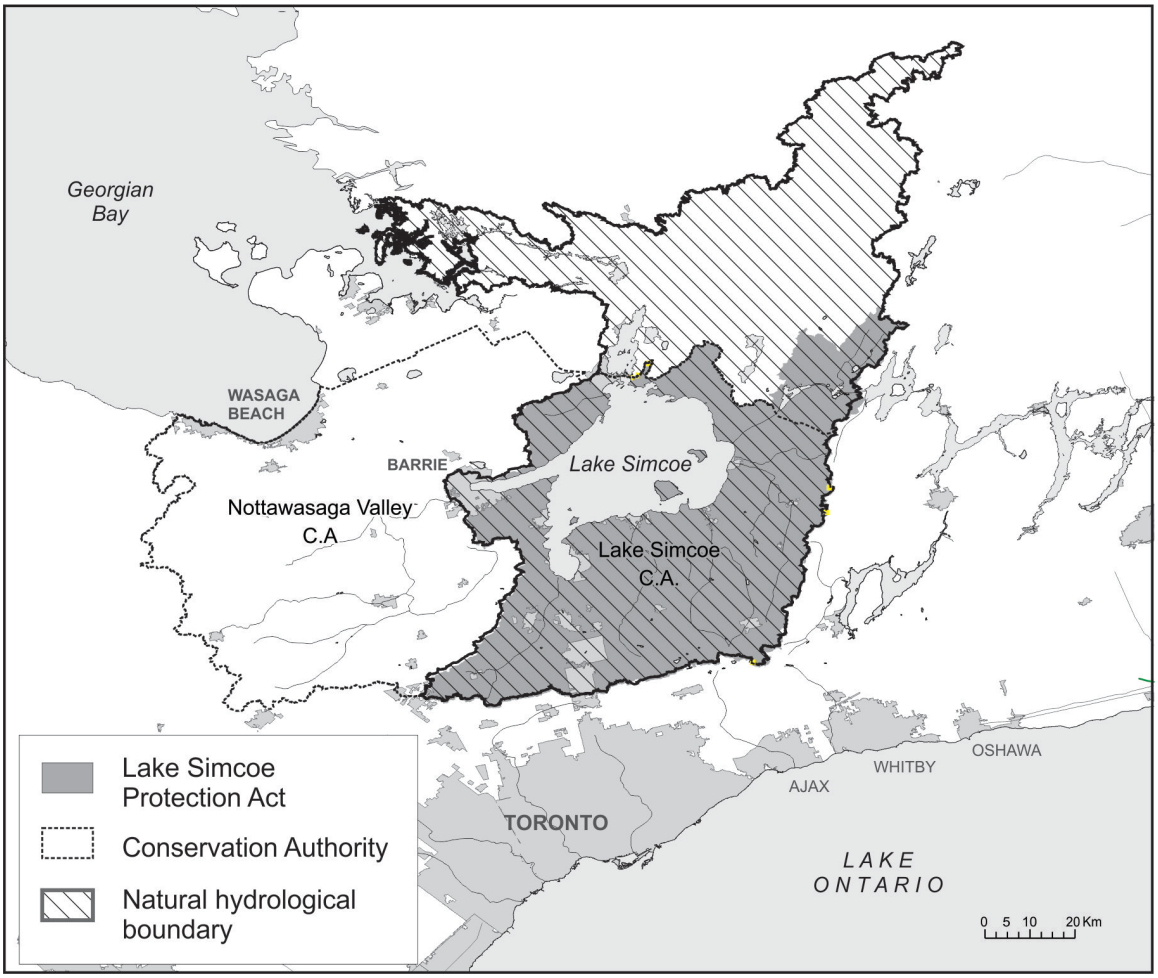
The LSPA (Section 2) states that the boundary of the LSPA is "(a) Lake Simcoe and the part of Ontario, the water of which drains into Lake Simcoe, or (b) if the boundaries of the area are described by clause (a) are described more specifically in the regulations, the area within those boundaries" (R.S.O. 2008, c.23). The boundary is currently defined by a regulation and largely follows the jurisdictional boundary of the LSRCA. Figure 11 identifies the hydrological boundary of the Lake Simcoe watershed created by the OMNR and the legislative boundary for the LSPA and LSPP. Interviews with Ontario government staff suggest that several factors were considered in establishing the boundary for the Act and Plan, including how the scale of boundary would impact the scope of actors to engage, the area contributing to the environmental problems, and the manageability of the resulting policy.

Also considered was whether the Act and Plan would be limited to just the Lake, or if it should be the watershed. Limiting the scope of the Act and Plan to the Lake would limit the number of government agencies involved and would include those historically participating including the MOE, MNR and the LSRCA who have responsibility for shorelines and water resources. Whereas increasing the scale of the Act and Plan to include the watershed (and therefore the surrounding land resources) would then involve other government agencies such as MMAH whom is responsible for land use planning. A senior MNR staff commented,

> One thing we had to do early in the game was decide, are we going to focus on what we call the blue polygon, what we call the lake, or include the land base surrounding it. If we have focused on the polygon, it would have been really only an MOE only legislation because it would have been water quality and would have dealt with any of

the sewage treatment plants that flow into the lake that sort of thing. But we recognized that the watershed is a significant input

Figure 11 Lake Simcoe Watershed and Jurisdictional Boundaries



Monitoring by the LSRCA and the MNR indicated that the entire Lake Simcoe watershed should be included in the legislative boundary because of the geographic scope of phosphorus loadings. An Ontario government staff member clarified that the Lake Simcoe watershed boundary was ultimately selected based on what would be a manageable geographical/political area. "[The boundary is] generally based on a watershed boundary, but ultimately it is just a defined boundary sometimes out of convenience more than anything else. The true Lake Simcoe watershed… technically it could include Lake Couchiching, it is really just defining where you want to manage your resources."

The selected legislative boundary is also malleable because it can be altered through regulatory changes if it is determined through research and scientific evidence that there is an area outside of the existing boundary that "directly affects, or would directly affect the ecological health of the Lake Simcoe watershed" (R.S.O. 2008, c. 23, s. 13(3)(b)). If scientific monitoring and assessment conducted under the LSPA identify significant impacts originating from outside

the existing watershed boundary, then that boundary can be altered to include additional geographic areas. Interviews with two Ontario government staff suggest that it is likely that the boundary will change again as information improves. Hence, the "natural" hydrological boundary is not the *de facto* boundary in this legislation. Instead, several additional criteria, including political considerations, defined the legislative boundary.

3.5.1.2 Accountability

Leading up to the LSPA, there were two mechanisms in place regarding accountability for actions and decision making by government agencies in the watershed. The Lake Simcoe Environmental Management Strategy (LSEMS) was a partnership between several government agencies and the LSRCA through which the agencies collaborated on efforts to improve the state of the watershed. The LSRCA is responsible for watershed planning and permitting regarding waterfront developments and is a public agency. However, neither the LSRCA, nor the LSEMS program had jurisdictional authority to create and implement new regulations to protect or enhance the watershed. Additionally, prior to the LSPA being introduced, the LSEMS program had undertaken a governance review process which included community members and multi-sector stakeholders. However, with the introduction of the LSPA, the governance recommendations made by the multi-stakeholder LSEMS governance review were never implemented by the provincial government. Thus, while a watershed organization did exist (LSRCA), it lacked authority to implement new legislative controls. When a new governance structure was created by the LSEMS program through a multi-stakeholder effort, it was bypassed as a result of the introduction of the LSPA.

The LSPP sought to address some issues of accountability. The first component that the Plan used to address accountability was clarification of the relationships among separate pieces of legislation that affect the watershed. The LSPP include two types of policies that have legal effects regarding policy decisions under other pieces of provincial legislation such as the *Ontario Water Resources Act* (R.S.O., 1990, c. O.40). In this context, decision made under the *Ontario Water Resources Act* must conform to or consider the policies of the LSPP (Government of Ontario 2009, 8). Therefore, the Plan lays out the legislative decision making hierarchy for the numerous provincial pieces of legislation that have overlapping jurisdiction in the watershed. In doing so, the Plan seeks to identify which legislation holds highest authority, and therefore can be used to identify those actors and processes for decision making and implementation responsibilities.

The second component of the LSPP relating to accountability is the specific identification of public agencies that have responsibility for each policy, or in some cases, a group of responsible agencies. In the case of a group of agencies, one will be identified as the lead agency for specific policy concerns. When a public agency has been identified as responsible for a particular type of policy, it is required "to comply with any obligations imposed on it by the monitoring policy" (Government of Ontario 2009, 9). This action in effect, gives legal ramifications to any inaction on the policy item by the government agency. Lastly, the LSPP identifies how agencies can be held accountable to the public, and makes specific reference to courts, tribunals and progress reports as required by the LSPP (Government of Ontario 2009, 9). These components clarify who is responsible for what actions, to what other policy or legislation the Plan must adhere, and how issues of accountability can be addressed through specific governance mechanisms.

A third accountability component of the LSPP is the inclusion of progress and goal achievement indicators and reporting. Each chapter of the LSPP focuses on one of the major threats to the watershed. Progress metrics are included in each chapter (except those relating to recreational use and climate change), as are targets and indicators (Government of Ontario 2009). The inclusion of progress metrics is especially useful for governance actors to monitor and assess the implementation and achievement of the LSPP's goals. In laying out specifically the goals to be achieved, and requiring reporting on these items, the public has access to the recorded progress of the Plan and can consequently hold the provincial government more accountable for their successes, but also failures to reach the goals of the Plan.

Other accountability measures for the public are provided by the legislated annual action reports, five year progress reports and the 10 year full review produced by the provincial government, each of which are published on the Environmental Bill of Rights Registry – a public disclosure mechanism used in Ontario (R.S.O. 2008, c. 23, s. 12(3)). Additionally, any proposed amendments to the LSPP must also be posted to the Environmental Bill of Rights Registry (R.S.O. 2008, c. 23, s. 13(3)(c)). Thus, a number of measures have been incorporated into the LSPA to ensure accountability for actions by government actors required by the LSPP.

In addition to the requirement placed on the government by the LSPP, it is important to consider the creation and implementation of the LSPA and Plan as an act of accountability on the part of government. Importantly, six interviewees noted that the LSPA and LSPP exist specifically because of the actions of non-governmental groups in the watershed. The data from these six interviews suggested that the provincial government was motivated to introduce the LSPA because of the efforts of the watershed groups who became a visible and vocal force and demanded stronger protection for the lake. To illustrate, an Ontario government staff member noted

> You had an enormous environmental NGO collaboration out there that caught the ear of government and they had both the federal ear and the provincial ear and they wanted a number of things from the province. They wanted legislation, they wanted something with teeth. They wanted a *Lake Simcoe Protection Act*. They wanted the government of Ontario to step up to the plate and what they meant by that was that they wanted more involvement by the province.

As a result of the public pressure, and action by ENGOs the provincial government was responsive to their calls and introduced the LSPA. That in itself demonstrates a degree of accountability on the part of government. In the following section on participation and empowerment, the findings demonstrate how direct involvement of non-government actors in the LSPA and LSPP processes also contribute to holding the provincial government accountable to its stated goals and actions in Lake Simcoe.

3.5.1.3 Participation and Empowerment

Engaging communities across a geographical area as large as the Lake Simcoe watershed (Figure 10) can be difficult and costly. Considerable diversity exists in the types of people in the watershed, including urban, rural, and agricultural, First Nations and recreational/seasonal residents. Historically, engagement of members of the public has also been limited to the jurisdictional area of the LSRCA, the boundaries of which, as noted earlier, do not accord with

the hydrological boundary of the watershed. Primarily these challenges regarding participation and empowerment relate to the devolution of power and authority.

The results from this research demonstrate that issues of power and authority devolution are more complex in the context of multi-level governance mechanisms. From one perspective both power and authority have remained with the provincial government with the implementation of the LSPA because no formal decision making power was devolved to a watershed-based non-governmental group or agency. Two interviewees suggested that there was never any intention by the government to share authority with stakeholders. For example, one provincial government staff person noted "this was still a provincial exercise; having an LSPA and having a LSPP was promulgated by the province. Even though [during development of the LSPA and LSPP] we did go to great effort to consult [the public], it wasn't a shared product, it was a provincial product." This argument was reinforced by a second provincial government staff member who stated "at the end of the day the government still holds the final level of authority." However, a contrasting perspective argued that some power and authority was granted to stakeholders. A third provincial government staff person, observed,

> Why I said this is a hybrid [governance model] is they [the provincial government] have also enshrined these committees to ensure that people have a formal seat at the table, so it's very transparent. In terms of what people's views are and what advice they give government. Governments can take the advice, sometimes they will leave it, but with these formal committees its difficult if you choose not to.

In this comment the third government official is referring to two committees that were established under the LSPA: the Lake Simcoe Science Committee and the Lake Simcoe Coordinating Committee. The two committees provide opportunity for non-government actors to directly engage and access provincial government actors. Both committees are enshrined in the LSPA as permanent committees that engage directly with government policy makers and are comprised of community and multi-sector actors (R.S.O. 2008, c. 23, s. 18, 19). The Science Committee is charged with providing advice to the Minister of Environment regarding the ecological health of the Lake Simcoe watershed for a wide range of issues, including the identification of threats, research needs, types of monitoring programs, and advising on the extent to which proposed amendments adhere to the precautionary principle (R.S.O. 2008, c. 23, s. 18). The Coordinating Committee is charged with overseeing the implementation of the LSPP, providing advice regarding implementation, and making recommendations on amendments to the government (R.S.O. 2008, c. 23, s. 19). Together, the members of the two committees are granted direct access to decision makers, and have a formal mandate to provide advice to the provincial government on the implementation process of the LSPP.

Both of the Science and Coordinating committees are extensions of previous committees that were developed during the creation of the LSPP. Prior to the Act, the Lake Simcoe Science Advisory Committee (LSSAC) held much of the same responsibility for informing and advising the Minister during the creation of the LSPP (Government of Ontario 2008). The efforts of the committee culminated in the report, *Lake Simcoe and its Watershed: Report to the Minister of Environment* (LSSCA 2008), which informed the key issues and structure of the LSPP. The Lake Simcoe Stakeholder Advisory Committee also was comprised of a diverse group of stakeholders and was charged with providing feedback on the development of the LSPP from the social perspective. Each committee was engaged in an intense six month period of consultation during

the development of the LSPP, during which government staff prepared drafts of each section of the LSPP along with corresponding research and presentations. These would be presented to the Science Committee for consideration. The input from the Science Committee was then used to update the LSPP. The Stakeholder Committee had an opportunity to review and comment on the draft LSPP. The process of the review meetings provides an important view into the collaborative relationship amongst the actors involved. While the government directed the topics of conversation, and provided the physical and political space for dialogue, interview responses indicated that the input received from the committees was considered valuable by government officials, and essential to the success of the process. A senior staff member from the MOE commented, "I'll be the first to say, we wouldn't have half the stuff if it wasn't for them [ENGO's on the Stakeholder Committee]."

In sum, the issue of whether or not power and authority have been shared with non-government actor prompts deeper consideration of the meaning of power and authority. From a multilevel governance perspective, both the provincial government and the non-government actors have specific authority and power. A key concern is how inter-organizational dynamics play into these processes. While the provincial government holds ultimate authority for rule-making and is responsible for implementation of legislation, non-government actors on both committees have demonstrated that they hold the power and authority to influence and sway the direction of the policy process. In particular, they secured for themselves a permanent, legislatively-enshrined level of participation that requires them to give advice, but importantly, also gives them the power to request changes to the LSPP.

3.5.1.4 Policysheds

In the Lake Simcoe watershed, land use planning involves 23 different municipal land use plans, five provincial statutes that direct land use planning, and a separate watershed planning process directed by the LSRCA (Figure 12). Thus the policyshed is a patchwork of overlapping and competing management programs, legislations and land-use planning systems - most of which do not align neatly with the watershed boundary. A senior staff from the Ministry of Municipal Affairs and Housing commented,

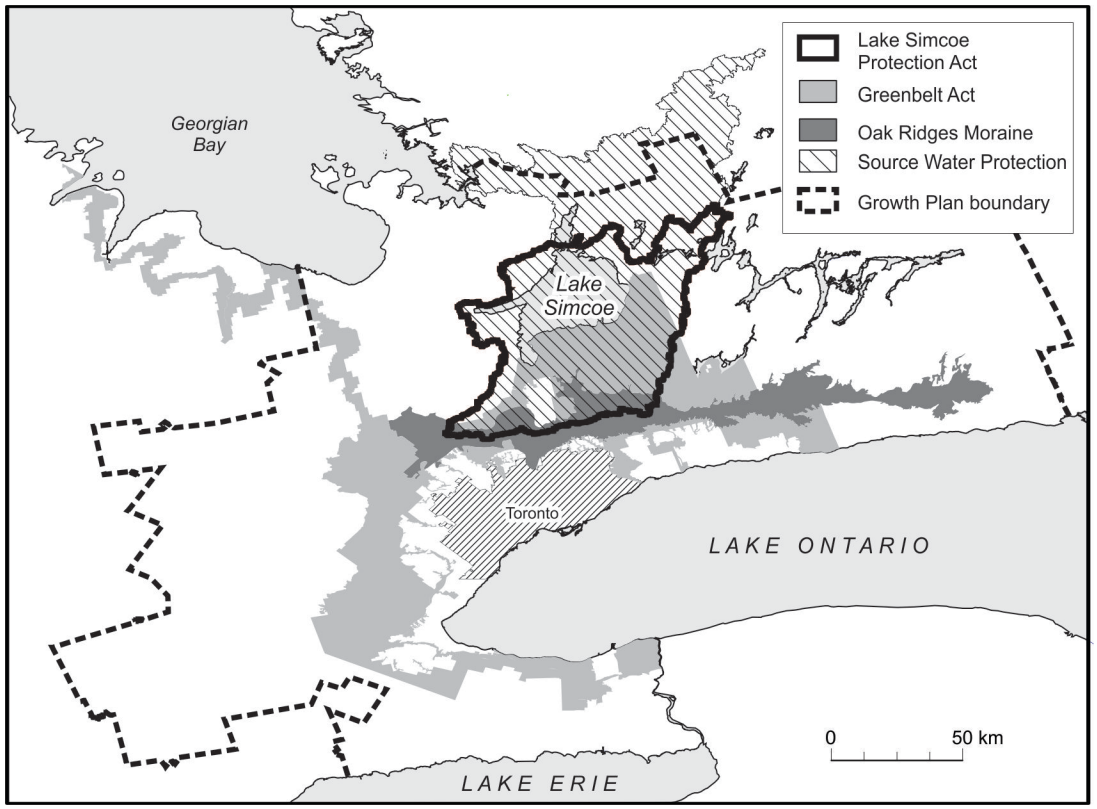
> There's a lot of provincial legislation and plans that impact this geography, the Planning Act, which is guided by the provincial policy statement that is province wide, and obviously applies to the watershed, the Growth Plan so the greater golden horseshoe, you have the Greenbelt Plan, you have the Oak Ridges Moraine Conservation Plan, and now you have the Lake Simcoe Protection Plan, and soon under the Clean Water Act, you'll have Source Protection Plans that will be created. Technically they are another mandated provincial plan. So in making decisions, you can see the layers of complexity that are in place now in comparison to even eight years ago.

Regarding the policy landscape, the aim of the LSPP was twofold. First, the LSPP functions as an integration mechanism for areas where the LSPP overlaps with other land use policies. Second, the LSPP aims to create a cohesive policy landscape throughout the watershed by introducing complementary policies for areas not currently covered by existing land use planning policies. The LSPP uses three key mechanisms to implement these aims.

First, in the areas outside of other provincial land use plans, the mechanism for integration is a requirement for municipal Official Plan to conform with the LSPP. In other words, where no other provincial land use plans have jurisdiction, the municipality must alter its Official Plan regulations to be in accordance with those set out in the LSPP (R.S.O. 2008, c. 23, s. 6(3)). Therefore existing land use policies, and the LSPP are integrated through an already established decision making process that clarifies which policies have greater authority. In an effort to ensure there are few loopholes, the LSPA explicitly states that if there is conflict between any of the policies that have application within the watershed, the one that provides the greatest protection to the ecological health of the watershed prevails (R.S.O. 2008, c. 23, s. 6(4)).

Second, in order to avoid duplication and to achieve a level of integration, the LSPP does not apply to areas already covered by Provincial land use plans within the Lake Simcoe watershed. Falling within parts of the watershed boundary are five other provincial land and water management policies. With the exception of one focused on source water protection (a provincial program organized on a watershed basis under the *Clean Water Act* (S.O. 2006, c. 22), each of the plans relates primarily to natural heritage feature protection through land use planning policies. Thus Chapter 6 of the LSPP, which relates to natural heritage features, notes where other plans have jurisdiction; the policies noted in this section therefore only apply to areas outside of the boundaries of these plans (Government of Ontario 2009, 52); R.S.O. 2008, c. 23, s. 6(5)).

Figure 12 Provincial Level Policyshed in Lake Simcoe



Finally, Subsection 6 of the LSPP also extends the integration mechanism to all decisions by public bodies. Therefore, any comment, submission, advice or decision by a public body shall

also conform to the LSPP (R.S.O. 2008, c. 23, s. 6(7)). Thus the LSPP specifically identifies its relationship to other planning policies within the watershed, and explicitly states how, and by what means they should interact through established decision making processes. Together, these three mechanisms have the potential to aid implementation agencies (i.e., government, LSRCA) by clarifying the interactions and relationships between multiple policies and the hierarchical nature of which one takes precedence. Cumulatively, the mechanisms seek to create a more holistic and integrated planning environment for the watershed.

3.5.1.5 Problemsheds

The concept of "problemsheds" refers to the area affected by an environmental problem. For example, in Lake Simcoe one problemshed is defined by the landscape on which an invasive species has established itself. Another example is the area where atmospheric phosphorus is deposited. Similar to policysheds, there often is incongruence between watershed boundaries and the spatial scope of other environmental challenges and their problemsheds. The LSPP includes a number of governance mechanisms designed to address the issue of problemsheds.

First, the LSPA gives permission to the government agencies listed in the LSPP to conduct research and monitoring activities outside of the watershed boundary in order to determine whether or not activities affect the ecological health of the watershed (R.S.O. 2008, c. 23, s. 3(3)). These areas can be understood as 'grey zones' under the Plan. An example of a grey zone is the concern around atmospheric deposition of phosphorus coming from sources "beyond the watershed, but close enough that they are contributing to the atmospheric load" (Government of Ontario 2009). This was mentioned by an MOE scientist who commented, "one thing I think will come up fairly early on in the research is identifying areas that are beyond the watershed boundary but close enough that they are contributing to the atmospheric load and that we should expand our stewardship into those areas." This is estimated to be 19 tonnes of the 72 tonnes of phosphorus that enter the lake annually. As previously noted, the LSPA permits amendments to the boundary of the Plan if an area has been demonstrated to generate a negative environmental impact on the watershed. Therefore, the objective of this clause in the LSPA is to allow new areas to be brought under the jurisdiction of the LSPA and LSPP.

Other examples of addressing issues related to problemsheds in the LSPP include policies dealing with water quantity, climate change and invasive species. Section 5.2 of the LSPP calls for water budgets to be developed for sub-watersheds that exist as part of the larger hydro-geological area (Government of Ontario 2009, 39). In Section 7.11, the LSPP attempts to deal with the immense problemshed of climate change. It states that valuable effort can be made within the watershed, to adapt to and build resiliency to the impacts that will result from negative activities outside the watershed (Government of Ontario 2009, 65). Finally, section 7.3 calls for a regulatory proposal to require anglers who use live bait to use only bait caught within the watershed, with the goal of preventing the spread of invasive species (Government of Ontario 2009, 60). This clause in the statute recognizes the external nature of invasive species but draws on the concept of localism to prevent further invasion by requiring bait to be locally sourced. These policies are valuable in that they do not ignore the externalities of problemsheds impacting the watershed, but instead identify and attempt to address them within and sometimes beyond watershed.

3.5.1.6 Summary

Table 4 summarizes these water governance challenges discussed above, notes how they manifest in the context of the Lake Simcoe case, and identifies mechanisms or approaches of the LSPA and LSPP that relate to these challenges. To clarify, the noted mechanisms and approaches do not suggest that the boundary challenge has been solved, but rather simply identify what has been used in the Lake Simcoe case.

Table 4 Watershed Boundary Challenges and Lake Simcoe

Problem noted in Literature	Presence of Problem in Lake Simcoe	Approaches Utilized in Lake Simcoe
Boundary Selection Nested set of watershed boundaries "Naturalness" of boundary in question as a result of human impact Politically influenced	Lake Simcoe watershed nested within the Great Lakes Basin, and contains 18 sub-watersheds (basin report) Watershed heavily impacted by residential development and Holland Marsh Watershed boundary selection historically linked to the membership of municipal governments in the LSRCA (wood) which created jurisdictional area	Manageable area Source of environmental problems Engagement of government agencies Potential to be altered based on new knowledge
Accountability Limitations in authority of watershed organization Poor accountability mechanisms because of lack of authority and reporting structure	LSEMS has no teeth to implement regulations, no authority Had proposed new governance, but was dissolved by LSPA	Clear distinctions between types of policies in LSPP Identifies specific responsible authorities Include targets and indicators which provide metrics to measure progress Legislated review periods LSPA and LSPP a response to action of citizens and NGO's
Participation and Empowerment Watershed boundary is not a meaningful boundary for public, so participation and therefore accountability is weak	Watershed is extremely large and a diverse population. Primary division is between urban, recreational and agricultural and First Nation residents. Costly to engage whole watershed Historically engagement also limited by LSRCA jurisdictional authority	Ultimate authority remained with the provincial government for decision making Intensive use of stakeholder and science committees to influence development of LSPP Stewardship Network Permanent multi-sector and science committees with direct access to policy process. Coordinating committee with

		power to request amendments, and directly oversee implementation process
Policysheds Incongruence between policy jurisdiction and environmental challenges	Multiple provincial, municipal and watershed scale policy programs which resulted in fragmented and overlapping policy landscape	Reduction of duplication between LSPP and previously established provincial land use plans Integration of LSPP policies with municipal jurisdictions through Official LSPP conformity All comments, submissions, advice or decisions by public bodies must conform to LSPP
Problemsheds Incongruence between boundaries of multiple environmental problems	Several environmental challenges are derived from outside of the watershed, ie invasive species and atmospheric deposition of phosphorus	Allow for research and monitoring outside of legislated boundary to understand extent of externalities Permits for amendments to boundary to include area of externalities if necessary to regulate negative activities Recognition of externalities impact on watershed, and introduces policies to mitigate problems where feasible

3.5.2 Water Governance: Tools that Transcend the Boundary

In addition to the components presented above, the LSPA also incorporates a number of innovative governance mechanisms regarding how the LSPA is structured and implemented. The LSPP is structured around four different types of policies. Strategic Actions play an important role in the adaptive nature of the LSPP by introducing issues or problems acknowledged to play a role in either the restoration, or degradation of the watershed (i.e., shoreline protection or recreation), but which require further research, consultation or monitoring in order to formulate how they should be addressed. Thus, Strategic Actions identify the type of work to be done, which may later be used to bring amendments to the LSPP as a result of their analysis. This type of action is related to the LSPA being considered an "enabling" piece of legislation, in that it provides authority for the LSPA to develop regulations around an issue, without stating the details of the regulation (R.S.O. 2008, c. 23, s. 26, 27). This also permits the agencies named in the LSPP an opportunity to further determine whether a) a regulation is necessary, and b) what the appropriate approach and details of the regulation would be. An example is the case of on-site sewage treatment (septic systems) noted in Section 4.13 of the LSPP which calls for the proposal of a regulation of these systems when in 100 m of a shoreline (Government of Ontario 2009, 30). Therefore, the combination of the strategic actions, and the enabling capacity of the LSPA permit the governance system to adhere to the pre-cautionary principle.

Also, the LSPP has the potential to be amended at any time, as noted in Section 8.13 (Government of Ontario 2009, 84). This is unique to the LSPP, in comparison with other provincial level plans, which can only be amended during their 10 year review. As noted by one government staff member, the LSPP was less than one year old before there were consultations being held for amendments to the Phosphorus Strategy, Shoreline Protection Strategy. Additionally, the LSPP can be amended as a result of research, monitoring and reporting reviews (annual and 5 year review). Thus, the LSPP has the potential to be very responsive to new knowledge and understanding, and incorporate this quickly into the management of the LSPP, permitting the plan to be very adaptive in nature.

Lastly, the implementation of this LSPP occurs through policy integration which takes place at several levels of government. Specifically, both levels of municipal Official Plans must conform to the LSPP. The actions and management plans of the Lake Simcoe Conservation Authority, which provide a watershed scale jurisdiction, are also guided by the LSPP in addition to other provincial level agencies and legislation that must be integrated with the LSPP. Second, multilevel learning and collaboration has occurred primarily through the Committees for the Plan, and will continue to take place in the permanent committees. In addition to these committees, there were also a number of other consultation and training events that permitted cross level learning. These include training for municipal planners and the public on the implementation of the LSPP, the extensive consultations held prior to the introduction of the LSPA, and consultations currently taking place for amendments to the LSPP. Combined, these approaches provide a precautionary, adaptive and multi-level governance process.

3.6 Bounded and Unbounded Water Governance

The purpose of this paper is to explore how governance for water can transcend the watershed boundary. The case of Lake Simcoe provided valuable insights as to whether this is feasible or appropriate. The case demonstrated that boundaries are necessary for select purposes such as delimiting the scope of an organization's mandate, or the coverage of a statute. However, it also highlights that water governance can transcend the use of a watershed boundary for many activities (Table 5).

Table 5 Strategies for Water Governance

Thematic Area	Strategy
Legislative Design	- Harmonization of new and existing policies - Utilize existing mechanisms to implement harmonization
Organizational Arrangements	- Clear identification of which governing agencies are responsible for individual responsibilities - Implementation, monitoring and authorities exist at multiple levels - Utilize existing organizational authority
Role of Science	- Underpins entire development process - Directs adaptations of legislation and regulations - Led by non-government scientists

	- Adaptive approach built on precautionary principle
Multi- actor governance	- Role for non-government actors in policy development, review and implementation - shared institutions created by engagement in policy creation and implementation rather than through a new organization
Jurisdictional Boundary	- Amendable based on emerging science - Defined by capacity to manage (within political, economic and social contexts)

In the case of Lake Simcoe, a boundary was necessary to identify the scope of the legislation, and therefore the geographical area over which the legislation grants authority in decision making. The boundary chosen was largely based on hydrological parameters (i.e., the Lake Simcoe watershed). In that sense, the use of a boundary in Lake Simcoe responds to the call from authors who argue that governance should be organized and integrated at this scale (Huitema, *et al.* 2009; Leach 2006; Schmidt and Morrison 2012). However, the boundary is only loosely based on the natural hydrological boundary. This is in accordance with the view that suggests that all boundary choices are inherently political (Blomquist and Schlager 2005; Fitzsimmons 1996; Warner, *et al.* 2008). The data from this study show that the hydrological boundary was only a starting point; it was adjusted based on a number of other social and political considerations. Thus, while a boundary was utilized to define the scope of the *Lake Simcoe Protection Act*, it was not selected based on the inherent 'naturalness' of the watershed. Additionally, the legislative boundary does not limit the research and monitoring activities of the legislation. While most of these activities will take place within the legislative (watershed) boundary, research and monitoring will also take place outside the boundary if an issue of concern is identified that could be impacting the watershed. Therefore, the case of Lake Simcoe reinforces that strict adherence to watershed boundaries is not necessary (or desirable). A review of non-boundary dependent tools in the case highlight a focus on process, rather than boundaries for water governance. The use of a boundary in the Lake Simcoe empirical case is somewhat limited. While it identifies the jurisdictional areas of the legislation, it is also a flexible and permeable boundary where activities can take place outside of the boundary. This approach permits greater attention to coordination across levels and scales. In this case the LSPP is a mechanism used to harmonize the policies within the watershed, and is intended to create clearly defined areas of policy authority between the policies that apply to the watershed. This occurs through two mechanisms. First, the highest level of authority is identified in cases where there is overlap among mandates. Second, the LSPP ensures cross scale coordination through the municipal Official Plan process through which all policies of the LSPA and other provincial policies are implemented. In doing so, competition between policies is reduced and linkages across scales are improved.

Working across multiple levels and scales is an important way to address the question of the mismatch between watershed boundaries and relevant policysheds and problemsheds. Doing so recognizes that not all action must take place at one scale (i.e., the watershed). The implementation of the LSPP takes place at a variety of scales and levels to address both issues of policysheds and problemsheds. For example, municipal Official Plans are used by municipal government for land use decisions, sub-watershed plans are utilized for water management

activities, and the shoreline is one of the many areas of focus for improving natural aquatic habitat. Importantly, the LSPP does not use the watershed boundary to attempt to encircle all of the environmental challenges facing the watershed. Rather it permits strategic policy options for dealing with the problems arising outside of the watershed, but which have impact within the watershed.

Also significant, a new watershed organization was not created to implement the LSPA. Instead, coordination across multiple levels and scales of organizations and government agencies was identified through the LSPP development process as a potentially more effective approach. Consequently, the LSPP is implemented by relevant actors at the municipal, provincial and federal government levels, and by members of local community and environmental groups. This approach stands in contrast to calls for the creation of new agencies at the watershed scale that are expected to provide this integrative function (e.g., European Union Water Directors 2003; Global Water Partnership, Technical Advisory Committee 2000).

Another important characteristic of the LSPP is its recognition of the 'unknown scale' through explicit inclusion of a kind of 'grey zone' around the LSPA legislative boundary. These grey areas are an opportunity to include in the legislated area of the LSPA, areas where externalities are generated, if determined through research and monitoring activities. Therefore, the LSPA gives government the authority to take actions to improve the ecological health of the watershed even though the problem that threatens the watershed is generated outside of its boundaries. The LSPP also has the capacity to introduce regulations or environmental management plans for grey zones introduced into the legislated area. Therefore, the LSPP recognizes that new scales may also be identified, and permits their inclusion into the management of the watershed. Whether or not this approach will be effective could not be determined through this research. Nonetheless, it stands as a potential example of the kind of adaptive approach to governance that increasingly is being called for. For instance, Folke (2005) suggests that flexible and adaptive institutions are necessary, and that decision makers should be able to respond to new knowledge, technical capacity, and resources. In the Lake Simcoe case, flexible and adaptive institutions and behaviours underlay the design of the LSPA and the LLSPP. Critically, the jurisdictional boundary can be amended by government based on new scientific information relating to the problemshed gathered through monitoring activities, or outcomes from Strategic Action policies. The Strategic Action policies leave a place holder in the LSPP for future areas of study where issues have been identified as a potential concern, but which require further research, consultation or monitoring in order to formulate how they should be addressed. Thus, Strategic Actions identify the type of work to be done, which may later be used to bring amendments to the LSPP as a result of their analysis. The LSPA is also an "enabling" piece of legislation, in that it provides authority for the LSPA to develop regulations around an issue, without stating the details of the regulation (R.S.O. 2008, c. 23, s. 26, 27). This also permits the agencies named in the LSPP an opportunity to further determine whether a regulation is necessary, and what the appropriate approach and details of the regulation would be. These measures can lead to amendments to the LSPA, but importantly, the amendments can take place at any time. This distinguishes the LSPA from other statutes that can only be reviewed at fixed intervals, if at all.

Constructing shared institutions requires a focus on the quality of interactions and joint development of policies and programs through learning by doing. This insight is useful for considering the approach in Lake Simcoe regarding policysheds and participation and

empowerment. Policysheds can only be effectively created through a joint appreciation and commitment to integration and coordination across scales, while empowerment in participation comes from the quality interactions and joint development of policies and programs. The two committees created by the LSPA (the Science and Coordinating Committees) have permanent access to government, and have the power to call for amendments to the LSPA. This provides a meaningful empowerment opportunity for those involved. The fact that the government engaged members of the public deeply in developing the LSPP also is important. The two predecessor committees that provided a mechanism for this interaction were involved in an intense negotiation process to determine key elements of the LSPP and to provide input to its overall direction. Finally, coordination efforts necessitated by the Official Plan conformity process required open communication among various levels of government and between agencies to achieve a level of integration between the various provincial and municipal policies. This too demonstrates the multilevel governance approach of the LSPA and LSPP.

3.7 Conclusion

Water governance scholars and practitioners have long grappled with questions surrounding how best to engage actors, formulate policies and plans, and implement the results with success (Bakker and Cooke 2011; Morrison, *et al.* 2004; Smith and Porter 2010). Watershed boundaries have been identified as a way to ease the challenges of obtaining participation, integrating resource problems and providing a coherent policy framework (Grigg 2008; Mitchell 2005; Savenije and van der Zaag 2008; Varis and Rahaman 2005). Yet critical analyses of the role of the watershed boundary for governance are pointing to a host of challenges (Blomquist and Schlager 2005; Fitzsimmons 1996; Warner, *et al.* 2008; Woolley and McGinnis 1999). These relate to boundary selection, participation and empowerment, accountability, policysheds and problemsheds. Critiques of the use of the watershed to define the scope for governance suggest that doing so does not ensure integration of processes, issues, problems or policies. More fundamentally, there is little evidence that adopting a watershed boundary necessarily leads to harmonized policies, reduced power struggles, or more effective collaboration. Whether applied by legislation or policy, watershed boundaries simply create another jurisdictional boundary for governance. As Tiesman and Edelenbos (2011, 102) have noted, "no redefinition of boundaries will make boundaries disappear." What then is the role of the watershed boundary in governance for water?

Results from this research show that a watershed boundary can be used to define a legislated area, and to delimit management areas as has been suggested by watershed governance scholars. However, the case of Lake Simcoe has highlighted a number of caveats for identifying and applying a watershed boundary for water governance. In the case of Lake Simcoe, the watershed boundary was not a strictly hydrological boundary, but was modified based on both political and management needs. Yet, the case has also indicated that issues of accountability, participation and empowerment can be navigated through non-bounded mechanisms, and highlighted some specific opportunities for improved governance process.

Perhaps most importantly, this research indicated that non-boundary governance mechanisms were being used extensively by the provincial government to navigate a complex water system. The LSPA and LSPP include mechanisms for learning followed by adaptation, the

creation of shared institutions, and multiple mechanisms to integrate issues and solutions across scales and levels. This is an important advancement in water governance as it demonstrates a focus on process. Specifically, the case illustrates the principles of adaptation, learning by doing and accepting that not all is understood about our physical and social environment. It also highlights the fact that these systems are in constant flux, and our capacity to govern them is dependent upon our ability to become dynamic, responsive and adaptable governance actors.

Chapter 4

Environmental Non-governmental Organizations in Water Governance: Mechanisms, Relationships and Roles

4.1 Introduction

The changing role of the state in the last quarter century has been an important contemporary concern for policy makers, scholars and the public (Gouldson 2009; Hysing 2009; 2011, 102). There is increasing recognition among governance scholars that non-government actors are exerting influence over governance systems and contributing in novel ways to governance process (Newell, *et al.* 2012). The role of non-government actors such as non-governmental organizations (NGOs) is particularly pertinent. NGOs can be understood as "non-government or non-profit organizations that have traditionally been composed of volunteers and concerned with distinct policy objectives" (Lane and Morrison 2006, 233). NGO actors have long played an important role in the governance process through advocacy, protests, awareness campaigns and citizen movements (Pross 1986). Classical governance arrangements, whereby the state exerts hierarchical control and dominance over the governing of society (Treib, *et al.* 2007), have proved unsuitable and unresponsive to current social, cultural and environmental complexities (Lemos and Agrawal 2006). As a result, NGO actors have become more involved in governance beyond the role of advocacy and stakeholders. NGO actors are generating opportunities for, and sometimes directing, governance processes (Auer 2000a; Bugdahn 2008; Dombrowski 2010). In this way they are exerting greater agency and authority (Benecke 2011).

Lane and Morrison (2006) have observed, environmental policy is routinely being developed through joint action between governments and NGOs. To illustrate, Kapaciauskaite (2011) found that non-government actors were involved in initiating international conventions, drafting agreements, and providing scientific and technical expertise; they have also played roles in implementation and monitoring of decisions and actions. Other scholars suggest that an even more important change is taking place: non-government actors are not simply being invited to participate in governance activities by government (Edelenbos, *et al.* 2010; Gouldson 2009; Gunningham 2009b). Instead, they are actively pursuing their own governance agendas (Crow 2008; Gouldson 2009) and thus are becoming important actors in shaping environmental solutions (e.g. Auer 2000a; Wapner 1995). While Legler (2012) states that unless non-government actors are able to obtain authority, their efforts to govern are meaningless, other authors suggest that non-government actors are creating their own distinct roles in governance processes that go well beyond simply being subjects for consultation. As a result, they are further altering the governance frameworks in which they operate.

4.2 An Emerging Conceptualization of NGOs

Some authors contend that contributions by non-government actors are creating a more resilient and democratic environments by revitalizing the governance process (Kapaciauskaite 2011; Kim 2009). In many cases, non-government actors are not bound by the legal or policy frameworks that constrain government actors, and therefore they have the flexibility to introduce new and novel mechanisms for governance. They can more readily adapt their approaches, the scope of

their activities, and the communities they engage based on the energy, creativity and responsiveness of the process (Auer 2000a; Dombrowski 2010). In this sense they are 'light on their feet' as compared to governments. By drawing on this capacity, non-government actors also have the potential to increase the level of participation in governance by citizens, which can foster greater democratic engagement (Crow 2008; Wright 2000). These examples suggest that the actions of NGOs can be complementary to those of government actors because NGOs can offer new opportunities, ideas, resources and solutions to complex challenges.Knowledge on NGOs is vast and includes a number of sub-focus areas including ENGOs, interest groups and the not-for profit sector. While acknowledging that there are nuances between these individual actor types, for ease of discussion, these sub-groups are collectively identified as NGOs given that each form refers to, at the broadest level, a non-government actor. This approach is also useful, given that this research offers an emerging conceptualization of NGOs, one that requires further refinement and empirical evaluation. Additionally, where preliminary research indicated additional elements of character (i.e. networks and policy entrepreneurs) discussions from these literatures were included in the framework in order to permit the broadest assessment of these actors and their potential.

With increasing acknowledgement of the changing role of NGO actors and their potential to shift the dynamics among actors, an investigation of these actors is warranted. This research uses an empirical water governance case to investigate the changing role of environmental non-governmental organizations (ENGOs). The paper draws on multiple literatures, including NGO, policy entrepreneurs, networks and governance develop an emerging conceptualization of the mechanisms, structures and roles of ENGOs. Accordingly, three research questions guide this investigation. First, what mechanisms are ENGO actors utilizing to contribute to water governance in new and novel ways? Second, if ENGO actors are engaged differently, how has this affected the governance structures in which they operate? Finally, what roles can ENGO actors play in water governance processes? An empirical case study set within a water governance context is used to evaluation the conceptual framework. Data drawn from interviews, formal documentation and a survey are used to respond to these research questions. Lessons for water governance are identified in the conclusion regarding the changing dynamic of water governance and the engagement of ENGOs.

4.2.1 NGO Mechanisms

Political Pressure

Doyle and McEachern (2008) note that during the 1970s and 1980s, there was an explosion in NGO numbers in North America. This explosion was largely due to the emerging array of environmental problems, and the international meetings held to respond to them. An early example is the Stockholm Conference in 1972 on the Human Environment (Conca 1995; Peet 1994). NGOs engaged in these international meetings were heavily focused on lobbying and applying political pressure on governments and international bodies to either stop or regulate economic activities that negatively affected the environment (Doyle and McEachern 2008). Specific activities included political confrontation and protest (Bryant 2009); demonstrations and informational campaigns (Conca 1995); mass mobilization strategies to engage the public (Wright 2000); direct action activities, and creating media events to gain attention (Kellow 2000). In essence, their approach was confrontational and combative, with the goal of gaining influence and power over policy processes (Bryant 2009; Conca 1995; Doyle and McEachern 2008).

Policy Change

Many NGOs today continue to use the combative strategies noted above. However, the NGO literature suggests that the approaches utilized by some contemporary NGOs have shifted and are proving less combative and more cooperative and innovative. For example, Vaughan and Arnseault (2008) suggest that NGOs in the health sector are seeking to create policy change by redefining problems, reframing issues, and securing desired legislative changes. Dombrowski (2010) argues that ENGOs are making an effort to have a diverse range of non-government actors participate directly in decision making. In this way, NGO's are reformulating policy issues and opportunities through supporting more inclusive processes. In doing so, NGOs can alter the landscape of perspectives represented and valued in the governance process (Peet 1994).

Knowledge Brokers

NGOs can play a key role in linking different kinds of knowledge (i.e., scientific, cultural) across scales (i.e., local, regional, provincial). For example, NGOs can act as information translators between the languages and world views of different actor groups, such as technical experts and citizens; similarly, they can bridge the political and environmental perspectives (Auer 2000a). Dombrowski (2010) suggests that NGOs can act as conduits of information across scale, 'upstreaming' the concerns of local communities, and 'downstreaming' the debates and agreements of regional, national or international institutions. Thus, NGOs can serve an important function by bridging between actors, and thus breaking down barriers across scales and between different types of knowledge.

Policy Entrepreneurs

NGO's are also acting as policy entrepreneurs (Vaughan and Arsneault 2008; Young 2009) in order to influence and participate in governance. Policy entrepreneurs are defined as "individuals [who] see problems from new perspectives and develop innovative new approaches to solve them; they are able to effectively mobilize and lead others in support of their proposed solution" (Vaughan and Arsneault 2008, 413) They seek to create dramatic change within their areas of interest (Mintrom and Norman 2009). In the context of water policy, Huitema and Meijerink (2009) suggest that policy entrepreneurs use a number of different strategies to navigate the governance system. These include developing and promoting new ideas, building coalitions, recognizing and exploiting opportunities, recognizing and exploiting multiple venues or platforms of participation, and orchestrating and managing networks (Huitema and Meijerink 2009a, 380). Other studies of NGO strategy also emphasize the importance of coalition and networking building in accounting for the success of NGOs (Crow 2008; Richardson 2000; Wright 2000).

4.2.2 Governance Structures: NGO's and a Network Approach

Insights drawn from the network governance literature provide additional understanding regarding the approaches of NGOs. In the context of governance, networks are comprised of distributed sets of people (Volkoff, *et al.* 1999) who have come together for problem-solving purposes (Reihlen 1996). They are united by acknowledgement of their mutual dependency (Isett and Provan 2005; Klijn and Koppenjan 2000) and by their shared interest and approach to problem solving (Hay 1998; Hudson 2004). Actors in the network collaborate to achieve innovative solutions through knowledge sharing, collective learning and negotiation (Adam and

Kriesi 2007; Borzel 1998; Cash, *et al.* 2006; Reihlen 1996; Volkoff, *et al.* 1999). The contexts in which a network operates are typically characterized by meta or indivisible problems too intricate to be effectively managed by one organization alone (Gray 1985; Trist 1983).

Through the process of identifying the problem, network actors come to understand that they offer asymmetrical resources, and that through collaboration they can provide more effective solutions to their common problems (Gulati and Gargiulo 1999; Hudson 2004). Trist (1983) and Jarillo (1988) suggest that network formation is enabled by the presence of individual actors who have the ability to create ties with other actors – a joining made easier as a result of similar concerns and outlooks. These types of actors are sensitive to situations that require mobilization, and are able to engage other actors to address those issues. In contexts as diverse as international negotiations (Oberthur, *et al.* 2003), health care (Provan and Milward 2001) and environmental governance (Dombrowski 2010), NGOs increasingly are supplying this entrepreneurial energy and playing these bridging functions. Insights from the network literature suggest that actors operating in this capacity are strategic and directed in their actions, with each carrying a particular purpose and objective. Network actors are hyper aware of their contexts, and the opportunities and constraints they face. As a result, they can have skills and knowledge that prove to be extremely valuable for successful environmental governance.

4.2.3 Shifting Roles in Governance and the Positive Sum Game

Governance can be understood as "the structures and processes by which people in societies make decisions and share power" (Young 1992, 160). Early discussions by Rhodes (1996) centred around the government-to-governance debate which questioned whether governance was shifting from conventional top-down government control towards alternative models for governing such as collaboration, partnerships and networks (Folke, *et al.* 2005). Authors such as Gunningham (2009b) argue that what has changed is the processes governments are using. In particular, there has been a shift from governments relying on formal consultation processes, to governments making use of participatory dialogue, deliberation, and consensus building strategies. These processes often are framed as a way to increase flexibility, inclusiveness and transparency (Duit and Galaz 2008). However, others suggest less positive reasons for this shift. Agrawal (2005), for example, argues that increased use of multi-stakeholder bodies that have responsibilities for environmental governance, but whose power to effect change is limited, are being created by state actors to enhance their legitimacy without actually reducing their power.

Researchers who reject the government-to-governance perspective argue that governments are pursuing their traditional legislative roles, while at the same time adopting new practices and approaches for decision making that involve a wider range of actors. This view suggests that governance is not a zero sum game whereby power is either held by governments or by autonomous, non-government actors. Instead, Kim (2009, 874) argues, new ways of governing permit a "mutual empowerment of state and society". Johns and Rasmussen (2008) state that in the context of water policy in Canada, "there has been a steady increase in involvement of non-state actors…such partnerships are an attempt to involve citizen and groups at the national, provincial and local levels in the planning and implementation of improved water and watershed management." These result in positive sum outcomes for both state and society, where opportunities are created for both government and non-government actors to be engaged and active. Through governance processes, actors contribute to, and in some cases benefit from, the synergy of their interactions with other actors. This notion of a positive sum game is supported by

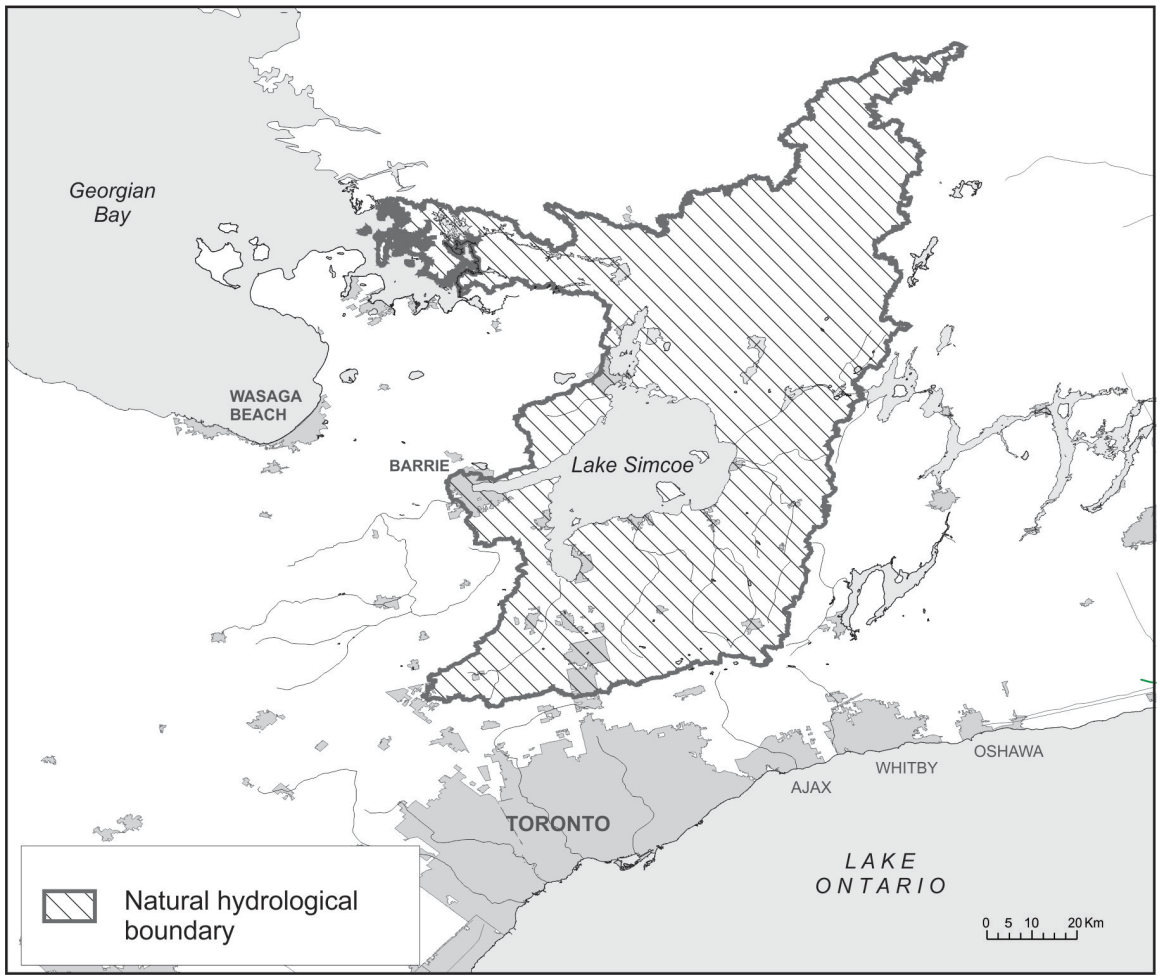
Lane and Morrison (2006), who note that the emergence and strength of NGOs in governance provides a complementary, rather than a competitive, function.

4.3 Empirical Context

The research utilized a single case study focused on Lake Simcoe. This important water body is located in southern Ontario, one hour's drive north of Toronto, Canada's largest metropolitan area. Environmental governance in the Lake Simcoe watershed provides an excellent case study for building understanding of the changing roles of NGOs. First, the governance system in Lake Simcoe is complex due to its geography, economic value, environmental stressors and public engagement activities. The Lake Simcoe watershed (Figure 13) crosses 23 municipal boundaries and has a total land and water surface area of 3,303 sq. km., of which the lake itself occupies approximately 22% or 722 sq. km. The watershed contains significant natural, urban and agricultural systems and is a source of drinking water for five municipalities (LSRCA 2009; OMOE 2009). Lake Simcoe is southern Ontario's largest inland lake, excluding the Great Lakes (Government of Ontario 2009). The watershed provides significant economic value to the region and the province, bringing in an estimated $200 million annually through recreational activities (Government of Ontario 2009). Water quality problems in Lake Simcoe have been documented since the 1970s. These problems include an overloading of phosphorus, invasive species, climate change, land use change, and water-related recreational water activities, such as boating and fishing (LSSAC 2008).

Second, several distinct governance systems have existed in the watershed since the late 1970s. Prior to 1990, an informal communications network circulated information about research in Lake Simcoe between government agencies and the Lake Simcoe Conservation Authority. By the late 1980s, the members of this network sought opportunities to formalize their activities. In 1990 a government-driven collaborative program, the Lake Simcoe Environmental Management Strategy (LSEMS), was established to coordinate efforts to improve the health of the watershed. The LSEMS program completed three phases (1990-1995, 1996-2000, 2001-2007) of monitoring and management, and achieved phosphorus reductions in each stage (LSEMSSC 2007). Nonetheless, during each phase environmental challenges in the basin continued to grow and become more complex. As a result, in the early 2000's the capacity of the LSEMS to effectively address increasingly complex environmental challenge in the watershed declined. In 2007, the Ontario provincial government announced its intention to introduce the *Lake Simcoe Protection Act* (R.S.O. 2008, c. 23) (LSPA), which came into effect on June 2, 2009. The LSPA and associated regulations are currently being implemented.

Figure 13 Lake Simcoe Watershed



Third, NGOs have become actively engaged in governance in the watershed. During the second and last phases of LSEMS, water quality problems were becoming evident along shorelines and near shore areas. Consequently, a number of NGOs became established and were very active. In 2003, an umbrella organization named Rescue Lake Simcoe Coalition (RLSC) was formed to bring together small community groups to advocate for improvement in the governance of the watershed. A second organization, Ladies of the Lake (LofL), was also created in 2005 with the goal of developing public engagement strategies to raise awareness and to engage the public. The RLSC later joined forces with Environmental Defense (ED) (a national environmental advocacy organization) and Ontario Nature (ON) (a provincial scientific and environmental advocacy organization) to form Campaign Lake Simcoe (CLS). As will be demonstrated below, these organizations were instrumental in the process that led to the creation of the *Lake Simcoe Protection Act* (R.S.O. 2008, c. 23). Thus, the case is an outstanding example of a large scale governance system that experienced significant social, economic, and environmental stress, and where NGOs played critical roles in shaping the changes that occurred.

4.4 Methods

To gain insight into the actions and motivations of NGO actors, a deep analysis of their work within an empirical case is necessary (Young 2009). This approach permits grounding and helps to define their use of mechanisms, structure and roles within a governance system. It is critical to examine the efforts of NGOs both as independent actors, organizations, and networks, as these are the multiple scales in which they operate. Further, their actions must be examined in the social, cultural and economic contexts in which they took place. This research used a single in-depth case study method, and examined activities over a 10 year period. This time scale encapsulated the breadth and depth of work by various NGOs, and permitted the networked and entrepreneurial nature of their work to be highlighted.

4.4.1 Data Collection and Analysis

The Lake Simcoe case involves a highly complex set of governance actor interactions and activities that culminated in a significant environmental and policy outcome, the LSPA, all within a relatively short period of time (2003 to 2008). Inherent in the research process was the need to balance formal documentation of activities with personal insights and knowledge regarding the governance processes as they played out amongst actors and organizations. Additionally, balancing qualitative data with quantitative, structural data was important to satisfactorily depict and assess network relationships. Therefore, the research drew upon three data sources: documentation of actions (formal reports, legislation and policy documents, websites of the organizations, media releases); key informant interviews; and a survey of key actors that provided the data in support of a social network analysis (SNA).

Documents established a baseline of activities from multiple organizations and informed subsequent steps in the research process. Documents were gathered from the internet, from libraries and public offices, and from the personal libraries and collections of interviewees who shared published and unpublished materials. Purposive sampling (Bradshaw and Stratford 2005) was used to identify potential interviewees from an initial list of names derived from the document collection. Potential participants were required to be directly engaged in the governance activities during the study time period. Interview requests were sent to 59 people, with 34 accepting. Semi-structured interviews focused on 1) the characteristics of the NGO actors in the watershed and 2) the strategies and impacts of NGO governance activities over time since their rise in early 2000. Interviews were conducted with 17 people representing provincial government agencies, four people employed by the Lake Simcoe Conservation Authority, one land developer, five municipal government staff people, and seven representatives of NGO's. Interviews typically lasted about an hour, with a few running closer to 45 minutes, or as long as 90 minutes. Interviews were transcribed verbatim and then coded and analyzed using Nvivo 8 software. Interview data were verified with those interviewed (Carlson 2010).

The approach to data coding and analysis was grounded in the principles presented by Liamputtang and Ezzy (2005) and supported by Hennink, *et al* (2011, 206) and Yin (2011, 95) who stated that "theory building occurs in an ongoing dialogue between pre-existing theory and new insights generated as a consequence of empirical observation" (Liamputtong and Ezzy 2005, 266). The coding casebook was built using both an inductive and deductive approach. In the first round of coding, new nodes were developed as free nodes, and the code book was built successively as additional interviews were completed. Once the entire set of interviews was

coded, a second round of coding was conducted to ensure that all nodes were consistently applied across the data. Then, data for each node was reviewed and considered in light of the other nodes that were developed (Berg 2009). After this review, the nodes were converted to tree nodes and restructured into a relational hierarchy, in the process of categorizing to derive meaningful categories (Hennink, *et al.* 2011). Next, each tree node was reviewed and analyzed for insight and understanding regarding the node theme, through the process of conceptualizing, in order to find relationships and meaning between and among categories and codes (Berg 2009; Hennink, *et al.* 2011). Additionally, data analysis was conducted on nodes by way of text and compound queries to identify concepts, and to explore patterns, themes and meanings in the data. In order to draw out contrasting or supporting positions amongst actors, separate analyses were conducted and contrasted based on the characteristics of the respondent. During the entire data collection and analysis, constant 'memoing' of emergent ideas and code development was employed. Therefore, quality of coding was established through: verbatim transcription, codebook, memoing and coding saturation (Hennink, *et al.* 2011).

An online survey was circulated to all actors who had previously been interviewed, as well as to those who had been identified as a key actor by at least two other actors who had been interviewed and for whom contact information was available. The survey had two objectives: 1) to ask respondents about the processes of governance in the watershed, and 2) to characterize interactions among key actors involved in governance for water in the Lake Simcoe watershed. The survey was circulated to 78 people, and completed by 43, for a response rate of 52%. Of those who responded, 21 had also been interviewed. The respondents were asked to rate the presence of the principles of governance (open and transparent, inclusive, communicative, integrative, equitable and ethical, accountable, efficient, sustainable) both before they became engaged, and after they were engaged in Lake Simcoe governance.

The survey asked respondents to identify organizations with whom they had collaborated on a Lake Simcoe project within the period 2006 to 2010. This period was selected as it encapsulated an extremely high period of activity amongst NGO actors in the watershed as identified by formal reports and the websites of the organizations. The data were imported into a SNA software tool, UCINET, where they were analyzed. Another software tool, NetDraw, was used to create visual depictions of the data. In SNA, density and degree centrality are key variables that can be used to study the structure and of the network (Borgatti, *et al.* 2013). Density refers to the number of ties that exist in a network – the more ties, the more closely linked each actor is with other actors in the network (Bodin, *et al.* 2006). A perfect density, where all actors are connected to all other actors is represented by 1.0. Centrality relates to an actor's position in a network relative to the position of other actors (Bodin, *et al.* 2006). Degree centrality is measured by the number of direct ties one actor has to another (Bodin 2006) with 1.0 reflecting a tie to all other actors in the network.

4.5 Results

Three research questions guided this investigation as derived from the literature. First, what mechanisms are NGO actors utilizing to contribute to governance in new and novel ways? Second, if NGO actors are engaged differently, how has this affected the governance structures in which they operate? Finally, what roles can NGO actors play in governance processes? Before examining these questions, it is first necessary to provide a brief review of the core NGO actors in

Lake Simcoe that were highly active in the governance process in the Lake Simcoe watershed leading up to, and during the creation and implementation of the Lake Simcoe Act. Table 6 outlines the basic construction of two organizations, and one collaborative campaign that became active in the early 2000's; for simplicity, Campaign Lake Simcoe (CLS) is described as an organization in this paper.

Table 6 Key NGO's in Lake Simcoe

Name of NGO Actor	Established by Whom and When	Motivation for Creation	Focus of Actions	Types of Members	Style of management
Rescue Lake Simcoe Coalition (RLSC)	Cottagers Est. 2003	Concerned about the physical evidence of changes in the Lake and the perceived lack of engagement and action by the Conservation Authority to improve Lake conditions and community awareness	Community engagement and awareness	Resident associations, naturalist groups, cottagers	Charitable organization Board of Directors
Campaign Lake Simcoe (CLS)	A tri-NGO campaign comprised of Environmental Defense, RLSC, Ontario Nature Est. 2005	A political advocacy campaign to call for greater protections for the Lake Simcoe Watershed	Political advocacy, grassroots engagement	NGO's and the public Coordinator was also a cottager	Charitable organizations Collaborative partnership, led by Environmental Defense
Ladies of the Lake (LofL)	- Two Lake Simcoe Cottagers Est. 2005	Concerned about the physical evidence of changes in the Lake, and lack of creative solutions and engagement	Community engagement and awareness	Volunteers	Charitable organization Board of Directors

Data from the survey provide additional insight into the characteristics of individual NGO actors. NGO actors active in the governance system had a direct connection to the Lake as demonstrated by the fact that 71% of NGO actors who responded live in the watershed, while 28% had a recreational property in Lake Simcoe watershed. Therefore a large number of the actors working on Lake Simcoe issues were directly affected by the state of the watershed. The survey found that 14% of NGO actors said that working on Lake Simcoe issues took up the majority of their week, while 56% spend between 1-10 hours per week, and 29% spend 11-20 hours/week. As a measure of their commitment, 43% said that their engagement in Lake Simcoe issues was voluntary. Of the NGO actors engaged on Lake Simcoe issues, 86% had a university or graduate university degree. Most were older – 71% between the ages of 50-74, and most (71%) were female. Each of the three organizations described in Table 6 was spurred to action by similar motivations – concern for the condition of the lake.

4.5.1 Mechanisms of NGO actors

Results are described in relation to the five key mechanisms noted in the literature that NGOs may utilize in order to engage in governance processes. This includes applying political pressure (Bryant 2009), seeking policy change (Peet 1994), acting as knowledge brokers (Auer 2000b)and entrepreneurs (Huitema and Meijerink 2009b), and operating as and through a network (Dombrowski 2010). Data for this section were drawn from the websites of the organizations, media releases, reports, government policy documents and interviews with key actors. While numerous activities were undertaken over the 10 year time period of analysis, selected examples of each mechanism are described below. A detailed table of a wider range of selected activities is provided in Appendix B.

4.5.1.1 Political Pressure

Political pressure was applied through multiple methods. NGOs in Lake Simcoe engaged in effective lobbying and media campaigns. For example, the goal of the CLS was to achieve legislative protection for Lake Simcoe, and lobbying was a direct and strategic activity undertaken by CLS in the early days of the campaign. Initial steps included finding and meeting with a supportive Member of Provincial Parliament (MPP). A collaborative partnership was formed with an MPP from the opposing party. The combined efforts of CLS and the MPP led to the introduction of *Bill 106– An Act to establish a natural heritage system and watershed protection area for Lake Simcoe and the Nottawasaga River* into the Legislative Assembly of Ontario. Unable to find strong support amongst his political party, the MPP modified the Bill into a Resolution that was then voted on and passed in the legislature. In Ontario, when a Resolution is passed in the legislature, the members of provincial parliament are indicating to the ruling party that they would like to see action on an issue. The passing of the Resolution brought political attention to the issues in Lake Simcoe, which later became a focal point for the forthcoming provincial election.

Comments from a regional government planner highlighted the effectiveness of the political efforts of the NGOs.

> These folks, and you see it in most very effective stakeholder groups, they are well connected, they are well funded, they have an understanding of the dynamics of the sort of the context in which they are dealing. They are not afraid to call on that. These

> folks, in some respects, had direct or at least semi direct linkages to their political masters of the province, which is an interesting dynamic.

Similar commentary was offered by a government policy maker: “they were meeting with ministers, they were lobbying their MPP's, they were pushing the Conservation Authority and they were riding through the province to change things.” CLS was deeply engaged in lobbying and making its presence known to other governance actors in the watershed.

Evidence collected through the interviews and document analysis shows that the NGOs were also particularly media savvy. Two actors, one from CLS and one from LofL, were particularly instrumental in this regard. A regional government planner commented, “It's been very interesting the amount of media coverage and the amount of attention this brought to Lake Simcoe, courtesy of some of these other actors, the not for profits groups, and the groups that kind of rallied around Lake Simcoe as an issue or concern. They drew attention to it.” This was critically important for garnering attention from the provincial government. Both CLS and LofL ensured their events had media attention from the news outlets, they regularly published media releases announcing their activities, and they had a strong web presence. The media efforts of the NGOs were necessary to ensure that Lake Simcoe issues could hold the attention of policy makers, and to bring them into the election campaigns during the provincial election that took place in 2007.

2.1.1.1 Policy Change

In the Lake Simcoe case, these NGO actors focused much of their effort on changing the policies affecting Lake Simcoe. They started by re-framing the problem as a governance issue rather than as just an environmental management issue. They did that by first demanding a seat at the table during the last phase of the Lake Simcoe Environmental Management Strategy (LSEMS), and then during the creation of the LSPA and LSPP; through these efforts, they fought for permanent opportunities to participate in the decision making process. Following these efforts, they worked towards a specific goal of legislation, and made that goal very clear to the government. The whole process of action is captured in the following quotation from a provincial government official:

> They [NGOs] are more vocalized, more organized, strategic. I think it's unique in that we've seen many places in the province where groups are well organized and able to mobilize quickly and are effective. It is not unique in that citizens were mobilized, but it is unique in the outcome, that there is watershed protection… but also to have these committees, the ongoing mechanisms to have a seat at the table, the government formally requiring in the legislation to listen to their advice, not to take it, but they can give the government that advice. I can't think of anywhere, where the outcome is ongoing legislation, to be engaged. It's a little different. Usually, it's we're opposed to something, and the government intervenes to side with them and prevent it, or the opposite.

These actions demonstrate the capacity of the NGOs to influence and steer the process in ways they saw necessary.

Both CLS and LofL drafted strategic plans to lay the groundwork for policy change and to effectively carry out their plans by using a variety of techniques to advocate and generate support both from the public and from the government. The NGOs did so by crafting the LSPA as a solution not only for the environmental challenges, but also for the governance challenges. The

Act was posited by CLS and LofL as the best option for all parties involved in the watershed. Rather than blame the complex challenges of Lake Simcoe as a "what the government is doing wrong" problem, the NGOs called for more people to be engaged in the problem solving, and for a highly effective approach to protect the lake, rather than framing it as a fight against a government. This notion is captured in the following quotation by a provincial government staff person:

> I find that this job, I appreciate it, in the sense that I've worked on other things where people have been highly involved but it's been more of a NIMBYism type. And I find that working here, I really appreciate it, because I find that it is really a community driven process, they really lobbied for it, and they lobbied for protection, but have also been very reasonable about, obviously they've got concerns that we're not always going to be able to address and all that, but overall, I find the working relationship to be much more civil, and they worked really hard, and the history is so important within the watershed and we definitely couldn't continue to do it without them.

Documents and interviews also indicated that individual NGOs were participating directly in the governance process through the various committees associated with the Lake Simcoe Protection Act (LSPA) and Lake Simcoe Protection Plan (LSPP). As advocated by the NGOs, the government created the Stakeholder Advisory Committee after the passing of the LSPA. This committee was charged with providing input to the development of the Lake Simcoe Protection Plan (LSPP), the document which provides a framework for action under the Act. The LSPA also required that a permanent stakeholder committee be established to oversee the implementation of the LSPP. Consequently, the government also created the Lake Simcoe Coordinating Committee to serve this function. NGO actors were appointed to both of these committees.

In addition to serving these formal governance roles, NGOs were making official submissions during the legislation development process. In particular, CLS would submit a number of rebuttal reports to each piece of legislation, policy and regulation document produced by the government. The participation of the coordinator at ED is particularly noteworthy. In this instance, the coordinator represented someone who was embedded in the policy development process from both the grassroots perspective of the RLSC, but also from the broader policy development perspective at ED. Thus the Campaign benefitted from someone who could contribute from a number of perspectives, but also dedicate a full time effort towards the work. This idea is captured in a quotation from a LofL member.

> Because in order to be a watchdog you have to know what it is you're guarding. You almost have to know more about the topic then the other people who are implementing the work. I mean, someone like [the ED coordinator] is a fabulous watchdog because they have the wherewithall to be a very thorough watchdog. They worked with Environmental Defense and that is what they do. But not many people can be like that. I can't even do that. Because I can't go to government with documents and go line by line and ask why didn't you do this and why didn't you do that.

4.5.1.2 Knowledge Brokers

Dismay with previous governance process in Lake Simcoe was a motivating factor for both CLS and LofL. In particular, interviews with actors from both of these organizations identified that a lack of knowledge transfer between the LSEMS project and the public was a critical motivator for engagement. The founder of LofL commented,

> when we started to talk to people and in particular, politicians, about what was going on here before our very eyes, the lake was getting sicker and sicker, and what was anybody doing about it and the answer from all of the politicians was, we haven't heard anybody complain about this, there is nothing wrong with the lake and I don't think that anybody is interested. We said, we think you are wrong and set out to do something to show those people that people did care about the lake and it was important that government take an initiative.

While CLS primarily focused on lobbying and policy change efforts, the LofL spent considerable effort generating new knowledge through shared learning experiences with a broad spectrum of citizens. One of their largest projects was called the Naked Truth. The project involved simultaneous expeditions for 300 citizens that took participants under the water (diving), on the water (canoes), along the water (shoreline hike) and above the water (planes) providing them an opportunity to capture what they saw happening on the lake. Participants documented their experiences and through rounds of facilitated dialogue, these experiences would be built into a Citizen's Action Plan (Ladies of the Lake and Windfall Ecology Centre 2006). The Citizen's Action Plan was then proffered as a potential solution for the challenges in Lake Simcoe. This was followed by a report on the state of youth environmental education, titled *Whales in Lake Simcoe* (Ladies of the Lake 2007). Here LofL are generating their own policy solutions, and building community support for its implementation.

CLS's regular contributions to the policy development process also contributed to the transfer of knowledge between grassroots organizations and the government. Documents produced and circulated to government often represented the combined efforts and perspectives (in most cases) of more than 20 groups in the watershed (e.g.Campaign Lake Simcoe 2007a; Campaign Lake Simcoe 2009). Other examples of knowledge brokering opportunities also include the combined efforts of CLS and LofL (as well as other NGOs) to host the Lake Simcoe Summit, 2007 and the website www.our30million.LSRCA which has now transferred to www.ourlakesimcoe.LSRCA. The website was a clearing house for information on how the federal government's $30 million, five year, Lake Simcoe Clean Up Fund was being distributed and implemented. Funding was intended for environmental improvement projects in the Lake Simcoe watershed.

4.5.1.3 Entrepreneurs

NGOs in the watershed exhibited an entrepreneurial spirit when they engaged in particular activities, including identifying and strategically exploiting opportunities, creating innovative solutions, and engaging a multipronged approach to problem solving. While this discussion focuses largely on the role of the NGO as an organization or campaign, it is important to note the individual leadership in both contexts. Leaders within both of these contexts (LofL and CLS) have close personal connection to the watershed with family residences on the Lake. Both worked to fill a gap where they saw an opportunity for leadership by creating or taking on leadership roles in organizations that were focused on the Lake. Both also were engaged not only in their own organizational work, but sat on the governance committees for the LSPA.

CLS navigated the political context of an upcoming election to campaign for change through two complementary activities. First, they built awareness of the environmental challenges

in Lake Simcoe at the community level resulting in public pressure for the government to address the challenges. Second, CLS navigated the political context by building a strategic partnership with an MPP from the opposing government party which created additional political pressure between the government parties and created a win-win situation for Lake Simcoe regardless of who won the election. The previously discussed Naked Truth project illustrates the entrepreneurial orientation of LofL. A later project entitled Rewilding Keswick Creek, also highlights their inventive nature. LofL build a cross sectoral partnership with the Conservation Authority and another NGO, Windfall Ecology Centre. The project focused on revitalizing one of the most urbanized and degraded sub-watershed, where socio-economic conditions were also poor. High school students, through a variety of activities, competed to reinvent a space with the winning design being implemented.

While CLS and LofL each took a very different approach to generating attention and directing the policy, both maintained a continuous stream of activities that also varied, and provided a multi-pronged approach to engaging with the governance process. While they shared an objective – bring attention to the need for a comprehensive policy for Lake Simcoe – they created opportunities through very different means. LofL focused on grassroots efforts and sought to engage the general public in the problem. They host an annual water festival – SPLASH in Lake Simcoe and fundraised $250,000 by creating a 'calender girls' style calendar with women from the watershed. This fundraising effort supported the creation of a Citizens Action Plan, and a summer environmental film school for youth in the watershed. At the time this paper was written (2013), LofL was in the process of creating an Ontario Water Centre. RLSC and CLS lobbied, created media campaigns, partnered with smaller NGOs, and played a watchdog role. Additionally, actors from both organizations would engage in the governance activities led by government such as the LSEMS process, and the committees for the LSPA and LSPP. Thus, individually, and combined, they carried out diverse, but complementary activities that sought to achieve a shared goal.

4.5.2 Structure of the Governance System

Both CLS and LofL operated through networks and diverse connections. RLSC was comprised of a network with several smaller naturalist, environmentalist and ratepayers associations across the watershed. With the creation of CLS, a larger network was formed between RLSC, ED and ON. LofL also built a network with the Windfall Ecology Centre (NGO), and the Conservation Authority for several projects. Networked efforts also include the coming together of the CLS and LoL for several public events, and the provision of support for each others' work.

Each one of the individual organizations within this network offered their own area of expertise and focus, as well as a set of resources. Their coming together into a larger network for a coordinated response to the challenges in Lake Simcoe signals their mutual dependency, as well as shared interest in problem solving. Several of the contextual factors also align with the precursor factors noted by the literature including the presence of a meta-problem, uncertainty, a set of complex tasks. The collaboration within each of the level two networks (CLS and Lol) involved several opportunities for knowledge sharing, collective learning and negotiation, as each crafted their own set of activities. For CLS this would have included efforts to develop their reports that were endorsed or collaboratively developed with their member organizations, which was similar for the LofL network where each of their programs and projects were developed in collaboration with their network counterparts. At the heart of this meta-network is the non-

competitive and supportive environment that was created by appreciation of each other's asymmetrical resources, and was the true key to success in the policy process. RLSC brought the grassroots, ON the science and technical expertise, ED the advocacy and strategic planning, WEC the innovation and LofL engaged the grassroots, but often also presented the public face of the network.

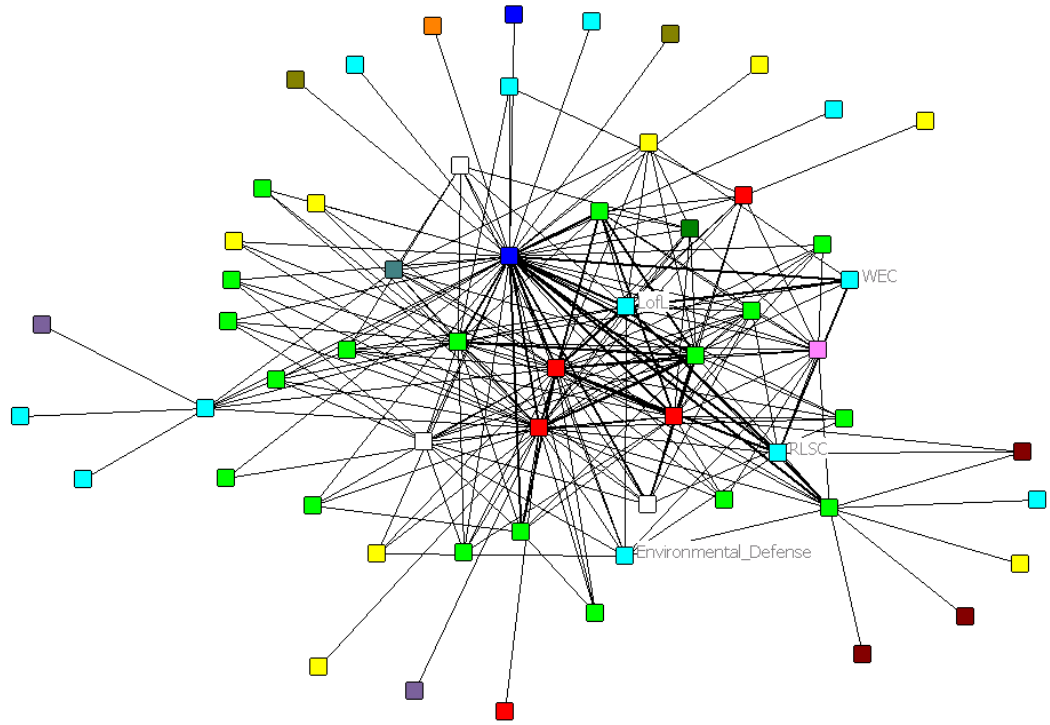
An important characteristic of governance efforts of NGOs in the Lake Simcoe watershed was their ability to work with government actors through a variety of mechanisms. In the previous section it was noted that both CLS and the LofL engaged in the formal consultation efforts organized by government agencies. Actors from each of these NGOs participated as full members in several separate processes, including the search for a new governance model for LSEMS, and the Stakeholder, and Coordinating Committees created by the LSPA. In this section Social Network Analysis is used to identify the structure of the governance network in which the NGO's operated in order to reveal how NGO actors are engaged in the governance structure in Lake Simcoe.

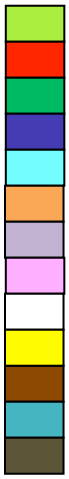
Figure 14 was produced based on responses of survey participants, who were asked to list the agencies with which they had collaborated. Collaboration in this survey was defined in terms of formal partnerships within a project or program in which each actor holds a key role, and decisions are made through a process of negotiation and agreement. The figure presents a visual depiction of the network connections amongst governance actors in the Lake Simcoe watershed. The density of the network is quite low – 0.070 which relates to the high number of pendant organizations (actors who only have one tie) shown in the network. This low density suggests there is not a high level of connection among all the network actors. However, when accounting for the pendants (pendants are nodes with only 1 tie) the density changes dramatically to 0.773, offering a very high level of connectivity amongst actors. This suggests that the core actors in the network collaborate on a regular basis and have a high level of interaction amongst the network.

In Figure 14 the LofL are the most centrally located of the NGOs in this network (as measured by degree of centrality – 0.036), while RLSC is 0.023, Ministry of Environment is 0.07, and the Conservation Authority is 0.10. Of note, both of these NGO actors have direct ties to the provincial government agencies and the Conservation Authority. This indicates, that while the provincial agencies have formally taken the lead in the governance process a wide variety of governance actors maintain a close collaborative relationship with the Conservation Authority. This is likely due to the fact that the Conservation Authority led the LSEMS process.

The structure of this governance network also indicates that the key NGOs (RLSC and LofL) were collaborating formally with a diverse range of organizations outside of government agencies and other NGO's. Overall this highlights the deeply connected network in which both the government, Conservation Authority and the key NGO's are embedded

Figure 14 Network of Organizations that Formally Collaborate in Lake Simcoe - 2010





Municipal Government
Provincial Government
Federal Government
Conservation Authority
NGO's
Consultants
Sports recreation groups
Elected officials
Developers
Academics
Resident Associations
First Nations
Philanthropic Organizations

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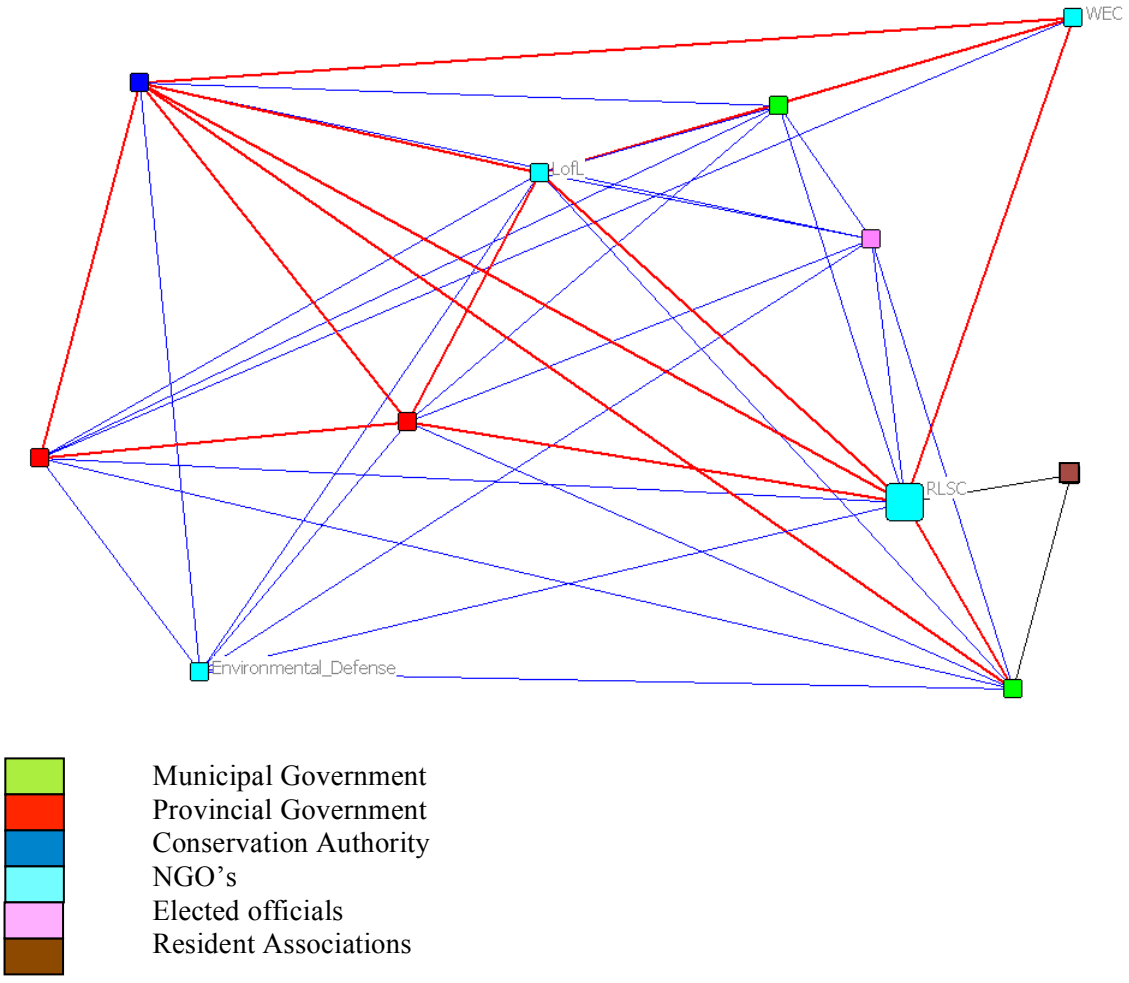
Figures 15 and 16 display the ego network (the actors with whom the NGO's are directly connected with) for RLSC (CLS) and LofL, based on the question "With whom do you formally collaborate?" In the following two figures, the red lines denote a reciprocal relationship whereby both organizations noted that they collaborated with each other. The blue lines denote a one way tie, where only one of the organizations noted collaboration with the other. Additionally, both Figures 15 and 16 display how the actors connected to the NGO are also connected amongst

themselves. Figure 15 shows in closer detail the set of actors that RLSC are directly tied with in formal collaborative projects. RLSC has 10 direct connections, and a total of 37 ties. RLSC/CLS show direct and reciprocal ties to three government agencies and the LSRCA, as well as with other NGO actors, including LofL. It is significant that several of RLSC's closest ties are with government.

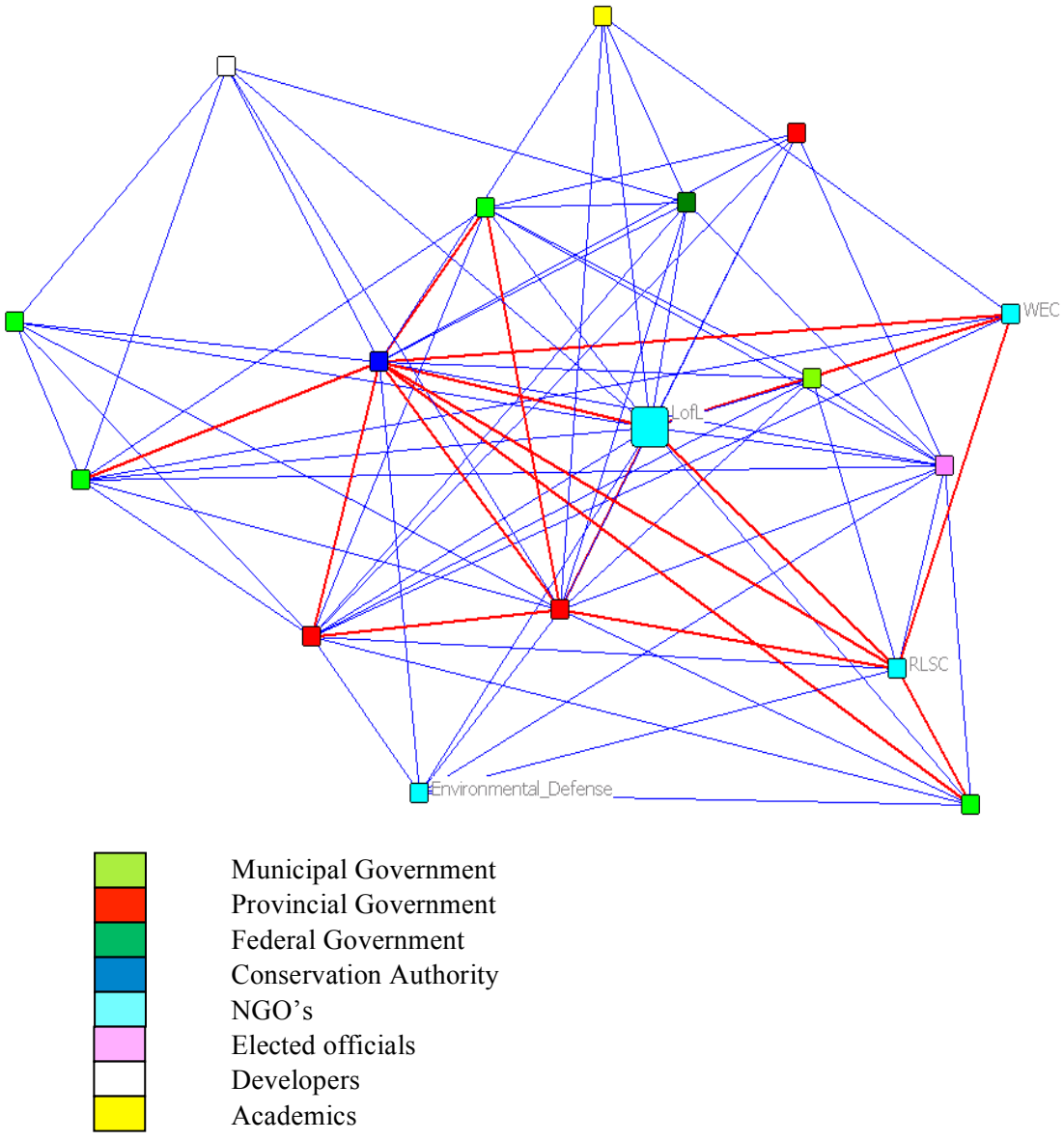
Figure 15 RLSC Ego Network



In Figure 16, the ego network of the Ladies of the Lake is displayed. Their network is somewhat larger than RLSC with 16 organizations and a total of 74 ties. LofL and RLSC are directly tied to government agencies, but are also collaborating with a diverse range of other organizations. While LofL play a brokering role (an actor that can serve as a conduit for information and resources when found between ties of two organizations) for a number of organizations in the

network, it is still secondary in terms of network size as compared with government organizations and the Conservation Authority.

Figure 16 Ladies of the Lake Ego Network



By comparison, the Ontario Ministry of Environment (the ministry responsible for the Lake Simcoe Act) has 30 organizations in its ego network and 159 ties (not shown). The Conservation Authority has 46 organizations in its ego network and 177 ties (not shown). Importantly, figure 14 indicates a network that is highly connected, where a number of reciprocal ties exist, including between government and ENGO's .

In this governance network there is a high level of network connection represented by formal collaborations between NGO's and governments. There is also a residual set of connections with the Conservation Authority, which previously led the governance process through LSEMS. Importantly the structure of the governance network and the ego networks suggests that beneficial and relevant working relationships have been developed and implemented between governance actors.

4.5.3 Governance Roles

Drawing from the survey of NGO' actors, this section discusses their motivation for action in Lake Simcoe, and how they conceptualize different roles for different types of actors within a governance process. When asked to comment on factors that influenced their decision to participate in governance activities in the watershed, 71% said that the future of the watershed was in jeopardy. Three factors tied for secondary importance, with 57% commenting that challenges to the watershed were too complex to be handled by one organization; solutions could only be created through the engagement of a diverse range of people and organizations; and opportunities existed to develop a shared, united vision for the watershed.

Stated motivations appear to reflect the weaknesses the NGO actors perceived in the governance system prior to their becoming engaged. Survey respondents were asked to comment on key principles of contemporary governance, and how present they were in Lake Simcoe governance before they became engaged in LS governance and after the LSPA was passed. The survey asked if the governance process was open and transparent, inclusive, communicative, integrative, equitable and ethical, accountable, efficient and sustainable. NGO actors commenting on the state of these principles prior to them becoming engaged in LS governance rated all of the factors as poor. Transparency and inclusiveness having a 100% response rating of poor, and communicative being 85% poor. These responses are clear indicators of motivations for becoming involved. Assessment of these principles after the passing of the LSPA show an increase in all areas, suggesting that NGO actors had felt significant progress was made.

Actors were also asked how engaged various governance actors were in Lake Simcoe governance activities. Here there is some improvement in the assessment of how effectively the general public engaged with Lake Simcoe governance (before 100% said poor, after – 42% said good), but there is a larger increase in the perception of how effectively government was engaged at all levels. Municipal government improved from 42% saying poor, to 71% saying fair. Federal government improved from 71% saying poor to 71% saying good. Provincial government improved from 42% poor to 71% good. The Conservation Authority remained the same at 57% fair. Responses to these two questions indicate an improved governance context whereby principles of process, and action on the part of government have taken place. Importantly, this is alongside the rise of NGO action, thus depicting a mutually supportive environment for governance.

NGO actors also commented on what they felt the primary role should be for a various range of governance actors; 42% maintained that government's primary role is that of regulator, while 84% said the role of NGOs should be one of either watchdog, participant or steward. This delineates a clear path for who should be conducting which types of activities, but within a shared environment of governance. Results from the survey data indicate that NGOs identified a gap in the process of governing, whereby the diversity of actors engaged was insufficient, principles of

engagement had been disregarded, and a significant challenge needed to be addressed. Opinions regarding these components of governance changed dramatically over the short period of time during which NGO actors became engaged and worked towards a LSPA in concert with government actors. Importantly, 47% of *all* respondents stated that the provincial government should remain as regulator and ultimate authority, while 81% of *all* respondents stated NGO's should remain external as either watch-dog, participant or collaborator, but complementary to governments in their roles.

4.6 Discussion

The objective of this research was to explore how the role of ENGO actors has changed in real world environmental governance processes. The research was based on a detailed, long term single case study analysis focusing on a 10 year period of activity. The analysis examined the actions, characteristics and roles of ENGO actors, and captured the structural component of the governance system. The results from the research offer several insights into the way NGO's are working within governance systems. Table 7 outlines the key findings in relation to proposed conceptual framework for this research.

Table 7 Key Findings on ENGOs

Mechanisms Used by NGO's	- networks that utilized diverse skills, knowledge and capacities - avoided duplication and competition - held shared vision and goal for the watershed - diversity of tactics made for stronger effort collectively - actions directed at several levels of government - entrepreneurial action exhibited by development of own plans and programs for Lake Simcoe - keen attention to and utilization of political opportunity
Changes in Structure	- NGOs directly tied to government agencies – enables stronger transfer of knowledge, and mutual benefit opportunities - reciprocal relationship between government and NGOs acknowledged by both parties
Roles of NGO actors	- NGO confirmed their role as watchdogs, and the role for government was as regulator - confirmed role in governance process as collaborator

In building understanding around the types of activities that NGOs are engaged in and their approaches, the results identified that NGOs in Lake Simcoe are utilizing a networked approach. NGOs are also serving in instrumental roles in accessing and engaging multiple levels of governance actors and a wide range of techniques to both steer governance and improve process. Perhaps the single most important finding was the diversity in the types of NGO organizations active within the watershed, and the ways in which they collectively utilized a multi-level approach to achieving their objectives. Each NGO highlighted in this research played a particular role in the governance network in Lake Simcoe. Simultaneously, the NGOs did not duplicate,

overlap or compete with each another. Rather, the NGOs offered mutually beneficial support for their shared goal: greater protection for Lake Simcoe. The NGOs came together for particular purposes, activities or events (e.g., Lake Simcoe Summit, LSEMS governance review), but operated with the understanding that other NGOs were carrying out certain activities such as political advocacy or grassroots water awareness campaigns. They therefore recognized the value of, and operated with an understanding of, their asymmetrical resources and the value of bridging ties with other actors (Hudson 2004; Jarillo 1988). Through this complementary set of actions by the NGOs, multiple initiatives were used to raise awareness, change behaviour, and pursue legislative goals. The diversity of tactics used by the groups highlights not only their significant capacities to effect change, but also their ability to readily adapt their approaches (Auer 2000a; Dombrowski 2010).

The structure of the network also sheds light into how knowledge was transferred among actors, and the resiliency that a broad water governance network can offer. The network analysis identified close ties between government and NGO organizations. In having direct and ready access between these organizations, the transfer of knowledge and mutual knowledge creation opportunities is increased. Additionally, the diversity of network members, and their direct linkages create a stronger 'net' through which collaborations, but also challenges can be captured, before creating irreversible damage to both the governance and ecological systems.

The various activities of the NGOs were also designed to resonate with different levels of governance – the watershed, the region and the province, as well as at multiple social levels of organization – personal, community, society. Thus there were multiple avenues for entry and for impact. Perhaps most importantly, they were not only operating at these various levels, but also they were the bridge between them by transmitting knowledge and expertise both up and down and between organizations. This supports the findings by Kapaciauskaite (2011) and Kim (2009) who found that non-government actors are creating a more resilient and democratic environments by revitalizing the governance process.

The tactics of the NGOs also proved entrepreneurial. The literature identifies a number of entrepreneurial activities and includes new and innovative approaches (Vaughan and Arsneault 2008), variety of tactics (Huitema and Meijerink 2009a), exploiting multiple venues, and importance of coalitions (Crow 2008). Through the combined efforts of the NGO's, their efforts offered a multi-faceted approach to governance. In the case of LofL, rather than waiting for the provincial government to change policy on Lake Simcoe policy, this NGO sought its own community development plan. Even while the *Lake Simcoe Protection Plan* was being implemented by government, LofL created their own partnerships and programs to complement the efforts being undertaken by the Province (e.g., Rewilding, WASTE films, Ontario Water Centre). Combined, the NGOs utilized a variety of tactics and strategies at multiple levels and scales as described above and they valued and drew strength from building coalitions. This was especially the case for CLS and the RLSC, which worked directly with numerous smaller NGOs to build support and knowledge capacity for their research and reports.

The governance efforts of CLS exhibited a distinct effort to navigate and manipulate the institutional system. CLS comprised a set of highly engaged actors who sought to understand the institutional context, its opportunities and constraints, and then work through the formal institutional government system to bring about the change they deemed necessary in order to achieve a Lake Simcoe Protection Act. CLS was able to pursue a changed system of decision

making by adopting a very strategic approach, engaging deeply with both the community and political authorities, supporting government action where warranted, making clear the rules of negotiation through media and messaging, and being legitimized by their broad support from the public. CLS did so through distinct actions such as recognizing an upcoming provincial election as an opportunity, collaborating with an opposition MPP to draft the initial Lake Simcoe Protection Act Bill, demonstrating an extremely high level of responsiveness to each policy initiative of the province, and calling for citizens to hold the government to account. This is significant as it demonstrates a capacity to work within institutional constraints, but at the same time to achieve independent goals. CLS in particular, was able to steer the governance system in the direction it created and to pursue its own governance agenda (Gouldson 2009).

The Social Network Analysis component uncovered an important trait in the governance structure in this case study. By identifying actors with whom they formally collaborated, the networks for RLSC and the LofL show a clear, direct and reciprocal relationship with several government agencies as well as elected officials. These reciprocal relationships indicate a valuable development in the structure of the governance system, whereby both governments and NGO's identify each other as collaborators, and have moved beyond strict definitions of "government" and "stakeholder``. The findings demonstrated a high level of density between actors in the governance network once isolates and pendants were removed. Such a high level of interaction, not only among key NGO actors, but also with a broad range of governance actors between and amongst themselves, indicates a shift in the governance dynamics of actors. Where previously there was a combative approach (Bryant 2009), both government and NGOs in this case are choosing a process which provides mutual empowerment (Kim 2009). This case is an example of a high level of collaboration across sectors, which created a dense institutional network of governance actors working to achieve a positive sum game of governance through recognizing and utilizing complementary skills and resources (Lane and Morrison 2006).

The largest gap in the literature was a lack of knowledge around the motivations of NGO actors. Results from this case on why NGO actors are engaging in governance and what they hope to achieve provided valuable insight. Significant drivers for NGO's were not only the physical degradation of the watershed, but also the processes of governance and the principles that informed decision making processes. Additionally, these actors saw the need for a multi-sector/organization/scale approach to the problem, as it was far too complex a problem to be handled by any one actor. Underpinning these concepts was acceptance of the need for positive interaction and collaboration, as opposed to negative combative practices. Related to this finding is how NGOs responded when asked about roles. When asked about the role of government, several confirmed that government should continue as a regulator and maintain the status quo as the primary governing authority. While NGOs want, and will create roles for themselves and space for other non-government governance actors, this is not a loss of opportunity for government. Instead, a governance space where multiple actors interact and collaborate is created, but does not decrease the capacity of previous actors. Given that NGOs continue to lend support for the role of government implies NGOs do not want to drive governance. NGOs recognize the specific resources, skills and capacity that government offers. However, they feel that they can offer complementary resources, skills and capacity to the greater benefit of governance as a whole.

4.7 Conclusion

This research suggests that there is a changing dynamic between government and non-government actors, and that governance processes are also evolving. From a broad literature review of governance, NGOs, networks and entrepreneurs, a more comprehensive understanding emerged regarding the mechanisms, structures and roles of non-government actors. The empirical case study in Lake Simcoe identified actions by NGO actors, revealing that actions of the NGOs were inclusive of traditional roles. However, the findings also indicated that using a network and entrepreneurial lens broadened the scope and understanding of additional activities and NGO's engagement with government actors. The research demonstrated that with the exception of lobbying, few of the traditional approaches of NGO's, such as the combative and confrontational activities of protests, demonstrations, and negative information campaigns, were present in the case study. In place of these activities was a multi-pronged, networked and cooperative approach to exert power, direction and influence over the governance process. In the case of Lake Simcoe, multiple NGOs identified a clear and direct objective: the creation and implementation of a Lake Simcoe Act. Over the course of several years, multiple activities were implemented in a strategic fashion to achieve this goal. Thus, understanding the approaches and capacities of NGO actors in water governance is critically important to a wide range of actors, including governments, policy makers and practitioners who interact with NGOs on a consistent basis. NGOs in the Lake Simcoe case have demonstrated an increased capacity to contribute, steer and create governance opportunities. As a driving force of governance, their efforts cannot be dismissed.

The work of the NGO's in Lake Simcoe highlight a multi-pronged approach, whereby they worked within, alongside, and external to government. The NGOs in this case maintained their individual identity and organizational vision, but collaborated when there was opportunity to create a synergistic effect, whereby asymmetrical resources, knowledge and connections could be utilized to support the goal. Additionally, once these NGOs gained access to the decision making table, they participated in government-drive governance activities in roles that extended well beyond simply offering advice and commentary. In parallel, they conducted their own initiatives, or collaborated directly with government, in an effort to bring innovation into government process. This suggests that there are opportunities for synergy between NGOs and government, whereby a faster moving institution, can ebb a slower moving institution.

This case study underscores recent arguments that suggest there is still a critical role for government, and that government is not in retreat. The objective of the NGOs in Lake Simcoe was to obtain legislative support for the watershed. Such an objective suggests that NGOs expect and indeed, rely on government, to maintain hierarchical control, and that formal legislated mechanisms of accountability are still relevant and in demand. Yet, NGO actors have also become more involved in governance, beyond the role of stakeholders participating in consultations. Hence, this case highlights how recent actions by NGO are generating opportunities for, and also guiding, the governance process. The implication of these findings regarding the role of NGO's, as well as how NGO perceive the roles for other governance actors, are significant. The dynamic between governance actors clearly can be altered. The findings points towards a more fluid and malleable governing environment in the sense that action, knowledge, networks, and resources outside of government can exert influence and direction over government policy and the process of governing (Auer 2000a; Wapner 1995). Governance in this case study does not indicate a one-way directional decision-making process. Rather, it is a dance

of actors moving in, out, and within a shared space. Given this changing context, the governance process lends itself to less predictability, but perhaps instead greater resiliency. The governance process has engaged a diverse range of interests, voices, and ideas. It has involved negotiations between collaborators responsible for a societal, environmental and economic good and has achieved the creation of shared objectives and strategies for implementation. It is possible that this form of governance may offer a more suitable and attentive response to current social, cultural and environmental complexities.

Ultimately, this research suggests that considerable scope exists for actors in environmental governance to govern in new ways using their existing resources. It is not what the NGOs in the case have achieved, but how they achieved it that provides lessons for governance. These lessons are not limited to other NGO actors, but hold meaning for government actors as well. In this instance, government actors were open to working with the evident capacity of non-government actors, without ceding authority. This case demonstrated the power of a positive sum game, as opposed to the negative sum game that traditional hierarchical and market governance processes have lent themselves.

Chapter 5

Conclusion

5.1 Introduction

In this thesis, the research was organized into three chapters and was presented in manuscript form. Though intended to be standalone publications, the individual papers are related to one another and to the overall research objectives. In this chapter, the full span of research from the thesis is synthesized and assessed. The chapter begins with a review of the purpose and objectives, and then provides a brief synopsis of the major findings from each chapter. Later a discussion on the significant academic contributions is presented. This is followed by opportunities for practice and future areas of research for water governance.

5.2 Purpose and Objectives

The purpose of this doctoral research is to characterize and explain changes in a water governance system. The research explored a water governance case over a 30-year period to evaluate how and why the water governance system changed. Within the broader purpose stated above, there are four specific study objectives:

- To evaluate changes in governance architecture over time;
- To identify and assess governance tools;
- To examine the changing role of NGOs in governance
- To offer insight and theoretical contributions on how more effective governance processes can be created.

5.3 Major Findings

Research findings were presented in three separate chapters. Chapter Two provided an analysis of the changing governance architecture in the Lake Simcoe watershed over a 30-year period. Chapter Three provided an investigation on the use of the watershed boundary for water governance. Chapter Four examined the roles of non-governmental actors in water governance. In the following section, a summary of the major findings from each of these chapters is provided. In the last section the discussion returns to the governance framework.

5.3.1 Governance Over Time

Howlett, *et al*. (2009) called for multi-dimensional analyses of governance change. This research provided a multi-year, multi-scale, triangulated analysis of a governance system over a 30 year period. It evaluated the governance system from statistical, social and formal documentation perspective in order to assess the direction of change in governance. In so doing, it contributes to debates in the governance literature regarding the role of the state.

Recent scholarship in the governance field rejects the notion that governments in the West are in decline (Bell and Hindmoor 2009; Hysing 2009). This research offers empirical evidence

that demonstrates that the reality, at least in the context of environmental governance, is more nuanced. As evident in phases Two and Three, there was indeed a retreat of the government from participation in environmental governance in the Lake Simcoe region. The evidence indicates that this was a direct result of economic circumstances in the province, rather than a strategic decision on the part of the provincial government to move away from involvement in governance in the region. This finding is further supported by the fact that there was a re-emergence of the provincial government as a dominant actor in phases Four and Five despite the fact that governance during these periods still occurred through a network form. Importantly, the "retreat" of the government that did take place during phases Two and Three did not involve a reduction in the legal and constitutional responsibility or authority of governments. Instead, it was a shift from activities such as conducting expert science, monitoring and planning, to a more limited focus on regulatory control. During these phases, the government retained authority and control. Ultimately the role of government in the governance system at the end of this research period (2010) was very strong and hierarchical, as demonstrated by the introduction of legislation, regulatory controls and a top-down implementation process.

Despite the clear return to a hierarchical style of governing, the research also demonstrated that the roles governments play can change, but not in simplistic "advance" and "retreat" forms. As others have noted, governments can shift from strictly using command and control approach to relying on alternative governing mechanisms such as interactive governance, collaboration, deliberative policy making, inclusive management or partnerships (Howlett, *et al.* 2009; Hysing 2009; Tenbensel, *et al.* 2011; Termeer 2009). This phenomenon is apparent in Lake Simcoe. Attention to the public and scientific community's engagement in the Act and Plan provides a pertinent example. The development of the Act proceeded through traditional, although more expansive, consultative processes, i.e., public comment periods that permitted written submissions as well as community workshops. However, the creation of two public committees (Science and Stakeholder) that directly and frequently advised the government on the formulation of the Plan, and which were widely considered by government staff interviewed for this study to have provided significant contributions to the development of the Plan.

Additionally, two new permanent committees (Science and Coordinating Committees) were established by the Act, to oversee the implementation process, and to advise and make recommendations on the adaptation of the Plan. As a steering mechanism, these committees represent a strategic effort on the part of government to more effectively engage and broker professional relationships with non-government actors. This reinforces the argument that governance does not have to be a zero-sum game, in other words, there is room for multiple actors who are engaging in different types of activities (Bell and Hindmoor 2009; Blakeley 2010). In this case, governance of the watershed changed as a result of several social, economic and environmental factors. In phases Two and Three government participation declined. In phases Four and Five, the government slowly increased its level of participation; Phase Five concluded with the provincial government introducing strongly directive legislation.

In this respect, the governance system in this watershed began with a network, which evolved through several phases, before concluding with a formal hierarchical system. This reinforces the fact that governance transitions can be non-linear and do not accord with the hierarchical to market to network narrative. Also, as is apparent in this case, the choice is not between governing through hierarchies or governing through networks. Instead, both forms can exist simultaneously.

This research concludes that the role of government is indeed changing and becoming more inclusive of alternative mechanisms of governing, and that governance does not transition in a clearly delineated linear fashion. The non-linear transition of governance highlighted two important findings. First, that governance changes as a result of the economic, social and environmental context in which it is embedded. Second, because governance systems are embedded within one another, the question is not about 'one' system shifting, but the recognition of multiple systems existing, interacting and changing on multiple scales.

5.3.2 Boundaries for Governance

How can governance for water transcend the watershed boundary? The case of Lake Simcoe provided valuable insights to respond this question. The case demonstrated that boundaries are necessary for purposes such as delimiting the scope of an organization's mandate, or the coverage of a statute. However, it also highlights that water governance can transcend the use of a watershed boundary for many activities.

Water governance scholars and practitioners have long grappled with questions surrounding how best to engage actors, formulate policies and plans, and to implement the results with success (Bakker and Cooke 2011; Morrison, *et al.* 2004; Smith and Porter 2010). Watershed boundaries have been identified as a way to ease the challenges of obtaining participation, integrating resource problems and providing a coherent policy framework (Grigg 2008; Mitchell 2005; Savenije and van der Zaag 2008; Varis and Rahaman 2005). Yet critical analyses of role of the watershed boundary for governance are pointing to a host of challenges (Blomquist and Schlager 2005; Fitzsimmons 1996; Warner, *et al.* 2008; Woolley and McGinnis 1999). These relate to boundary selection, participation and empowerment, accountability, policysheds and problemsheds. Critiques of the use of the watershed to define the scope for governance suggest that doing so does not ensure integration of processes, issues, problems or policies. More fundamentally, there is little evidence that adopting a watershed boundary necessarily leads to harmonized policies, reduced power struggles, or more effective collaboration. Whether applied by legislation or policy, watershed boundaries simply create another jurisdictional boundary for governance. As Tiesman and Edelenbos (2011, 102) have noted, "no redefinition of boundaries will make boundaries disappear." What then is the role of the watershed boundary in governance for water?

Results from this research show that a watershed boundary can be used to define a legislated area, and to delimit management areas as has been suggested by watershed governance scholars. However, the case of Lake Simcoe has highlighted a number of caveats for identifying and applying a watershed boundary for water governance. In the case of Lake Simcoe, the watershed boundary was not a strictly hydrological boundary, but was modified based on both political and management needs. It has also indicated that issues of accountability, participation and empowerment can be navigated through non-bounded mechanisms, and highlighted some specific opportunities for improved governance process. For example, research and monitoring take place based on the scale of impact, cross scale coordination occurs through mandated harmonization of policies, multiple scales and levels are utilized for implementation, there is no watershed scale organization, there is a commitment to learning and flexibility regarding how policies are identified and applied, policy adaptation can occur with ease through an updated legislative amendments process, and there is empowerment for many through the creation of shared institutions.

Perhaps most importantly, this research indicated that non-boundary governance mechanisms were being used extensively by the provincial government to navigate a complex water system. The LSPA and LSPP include mechanisms for learning followed by adaptation, the creation of shared institutions, and multiple mechanisms to integrate issues and solutions across scales and levels. This is an important advancement in water governance as it demonstrates a focus on process. Specifically, the case illustrates the principles of adaptation, learning by doing and accepting that not all is understood about our physical and social environment. It also highlights the fact that these systems are in constant flux, and our capacity to govern them is dependent upon our ability to become dynamic, responsive and adaptable governance actors.

5.3.3 Non-government Actors in Governance

This research suggests that there is a changing dynamic between government and non-government actors, and that governance processes are also evolving. Some scholars suggest non-state actors are not simply being invited to participate in governance activities by government (Edelenbos, et al. 2010; Gouldson 2009; Gunningham 2009b). Instead, they are actively pursuing their own governance agendas (Crow 2008; Gouldson 2009) and thus are becoming important actors in shaping environmental solutions (Auer 2000; Wapner 1995). From a broad literature review of governance, NGOs, networks and entrepreneurs, a more comprehensive understanding emerged regarding the capacity and approaches of non-government actors. The empirical case study in Lake Simcoe identified actions by NGO actors, revealing that actions of the NGOs were inclusive of traditional roles and actions of NGO action. However, the findings also indicated that using a network and entrepreneurial lens broadened the scope and understanding of additional activities and NGOs engagement with government actors. The research demonstrated that with the exception of lobbying, few of the traditional approaches of NGO's, such as the combative and confrontational activities of protests, demonstrations, and negative information campaigns (e.g. Pross 1986), were present in the case study. In place of these activities was a multi-pronged, networked and cooperative approach to exert power, direction and influence over the governance process (Benecke 2011). In the case of Lake Simcoe, multiple NGOs identified a clear and direct objective: the creation and implementation of a Lake Simcoe Act. Over the course of several years, multiple activities were implemented in a strategic fashion to achieve this goal. Thus, understanding the approaches and capacities of NGO actors in water governance is critically important to a wide range of actors, including governments, policy makers and practitioners who interact with NGOs on a consistent basis. NGOs in the Lake Simcoe case have demonstrated an increased capacity to contribute, steer and create governance opportunities. As a driving force of governance, their efforts cannot be dismissed.

The work of the NGO's in Lake Simcoe highlight a multi-pronged approach, whereby they worked within, alongside, and external to government. The NGOs in this case maintained their individual identity and organizational vision, but collaborated when there was opportunity to create a synergistic effect, whereby asymmetrical resources, knowledge and connections could be utilized to support the goal. Additionally, once these NGOs gained access to the decision making table, they participated in government-drive governance activities in roles that extended well beyond simply offering advice and commentary. In parallel, they conducted their own initiatives, or collaborated directly with government, in an effort to bring innovation into government process. This suggests that there are opportunities for synergy between NGOs and government, whereby a faster moving institution, can ebb on a slower moving institution.

This case study underscores recent arguments that suggest there is still a critical role for government, and that government is not in retreat. The objective of the NGOs in Lake Simcoe was to obtain legislative support for the watershed. Such an objective suggests that NGOs expect and indeed, rely on government, to maintain hierarchical control, and that formal legislated mechanisms of accountability are still relevant and in demand. Yet, NGO actors have also become more involved in governance, beyond the role of stakeholders participating in consultations. Hence, this case highlights how recent actions by NGO are generating opportunities for, and also guiding, the governance process. The implication of these findings regarding the role of NGO's, as well as how NGO perceive the roles for other governance actors, are significant. The dynamic between governance actors clearly can be been altered. The findings points towards a more fluid and malleable governing environment in the sense that action, knowledge, networks, and resources outside of government can exert influence and direction over government policy and the process of governing (Auer 2000a; Wapner 1995). Governance in this case study does not indicate a one-way directional decision-making process. Rather it is a dance of actors moving in, out, and within a shared space. Given this changing context, the governance process lends itself to less predictability, but perhaps instead greater resiliency. The governance process has engaged a diverse range of interests, voices, and ideas. It has involved negotiations between collaborators responsible for a societal, environmental and economic good and has achieved the creation of shared objectives and strategies for implementation. It is possible that this form of governance may offer a more suitable and attentive to response to current social, cultural and environmental complexities.

Ultimately, this research suggests that considerable scope exists for actors in environmental governance to govern in new ways using their existing resources. It is not what the NGOs in the case have achieved, but how they achieved it that provides lessons for governance. These lessons are not limited to other NGO actors, but hold meaning for government actors as well. In this instance, government actors were open to working with the evident capacity of non-government actors, without ceding authority. This case demonstrated the power of a positive sum game, as opposed to the negative sum game that traditional hierarchical and market governance processes have lent themselves.

5.4 The Changing Governance Context

Ultimately, the objective of this thesis is to identify how governance changes over time. The research used a holistic perspective as a basis from which to explore this question. Taking a holistic perspective allows space for the depth and complexity that is inherent in governance structures and processes and dynamics. It is necessary for investigations of governance to examine the full range of elements, in order to decipher, describe and gain knowledge of the true construction and interactions of governance. While the three core chapters of this thesis have provided a detailed examination of the architecture, tools, and actor roles that have taken place in the watershed, there is now opportunity to shift the scale of assessment and collectively examine the architecture of governance. From a whole system perspective, there are three key contributions that have been made.

Governance processes have the potential to be flexible, adaptive and responsive

There are two important takeaways to this point. First, a governance system requires time to develop knowledge, resources, and capacity (Chapter Three). Second, this governance system did not become inert; it continued to evolve over time and in response to major system drivers. This is most clearly demonstrated in Chapter Two.

Biermann, et al. (2009) comment that governance is an "incremental processes of institutionalization." In this case it is important to acknowledge the necessary need for the 'institution' or the 'system' to develop. This case took place over a 30 year period, and acknowledging the time taken to develop the institutional memory, the scientific resources, and human capacity cannot be under-valued. During this period relationships between organizations as well as individuals were developed. Scientific data collection, and a strong network of researchers enabled significant knowledge capacity around the system, its challenges and opportunities (Chapter Three). Additionally capacity both, human and technological had time to develop and synchronize (also evidenced in Chapter Four). Each of these components represents pieces of the puzzle that need to be present in order for the puzzle to be completed.

The shifts in the system took place over a 30 year period and illustrate a moving institution that is responsive to changes in social, economic and environmental contexts. Burns and Stöhr (2011) offer a useful framework through which to examine the shifts in governance in the Lake Simcoe watershed. They identify four drivers for shifts in governance including 1) dominant power and a shift in the agent's cognitive-normative framework, 2) power shifts, 3) a new governance order is established through multi-agent negotiation, 4) governance shift through diffusion and emulation (organic transformation) (Burns and Stöhr 2011). In this case all but one of these drivers (organic transformation) was responsible for shifts at various periods. In the beginning a shift in the cognitive normative framework of the key governance actors led to the creation of the LSEMS process as a result of improved understanding that the system was experiencing distress. In the next phase, the Conservation Authority became the newly dominate actor in leading the process. Following from this a new governance order was established through multi-agent negotiation and culminated in the Lake Simcoe Protection Act. Newell (2012) notes that many institutions are charged with responding to environmental challenges that did not exist when they were initially created. Significantly, rather than remain firmly planted with the same governance architecture that the system began with the Lake Simcoe system continued to evolve over time, in a way that was keenly responsiveness to these shifts. This led to a governance system under constant construction due to the push and push between governance elements.

Reduced presence of government did not hold back processes of governance

The level of government engagement in governance in Lake Simcoe varied across phases. As described in Chapter Two, while they maintained their legislated authority throughout the case, and actually increased it in the last phase, between phases 2-4, the government was less engaged. In this case the presence of government began with giving support to the bureaucratic staff initiative, and then it moved towards a classic retreat due to the economic context of the province and re-emerged with the political opportunity to introduce the Lake Simcoe Act. What is significant to note, is that while the government's level of engagement was reduced, governance processes continued, and even became amplified during this time. The space created by the reduced capacity of the provincial government ministries permitted the emergence of the conservation authority as a strong leader, who then engaged other governance actors. This is not to say that the widening of governance actors could not have happened with the government

leading the process, but simply that it did occur with a different governance actor at the helm. Additionally, it was the strong engagement of NGO actors in the final phases who really pushed the governance processes forward and held significant energy for the efforts during this time. Pierre and Peters (2000) comment that states are increasingly dependent on other social actors. However this does not appear to hold true in this case. It was not a dependency on other actors by government, so much as an organic re-organization of key actors facilitating and enabling governance outside of the actions of government, but notably within the confines of government legislation, and at the request for more government engagement (Chapter Four). A point by Legler (2012) raises another important aspect for discussion; he states that unless non-government actors are able to obtain authority, their efforts to govern are meaningless. In this case, while it was never an outright goal of the LSRCA to obtain more power, its actions to improve conditions in Lake Simcoe were certainly constrained by a lack of authority. While the ENGO's demonstrated quite clearly that they too were not interested in obtaining more authority, they were nonetheless able to wield great influence and power over a process to achieve greater authority, but for government, not themselves (Chapter Four). This leads to an important final point, that government in this case is embedded within governance. Government is not separate from governance, but operates within a context of governance in which other actors have the potential to be equally active, and where there are synergistic opportunities to collaborate to govern.

Non-government actors have agency

"Agency relates to the ways in which actors exercise influence, proscribe behavior, substantively participate in rule making, set their own rules and as such contribute to the purposeful steering of society" (Newell, *et al.* 2012). Benecke (2011) states that NGOs have greater agency and authority, and this holds true for both the LSRCA and the ENGO's in the Lake Simcoe watershed who demonstrated greater agency. This was explored deeply in Chapter Four regarding ENGO's but also relates to the actions of the LSRCA. These two actors were able to expressively steer the governance systems in particular directions (Newell, *et al.* 2012). Especially in the case of the ENGO's they sought to create and implement experimental approaches, and innovative solutions (Newell, *et al.* 2012). Bulkley and Moser (2007) suggest that the key legitimizing factor for non-government actors is their ability to mobilize the masses, and engage them in the issues at hand. While in this case, select projects by ENGO's sought to engage a broader community, it was not their sole focus, nor is it where they derived their legitimacy. Their legitimacy was built on their ability to orchestrate a strategic plan in order to obtain a particular result, and the methods they utilized including, strategic assessment of the policy landscape, networking to collaborate efforts, share resources and build presence, optimization of opportunities and political maneuvering.

5.5 Recommendations for Practice

Given the heavily empirical nature of this research, there are several recommendations for practice that have emerged. There are five valuable implications for practice that can be drawn from this research.

Attention to individual knowledge and capacity through a distributed governance approach

To begin, towards the later stages of this research period, individual efforts and skills of various governance actors were identified and more appropriately utilized. This is made clear during the development of the Plan, where academic researchers were given a mandate to provide scientific

knowledge and background not only on the health of the lake, but also on potential future remedial actions in the Science Committee. The provincial government was attentive to the expressed interests of its constituents (the call for an Act) and passed legislation. Yet, rather than offer a heavily prescriptive piece of legislation, the government strategically left the details of how the Act would be enabled relatively open. This was significant in two ways. It permitted the details of the Plan (content, implementation and review process) to be determined by the bureaucratic government ministries in collaboration with non-government actors and the science community as opposed to focusing on these types of details in the legislative process. It also enabled a strong facilitation role for Ministry of Environment. Other key roles were established for the municipal governments and the conservation authority that spoke to their specialized knowledge and authoritative capacity in a distributed governance approach. Therefore it is suggested that a scan of individual actors could be used to identify their knowledge and capacity and then, where they could then be incorporated into processes accordingly and permit a wide engagement of actors.

Attention to time and the building of scientific knowledge

Scientific knowledge was the core component of efforts for most of the early phases of governance in the watershed. With a collective partnership amongst three provincial ministries and the conservation authority, comprehensive and well developed data were available for the watershed to understand trends, stresses and effectiveness of remedial action. The collaboration of efforts constructed a sizeable knowledge base from which future efforts could grow. The size, location and presence of research facilities also further snowballed research efforts in the watershed. Interestingly, some early work of the Ladies of the Lake focused on clarifying scientific knowledge for the general public (Citizens Action Plan), but again, it was able to undertake this task due to the fact that a vast collection of data existed. The value of accessible, long term data on the status of the watershed cannot be undervalued as it is the foundation, or more importantly the starting point for governance processes and decision making.

Attention to facilitated processes

The substantial financial and time investment made in the collaborative processes implemented to create the Plan should also not be overlooked. On the part of the Ministry of Environment, they had a clear understanding that the non-government actors demanded a fair, open, honest and legitimate process for dialogue and debate, and to do otherwise would jeopardize the potential to achieve constructive results. Often attention to facilitated dialogue is treated as a simple task that involves hiring an external consultant. Yet in this case, significantly more effort was expended to ensure that non-government actors were comfortable and encouraged by the process and would thereby invest and commit to the process. This began with the Science and Stakeholder committees being formally appointed through provincial government offices. It carried through to the day to day action during the year of deliberation on the Plan including very clear responses on the part of government to how they considered and weighed comments provided by non-government actors. It also included more practical strategies such as video conferencing for those who could not attending meetings in person and the posting of meeting notes immediately following meetings. Also significant was the cyclical nature of commenting on components of the Plan – where draft items would move between the Science committee, provincial ministry(ies) the Stakeholder committee and back again. These measures created clear lines of accountability for

how things were being developed, responded to and advanced between various actors. Specific efforts on processes should be receive deep attention.

Attention to opportunity

This recommendation requires a keen attention to context and strategy, yet in several instances was well utilized by various governance actors. This is in specific reference to the capacity to see how 'space' is being opened, and the opportunity that may create to advance a particular agenda. This is not limited to policy opportunities, but rather tactical movement to move issues or needs through a system. In this case the system is the social-political-economic-environmental system of the Lake Simcoe watershed. This is a highly diversified, complex and inter-related system. Examples within this case include the opportunity to draw in political support for Lake Simcoe efforts in the early stages from the provincial government via the Memorandum of Understanding and financial backing from provincial cabinet. The skill to identify and monopolize this opportunity in order to further research efforts in the watershed was valuable. A later, example is the Conservation Authority taking a scan of the economic climate and seeing the financial withdrawal of the provincial government – this provided a necessary opportunity to draw in the municipalities as a financial partner, but also as implementer. Later still the Campaign Lake Simcoe drew on the political opportunity of an upcoming election to push their agenda to achieve legislation in the watershed. Each of these present strategic maneuver's within the system, and were used to achieve a particular goal. This is related to one of the earlier recommendations whereby actors should be utilized for their particular skill and expertise, here too, opportunity must be sought and monopolized in a strategic manner.

Creative Destruction

At its most basic, creative destruction refers to the breaking apart of current systems, in order to enable a reconstruction through new stimuli and innovation. This process, although highly uncomfortable, unclear and at times alarming, can lead to inventive opportunities and a new path forward. Nearing the final phase of governance in the watershed, with the Conservation Authority leading efforts, who undertook a process to develop a new governance model for the watershed, and included in their efforts several non-government actors. While authentic and well intentioned, this process was ultimately unsuccessful, because alongside of these efforts the non-government actors were generating their own opportunities and building the solutions they felt necessary for the watershed. As described in this thesis, several new elements were ultimately developed. However, the process just before the emergence of the Act is important. During this period, there was significant contestation and conflict between the historical governance system in place, and the one being sought by non-government actors. This is not to say there was public inter-personal conflict, but that there was a push and pull between what had been, and what could be – which option would prevail? For all actors involved, this is a highly involved period, but where like two race cars, one may pull ahead, only to be superseded by the other moments later. Because it involves much investment of effort and resources, the stakes are high, but ultimately one must fall away. In this case, it was the Conservation Authority's role as governance leader that needed to fall away to make room for a new architecture to emerge. The highly challenging aspect of this recommendation is to know when to push and when to pull on the system and in what direction. This again leads to the acuity of governance actors ability to read and see the system and opportunity. But also to get comfortable with 'being uncomfortable' in order to see new processes emerge.

5.6 Ideas for Future Research and Study Limitations

There were two primary study limitations for this research. The first pertains to the data used for the social network analysis in Chapter Two. Data for the historical networks were based on meeting attendance, and could not be collected from the individuals first hand. Given that this was the type of data used, assumptions were made that meeting attendance equaled collaboration. While this assumption is supported by other formal documentation noting joint commitment to a project, several nuances of interpersonal interactions are lost, for example, variations in effort by each agency. Social network analysis data is most accurate when captured in real time. However, opportunity to capture governance data in real time may be infrequent, as a result of associated costs (long-term research projects) and access (depending on the political sensitivity of the governance system). Therefore the validity and potential for this kind of research is dependent on the availability of well managed formal documentation. The second study limitation relates to the lack of capacity to assess the success of the proposed multilevel and adaptive governance approaches identified in Chapter Three. These tools and processes are only valuable in light of their successful implementation. The time period of this research did not permit for an evaluation of these components. An evaluation of these tools would also lend itself to a future area of research.

Given that this research uses a single case study methodology, the single largest future research opportunity is to apply conceptual developments from this research to multiple case studies to uncover whether the results from this research are evidence of wider trends or an example of an outlier case. Specifically, in regards to Chapter Two, whether governance systems exhibit similar patterns over time, or if multiple patterns exist would build the governance literature and provide greater insight into the actual complexities and interconnections between multiple governance systems in one geographic location, and for system change over time. Results of Chapter Three identified multiple tools and processes for water governance that were not reliant on a watershed boundary. Building a collection of tools and processes which are characterized by multilevel and adaptive characteristics would aid practitioners and broaden the scope of what is possible for water governance. Research from Chapter Three presents data which is perhaps the most context-specific, therefore determining if such skill and agency by other NGO's can be applied will be important.

Two other important areas for research emerge from this work. The distributed governance model presented in Chapter Three is a direct contrast to many of the international watershed governance models that primarily focus on the creation of a watershed organization. Thus whether this model also has the potential to be implemented at other scales would serve as a valuable development for the water governance model. Lastly, the relatively new application of Social Network Analysis to governance systems creates important opportunities to challenge and further develop governance theory. Greater application of this methodology to multiple cases, and a deeper application of the analytical tools that provide insight to power, communication and resource transfer would bring greater empirical weight to the literature.

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Appendix A – Survey

Lake Simcoe Watershed Network Survey

Introduction

Thank you so much for clicking on the link!

My name is Seanna Davidson. I am a PhD student at the University of Waterloo, in the Department of Geography and Environmental Management.

This survey is for my PhD research on the governance of Lake Simcoe. I really appreciate your participation because I couldn't do my research without you.

To thank you for your time, at the end of this survey you can check the raffle box, which will enter your email into a raffle for **10 cash prizes of $50. There is a 1 in 10** chance of winning!

Below you'll see information regarding the overall purpose of the research, information regarding the ethics approval, and contact information. Once you accept the terms you'll be able to begin the survey.

If you answer all the questions, the survey can take up to 30 mins to complete. On each page you have the option of saving your work and returning later.

Thanks again!

1. Would you like to read more on the purpose of my research, or jump right into the survey? *

Yes, I'd like more details first
No, I'm ready to get started

My research focuses on water governance in the Lake Simcoe watershed. I have four specific goals:

• Identify the people who have been involved in water governance in the watershed from the early 1990's up to now

• Determine how these people have been involved, and the degree to which they have worked collaboratively

• Evaluate how peoples' activities have influenced, or have been affected by local, regional and provincial water governance activities

• Uncover lessons regarding water governance that may be relevant in other places facing the kinds of challenges that exist in the Lake Simcoe watershed.

The survey will ask you to comment on your perception of governance, as well as your interaction with other organizations and individuals who have participated in Lake Simcoe water governance efforts.

Your participation in my study is completely voluntary. I will note your name, professional affiliation and any voluntary organizations with which you participate. Additionally, your responses will be known to me, and will be included in my PhD thesis research.

You may decide to withdraw from this study at any time simply by letting me know. You can also decline to answer any of the questions. Names and affiliations will only be used with permission; if you indicate that you would like to remain anonymous, then all information you provide will be considered confidential.

The data from this survey will be stored on a secure server on a password protected computer for one year and then erased. Only authorized researchers will have access to the information collected. There are no known or anticipated risks to you as a participant in this study. I will send you an executive summary of the research results once my research has been completed.

If you have any questions regarding this study, or would like additional information to assist you in reaching a decision about participation, please contact me, by email at s4davids@uwaterloo.ca. You can also contact my advisor Dr. Rob de Loë, at 519-888-4567 ext. 38648 or by email (rdeloe@uwaterloo.ca).

At the end of the survey you will have the opportunity to be entered into a draw for a cash prize of $50, with a 1 in 10 chance of winning. If you do wish not to answer some of the questions, then simply proceed to the last page where you can enter your details to be included in the draw. Winners will be notified by email once the survey has closed. The amount received is taxable. It is your responsibility to report this amount for income tax purposes

This study has been reviewed and received ethics clearance through the Office of Research Ethics at the University of Waterloo. If you have any comments or concerns resulting from your participation in this study, please contact Dr. Susan Sykes, Director, Office of Research Ethics at 519-888-4567 ext. 36005 or by email at ssykes@uwaterloo.ca.

2. Please indicate whether you will participate in the study.
*

- ○ Yes, I have read and understood the statements above and agree to participate in this study.
- ○ No, I do not wish to participate in this study.

Governance in the Lake Simcoe Watershed

This section focuses on capturing your experiences and participation in governance processes in the Lake Simcoe watershed. Environmental governance can be defined as "**the processes and institutions through which societies make decisions that affect the environment**." Let this definition be your guide as you respond to the questions that follow.

Over the course of time, numerous processes, programs and activities have taken place in the Lake Simcoe watershed. The following questions do not refer to specific processes, programs or activities. Rather they are referring to your generalized perspective on governance in the Lake Simcoe watershed. When responding please consider your experiences in totality and use these generalized perspectives to respond to the questions below.

3. Please indicate the year that you became engaged in Lake Simcoe watershed issues. If you participated both professionally and personally, please use the earliest date.

4. **At the time** you became involved in Lake Simcoe watershed issues, to what extent would you say the following principles were present as they pertained to governance activities in the Lake Simcoe watershed?

	No Opinion	Poor	Fair	Good	Excellent
Open and transparent	○	○	○	○	○
Inclusive ie. a variety of actors participated, diverse issues are discussed	○	○	○	○	○
Communicative ie. information was not only accessible but advertised	○	○	○	○	○
Integrative ie. sought to consider water issues holistically	○	○	○	○	○
Equitable and ethical	○	○	○	○	○
Accountable	○	○	○	○	○
Efficient	○	○	○	○	○
Sustainable	○	○	○	○	○

5. **Currently**, what is your perception of the following principles as they pertain to governance in the Lake Simcoe watershed?

	No Opinion	Poor	Fair	Good	Excellent
Open and transparent	○	○	○	○	○
Inclusive ie. a variety of actors participated, diverse issues are discussed	○	○	○	○	○
Communicative ie information was not only accessible but advertised	○	○	○	○	○
Integrative ie sought to consider water issues holistically	○	○	○	○	○
Equitable and ethical	○	○	○	○	○
Accountable	○	○	○	○	○
Efficient	○	○	○	○	○
Sustainable	○	○	○	○	○

6. Please rate the following groups based on your opinion of how effectively engaged they were in the governance of the Lake Simcoe watershed **BEFORE** you became involved in Lake Simcoe watershed issues.

	No Opinion	Poor	Fair	Good	Excellent
General Public	○	○	○	○	○
Not-for-profit groups	○	○	○	○	○
Conservation Authority	○	○	○	○	○
First Nations	○	○	○	○	○
Researchers	○	○	○	○	○
Municipal government	○	○	○	○	○
Provincial government	○	○	○	○	○
Federal government	○	○	○	○	○
Developers	○	○	○	○	○

7. Please rate the following groups based on your opinion of how effectively engaged they **CURRENTLY** are in the governance of the Lake Simcoe watershed.

	No Opinion	Poor	Fair	Good	Excellent
General Public	○	○	○	○	○
Not-for-profit Groups	○	○	○	○	○
Conservation Authority	○	○	○	○	○
First Nations	○	○	○	○	○
Researchers	○	○	○	○	○
Municipal government	○	○	○	○	○
Provincial government	○	○	○	○	○
Federal government	○	○	○	○	○
Developers	○	○	○	○	○

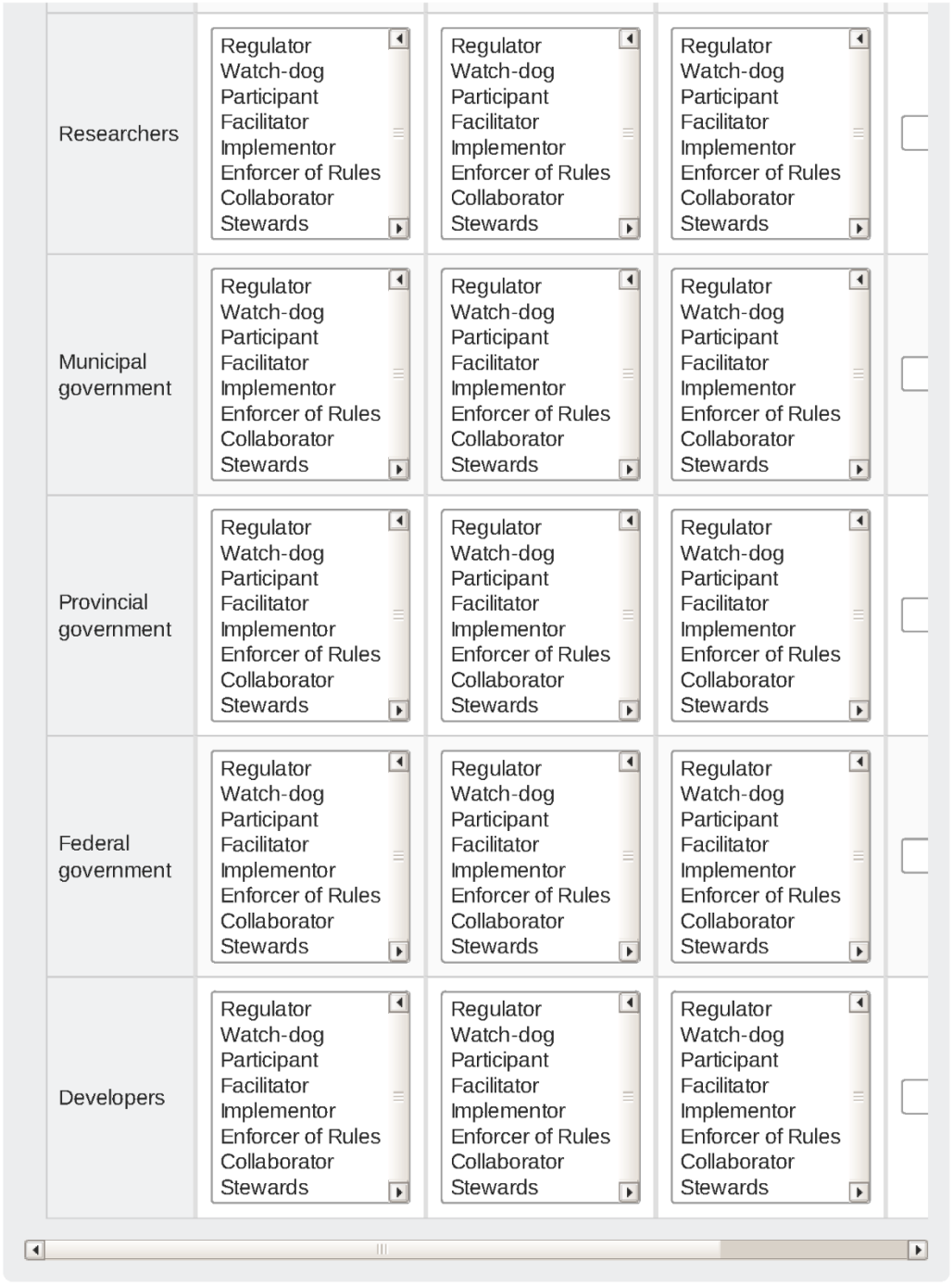
8. To what degree has your appreciation of the role of the following groups in the governance of the Lake Simcoe watershed changed as a result of your engagement in Lake Simcoe watershed issues?

	Worse	Same	Better
General Public	○	○	○
Not-for-profit groups	○	○	○
Conservation Authority	○	○	○
First Nations	○	○	○
Researchers	○	○	○
Municipal government	○	○	○
Provincial government	○	○	○
Federal government	○	○	○
Developers	○	○	○

9. In your opinion, what would you say is the role of the following groups in the governance of the Lake Simcoe watershed?

- Pick a primary role for each group.
- If you feel the group has an additional role, use the second and third colomn to identify this role.
- If there is a role not listed, use the final column to include a role

	Primary Role	Additional Role	Additional Role	Ac
General Public	Regulator Watch-dog Participant Facilitator Implementor Enforcer of Rules Collaborator Stewards	Regulator Watch-dog Participant Facilitator Implementor Enforcer of Rules Collaborator Stewards	Regulator Watch-dog Participant Facilitator Implementor Enforcer of Rules Collaborator Stewards	
Not-for-profit groups	Regulator Watch-dog Participant Facilitator Implementor Enforcer of Rules Collaborator Stewards	Regulator Watch-dog Participant Facilitator Implementor Enforcer of Rules Collaborator Stewards	Regulator Watch-dog Participant Facilitator Implementor Enforcer of Rules Collaborator Stewards	
Conservation Authority	Regulator Watch-dog Participant Facilitator Implementor Enforcer of Rules Collaborator Stewards	Regulator Watch-dog Participant Facilitator Implementor Enforcer of Rules Collaborator Stewards	Regulator Watch-dog Participant Facilitator Implementor Enforcer of Rules Collaborator Stewards	
First Nations	Regulator Watch-dog Participant Facilitator Implementor Enforcer of Rules Collaborator Stewards	Regulator Watch-dog Participant Facilitator Implementor Enforcer of Rules Collaborator Stewards	Regulator Watch-dog Participant Facilitator Implementor Enforcer of Rules Collaborator Stewards	


Researchers
Municipal government
Provincial government
Federal government
Developers
Regulator
Watch-dog
Participant
Facilitator
Implementor
Enforcer of Rules
Collaborator
Stewards

10. Has the governance of the Lake Simcoe watershed improved since 2006?

- Governance is defined as, "**the processes and institutions through which societies make decisions that affect the environment**."

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

Lake Simcoe Network

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11. Indicate your engagement with, and preference for the following actors regarding Lake Simcoe watershed issues.

- Please refer to **recent (2006 to current)** engagement
- You may choose more than one option for each person
- **Formal capacity** suggests that you interact as a result of professional activities
- **Informal capacity** suggests that you would call, email or meet out of personal interest or concern

This is the only page like this. The following pages are significantly shorter!

- **You only need to respond for the people you know, everyone else you can leave blank**

This information is critical to the research, please take the time to fill out this section.

	Discuss Lake Simcoe watershed issues in a formal capacity	Discuss Lake Simcoe watershed issues in an informal capacity	You would voluntarily collaborate with on Lake Simcoe watershed issues
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐

	capacity	an informal capacity	Simcoe watershed issues
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐

12. Who is not listed here that you...

- Please respond regarding your **recent (2006 to current)** engagement with actors in the Lake Simcoe watershed
- You may submit up to five additional names

	Other	Other	Other	Other	Other
Discuss Lake Simcoe watershed issues with in a formal capacity?					
Discuss Lake Simcoe watershed issues with in an informal capacity?					
You would like to collaborate with on Lake Simcoe watershed issues					

Survey Break

You're just about half way through! Only a few more pages to go.

From http://www.treehugger.com/files/2009/08/lake-simcoe-environment.php

Lake Simcoe Network

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13. Identify the organizations that...

- Please answer the following set of questions regarding your interactions with organizations on Lake Simcoe watershed issues.
- **Resources** refers to any of the following: financial, human or data
- You can click more than one response for each actor

	Provide you with resources	You share resources with	You have you collaborated with on more than one project?
Rescue Lake Simcoe Coalition	☐	☐	☐
Environmental Defense	☐	☐	☐
Ladies of the Lake	☐	☐	☐
Windfall Ecology Centre	☐	☐	☐
Georgina Island First Nations	☐	☐	☐
Innisfil District Association	☐	☐	☐
BILD	☐	☐	☐
Lake Simcoe Region Conservation Authority	☐	☐	☐
Ministry of Environment	☐	☐	☐
Ministry of Agriculture, Food and Rural Affairs	☐	☐	☐
Ministry of Municipal Affairs and Housing	☐	☐	☐
Department of Fisheries and Oceans	☐	☐	☐
York Region	☐	☐	☐
Durham Region	☐	☐	☐
Simcoe County	☐	☐	☐
	Provide you with resources	You share resources with	You have you collaborated with on more than one project?
City of Barrie	☐	☐	☐
City of Orillia	☐	☐	☐

City of Kawartha Lakes	☐	☐	☐
Town of Newmarket	☐	☐	☐
Town of Bradford West Gwillimbury	☐	☐	☐
Town of East Gwillimbury	☐	☐	☐
Town of Georgina	☐	☐	☐
Town of Aurora	☐	☐	☐
Town of Innisfil	☐	☐	☐
Town of Whitchurch-Stouffville	☐	☐	☐
Township of Oro-Medonte	☐	☐	☐
Township of Ramara	☐	☐	☐
Township of Brock	☐	☐	☐
Township of Uxbridge	☐	☐	☐
Township of King	☐	☐	☐

14. Identify additional organizations not listed above that...

- Please only list organizations regarding your work in the Lake Simcoe watershed.

	Other	Other	Other	Other	Other
Provide you with resources					
You share resources with					
You collaborated with on one or more projects					

Lake Simcoe Network

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15. To what extent did the following factors influence your decision to participate in Lake Simcoe watershed issues?

- If you participate in Lake Simcoe watershed issues as a result of your professional position, please respond to the questions regarding the opinion of your organization.

	No influence	Very little influence	Some influence	Significant influence	Primary influence
Challenges in the Lake Simcoe watershed were too complex to be handled by one organization	○	○	○	○	○
The future of the watershed was in jeopardy	○	○	○	○	○
The solution can only be created by the engagement of a diverse range of people and organizations	○	○	○	○	○
There was an opportunity to develop a shared, united vision for the watershed	○	○	○	○	○

16. Are there other factors that influenced your decision to participate in Lake Simcoe watershed issues?

17. Please rate the presence of the following concepts for the governance activities that you participated in regarding Lake Simcoe watershed issues?

	No Opinion	Poor	Fair	Good	Excellent
Shared interest in problem solving	○	○	○	○	○
Collaboration ie. multiple actors worked together for a common goal	○	○	○	○	○
Identification of innovative solutions	○	○	○	○	○
Knowledge sharing	○	○	○	○	○
Collective learning ie. was there learning that took place while in a group?	○	○	○	○	○
Negotiation	○	○	○	○	○
Establishment of collective norms ie. shared expectations for process and interactions were created together	○	○	○	○	○
Reciprocity ie. mutual exchange of support or resources	○	○	○	○	○
Transparency ie. a level of openness and accountability	○	○	○	○	○
Participatory decision making ie. a diversity of actors were involved in forming decisions	○	○	○	○	○

18. Are there other principles that were present that are not listed?

- You can list multiple responses by separating them with a comma.

Demographics

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19. Please check the option that best describes where you live

- On the shore of Lake Simcoe
- In a city on the shore of Lake Simcoe
- In the Lake Simcoe watershed but away from the Lake
- Outside of the Lake Simcoe watershed

20. Do you have a recreational property?

- on the shore of Lake Simcoe
- in the Lake Simcoe watershed
- outside of the Lake Simcoe watershed
- I do not have a recreational property

21. What is your current type of employment?

- Student
- Young Professional
- Mid Career Professional
- Established Professional
- Retired
- Other

If other, please explain

22. What profession are you in?

- Provincial government
- Municipal government
- Federal government
- Not-for-profit sector
- Marketing and Communications
- Facilitation
- Environmental consulting
- Developer
- Other

If other, please explain

23. On average, how many hours a week do you spend working on issues related to the Lake Simcoe watershed?

- 0
- 1-5
- 6-10
- 11-15
- 16-20
- Lake Simcoe work takes up the majority of my week

24. About how much of this time is required by your workplace or school?

- 0
- 1-5
- 6-10
- 11-15
- 16-20
- The majority of it is required for work or school

25. About how much of this time is voluntary?

0
1-5
6-10
11-15
16-20
The majority of it is voluntary

26. Please select all of the committees that you have formally participated in.

- [ ] LSEMS Steering Committee
- [ ] LSEMS Technical Committee
- [ ] LSEMS Communications Committee
- [ ] LSEMS Executive Advisory Committee
- [ ] LSEMS Citizens Advisory Committee
- [ ] Lake Simcoe One Voice Working Group
- [ ] Lake Simcoe Assimilative Capacity Steering Committee
- [ ] Lake Simcoe Stakeholder Advisory Committee (during creation of Act)
- [ ] Lake Simcoe Science Advisory Committee (during the creation of the Act)
- [ ] Lake Simcoe Coordinating Committee (current)
- [ ] Lake Simcoe Science Committee (current)
- [ ] Other

If other, please explain.
You can list multiple responses separated by a comma.

27. What is the highest level of education you've obtained?

- No certificate, diploma or degree
- High school certificate or equivalent
- Apprenticeship or trades certificate or diploma
- College or other non-university certificate or diploma
- University certificate or diploma below bachelor level
- University certificate, diploma or degree
- Graduate university degree

28. What is your age?

- under 25 years
- 25-34 years
- 35-49 years
- 50-64 years
- 65-74 years
- 75 years or over

29. What is your gender?

- Female
- Male

30. Please provide your contact information.

- This information will be used to contact you if you are a prize winner and to follow up with you regarding the research result summary.

First Name *

Last Name *

Title

Name of organization

City

Personal Email Address *

31. Would you like to be entered into the raffle for a cash prize? *

- Yes! Please enter me.
- No. I'm good thanks.

Thank You!

Appendix B - Selected Activities of NGO Actors

Date	Organization	Type of Activity
2003	RLSC	Formed
2005	RLSC	Conducted the Wave Program – promoting water safe lawn practices
	CLS	Formed
	LofL	Formed - created first calendar for fundraising 'calender girls' style around the Lake - Raised $250,000
	CLS	Lobby event next to parliament
2006	CLS	Lobby provincial MPP
	LofL, Windfall Ecology	Public Events and Report – The Naked Truth - engaged 300 members of the public in field trips around the Lake to document problems and opportunities. As a collective, combined into a report, and set of recommendations to the provincial government
	RLSC, LofL	Wave Program continues
	CLS	Lobby event next to parliament
	CLS	Works with MPP to introduce a private members bill
	Provincial Government	Introduction of private members bill – Lake Simcoe Protection Act. - Bill does not pass, but the legislature agrees to turn it into a Resolution, requiring the Provincial Government to Act
2007	LofL	Report - Whales in Lake Simcoe? - report on youth environment education in Lake Simcoe
	LSRCA	Working group formed to review new governance models - included NGO actors
	CLS	Campaign expands to include ON and RLSC
	CLS, LofL	Lake Simcoe Summit
	Provincial Government	Announces intent to create the Lake Simcoe Protection Act - announced at the Lake Simcoe Summit
	CLS	Media release - Applauding announcement of the LSPA
	CLS	Campaign gets a full time coordinator
	CLS	Begins monthly newsletter campaign
	Provincial Government	Provincial election

	LSRCA working group	Report - Towards a new governance model for LS - includes NGO actors
	CLS	Report - Top 6 Priorities for LSA
	Federal Government	Federal government creates the Lake Simcoe Clean Up Fund - Creates a citizens committee to advise on the distribution of funds. NGO actors on committee
	Provincial Government	Introduces interim phosphorus regulation
	CLS	Media Release – Supports Interim Regulation
2008	Provincial Government	Releases Lake Simcoe Strategy
	Federal Government	Announces additional funds for the Lake Simcoe Clean Up Fund
	CLS	Media Release – Welcomes Lake Simcoe Strategy
	Provincial Government	Conducts public consultation on Lake Simcoe Strategy - NGO actors engaged
	CLS	Media Release – Announce Problems with Lake Simcoe Strategy
	CLS	Report - What it Takes to Save Lake Simcoe - report endorsed by 41 NGO groups in the watershed
	Provincial Government	Introduces Bill 99 – The Lake Simcoe Protection Act
	CLS	Media Release – Applaud introduction of Act
	LofL	Second Calendar – Media Launch Event
	CLS	Canoe lake tour to take about issues
	CLS	Presentation to Standing Committee on LSPA
	Provincial Government	Passes Lake Simcoe Act
	CLS	Media Release – Celebrating Passing of Act
	Provincial Government	Lake Simcoe Stakeholder Committee established - NGO actors engaged on committee - As requested by NGO actors. Provide direct input to creation of Lake Simcoe Protection Plan
	LofL, RLSC, Windfall Ecology	Ourlakesimcoe.com launched - Website created by NGO's to track disbursement of Federal Lake Simcoe Fund
2009	Provincial Government	Releases Lake Simcoe Protection Plan (implementation strategy for Act) (LSPP)
	CLS	Media Release – Problems with LSPP
	CLS	Report - Cheers and Jeers for Draft LSPP
	CLS	Media Release – Plan Still has Issues

	CLS	Report - Plan for Success: a citizen response to the LSPP
	LofL, Windfall, LSRCA	WasteFilms – Youth Films Project - 64 youth made films about the environment in the Lake Simcoe watershed
2010	Provincial government	Public Information session on LSPP - NGOs engaged
	CLS	Media Release on Draft Strategies – what is missing
	Provincial Government	Workshops for Citizens, Planners, Municipalities on implementing LSPP - workshops for Citizens called for by NGO actors - as called for by NGO actors
	Provincial Government	Lake Simcoe Coordinating Committee established - provides advice to the minister on the progress of the implementation of the Lake Simcoe Protection Plan. NGO actors included
	LofL, Windfall, LSRCA	Re-Wilding Keswick Creek project - Youth create revitalization plan for a sub-watershed
	RLSC	Updating Strategic Plan
	LofL	Launch concept of the Ontario Water Centre
	CLS	Continues newsletter on Lake Simcoe