

Exploring factors that constrain and enable sustainable transboundary water governance in the Mackenzie River Basin

by

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AUTHOR'S DECLARATION

This thesis consists of material all of which I authored or co-authored: see Statement of Contributions included in this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

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- In no case can a co-author serve as an external examiner for the thesis.

Findings from this dissertation are reported in three co-authored manuscripts (Chapters Two, Three and Four). These chapters have been prepared for submission to refereed journals. Only Chapter Two has been submitted for publication.

I testify that I am the primary author of the manuscripts in my dissertation, and that the work was dominated by my intellectual efforts.



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Co-authorship for R.C. de Loë (Advisor) was determined based on meeting the following criteria:

- Substantial contributions to the conception and design of the work, and to interpretation of data;
- Contributing to editing and revising the work critically for important intellectual content;
- Final approval of the versions of the chapters that will be published as refereed journal articles;
- Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

I testify that Michelle Morris is the primary author of the manuscripts in this dissertation, that the work was dominated by her intellectual efforts, and that I have met the four tests outlined above.



Rob C. de Loë (Advisor)

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ABSTRACT

Governance of transboundary water systems is complicated by factors such as institutional fragmentation, social and environmental change, competing values for and uses of water and power dynamics. These challenges exist in both international and federal transboundary contexts, although much of the scholarly attention has been on international transboundary watersheds. Sustainable transboundary water governance is an important goal given the fact that freshwater ecosystems are among the most rapidly degrading in the world. Governance, the ways in which decisions are made and implemented, can have a critical role to enable sustainability in transboundary watersheds. Many analyses of transboundary water systems provide only partial accounts of transboundary water governance because they focus primarily on the roles of governments and interjurisdictional institutions. Furthermore, analyses of federal transboundary water systems have not satisfactorily considered the role of power dynamics as possible constraints on transboundary water governance. Appreciation of the full complexity of transboundary water governance, and factors that constrain and enable sustainable transboundary water governance, requires considering governance processes at multiple levels and the variety of actors that may be involved therein. A power-analysis can facilitate consideration of which interests are advantaged in various governance processes that have implications for sustainable transboundary water governance.

The purpose of this study is to explore factors that constrain and enable sustainable transboundary water governance in a federal transboundary water system. Explicitly assessing multi-level governance processes, and the ways in which power dynamics impact them, facilitates a consideration of their roles and contribution to transboundary water governance. This study's purpose is achieved via the following objectives: 1) identify the jurisdictional levels at which federal transboundary water governance takes place in the Mackenzie River Basin, (MRB), Canada; 2) consider the design and performance of an interjurisdictional river basin organization (RBO) in the MRB; 3) determine the ways in which power dynamics impact a) collaboration and b) water use decisions within jurisdictions in the MRB; and 4) assess the role and contribution of a) an RBO, b) collaboration and c) water use decisions within jurisdictions to transboundary water governance within the MRB. Single and multiple case studies and qualitative data collection and analysis methods were used to achieve these objectives. Two hundred and ninety-six documents, 30 interviews and personal observations were collected and analyzed to achieve the study objectives.

The MRB, a jurisdictionally and ecologically complex federal transboundary system in which three provinces, three territories, a federal government and Indigenous governments have responsibilities for water, provided an excellent empirical context in which to explore these issues. Upstream hydroelectric developments and oil sands mining have emerged as key transboundary concerns in this basin. The multiple perspectives, values, interests and power dynamics among key actors in the basin challenge governance that contributes to sustainability. Furthermore, as a basin that at 1.8 million km² that drains approximately 20% of Canada's land mass, a multi-level governance design is essential to achieving coordination and inclusion required to enable sustainable transboundary water governance. In fact, a number of multi-level governance initiatives, including an interjurisdictional water management institution, collaborations at various levels and major water use decisions, exist within and among jurisdictions in the basin. They are included as case studies in this dissertation.

By considering multi-level governance processes and the ways in which power dynamics impact federal transboundary water systems, this study makes two major contributions to the transboundary water governance literature. First, it demonstrates the need to consider large

transboundary water systems as systems of multi-level governance. Considering the ways in which governance processes at multiple levels interact may be key to identifying factors that constrain and enable sustainable transboundary water governance. Second, by undertaking a power analysis of a federal transboundary water context this study directly challenges assumptions in the literature that the presence of a central government or well-developed regulations within federal jurisdictions can temper federal water conflicts. This study's assessment of the design and performance of an interjurisdictional institution, the ways in which power dynamics impact collaboration and water use decisions and consideration of the roles and contributions of multi-level governance processes in a federal transboundary water governance context provide empirical contributions to the transboundary water governance literature. The assessment of how power impacts collaboration in transboundary contexts adds a theoretical and empirical contribution to the collaborative governance literature.

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LIST OF ABBREVIATIONS

ACFN	– Athabasca Chipewyan First Nation
BCUC	– British Columbia Utilities Commission
BMC	– Bilateral Management Committee
CEMA	– Cumulative Environmental Management Association
EA	– Environmental assessment
ENGO	– Environmental non-governmental organization
Framework	– Surface Water Quantity Framework for the Lower Athabasca Region
GDP	– Gross Domestic Product
IAD	– Institutional Analysis and Development
JRP	– Joint Review Panel
Master Agreement	– 1997 Mackenzie River Basin Transboundary Waters Master Agreement
MCFN	– Mikisew Cree First Nation
MRBB	– Mackenzie River Basin Board
MRBC	– Mackenzie River Basin Committee
MRB	– Mackenzie River Basin
NWT	– Northwest Territories
P2FC	– Phase 2 Framework Committee
PAD	– Peace-Athabasca Delta
PADEMP	– Peace-Athabasca Delta Ecological Monitoring Program
RBO	– River Basin Organization
SRDP	– Slave River and Delta Partnership
UNESCO	– United Nations Educational, Scientific and Cultural Organization

Chapter One

Introduction

1.1 Research context and problem rationale

Freshwater ecosystems are among the most rapidly degrading in the world (Millennium Ecosystem Assessment 2005; Vörösmarty, *et al.* 2010), making sustainable water governance, which supports human well-being and ecosystem integrity, a pressing practical problem. Water crises related to pollution and overuse often stem from problems of governance, such as fragmentation or sector-specific valuation of water (Pahl-Wostl, *et al.* 2012). Governance, which involves decision-making and taking action in a range of activities such as monitoring, planning, coordinating and policy development and implementation, has an integral role to encourage sustainability (Newell 2012). Although there is no universal blueprint to achieve sustainable water governance, criteria such as transparency, inclusiveness, integration, adaptiveness and fairness can be used to measure progress toward sustainability (Lockwood, *et al.* 2010).

In transboundary water systems, where watersheds are intersected by international and/or federal political boundaries, achieving sustainability can be made difficult by institutional fragmentation, competing values for and uses of water, sovereignty, social and environmental change and power dynamics (Armitage, *et al.* 2015). Furthermore, transboundary water governance can be complicated by multi-level governance processes that involve a range of governmental and non-governmental actors at various levels (e.g., local, regional, basin-wide) in different kinds of governance activities (e.g., local monitoring, regional land use planning, policy development, intergovernmental agreements) (Cosens 2010; Dore and Lebel 2010; Suhardiman and Giordano 2014). These kinds of challenges exist for both international and federal transboundary systems (Burchi 2008; Delli Priscoli and Wolf 2009; Garrick, *et al.* 2014).

Much of the transboundary water governance literature focuses on international transboundary water systems, but there are over 300 watersheds around the world intersected by federal borders that provide rich empirical contexts for research (Garrick, *et al.* 2013). Federal countries, defined by the division of powers between elected and relatively autonomous central and sub-federal governments (Anderson 2008), can also be challenged to achieve sustainable transboundary water governance. Research and analysis that can provide insights on the factors that constrain and enable governance that contributes to sustainability in federal transboundary

water systems can help to address the problem of increasing water degradation. This research, by investigating a federal transboundary water context, is a step in that direction.

Understanding factors that constrain and enable sustainable transboundary water governance requires consideration of the multiple levels at which governance processes involving monitoring, planning, coordinating and decision-making occur. Multi-level governance includes federal political systems, in which authority is distributed among general purpose, territorially-based levels of government, as well as governance arrangements that involve governmental and non-governmental actors at various levels (Hooghe and Marks 2003). The latter kind of multi-level governance reflects the proliferation of multi-actor environmental governance arrangements across scales and levels (Andonova and Mitchell 2010; Newell, *et al.* 2012). Transboundary water governance takes place across scales and levels, and may involve a variety of governmental and non-governmental actors (Akamani and Wilson 2011; Cosens 2010; Dore and Lebel 2010; Zawahri and Hensengerth 2012). Scale is the “spatial, temporal, quantitative, or analytical dimensions used to measure and study any phenomenon” whereas level refers to “the units of analysis that are located at different positions on a scale” (Cash, *et al.* 2006). The geographic scale is often paramount in water governance. The river basin, which can be segmented into sub-basin levels, often is considered the desirable scale at which to coordinate transboundary water governance (Cooley and Gleick 2011; Grey and Sadoff 2003; Kliot, *et al.* 2001). However, the jurisdictional scale – which refers to how authority to make environmental governance decisions is distributed – is also pertinent. Interjurisdictional agreements and institutions, resource management decisions made by different levels of government, as well as multi-actor environmental governance arrangements (Weibust 2014a), are governance activities at different jurisdictional levels that can impact federal transboundary water governance.

An emerging literature acknowledges that governance takes place in transboundary water systems at multiple levels (Suhardiman and Giordano 2012), and this characteristic can enable adaptiveness in transboundary water systems (Green, *et al.* 2013; Raadgever, *et al.* 2008), which is a key component of sustainable transboundary water governance. However, much of the extant transboundary water governance literature focuses on one level in particular: the interjurisdictional. The transboundary water governance literature also tends to focus on the role of governments specifically (Akamani and Wilson 2011; Norman and Bakker 2008). There is a large body of scholarship that assesses interjurisdictional agreements and institutions. Within this research, river basin organizations (RBOs), interjurisdictional institutions that coordinate governance at the scale of the river basin, are considered key contributors to adaptive

transboundary water governance (Cooley and Gleick 2011; De Stefano, *et al.* 2012; Green, *et al.* 2013). However, RBOs throughout the world vary significantly in terms of form and functions (Huiteima and Meijerink 2014), which makes it necessary to assess, in detail, their actual designs and performance. Assessing their performance may also require considering the ways in which interjurisdictional arrangements such as RBOs coexist with other multi-level governance arrangements. For example, governance arrangements in transboundary systems may include collaborative forms of governance, which emphasize resource sharing, learning and problem solving among interdependent government and non-governmental actors (Gray 1989; Holley, *et al.* 2012) at various levels. In transboundary systems, collaborative forms of governance may also contribute to adaptiveness and problem solving among actors with different interests and perspectives (Birdsong 2008; Raadgever, *et al.* 2008).

Research that focuses solely on one level of governance, such as interjurisdictional institutions, provides only a partial account of transboundary water governance. Understanding the roles and functions of multi-level governance arrangements may be critical to illuminating the factors that constrain and enable sustainable transboundary water governance. Undertaking such an analysis requires in-depth investigations of the roles (e.g., coordinating, policy-making, information generation, resource use decisions) of interjurisdictional arrangements between and among governments, and the governance processes (e.g., community based monitoring, intergovernmental partnerships, intergovernmental agreements, resource use decisions) that occur at local and regional levels, such as collaboration or decision-making that takes place within jurisdictions in a transboundary system.

The extent to which governance contributes to sustainability is often related to existing power dynamics (Newell 2012). Power, defined as the ability to create or prevent change (Sayer 2012), or more generally as the ability to achieve preferable outcomes (Lukes 2005) can be distributed inequitably in transboundary basins (Zeitoun and Warner 2006). Power dynamics have been identified as crucial considerations for understanding transboundary water interactions at the international level (Zeitoun, *et al.* 2011), but there has been relatively little attention given to the role of power in federal transboundary water systems. Furthermore, much of the power-concerned research neglects to consider the roles of non-governmental actors or governance processes beyond interjurisdictional level interactions (Lopes 2012).

In federal countries where the responsibility for water is highly decentralized, sub-federal governments may be as protective of their autonomy to make resource management decisions as countries in the international context (Delli Priscoli and Wolf 2009). Factors such as

jurisdictional autonomy, unequal populations, asymmetries in financial and technical resources and upstream-downstream dynamics, can complicate achieving sustainability in federal transboundary water systems, as they do in the international context. Consider conflicts between sub-federal governments in India regarding hydropower development (Iyer 2013), or water allocation conflicts between states in the United States and Australia (Bhat 2009; Draper 2007; Weibust 2014b). These examples suggest that power dynamics also are at play in federal transboundary water systems. Important contextual differences exist between international and federal transboundary water systems. However, acknowledging that there are differences does not imply that federal systems are not prone to challenges that emerge because power dynamics, such as differences in the capacities to prevail in decisions, determine decision-making agendas or construct/impose dominant ideas among actors involved in federal transboundary water governance.

The fact that much of the power-concerned transboundary water governance literature tends to focus on interjurisdictional level interactions is also problematic from a perspective that views multi-level governance processes as important in transboundary water systems (Warner and Zawahri 2012). Governments are not monolithic entities, and there is no guarantee that a central government will intervene to resolve sub-federal disputes in federal transboundary water systems even when it possesses the authority to do so (Saunders 2014). Federal transboundary water contexts are inherently multi-level systems (Weibust 2014a). Sub-federal governments may enter into interjurisdictional agreements but retain significant political authority for waters that flow within their borders. Sub-federal governments may transfer responsibilities to or be involved in local and regional governance initiatives with non-governmental actors, such as collaboration, that can potentially impact transboundary water governance outcomes. However, power dynamics, such as the ability to set the agenda or have ultimate authority over policy decisions, may constrain the contributions collaboration can make in transboundary contexts, as has been shown in other contexts (Brisbois and de Loë 2016; Cook 2015). A power-based analysis can help to reveal who prevails, who sets the agenda and which actors benefit from underlying ideas in multi-level governance processes in transboundary systems. Such an analysis can facilitate a consideration of the role of multi-level governance processes in transboundary water governance by highlighting the outcomes they achieve, and interests advantaged in governance processes and outcomes. Insight derived from such analysis can assist in assessing the extent to which governance contributes to sustainability.

1.2 Research objectives

Understanding how power dynamics impact federal transboundary water governance can provide critical empirical and theoretical insight that may help to illuminate a path toward sustainability in federal transboundary water systems. Assessing the roles and contributions of governance activities can provide a more comprehensive consideration of federal transboundary water governance. Such research can also make substantive contributions to the literature, which has tended to focus on interjurisdictional interactions and international transboundary water governance contexts. In light of the above, the purpose of my research is to assess factors that constrain and enable sustainable transboundary water governance. A power analysis is useful for identifying factors that constrain sustainability and the roles that various governance processes play in transboundary water systems. My research purpose is achieved by fulfilling the following objectives.

1. Identify the jurisdictional levels at which federal transboundary water governance takes place in the Mackenzie River Basin (MRB), Canada.
2. Consider the design and performance of an interjurisdictional RBO, the Mackenzie River Basin Board (MRBB), in the MRB.
3. Determine the ways in which first-, second- and third-dimensional power dynamics, according to Lukes (2005), impact a) collaboration and b) water use decisions within jurisdictions in the MRB.
4. Consider the role and contribution of a) the MRBB, b) collaboration and c) water use decisions within jurisdictions to sustainable transboundary water governance in the MRB.

These objectives, and the overall research purpose, are accomplished using transboundary water governance in the Mackenzie River Basin (MRB), Canada, as an empirical setting. The MRB is a large, transboundary basin in northwestern Canada. It is both jurisdictionally and ecologically complex. Three provinces, three territories, a federal government and Indigenous peoples have jurisdiction for water in the basin, which contains some of the last remaining relatively pristine wilderness on the North American continent (Rosenberg International Forum on Water Policy 2013). However, the basin also hosts some of the largest resource development projects currently underway in Canada. More detailed information about this context is developed in section 1.4.

Through completing these objectives, this research makes substantive theoretical and empirical contributions to the transboundary water governance literature and collaborative

environmental governance literatures. Importantly, the research objectives build upon and speak to one another. Linkages among research objectives, their individual and cross-cutting contributions, and chapters of this dissertation that address each objective, are summarized in Table 1.1 and detailed below.

Addressing Objective 1 resulted in a focus on an interjurisdictional RBO, collaboration and water use decisions as empirical foci to achieve Objectives 2, 3 and 4. Achieving Objective 2 with respect to an interjurisdictional RBO reinforced the need to consider governance processes at multiple levels and the ways in which power dynamics may impact those processes, as identified in Objective 3. The assessment of the design and performance of an interjurisdictional institution and the ways in which power dynamics impact collaboration and water use decisions facilitated a consideration of the roles and contribution of these governance processes to transboundary water governance in an empirical context.

Achieving Objective 2 addresses a gap in the transboundary water governance literature regarding the actual design and performance of RBOs based on a detailed assessment of an empirical case. Much of the transboundary water governance literature identifies RBOs as key enablers of adaptive transboundary water governance (Cooley and Gleick 2011; De Stefano, *et al.* 2012). However, the actual design and performance of RBOs can vary significantly (Huitema and Meijerink 2014), making in-depth case studies helpful to determining the extent to which they contribute to adaptive and sustainable transboundary water governance.

Objective 3 helps to illuminate the ways in which power dynamics related to prevailing in decisions, determining agendas and benefiting from underlying ideas impact federal transboundary water governance in general, and simultaneously reveals specific governance processes that take place within federations. Power dynamics are key considerations for international transboundary water governance, but existing scholarship tends to focus on the interjurisdictional level and interactions between countries (Lopes 2012). Furthermore, less is known about how inequalities in the ability to achieve preferable outcomes among governance actors impact federal transboundary water governance. However, based on existing controversies about federal transboundary water governance related to pollution, over-abstraction and fragmentation, it is clear that power politics may be a constraint on governance that contributes to sustainability. Objective 3 a) facilitates a theoretical and empirical contribution to the collaborative environmental governance literature, which has tended to avoid detailed power-based analyses (Brisbois and de Loë 2015). It also requires considering the role of collaboration

Table 1.1: Research objectives, corresponding chapters & outcomes

Research objectives	Chapter(s)	Objective-specific outcomes	Cross-cutting outcomes
1: Identify the jurisdictional levels at which federal transboundary water governance takes place in an empirical context.	Two Three Four	Identification of a) an interjurisdictional river basin organization b) collaboration and c) water use decisions as case studies for analysis.	Identification and consideration of multi-level governance processes pertinent to federal transboundary water governance. An assessment of the ways in which multi-level governance processes constrain and enable sustainable transboundary water governance in a federal transboundary water system.
2: Consider the design and performance of an interjurisdictional river basin organization in a federal transboundary context.	Two	Detailed assessment of the design and performance of an existing river basin organization. Confirmation of the need to consider how power dynamics impact multi-level governance processes as detailed in Objectives 3 and 4.	
3: Determine the ways in which power dynamics impact a) collaboration and b) water use decisions within jurisdictions.	Three	3a) Assessment of the ways in which power dynamics impact collaboration, which reinforced the need to consider how power dynamics impact major water use decisions within jurisdictions. 3a) Consideration of how power impacts collaboration in transboundary contexts. Application of a power analysis framework to a federal transboundary water governance context.	
	Four	3b) Power analysis of major water use decisions internal to jurisdictions in transboundary water systems. Application of a power analysis framework to a federal transboundary water governance context.	
4: Consider the role and contribution of a) a river basin organization, b) collaboration and c) water use decisions within jurisdictions to transboundary water governance within federations.	Two Three Four	Assessment of the ways in which multi-level governance processes constrain and enable sustainable transboundary water governance in a federal context.	

in federal transboundary basins, which can provide necessary empirical insight to the transboundary water governance literature concerned with adaptiveness and collaboration in transboundary contexts. Objective 3 b) allows for a consideration of the ways in which power dynamics within jurisdictions can impact transboundary water governance outcomes in federations. This contributes to a growing literature that considers multi-level governance processes pertinent to transboundary water governance (Suhardiman and Giordano 2014; Warner and Zawahri 2012). The power-analysis framework used to guide analysis to achieve Objective 3 provides a theoretical contribution to the collaboration and federal transboundary water governance literatures. It provides a simple, but rigorous approach to assessing more and less obvious manifestations of power in these contexts.

Achieving Objectives 2 and 3 involved considering the design and performance of an interjurisdictional institution and the ways in which power dynamics impact several multi-level governance processes in a federal transboundary water system. Undertaking these analyses involved assessing the roles and contributions of the various multi-level governance processes to transboundary water governance. These assessments, undertaken in Chapters Two, Three and Four, address Objective 4 and the broader purpose of this study – to understand factors that constrain or enable sustainable transboundary water governance in federations.

Many scholars working on transboundary water issues have noted that additional nuance is required in analyses of transboundary water governance and this can be achieved by considering governance processes across scales and levels (Dore and Lebel 2010; Suhardiman and Giordano 2012; Warner and Zawahri 2012). By considering multiple levels of governance, and factors that constrain and enable sustainable transboundary water governance, this research is able to offer a practical contribution to governance that contributes to sustainability in transboundary systems in general and transboundary water governance in Canada's MRB specifically. This research points to the important role of water use decisions made within upstream jurisdictions as constraints on sustainable transboundary water governance. Furthermore, despite the presence of a diversity of governmental and non-governmental actors in multi-level governance arrangements in transboundary water systems, governments remain dominant, powerful actors. Collaborations were created in response to, but do not directly influence, major water use decisions about development upstream. Finally, considering the design and performance of an interjurisdictional institution contextualizes its role. In the MRB, the existing interjurisdictional institution, the Mackenzie River Basin Board (MRBB), has played a

relatively marginal, reactive role due to inadequate funding and the hesitance of governments to empower it to play a strong role in the basin.

This dissertation is presented in manuscript-style. Each of Chapters Two, Three and Four are interrelated but stand alone as manuscripts intended for publication in academic journals (see section 1.6). Chapters Two, Three and Four are guided by research questions, literature, theoretical grounding, methods, analysis and conclusions that are specific to each chapter. The purpose of this introductory chapter is to provide a rationale for considering these chapters as an overall conceptual whole, grounded in the study objectives, literature review and global methodology that informed this study. Additional contextual information helps to support the contention that these chapters can be viewed collectively. The remainder of this chapter reviews the literature related to transboundary water governance, collaboration, theories of power and sustainability used to inform this study. The empirical context in which this research is situated will be described and rationale for and execution of methods used in the course of this research will be presented. The final section maps out the remainder of this dissertation.

1.3 Literature review

This section presents several key arguments related to the transboundary water governance, collaborative environmental governance, theories of power and sustainability literatures that informed this study. The following section argues that appreciating the full complexity of federal transboundary water governance requires considering multi-level governance processes. Governance at local, regional and basin-wide levels can potentially impact transboundary water governance outcomes. Multi-level governance processes are especially important to consider as factors that may constrain and enable sustainable transboundary water governance. For instance, an emerging theme in some of the transboundary water governance literature is the identification of collaboration, which emphasizes inclusion, learning, data sharing and problem-solving, as a possible promising approach to governance in transboundary water systems. Although power is a central consideration in much of the transboundary water governance literature in the international context, less is known about how power impacts federal transboundary contexts. Furthermore, the collaboration literature has tended not to include thorough and theory-based considerations of how power dynamics impact collaboration. These shortcomings raise questions about the potential role of collaboration in federal transboundary water systems. A theory-informed power analysis can help to reveal the more and less obvious interests advantaged in multi-level governance processes in federal transboundary water systems. Finally, principles of governance that contributes to sustainability can be used to inform normative assessments

regarding the ways in which power dynamics and multi-level governance processes constrain or enable sustainable transboundary water governance.

1.3.1 Transboundary water governance

Transboundary water governance refers to how decisions are made and actions undertaken regarding waters that cross or form international or federal political boundaries. This definition of governance includes the roles of government and non-governmental actors and encompasses a broad range of activities (Holley, *et al.* 2012; Pierre and Peters 2000). Governance is sometimes used to refer to situations wherein the role of government has been severely diminished, is non-existent or gives way to post-sovereign forms of political authority (Karkainen 2004). The perspective adopted in this study acknowledges that although the role of governments may be changing in many western, liberal democracies, it would be a mistake to assume that governments are not still key actors (Newell, *et al.* 2012; Pierre and Peters 2000). It is important to understand and analyse the ways in which non-governmental actors or less traditional forms of governance that include non-governmental actors (Hooghe and Marks 2003) coexist or interact with traditional governance arrangements wherein governments are perceived to dominate (Skelcher 2005).

Despite the fact that a number of actors can be engaged in a variety of governance activities that can impact transboundary waters, much of the literature on transboundary water governance focuses on one or two particular aspects of transboundary water governance – the role of governments and interjurisdictional agreements. This focus is motivated, in part, by assumptions that governments are the dominant actors in transboundary water systems (Blatter and Ingram 2000). It is also informed by a concern that sovereignty – the authority and legitimacy to make and implement rules within a given territory without external interference – can complicate transboundary water governance. The possibility that sovereignty could lead to the adoption of extreme views that a government can do whatever it wishes with resources within its territory regardless of consequences to down or upstream neighbours – referred to as the Harmon Doctrine or absolute sovereignty (McIntyre 2010) – has led to concern that conflicts over transboundary waters could incite ‘water wars’ (Eliasson 2015). In fact, overt conflicts over water occur very rarely (Wolf 1998). The dominant trend in transboundary water governance is the application of limited sovereignty wherein governments recognize mutual obligations to cooperate and consider the needs of their neighbours (McIntyre 2010). Obligations may take the form of commitments to exchange information and to notify neighbouring jurisdictions of developments in interjurisdictional water management agreements, which may also include commitments to pass

on a particular quantity and quality of water (McCaffrey 2007). Therefore, interjurisdictional agreements between governments are considered key components of transboundary water governance.

There are important contextual differences between international and federal transboundary water systems. However, because they share similar challenges, interjurisdictional water management agreements are also considered key governance tools in federations (Burchi 2008; Draper 2007; Garrick, *et al.* 2013; Muys, *et al.* 2007). Federalism has several characteristics, including the division of authority between central and sub-federal governments that are democratically elected and possess some autonomy from one another (Anderson 2008). When sub-federal governments possess the majority of authority for water, upstream-downstream asymmetries, institutional fragmentation and power dynamics may impact transboundary water interactions, as they do in the international context (Delli Priscoli and Wolf 2009). Therefore, much of the transboundary water governance literature that considers governance within federations also focuses on the role of agreements among sub-federal governments.

In recognition of the importance of interjurisdictional water management agreements, a substantial literature has been written that identifies desirable features of transboundary water management agreements (Cooley and Gleick 2011; Green, *et al.* 2013; Klot, *et al.* 2001; Muys, *et al.* 2007) and factors that encourage the negotiation of agreements (Lindemann 2008; Tir and Stinnett 2011). In addition to prescriptions for desirable features of transboundary water management agreements, scholarship assesses the actual content of international (Conca, *et al.* 2006; De Stefano, *et al.* 2012; Giordano, *et al.* 2014; Zawahri, *et al.* 2014) and federal water management agreements (Burchi 2008; Garrick, *et al.* 2013). In recent years, adaptive governance has emerged as a key desirable feature of sustainable transboundary water management agreements. Adaptive governance is desirable in recognition that water is a non-stationary resource (Milly, *et al.* 2008). Further, social and environmental change may render rigid transboundary water management agreements obsolete (Falkenmark and Jägerskog 2010) and potentially conflict-prone (Cooley and Gleick 2011). Adaptive approaches to governance conceptualize ecosystems as complex adaptive systems characterized by uncertainty, non-linearity and surprise (Folke, *et al.* 2005). In response, it is necessary to build capacity to adapt to change to avoid conflict and to maintain ecosystem integrity. Institutions that are flexible, nested and promote learning may facilitate adaptive governance (Dietz, *et al.* 2003).

In the context of transboundary water systems and institutions formed at the interjurisdictional level, RBOs are identified in much of the literature as key institutions that may

encourage adaptive transboundary water governance (Cooley and Gleick 2011; De Stefano, *et al.* 2012; Green, *et al.* 2013). RBOs, which operate at the scale of the basin, may play key roles in coordinating responses to extreme events such as floods and droughts (Cooley and Gleick 2011). They may play problem-solving roles that can help to avoid conflicts (Drieschova, *et al.* 2008). RBOs can facilitate information exchange and data sharing between jurisdictions that help to ensure well-informed policy responses (Green, *et al.* 2013) and agreement implementation and enforcement (De Stefano, *et al.* 2012; Muys, *et al.* 2007). To the extent that RBOs are linked with local and regional management institutions, they may facilitate multi-level responses to emerging environmental and social challenges that can promote adaptiveness (Akamani and Wilson 2011; Raadgever, *et al.* 2008). While they may have key roles promoting adaptiveness, it is important to acknowledge that in practice, RBOs can vary significantly in terms of their actual responsibilities, levels of funding, membership and authority (Huitema and Meijerink 2014); these factors can significantly impact the roles they assume in transboundary water governance. Therefore, assessing the extent to which RBOs actually do contribute to adaptive transboundary water governance requires assessing their actual design and performance in context. The Institutional Analysis and Development Framework (Ostrom 1986; Ostrom, *et al.* 2014) provides a framework to consider, in detail, the formal and informal rules that impact how RBOs operate that can facilitate a consideration of the actual design of RBOs. The framework is considered in section 1.5.1.

Agreements and formal institutions, such as RBOs, are undoubtedly important aspects of transboundary water governance. Agreements can create mutual obligations, expectations, norms and institutions that can promote cooperation over transboundary waters. However, an explicit focus on agreements as the primary governance mechanism in transboundary water systems can be misleading. The presence of an agreement does not guarantee beneficial cooperation or effective governance, and neither does the absence of agreement guarantee anarchy, conflict or water degradation (Warner and Zawahri 2012). Power analyses of transboundary water interactions suggest that conflict and cooperation can coexist, and that agreements can be a manifestation of either or both. Zeitoun and Warner's (2006) framework of hydro-hegemony for analyzing power in interactions over transboundary waters, which draws from Gramscian notions of hegemony and Lukes' power theory, emphasizes that developing an agreement is just one of the tactics or strategies a powerful jurisdiction may use to secure preferential outcomes. Several different sources of power can impact transboundary water interactions, including geographic position; material resources, such as financial, technical and military resources; the ability to set the agenda through bargaining or stalling negotiations or agreements; and, the ability to construct

and impose dominant ideas about how transboundary waters should be managed (Cascão and Zeitoun 2010). Power can be expressed in strategies to control water resources via allocation or the development of major water use projects despite protests from neighbouring jurisdictions, by securing preferential outcomes via agreements or by using power beneficially to develop mutually-satisfactory arrangements (Zeitoun, *et al.* 2011; Zeitoun and Warner 2006). The scholarship on power focuses on the international context and conflict-prone regions in the Middle East and North Africa in particular. It is also concerned mainly with the role of governments (Lopes 2012), as is the transboundary water governance literature in general (Akamani and Wilson 2011; Blatter and Ingram 2000). Neglected in the power-concerned literature are the roles of non-governmental actors and governance processes that occur at multiple levels, including federal water systems.

Federal water systems are neglected in this literature, because Zeitoun *et al.* (2011, 164) suggest contextual differences between international and federal conflicts mean that

an inter-state conflict in the rough-and-tumble world of the Middle East cannot be understood and addressed in the same way that a water conflict in the European Union is, nor can it be readily compared to a sub-national water conflict.

They suggest that the presence of a central government that can intervene in sub-federal water disputes, the existence of well-developed regulations within federations and a federal government's monopoly on the legitimate means of military violence, make federal contexts significantly different from their international counterparts. However, the significance of these differences may not apply equally to all of the world's 28 federations (Anderson 2008). There is a high degree of variability in terms of the decentralization of responsibilities and central governments' willingness to intervene in sub-federal political disputes among federations in the world (Anderson 2008). Furthermore, the presence of legislation and regulation does not preclude power politics in federal systems. Power dynamics can inform the creation and implementation of environmental legislation and regulations in ways that can constrain sustainability and lead to undesirable outcomes (Raik, *et al.* 2008). The final key difference – authority over military matters – is significant, and although actual military conflicts are rare the threat of violence is an important tactic available to powerful jurisdictions (Zeitoun and Warner 2006). This may fundamentally alter how power dynamics impact federal transboundary water systems. However, such an admission does not mean that federal systems are immune to power-related challenges – only that they may manifest differently. A different framework for power analysis may be

necessary for federal transboundary water governance. I will consider such a framework in section 1.5.1.

1.3.1.1 Multi-level transboundary water governance

Empirical foci on governments and interjurisdictional-level interactions sit uncomfortably with acknowledgements and investigations that demonstrate a variety of levels are implicated in transboundary water governance (da Silveria and Richards 2013; Dore 2014; Suhardiman and Giordano 2012). Multi-level governance can refer to federal political systems as well as governance arrangements that involve a variety of governmental and non-governmental actors in task-specific activities at various scales and levels (Hooghe and Marks 2003). The latter form of multi-level governance is often nested within the institutional frameworks of existing political systems, including federations. Understanding how these different levels of governance interact and intersect may be critical to appreciating factors that constrain and enable sustainable transboundary water governance.

Studies have demonstrated that non-governmental actors are involved in transboundary water governance in a variety of ways (Gerlak 2015; Zawahri and Hensengerth 2012). For example, some analyses have suggested that multi-level dynamics in transboundary water systems are critical to enabling sustainable transboundary water governance by promoting adaptiveness (Akamani and Wilson 2011; Raadgever, *et al.* 2008). Linking local monitoring programs that involve non-governmental actors with higher level policy decisions may enable well-informed policy responses that can contribute to adaptive governance in transboundary basins (Green, *et al.* 2013). Deliberative processes that include multiple perspectives that exist at a variety of scales within basins may contribute to more sustainable water governance by encouraging learning, inclusion and accountability (Dore 2014). In this context, encouraging cross-sectoral interactions and linkages among multiple levels of water governance is considered an important component of effective and adaptive transboundary water governance (Raadgever, *et al.* 2008) that contributes to sustainability. da Silveria and Richards (2013) add that understanding the extent to which multi-level arrangements actually contribute to sustainability in transboundary water systems requires in-depth consideration of historical context, actual linkages between different levels of governance and existing power asymmetries.

A power analysis can provide needed insight into factors related to decision-making, agenda determination and underlying ideas and values that impact governance processes at various levels. In an empirical study of transboundary water governance in India and China Hensengerth and Zawahri (2012) suggest that non-governmental organizations encourage more

sustainable transboundary water management by providing data to and trying to influence internal decision-makers in both countries. Domestic policy changes in Spain and Portugal, combined with direction from the European Union, have arguably led to more sustainable transboundary water governance in that region (Lopes 2012). Suhardiman and Giordano (2014) illustrate how institutional fragmentation within Laos benefits interests associated with increasing hydropower development. This collection of work demonstrates the important role of governance processes within jurisdictions and the variety of actors therein for transboundary water governance. Even when governments sign interjurisdictional water management agreements, their internal governance warrants consideration because they typically retain significant decision-making authority for waters that flow within their territory.

Appreciating the full complexity of transboundary water governance requires broadening the scope of analysis to consider how multi-level governance impacts transboundary water governance outcomes. This necessarily requires extending empirical foci from beyond the role of governments at the interjurisdictional level. That said, empirical analysis of the institutional design and performance of RBOs can contribute to improved understanding regarding the extent to which they contribute to adaptive transboundary water governance. A framework that identifies important aspects of institutional design could improve understanding about RBOs. However, it is also critical to consider the role of power dynamics which can act as a constraint or enabler of sustainable environmental governance (Newell 2012) at multiple governance levels. Assessing the roles of different forms of multi-actor governance and water use decisions made within jurisdictions that may have transboundary implications is one of many possible paths forward.

1.3.2 Collaborative environmental governance

Collaborative environmental governance is based on the notion that inclusive dialogue in which opinions and ideas are articulated, debated and potentially transformed is the best way to effect environmentally sustainable change (Glasbergen 1998; Kronsell and Bäckstrand 2010). In collaborative processes, organizations and individuals pool resources, share knowledge and learn from each other to address a common problem (Fish, *et al.* 2010; Gray 1989; Holley, *et al.* 2012). Collaborative governance is celebrated for encouraging learning about diverse perspectives and creating innovative solutions participants find acceptable, even in contexts of power asymmetry or high stakes decision-making (Ansell and Gash 2007; Emerson, *et al.* 2012; Innes and Booher 2010). Collaboration may take place at local, regional and basin-wide jurisdictional levels (Heikkila and Gerlak 2005; Lane and Robinson 2009; Margerum 2008). Characteristics of

collaboration and collaboration's use at multiple levels make it a promising approach to governance in transboundary contexts (Dore 2014; Green, *et al.* 2013; Raadgever, *et al.* 2008).

The label, collaboration, has been assigned to a diverse class of governance activities. In general, it reflects a perceived shift from government-based, command and control forms of governance to more inclusive and deliberative forms (Holley, *et al.* 2012). Forms of collaboration differ based on the level and scale (local, regional, basin-wide) at which they operate, whether government actors are involved and the extent to which ideals of deliberative democracy inform the collaborative processes. They can also range from voluntary, grassroots initiatives to legislatively mandated processes initiated by government (Moore and Koontz 2003). For example, collaborative planning exercises are based on Habermasian ideals of deliberative democracy related to inclusion, interdependence and authentic dialogue (Innes and Booher 2010). They tend to take place at the local level and involve local level government officials (Healey 2003). In contrast, collaborative public management involves horizontal and vertical information sharing and cooperation between government ministries at various levels; non-governmental actors may or may not be involved and the process may not require deliberation (McGuire 2006). Cross-sectoral collaboration emphasizes voluntary problem-solving among the business community, non-governmental organizations and government (Selsky and Parker 2005). However, government may not be involved in this form of collaboration. Collaborative environmental governance, the form used to identify cases of collaboration in this study, emphasizes information sharing, dialogue and cooperative problem-solving between governmental and non-governmental actors at a variety of levels (Holley, *et al.* 2012; Margerum 2011). They may or may not be state-mandated (Moore and Koontz 2003).

Features of collaborative environmental governance such as inclusion, knowledge sharing and cooperative problem-solving make it potentially important in transboundary contexts where upstream-downstream challenges and a diversity of perspectives and values for water exist (Birdsong 2008). In transboundary contexts, collaboration that occurs at multiple levels and is linked may contribute to more adaptive and inclusive transboundary water governance (Akamani and Wilson 2011; Green, *et al.* 2013). It may promote the inclusion of actors and perspectives necessary to enable sustainable transboundary water governance (Dore 2014) and well-informed problem solving at the appropriate level (Cosens 2010). However, one important shortcoming in the collaborative water governance literature is that it has tended to neglect power (Brisbois and de Loë 2015), which may temper the role of collaboration in transboundary contexts. It also undermines the usefulness of the collaboration literature for transboundary contexts in which

power dynamics exist. Underdeveloped considerations of power in the collaboration literature may follow a general trend wherein forms of governance perceived to be novel, or departures from traditional, state-based approaches, such as collaboration, are analyzed without attention to important ‘traditional’ concepts such as power (Arts and Van Tatenhove 2004). It may also be the result of the uncritical adoption of normative theoretical ideals in empirical settings where power dynamics are at play but are undertheorized (Murray 2005). Regardless of the reasons, the collaboration literature does not yet have all the tools needed to assess and consider the role that power dynamics might have in informing what collaboration actually achieves.

Hence, while power asymmetries have been identified as an important precursor to collaboration (Ansell and Gash 2007), there has been relatively little systematic exploration of the ways in which power dynamics impact collaborative processes and outcomes. Important exceptions exist. For example, Purdy (2012) suggests that resources, authority and the ability to construct issues are important power-related factors that can impact collaboration. However, this work does not engage with the extensive and well-developed literature regarding theories of power which may be important for identifying subtle power-related effects. It also does not conceptualize a role for political-economic contexts. Other empirical studies have demonstrated that industry actors have disproportionate influence over collaborative processes in the environmental realm, through setting agendas and information control (Cook 2015). The political and economic contexts in which collaborations are embedded can constrain collaborative outcomes (Brisbois and de Loë 2016). Yet other empirical research, although it does not explicitly use a power analysis, suggests that power dynamics may be at work in collaborative processes. For example, research on collaborations in Australia (Holley, *et al.* 2012), South Africa (Mirumachi and Van Wyk 2010) and Canada (Norman and Bakker 2008) suggest that government actors are not always willing to cede authority to collaborative groups. For example, collaborations may serve advisory functions, leaving decisions regarding implementation to government actors. Critical analyses of large-scale collaborations in the US suggest that some interests will continue to be marginalized through collaborative processes (Kallis, *et al.* 2009). These findings challenge assumptions that collaboration results in inclusive, productive dialogue that can enable environmentally sustainable change. More systematic assessments of how power impacts collaboration can enrich the collaboration literature by identifying the ways in which power may challenge some of collaboration’s promising appeal. Such an analysis is critical for understanding the role that collaboration can play in transboundary basins.

1.3.3 Theories of power

Power is an essential concept in the social sciences, and is an especially important consideration in the context of policy and governance (Arts and Van Tatenhove 2004; Newell 2012). Theories of power are subject to much disagreement; they offer a variety of different approaches to investigating power dynamics and their effects in empirical contexts. Perspectives on power differ on whether they conceptualize power as exercised by agents (Dahl 1957), endowed in structures that determine, or strongly influence, human action (Gould, *et al.* 2004) or as an omnipresent force that informs all human consciousness and activities (Foucault 1982). Power relations may also be viewed as dominating or empowering (Haugaard 2012) or as a force that circulates and is not possessed (Foucault 1982).

A number of different power theory frameworks exist to guide empirical analysis, such as Gaventa's (2006) power cube, Barnett and Duvall's (2005) power taxonomy or perspectives that draw from post-structuralism (Digeser 1992). This study uses Steven Lukes' power theory to develop a framework for analyzing how power dynamics impact various transboundary water governance processes and the ways in which power may constrain or enable sustainable transboundary water governance. Steven Lukes (2005) developed an agent-centered theory of power that views power as domination – the ability to achieve preferable outcomes despite opposition. However, it is important to acknowledge that Lukes promotes a broad interpretation of agents as including individuals, collectivities and institutions (Hayward and Lukes 2008; Lukes 2005). These agents may not be aware of the effects of their actions and they may produce power-related effects through *inaction*. Lukes suggests that the agent-centred view is critical to holding agents morally, ethically and politically responsible for the power-related actions they bring about or fail to effect. Such a view is highly compatible with the central aim of this dissertation: to understand the factors that constrain and enable sustainable transboundary water governance. Part of the reason that power is so contested is because it is fundamentally tied to norms and values that are also highly contested (Dowding 2012; Lukes 2005). In this work, I suggest that sustainability is a desirable normative goal, which informs my power analysis. This view also distinguishes Lukes' approach, and my perspective, from post-structural perspectives that suggest power is not possessed by any one entity and that even strategies claiming to be emancipatory are imbued with power (Digeser 1992; Foucault 1982). Such a view makes allocating responsibility and developing an effective strategy to address power dynamics difficult. Lukes also offers an alternative to structural determinism. The possibility that agents could have acted differently is critical to his definition of power. Thus, using this theory of power illuminates the things that may be changed or challenged to enable greater progress toward sustainability. It

also offers, as compared with Duvall and Barnett (2005) and Gaventa (2006), a comparatively simple framework that can be used to analyse very complex governance settings. Steven Lukes' power theory can be usefully applied to natural resource governance contexts (Caine and Krogman 2010), such as the ones that concern this study. It can also help to uncover some of the less obvious dimensions of power that can impact transboundary water governance (Zeitoun and Warner 2006).

Lukes produced his book *Power: A Radical View* as a response to perceived shortcomings associated with two dominant theories of power that circulated in the 1970s (Lukes 2005). The first predominant theory of power, what Lukes refers to as power's first dimension, is Dahl's pluralist perspective on power. Dahl suggested that power is the ability to achieve preferable policy outcomes, despite opposition (Dahl 1957). The first dimension can be studied empirically by attending to which actors participate in policy decisions, the preferences they articulate and which actors prevail in decision making processes (Lukes 2005). Bachrach and Baratz (1962) critiqued the pluralist view of power for being too focused on actual behavior and decision-making. They articulated what Lukes refers to as power's second dimension: the ability to set the agenda by excluding relevant concerns from policy discussions, through influencing policy actors so that they do not raise relevant concerns or developing institutional environments that neglect particular interests (Bachrach and Baratz 1962). This form of power can also be directly observed by considering articulated grievances with the scope of the decision-making agenda or decisions not to act when it is possible to do so (Lukes 2005). The second dimension of power can result in what Lukes refers to as non-decisions which may not be revealed by analyzing power in its first dimension.

Lukes acknowledges that both the first and second dimensions of power offer insight into how agents can dominate the actions of others. However, he offers a critique based on the fact that the first two dimensions are too concerned with actual behavior and overt conflicts. He suggests that power works in a third, less obvious dimension, that allows for consideration of the ways in which "*potential issues* are kept out of politics, whether through the operation of social forces and institutional practices or through individuals' decisions" (Lukes 2005, 28, emphasis in original). This third dimension of power prevents overt conflicts from taking place by socializing individuals and groups to "accept the existing order of things . . . because they can see or imagine no alternative to it, or because they see it as natural and unchangeable" (Lukes 2005, 28). Power's third dimension is concerned with the ways in which ideas and values can be used to support an existing inequitable or unsustainable status quo without overt conflict. Certainly, Lukes drew

inspiration from Gramscian theories of cultural hegemony, which provide an explanation for why communist revolution did not materialize as theorized: ideas associated with private property and upward mobility were firmly entrenched in civil society institutions and adopted by working classes (Cox 1983). Gramsci added the role of ideas to Marxist concerns associated with the economic matters and the ownership of production: he added the crucial consideration that “man [sic] is not ruled by force alone, but also by ideas” (Bates 1975, 351). As mentioned above, an important distinction needs to be made between Lukes’ power theory and structural theories generally associated with Marxism. Lukes rejects structural determinism as a form of power (Hayward and Lukes 2008). A power relation rests, in part, on the possibility that an agent could have acted differently. This is necessary for assigning responsibility for things that might be changed to produce more sustainable forms of governance.

Lukes’ power theory is helpful for guiding empirical analyses of more and less obvious relations of domination. It can be usefully applied to governance processes in transboundary contexts. Understanding factors that constrain and enable sustainable transboundary water governance also requires assigning political responsibility so that constraints can be addressed or challenged. For reasons listed above, I use Lukes’ power theory in this dissertation.

1.3.4 Sustainability

There is no one-size-fits all definition or universal blueprint to achieve sustainability. Here, I offer a few reflections on concepts and criteria used in this study to make assessments about the extent to which governance contributes to sustainability. My consideration of sustainability is based on the assumption that governance can contribute to or thwart sustainability (Newell 2012) and that measuring dimensions of governance that may contribute to sustainability is an important contribution to furthering sustainability. Ultimately, this work is based on the belief that sustainability is a valuable concept and a normative goal. It is also worth noting that the purpose of this study is not to make assessments about whether a given governance arrangement is sustainable per se. Rather, I am interested in how multi-level governance arrangements and power dynamics may constrain or enable governance that contributes to sustainability. I undertake such investigations by using principles and criteria associated with governance that contributes to sustainability to inform my assessments, or where indicated in each manuscript, criteria related to the expected performance of various governance processes and institutions.

The concept of sustainability is premised on the notion that human and ecological well-being are interdependent, and that ecological degradation and economic inequality are significant, intractable and interrelated problems that must be addressed in such a way as to improve both

(Gibson, *et al.* 2005). Sustainability has a biophysical dimension regarding material limits but also an important social dimension related to governance – the ways in which decisions are made and actions are undertaken. Lockwood, *et al.* (2010) identify eight principles, including legitimacy, transparency, accountability, inclusiveness, fairness, integration, capability and adaptability, with which to evaluate environmental governance. Table 1.2 identifies evaluative questions related to these principles. Other metrics (Adger, *et al.* 2003) and paradigms, such as integrated water resources management, exist, but I prefer Lockwood, *et al.*'s (2010) approach. The criteria elaborated by Lockwood, *et al.* (2010) include normative principles to assess

Table 1.2: Governance principles for sustainability: criteria and evaluative questions

Criteria	Evaluative questions
Legitimacy	Do actors have the authority to govern based in legislation or stakeholder acceptance?
Transparency	Are decision-making processes visible? Is the reasoning behind decisions apparent? Is information related to decisions and performance publicly available?
Accountability	Are there mechanisms to hold accountable those responsible for decisions? Are there mechanisms to determine whether key responsibilities have been met?
Inclusiveness	Are there opportunities to participate in and impact governance processes?
Fairness	Are decisions free of systematic bias? Are the distributions of costs and benefits associated with decisions adequately considered?
Integration	Is there coordination across and between different levels of government? Do different government agency policies align?
Capability	Can individuals or organizations deliver on their commitments?
Adaptability	Are new sources of knowledge and learning incorporated? Are threats, risks and opportunities anticipated? Is governance reflective?

Adapted from: Lockwood, *et al.* 2010.

governance, a key concern of this dissertation, and concepts used in alternative paradigms such as integrated water resources management, which regards operational decisions about watershed planning. For instance, the integration criterion is a key concern associated with integrated water resources management (Mitchell 2005). Adaptability is a vital component of sustainable water governance (Pahl-Wostl 2007) and a necessary part of integrated water resources management (Hooper 2010). Unlike integrated water resources management, the criteria elaborated by Lockwood, *et al.* (2010) are not geographically bound to the watershed and concern governance specifically. This distinction is critical because challenges achieving governance that contributes

to sustainability, such as those related to power, may not originate in the watershed (Cohen and Davidson 2011; Davidson and de Loë 2014).

Lockwood, *et al.*'s (2010) criteria have been used in assessments of multi-level conservation initiatives (Wyborn 2015), adaptive river basin governance (Pahl-Wostl, *et al.* 2012) and transboundary water governance (Akamani and Wilson 2011). Importantly, as Wiek and Larson (2012) point out, the sustainability criteria refer to *procedural* aspects of governance that contributes to sustainability. If desired, the criteria can be combined with additional biophysical metrics used to make sustainability assessments (Wiek and Larson 2012).

In this dissertation, Lockwood, *et al.*'s (2010) principles were used to inform my assessments, unless noted otherwise in each manuscript. For instance, for Chapter Two criteria related to the effective and adaptive governance were used to make assessments about the role and contribution of the interjurisdictional institution in the MRB (see Table 1.5). In Chapter Three, expectations about the roles and contributions of collaborations in transboundary contexts were assessed against findings related to power dynamics. However, criteria used also correspond, in general, to criteria associated with governance that contributes to sustainability identified here, which served as a normative framework that underlay this study and directly informed assessments made in Chapter Four.

1.3.5 Summary

Transboundary water governance involves a diversity of actors at multiple governance levels. This is as true in the international context as it is in federal transboundary water systems. While interjurisdictional water management agreements and institutions have important roles, it is necessary to consider how governance activities at other levels contribute to transboundary water governance. A detailed analysis of transboundary water management institutions that operate at the scale of the basin can provide important insights related to the role and contribution of interjurisdictional institutions. Understanding the factors that constrain and enable sustainable transboundary water governance also requires considering the ways in which power dynamics impact governance processes at multiple levels. Although power has been identified as a critical factor that impacts international transboundary water interactions, less is known about how power impacts federal transboundary water systems and governance processes that may exist in transboundary basins, such as collaboration. Literature on collaboration, which has been identified as a potentially promising approach to governance in transboundary water systems, has not adequately considered the role of power dynamics. Such an assessment is critical to understanding the roles and contributions of collaborations in transboundary water systems.

Finally, a power analysis can reveal factors that constrain and enable progress toward sustainability; such an analysis can be informed by criteria associated with sustainability governance.

1.4 Empirical context: the Mackenzie River Basin

The Mackenzie River Basin (MRB), Canada, provides an excellent empirical context in which to situate this research. The MRB drains 20% of Canada's landmass; it encompasses an area of approximately 1.8 million km² (MRBB 2003b). Water in the MRB flows through three provinces – British Columbia, Alberta and Saskatchewan – three territories – the Yukon Territory, the Northwest Territories and a very small portion of Nunavut – as well as the traditional territories of Dene, Cree, Métis and Inuvialuit peoples (see Figure 1.1). The headwaters of the MRB are in the Rocky Mountains of British Columbia and Alberta, where the Peace and Athabasca rivers emerge, respectively. They flow northeast, converge at the Peace-Athabasca Delta (PAD), and turn northward to form the Slave River which drains into Great Slave Lake at the Slave River Delta. The Mackenzie River drains Great Slave Lake's northwestern corner, and is joined by major tributaries including the Liard River, which flows from British Columbia, and the Peel River, which flows from the Yukon. The entire Mackenzie River is approximately 4241 km long and has an average annual discharge of approximately 9910 m³/s into the Beaufort Sea in the Arctic Ocean (MRBB 2003b). British Columbia, Saskatchewan and the Yukon are primarily upstream jurisdictions, whereas Alberta is both an upstream and downstream jurisdiction – it receives water from British Columbia but passes water on to the NWT. The NWT is the ultimate downstream jurisdiction in the basin; it receives water from British Columbia, Alberta, Saskatchewan and the Yukon. The Nunavut's proportion of the basin is so small that it is generally not considered a basin jurisdiction in interjurisdictional arrangements.

There are significant differences in the populations of the provinces and territories in the MRB. In 2001, the last time that the population of the MRB was calculated, approximately 397,000 people lived in the MRB. At that time, almost three-quarters of the MRB's population resided in Alberta, 17% in British Columbia, 9% in NWT and less than 1% in Saskatchewan and the Yukon (MRBB 2003b). Approximately 15% of the basin's population is Indigenous. The proportion of Indigenous peoples relative to non-Indigenous persons in the basin is much higher in the northern territories. For example, the NWT's population is approximately 50% Indigenous

Figure 1.1: The Mackenzie River Basin, Canada



(Statistics Canada 2006). Since 2001, population has grown significantly in the headwaters of the MRB where major industrial developments are taking place. For instance, in 2015, the government of British Columbia identified Fort St. John as the province's second-fastest growing municipality in the province, with a 4.7% growth in population between 2013 and 2014 (BC Stats 2015). Between 2007 and 2012, Fort McMurray, which is located near major oil sands extraction in Alberta, and the largest city in the MRB, saw population grow by approximately 30% (Regional Municipality of Wood Buffalo 2012; Statistics Canada 2012). Important differences also exist among the provinces and territories regarding the size of their economies and the technical and financial resources available to governments. As shown in Table 1.3, the provinces of British Columbia and Alberta have much larger economies, measured by GDP, than do other provinces and territories in the MRB.

Table 1.3: Population and GDP in provinces and territories in the MRB and Canada as a whole

Jurisdiction	2015 Population	Real 2014 GDP (expenditure based; millions of chained 2007 dollars)
British Columbia	4 703 939	222 868
Alberta	4 216 875	320 113
Saskatchewan	1 138 879	63 127
Yukon Territory	37 288	2 363
Northwest Territories	44 253	3 849
Nunavut	37 025	2 018
Canada	35 985 751	1 747 709

Sources: (Statistics Canada 2015a; Statistics Canada 2015b)

In Canada, water management is largely the responsibility of the provinces as per section 92 of the Canadian constitution, under powers related to ownership of land and natural resources and jurisdiction over property (Clancy 2014), or territories through devolution agreements with the federal government (Rodon 2015). Each province and territory in the MRB therefore has distinct legislation and regulations pertaining to water, environmental assessments (EAs) and land management. The federal government also possesses potentially broad powers for interjurisdictional water matters; it has responsibilities for migratory birds, the criminal law, anadromous fish species, species at risk, transboundary waters, First Nations (one of three distinct Aboriginal peoples identified in the Canadian constitution) lands and powers under the peace order and good government clause of the Canadian constitution. However, in practice, the federal government has largely deferred to the provinces in matters related to transboundary waters (Saunders 2014). Unless there is clear electoral advantage associated with intervening in perceived provincial environmental matters, the federal government tends not to intrude even when it may possess the jurisdiction to do so (Harrison 1996). Therefore, responsibilities for water are highly decentralized in Canada, which creates transboundary water governance challenges related to institutional fragmentation, upstream-downstream asymmetries and power dynamics.

Indigenous peoples are also very important actors in water governance in the basin. They possess Aboriginal rights and title and treaty rights that are protected in section 35.1 of the

Canadian constitution.¹ These rights may include adequate quality and quantity of water (Passelac-Ross and Smith 2010; Phare 2009). In addition to constitutionally-protected rights, there are land claim agreements in the Yukon and Northwest Territories that assign Aboriginal governments responsibilities for resource management. They may also include commitments about water that flows into Aboriginal territories. For example, the Gwich'in Land Claim Agreement states that waters that flow into the Gwich'in territory will be “substantially unaltered in quality and quantity” (Gwich'in Nation and Government of Canada 1992, 88), a phrase that has informed several other land claim agreements and the Northwest Territories' water strategy (Government of the Northwest Territories 2010). The presence of land claims alters environmental governance in the territories. For example, in the Northwest Territories, Aboriginal governments tend to be viewed as partners in governance and are involved in various co-management arrangements and included in the water policy development and implementation (Government of the Northwest Territories 2010; Government of the Northwest Territories 2011). In the Yukon, as required by the Final Umbrella Agreement (1990), Indigenous governments are involved in land use planning processes. If the territorial government fails to adequately consult with Yukon First Nations, it is vulnerable to litigation, as demonstrated in the recent controversy over the Peel Watershed Land Use Plan (*The First Nation of Nacho Nyak Dun v. Yukon* 2015 YKCA 18). This is in contrast to the provinces which have struggled to meaningfully and respectfully incorporate Indigenous governments in environmental governance in ways that recognize their distinct rights and title (Passelac-Ross and Buss 2011; von der Porten and de Loë 2014). These perspectives inform the fundamentally different approaches to consultation and engagement with Indigenous peoples that the provinces and territories have adopted.

The federal, provincial and territorial governments – with the exception of Nunavut, which did not exist at the time – in the MRB signed the *Mackenzie River Basin Transboundary Waters Master Agreement* (the Master Agreement) in 1997, after decades of negotiation, in response to the perceived need to coordinate and communicate with one another. The need for coordination was first formally recognized after British Columbia completed construction of the W.A.C. Bennett Dam in 1968 (see Figure 1.1). Environmental changes – specifically low water levels – observed in the PAD over 1000 km downstream were believed to be caused by the dam and highlighted the need for interjurisdictional cooperation, information exchange and notifications of developments (Creery 1979; Mackenzie River Basin Committee 1981). In response, governments

¹ In this dissertation, the globally-preferred term “Indigenous” is used with the exception of contexts in which the term “Aboriginal” is based in law, locally appropriate or used in referenced documents or contexts.

formed the Mackenzie River Basin Intergovernmental Liaison Committee in 1972, through which they committed to communicating and providing prior notification of developments (Mackenzie River Basin Committee 1981). At that time, they also recognized the need for additional information on the ecology and hydrology of the MRB. In the late 1970s, they created the Mackenzie River Basin Committee (MRBC), which was responsible for facilitating a \$1.6 million (1979 dollars) study of the hydrology and ecology of the entire basin and providing recommendations to the governments based on the study findings.

The MRBC (1981, x) reported that

development of any resource, be it in one jurisdiction or several, could affect the uses of water by altering flows, levels or water quality downstream. Hence, the need for cooperative management represents the greatest and most urgent challenge for the future.

In its report, the MRBC recommended that governments enter into a formal agreement that contained commitments for flows, flow regulation and water quality at jurisdictional boundaries and establish a permanent board to implement the provisions of the agreement. Sixteen years later, the Master Agreement was signed. The Master Agreement articulates general principles to inform transboundary water management in the MRB, including maintaining ecosystem integrity, sustainable water management, cooperation and the right of each jurisdiction to use water so long as it does no harm to neighbouring jurisdictions (Government of Canada, *et al.* 1997). It created an RBO, the MRBB and included provisions for the negotiation of bilateral water management agreements between neighbouring jurisdictions. Recognizing the unique position of Indigenous peoples in the basin, the Master Agreement assigned seats on the MRBB to five Aboriginal representatives.

In the years since the Master Agreement was signed, a number of significant industrial developments have taken place in the MRB. In fact, some of the largest energy development projects in Canada are located in the headwaters of the MRB, including hydroelectric projects in British Columbia and oil sands extraction in Alberta. Two hydroelectric projects on the Peace River in British Columbia provide approximately 30% of the province's generating capacity (BC Hydro 2003b). A third, the Site C dam, was approved for construction in the fall of 2014 and will add an additional 1100MW of capacity to the system (BC Hydro 2014b). Between 1997 and 2014, production in Alberta's oil sands region, most prominently in the Athabasca sub-basin, grew by approximately 75% (Alberta Energy and Utilities Board 2001; Alberta Energy Regulator

2015). Current production from oil sands is expected to more than double by 2030 (Alberta Energy Regulator 2015).

More developments are planned. For example, British Columbia is anticipating significant increases in oil and gas production in the northeast portion of the province. The province estimates that approximately 78 trillion ft³ of natural gas could be developed in the northeast. The government intends to see annual levels of natural gas production increase from 1.1 trillion ft³ in 2009 to 2 trillion ft³ by 2020 (British Columbia Ministry of Energy and Mines 2012). Natural gas will be recovered via hydraulic fracturing, which is controversial, in part, because of its high water demands, uncertainties related to groundwater contamination caused by chemicals used in the fracturing process and its role in causing small earthquakes (Council of Canadian Academies 2014). Hydroelectric development on Alberta's northern rivers has also been considered for many years and has emerged as a topic of exploration in the legislature (Standing Committee on Resource Stewardship 2013). In late 2014, a 300 MW run-of-river dam on the Peace River in Alberta began the early stages of an EA (AHP Development Corporation 2015). Finally, the prospects of developing an over 1000 km long natural gas pipeline through the Mackenzie River Valley in the Northwest Territories has long been considered a potential option (Berger 1977; Imperial Oil, *et al.* 2004). In fact, the pipeline was recommended for approval in 2010 (National Energy Board 2010) but construction has been delayed indefinitely. There is relatively less development in the Yukon and Saskatchewan portions of the basin, which are also sparsely populated.

Current energy developments are controversial for the social and environmental impacts they create, and for their potential impacts to downstream ecosystems. Flow regulation on the Peace River has been a longstanding concern for downstream governments and Indigenous peoples (NRBSB 1996; Peace Athabasca Delta Committee 1970). In fact, it inspired the earliest forms of intergovernmental cooperation. Flows are manipulated on the Peace River to store water during late spring and early summer and released during periods of high electricity demand in the winter, which has resulted in significant alterations to natural flow patterns – flows are higher than would occur naturally in the winter time and reduced in the spring and summer (Church 2014). A multi-decadal drying event experienced in the PAD is believed by many to be caused by upstream flow regulation. There are different scientific perspectives on whether drying in the PAD is the result of flow regulation or reflects natural variability and climate change. Based on paleolimnological studies, Wolfe, *et al.* (2006; 2012) suggest drying in the PAD is consistent with the historical record of natural variability and that no impact from the dam can be detected.

Others, however, suggest that a combination of flow regulation and climate change has negatively impacted the capacity to form ice-jam flooding events on the Peace River critical to recharging the PAD (Beltaos 2014). This latter perspective is consistent with traditional knowledge about changes in the PAD (NRBSB 1996; Straka, *et al.* 2014). However, BC Hydro, which manipulates the flows and is currently building a third dam on the Peace River, has adopted the former view that drying in the PAD is consistent with natural variability (BC Hydro 2013a; BC Hydro 2014a).

Longitudinal studies have demonstrated that flow regulation has impacted sedimentation in the Peace River downstream in Alberta. Specifically, it has reduced the capacity to transport sediment throughout the river, resulting in the creation of sandbars at tributary mouths (Church 2014). Monitoring in the Slave River indicates higher than expected levels of some dissolved solids, which is believed to be linked to upstream flow regulation (Sanderson, *et al.* 2012). Therefore, in addition to changes in water levels in the river, changes in sedimentation and sediment transport have also been observed.

Environmental impacts from oil sands mining include habitat destruction, fragmentation, water use and pollution. Over 600 km of land is currently under development for oil sands extraction, and there are approximately 170 km² of tailings ponds in the region (MRBB 2012) which contain toxic materials including metals, naphthenic acids and polycyclic aromatic hydrocarbons (Timoney and Lee 2009). Oil sands development is controversial because of its environmental impacts and impacts to Aboriginal and treaty rights (Mantyka-Pringle, *et al.* 2015). The precise nature and extent of environmental contamination that has resulted from oil sands operations is currently a matter of scientific debate (Hodson 2013). Kurek, *et al.* (2013) detect increases in levels of polycyclic aromatic hydrocarbons subsequent to the onset of oil sands mining at lake sites approximately 90 km northwest of the major oil sands development area. Timoney and Lee (2009) indicate there is seepage from tailings ponds into the adjacent Athabasca River. Kelly, *et al.* (2010) add that contaminants associated with the oil sands industry, such as cadmium, mercury, nickel and lead, can be detected in snowpack in sites near the oil sands region and in the Athabasca River. Wiklund, *et al.*'s (2012) paleolimnological research indicates that contaminants from oil sands extraction do not reach the PAD 200 km downstream from oil sands activities. Regardless, there are concerns that contaminants from oil sands mining may reach the Slave River and Delta in the NWT (AANDC and GNWT 2012), or that there would be devastating impacts if one of the tailings ponds in the oil sands region were to fail (Grant, *et al.* 2010). Importantly, several studies have indicated that environmental baseline data and monitoring have been inadequate to measuring the impact of industrial operations on the

landscape (Auditor General of Canada 2011; Oil Sands Advisory Panel 2010). In response, a number of monitoring programs have been developed, including a multi-million dollar partnership between the federal and provincial governments (Government of Canada and Government of Alberta 2012) and more local, community based efforts.

In addition to oil sands development and hydroelectric facilities, climate change is a significant pressure on governance in the basin and a source of social and environmental changes. Measuring observed changes is difficult, in part, because a lack of baseline monitoring data in many parts of the basin (MRBB 2012). That said, changes have been observed in terms of river freeze-up and ice break-up in portions of the MRB (MRBB 2012). Furthermore, flows may decline in the Peace (Wolfe, *et al.* 2012) and Athabasca headwaters (Sauchyn, *et al.* 2015). Uncertainties about the impacts of climate change, but anticipated changes in flows, make an adaptive approach to governance in this basin critical.

Implementing governance arrangements that can contribute to sustainability may be challenged by existing power asymmetries in the basin. For example, upstream jurisdictions British Columbia and Alberta, where the most significant developments are taking place, have much larger populations and GDPs than the downstream NWT (see Table 1.3). They have significantly more material resources at their disposal and much more at stake in terms of current development projects. Furthermore, there are significant, and entrenched interests in this basin related to industrial development and economic growth that may complicate achieving sustainability (Clancy 2014). However, there is also a diversity of perspectives and values regarding water governance in the basin. As mentioned previously, the NWT's water strategy, inspired by land claim agreements within the territories, has an overarching goal of clean, productive waters for all time in the NWT (Government of the Northwest Territories 2010). Certainly, environmental non-governmental organizations (ENGOS) have articulated concerns regarding environmental sustainability and integrity (Grant, *et al.* 2010; WWF-Canada 2009) in the basin. Indigenous peoples have raised concerns related to ecological integrity, Aboriginal rights and title and treaty rights (Candler, *et al.* 2010; First Nations Summit 2014; Mikisew Cree First Nation and Canadian Parks and Wilderness Society 2014).

Given the size and diversity of the MRB, there is a role for multi-level governance processes in this basin. It would be incredibly difficult to integrate the diverse economic and environmental perspectives, and traditional knowledge, at the scale of the basin, always. In fact, a number of collaborative environmental governance processes have emerged at local and regional levels in response to perceived impacts associated with upstream developments and concerns

about climate change. Understanding their roles and contributions can be facilitated by an assessment of the extent to which existing power dynamics in the basin impact what they do. Importantly, decisions about upstream developments are primarily the purview of the provincial governments. Although governments signed the Master Agreement in 1997 they still retain significant authority to make decisions about water use without external interference. The Agreement articulates principles of maintaining ecosystem integrity and sustainability, but it also protects the autonomy of each jurisdiction to use water so long as it does not harm neighbouring jurisdictions. Therefore, although the Master Agreement and collaboration may have important roles in the basin, so does water use decision-making within jurisdictions. Considering how power dynamics impact water use decisions within upstream jurisdictions can lend insight into factors that constrain and enable sustainable transboundary water governance in the MRB. Finally, assessing the design and performance of the existing interjurisdictional institution, the MRBB, can facilitate a consideration of its role in the basin and how it may constrain and enable sustainable transboundary water governance.

1.5 Methods

Chapters Two, Three and Four contain sections detailing methods used for data collection and analysis that are tailored to the research questions and purposes of each manuscript. This section provides additional information on the methodological approach used to achieve the overall objectives of this research. This research was informed by a critical realist ontology. This perspective assumes that a reality exists that is external to the perceiver but that observing that reality is difficult, if not impossible, because of biases in perception, interpretation and understanding (Sayer 1992). A critical realist ontology is compatible with an interpretivist epistemology which recognizes that there are multiple meanings and interpretations of phenomena (Maxwell 2012). However, critical realists suggest that some interpretations are more valid than others in the sense that they correspond more readily to what actually exists in the world. In the words of critical realist, Sayer (1992, 67), “the admission that all knowledge is fallible does not mean that all knowledge is equally fallible”. Critical realists seek to produce research that helps to explain causes of events. In this dissertation, institutions, multi-level governance processes and power dynamics are considered potential factors that may constrain and/or enable governance that contributes to sustainability. Using frameworks and theories to guide analysis can help to uncover what exists, or knowledge about causes, in the world. The complexities of the particular contexts under investigation permit observations about patterns or dynamics related to causation but not direct cause-effect relationships. Judgements therefore rely

on some degree of abstraction guided by frameworks and theories used in the course of the research (Sayer 1992). The corresponding epistemology seeks data from multiple sources (Maxwell 2012) using qualitative methods that facilitate an in-depth understanding of context, perceptions and understandings and what exists in the world. Therefore, qualitative methods of data collection and analysis were used in this study, and data were sought from a variety of sources, including interviews, documents and personal observations. Frameworks were used to guide data collection and analysis. A case study research design, which was used for this study, is consistent with critical realist ontology and qualitative methods.

1.5.1 Frameworks

Two frameworks, used as diagnostic tools to identify important factors and key relationships in the empirical context (Ostrom 2011; Ostrom, *et al.* 2014), were used in this study to explore cases of interest. The first framework discussed below informed data collection and analysis for Chapter Two, while the second was used for Chapters Three and Four. In this section, I will describe the frameworks, why and how they were used and explain why two different frameworks were used in the course of this research. The frameworks were supplemented by criteria associated with governance that contributes to sustainability discussed in section 1.3.5 and detailed in Table 1.2. Specific criteria related to the performance of RBOs were used to make assessments in Chapter Two (see Table 1.5). Additional criteria are elaborated in each chapter.

1.5.1.1 A modified Institutional Analysis and Development framework

A modified version of Ostrom's Institutional Analysis and Development (IAD) Framework (Ostrom 1986) was used to guide data collection and analysis for Chapter Two. The IAD framework is one of the most widely used research frameworks in the social sciences (Weible 2014) and has been used and modified to analyze hundreds of resource management contexts (Ostrom, *et al.* 2014). Huitema and Meijerink (2014) modified the framework to distinguish between different kinds of RBOs and to provide an alternative to the existing empirically-based typologies which resulted in conceptual confusion. The modified IAD framework permits detailed assessment of the institutional design of specific RBOs in context, and helps to achieve Objective 2 of this study. The original framework, developed by Elinor Ostrom, posits that in environmental governance settings, actors interact to produce environmental management outcomes. The interactions and outcomes produced are influenced by several important external factors, including the biophysical environment, the characteristics of the community and seven formal and informal rules. The seven formal and informal rules determine: positions that can be assumed by actors (position rules); how actors become involved in the action situation (entry and

exit or boundary rules); the scope of choices and actions available to actors (authority or scope rules); information that is available to actors and how it is shared (information rules); how decisions are made (aggregation rules); the kinds of outcomes that they can affect (authority rules); and the benefits and drawbacks of participating and producing outcomes (payoff rules) (Ostrom 1986; Ostrom, *et al.* 2014). Huitema and Meijerink (2014) combined several rules to provide a simple framework to differentiate RBOs based on authority, aggregation, boundary, information and pay-off rules (see Table 1.4).

Table 1.4: IAD framework rules and indicators

Rules	Indicators
Authority rules	Scope of decisions, responsibilities allocated to RBOs
Aggregation rules	Formula used to make decisions
Boundary rules	Geographic boundaries that pertain to the RBO's jurisdiction How participants enter and exit the RBO
Information rules	The kinds of information considered relevant to the RBO's activities How information is shared
Pay-off rules	Benefits and costs to participants in the RBO

Source: Huitema and Meijerink (2014), adapted from Ostrom (1986)

Analytical criteria related to the performance of RBOs and adaptive transboundary water governance were also used to inform data analysis for Chapter Two and to contribute to the achievement of Objective 2. Performance criteria related to effective governance were elaborated by Huitema and Meijerink (2014) and supplemented with relevant criteria associated with adaptive transboundary water governance, as drawn from the transboundary water governance literature (see table 1.5).

The IAD framework provides a detailed structure that can be used to evaluate a large number of resource management contexts. It can provide a rich account of various factors that impact the interactions and outcomes that can be produced in environmental management contexts (Ostrom, *et al.* 2014), including transboundary water governance. It is therefore very useful for considering, in detail, the role of institutions in transboundary water governance. It can also be used to make comparisons between different kinds of RBOs (Huitema and Meijerink 2014). However, one significant shortcoming of the IAD framework, including the modified framework used in Chapter Two, is that it does not account for how power dynamics can impact resource management contexts (Clement 2010; Whaley and Weatherhead 2014). Certainly,

several of the rules refer to power-related dynamics, such as positions, information and scope. However, theories of power offer rich insights regarding the more and less obvious ways that power dynamics may impact resource management situations that the IAD framework may neglect. Theories of power can help researchers to identify and interpret power dynamics. Therefore, for scholars interested in how power impacts environmental governance, an approach informed by theories of power is necessary. For that reason, a different framework was used to guide data collection and analysis for Chapters Three and Four.

Table 1.5: RBO performance criteria

Normative criteria	Evaluative questions
Bioregional governance	Does the RBO operate at the scale of the bioregion?
Coordination	Does the RBO help to avoid contradictory policies and conflicts about geographical or jurisdictional boundaries?
Accountability	To what extent is the RBO linked to democratic institutions? To whom is the RBO formally held to account for its activities? What mechanisms exist to monitor and evaluate RBO performance?
Legitimacy	Is the RBO publically acceptable? Do those who are subject to the actions of the RBO approve of the institution (Gearey and Jeffrey 2006; Suchman 1995)? Does multi-actor dialogue inform RBO activities? What kinds of activities does the RBO undertake?
Environmental effectiveness	Does the RBO achieve goals related to ecological performance?
Multi-level design	Is the RBO linked with other governance activities in the basin? Does information flow freely between other forms of water governance in the basin and the RBO (Akamani and Wilson 2011; Green, <i>et al.</i> 2013)?
Incorporation of multiple knowledges	Does the RBO adequately integrate and use scientific, local and traditional knowledge (Raadgever, <i>et al.</i> 2008)?
Responsiveness	Is the RBO capable of responding to emerging issues in the basin (Green, <i>et al.</i> 2013; Lockwood, <i>et al.</i> 2010)?

Source: Huitema and Meijerink (2014), and others where noted

1.5.1.2 Power theory-based framework

As mentioned in section 1.3.3, Lukes' power theory was used to develop a framework for analysis for Chapters Three and Four of this dissertation. The framework was organized according to power's three dimensions – which provided general categories for analysis and interpretation. More detailed criteria were identified based on the collaborative environmental governance and transboundary water governance literatures to guide empirical assessments of how power may manifest in each context (see Table 1.6). Finally, assessments about the impact

of power dynamics were made relative to expected contributions of collaborations in transboundary contexts (Chapter Three) and characteristics of governance that contributes to sustainability (Table 1.2; Chapter Four).

Table 1.6: Power analysis framework

Form of power	Indicators	Examples from the collaboration literature	Examples from the transboundary water governance literature
1 st dimension: the ability to prevail in decisions (Dahl 1957; Lukes 2005)	• Observable conflicts over decisions • Observable preferences	• Financial and technical capacity (Holley, <i>et al.</i> 2012) • Capacity to make and implement decisions (Holley, <i>et al.</i> 2012; Purdy 2012) • Inclusion of various perspectives (Kallis, <i>et al.</i> 2009)	• Major water infrastructure projects (Zeitoun and Warner 2006) • Geographic position (Cascão and Zeitoun 2010; Dinar 2009) • Financial and technical capacity (Cascão and Zeitoun 2010)
2 nd dimension: the ability to set the agenda (Bachrach and Baratz 1962; Lukes 2005)	• Observable conflicts over the decision-making agenda • Conflicts about information excluded from decision-making • Decisions not to act (non-decisions)	• Control of information used in collaboration (Purdy 2012) • Control of the decision-making agenda, scope of factors that can be affected by collaboration (Cook 2015; Purdy 2012) • Participants invited/allowed to collaborate (Purdy 2012)	• Appeals to international norms/international law (Zeitoun and Warner 2006; Zeitoun, <i>et al.</i> 2011) • Scope of factors to be considered/included in agreements or discussions about transboundary water governance (Feitelson 2002; Zeitoun and Warner 2006) • Actors/interests that benefit from institutional fragmentation (Suhardiman and Giordano 2014)
3 rd dimension: discursive power - the ability to construct/impose and or/benefit from dominant ideas (Lukes 2005)	• Ideas presented as universally beneficial and desirable	• Ability to construct, represent or benefit from an idea (Purdy 2012) • Political and economic context in which collaboration is embedded.	• Ability to construct dominant ideas about which uses of water and management arrangements are beneficial (Feitelson 2002; Zeitoun, <i>et al.</i> 2011)

Importantly, as Lukes (2005) acknowledges, the dimensions of power overlap to some degree – and they can inform one another. Determining whether an instance is an example of

first- or second-dimensional power requires careful analysis— and it is possible that it may be both. For example, one aspect of first-dimensional power is the ability to participate in decisions or discussions and to prevail. Power's second dimension refers to the ability to set the agenda, which may also require participation. Therefore, careful consideration was taken to determine whether examples of participation without influence were instances of power's first or second dimension – did the exclusion of an issue or actor result in an agenda that failed to consider that actor's needs? If so, it was interpreted as power's second dimension but it was also informed by elements of the first dimension – the inability to prevail. A failure to achieve a preferential outcome is also an expression of power's first dimension. Likewise, an inability to influence, construct or impose an idea or value that informs decision making is evidence of power's third dimension. In this way, the dimensions build on one another but they can be considered analytically distinct according to the ways in which they impact decisions. The framework and indicators used to consider each dimension of power for each paper is summarized in Table 1.6.

1.5.2 Case study design

A case study design was adopted to facilitate an in-depth understanding of context and how institutions, multi-level governance processes and power dynamics acted as constraints or enablers of sustainable transboundary water governance. Case studies were appropriate because of the evaluative nature of this research (Yin 2009) and because I sought an in-depth understanding of power-related factors related to causation and context (Gerring 2007). Specifically, at an empirical level, I was interested in the design and performance of an interjurisdictional institution, as well as the ways in which power dynamics impacted several different governance processes in a federal transboundary water governance context. On an analytical level, I was concerned with what the empirical evidence implied for the roles of institutions and multi-level governance processes in transboundary water governance and their contributions to sustainable transboundary water governance. I studied contemporary events and had no control over the instances under consideration, making them explanatory case studies (Yin 2009). For each chapter, multiple sources of data, such as interviews, documents and personal observations, were used to triangulate findings to ensure validity.

Single and multiple case studies were used in the course of this research. The single case study design, although plagued by well-known problems related to generalizability (Yin 2009), was appropriate to address the purpose and research questions that informed Chapter Two. In this context, a single case study design was appropriate because of a significant gap in understanding about the institutional design and role of RBOs. Multiple case studies were used in Chapters

Three and Four. They allowed for detailed consideration of each case and comparisons across cases that facilitated more generalized findings relative to the research questions that informed each manuscript (Stake 2005). Cases were selected based on the purpose and research questions for each manuscript. In total, five separate cases were analyzed during the course of this research. One case – the MRBB – is assessed in Chapters Two and Three, using the modified IAD and power analysis frameworks, respectively. Cases, criteria used to select case, chapters to which case study analysis corresponds and research objectives they address are described below and summarized in Table 1.7.

Table 1.7: Case study selection criteria

Objective	Research Design	Case Study Selection Criteria	Cases Selected	Results Reported
2: Consider the design and performance of an interjurisdictional river basin organization in a federal transboundary context.	Single Case Study	• An interjurisdictional river basin organization that operates at the scale of a transboundary basin in a federal country.	• MRBB	Chapter Two
3 a): Determine the ways in which power dynamics impact collaboration.	Multiple Case Study	• Involvement of governmental and non-governmental actors • Resource and information sharing to address a common problem associated with transboundary water governance (upstream developments) • Take place within a transboundary basin	• SRDP • PADEMP • MRBB	Chapter Three
3b): Determine the ways in which power dynamics impact water use decisions within jurisdictions.	Multiple Case Study	• Recent major water use decision that took place within an upstream jurisdiction in a transboundary basin • Water use decision corresponds to key governance pressure with transboundary implications	• Site C EA & Decision • The Surface Water Quantity Management Framework	Chapter Four

A single case study design was used in Chapter Two, which focuses on the role of an interjurisdictional transboundary RBO to address Objective 2 of this dissertation. This focus determined the selection of the MRBB, the only RBO that currently operates in the MRB, as the

key case for analysis. For Chapter Three, which focuses on how power dynamics impact the role of collaboration in transboundary water governance (Objective 3a), a multi-case study design was used. Cases were selected according to several criteria. First, cases needed to include characteristics of collaborative environmental governance discussed in section 1.3.2, including the involvement of governmental and non-governmental actors, resource and information sharing and working to address a common problem. Second, cases needed to take place in the geographic boundaries of the MRB and to be concerned with matters of transboundary water governance, such as industrial developments in upstream jurisdiction or the integrity of downstream ecosystems. Finally, data availability influenced the selection of cases. The cases that were selected for this analysis include the Slave River and Delta Partnership (SRDP), the Peace Athabasca Delta Ecological Monitoring Program (PADEMP) and the MRBB. For Chapter Four, which asks how power dynamics impact water use decisions within jurisdictions that may have transboundary implications (Objective 3b), a different set of criteria was used to select cases for inclusion in the multiple-case study. Each case involved a recent water use decision that took place within an upstream jurisdiction that is also identified as key governance pressures in the MRB by the MRBB. Finally, the availability of data informed the selection of cases. The EA and decision-making process for the Site C Dam in British Columbia and the development of the Surface Water Quantity Framework for the Lower Athabasca River (the Framework), where most oil sands mining is currently taking place, were selected for inclusion in Chapter Three. Each case included in this study is briefly described below.

1.5.2.1 The Mackenzie River Basin Board

The MRBB was created by the 1997 *Mackenzie River Basin Transboundary Waters Master Agreement* (Government of Canada, *et al.* 1997). It is the only governance mechanism that exists at the scale of the MRB. The federal government, the provinces of British Columbia, Alberta and Saskatchewan, as well as the Yukon and the Northwest Territories, are party to the agreement. The Master Agreement details the roles, finances and membership of the MRBB. One appointed government official represents each of the provinces and territories that are party to the agreement. The federal government has three representatives, one each from the health, indigenous affairs and environment ministries. In addition, one Aboriginal member per province and territory is appointed to sit on the Board to represent Indigenous peoples. They are considered non-governmental members of the Board. The Board is responsible for providing a forum to exchange information and coordinate among governments. The Master Agreement also assigns the Board responsibilities to consider the needs of Aboriginal peoples, identify necessary studies,

recommend objectives for water quality or quantity, establish technical committees, monitor the progress of the completion of bilateral water management agreements and implement the principles of the agreement in general (Government of Canada, *et al.* 1997). The Agreement's preamble suggests that a broad interpretation of the Board's role in the basin is possible (Donihee, *et al.* 2000). In Chapters Two and Three, I evaluate specific features of the Board's institutional design as well as factors that have constrained a broad interpretation of the Board's role in the basin.

1.5.2.2 The Slave River and Delta Partnership

The Slave River and Delta Partnership was created in 2010 in response to growing concerns that upstream developments in British Columbia and Alberta were negatively impacting the ecological integrity of the Slave River and Delta. It was also created as a part of the implementation of the government of the Northwest Territories' *Water Stewardship Strategy* (Government of the Northwest Territories 2010; Government of the Northwest Territories 2011). The primary goal of the water stewardship strategy is to ensure that waters in the NWT remain clean and productive for all time. Currently, a number of tools are being used to achieve this goal, including the development of community-based monitoring programs such as the SRDP. Members of the SRDP include academic institutions, municipalities, members of the public, federal and territorial government officials and First Nations and Métis governments (AANDC and GNWT 2012). A Steering Committee identifies key monitoring priorities and paid members undertake monitoring to address community questions about the health of the SRDP.

1.5.2.3 The Peace Athabasca Delta Ecological Monitoring Program

PADEMP was created in 2008. Like the SRDP, it was created in response to growing concerns about the impacts of upstream development, specifically on the PAD. Parks Canada has assumed a leadership role in PADEMP because 80% of the delta is located in Wood Buffalo National Park (Macmillan 2013). First Nations and Métis governments, provincial, territorial and federal governments and ENGOs are participants in PADEMP. They are involved in determining PADEMP's key objective, which is to ensure the cultural and ecological integrity of the PAD (Peace-Athabasca Delta Ecological Monitoring Program 2015). To achieve this objective, PADEMP has been developing a vulnerability assessment of the PAD, undertakes studies to address key monitoring priorities and facilitates information exchange between various monitoring programs that are underway in the region (Macmillan 2013).

1.5.2.4 The Environmental Assessment and Decision Regarding the Site C Dam

The EA for the Site C dam began in 2010 and was completed in 2014, but the dam has been assessed and rejected two previous times – once in the early 1980s and again in the 1990s. The Site C dam will be the third hydroelectric dam on the Peace River in British Columbia, and will add an additional 1100 MW of capacity to the current system on the Peace, which currently provides approximately 30% of British Columbia’s generating capacity (BC Hydro 2014b). The Site C dam figures prominently in the provincial government’s plans for economic development (British Columbia Office of the Premier and British Columbia Ministry of Energy and Mines 2014) but it has generated a considerable amount of local and downstream opposition. There are historical, and current, impacts associated with the operation of the two existing dams on the Peace River, which many are concerned will be further embedded by the operation of the Site C dam (Athabasca Chipewyan First Nation and Mikisew Cree First Nation 2014; NRBSB 1996; Straka, *et al.* 2014; Treaty 8 Tribal Association 2014). While the province of British Columbia has primary authority to allocate water and to approve the construction of hydroelectric facilities, the federal government also has responsibilities for navigation and fisheries that a major dam could impact. Therefore, a cooperative, joint environmental review process was established to assess the project’s potential social, cultural, heritage and environmental effects. A report prepared by the Joint Review Panel (JRP), which provided recommendations regarding whether, and under what conditions, the dam should be built, was released in May 2014 (JRP 2014). In November 2014, the provincial and federal governments announced their approvals and conditions for the Site C project’s construction and operation and in December 2014 (Aglukkaq 2014; British Columbia Environmental Assessment Office 2014b), the province of BC announced its decision to invest in the \$8.8 billion project (Clark 2014).

1.5.2.5 The Surface Water Quantity Management Framework for the Lower Athabasca River

The development of the Surface Water Quantity Management Framework for the Lower Athabasca River in Alberta also took several years to complete. The Framework comprises part of the Government of Alberta’s Lower Athabasca Regional Plan, which seeks to manage cumulative effects in designated land use areas by developing management frameworks for water quality, water quantity, air and biodiversity according to common principles and priorities in the Regional Plan. The Regional Plan identifies continued oil sands extraction as a priority use for the Lower Athabasca region (Government of Alberta 2012). The Framework is intended to manage the effects of that growth. Importantly, and as mentioned earlier, the growth in oil sands extraction that has taken place in Alberta has created concerns downstream in the NWT.

Therefore, the Framework is a policy decision with potential transboundary implications. The Framework was developed based on the non-consensus recommendations of the Phase 2 Framework Committee, a multi-stakeholder committee that deliberated options for cumulative water withdrawals for oil sands mining in the Lower Athabasca Region. All six mining companies currently withdrawing water from the Athabasca River, representatives of the federal and provincial governments, one First Nation group and one Métis group, as well as three ENGOs participated in the Phase 2 process (Ohlson, *et al.* 2010). However, several First Nations and Métis governments declined to participate in Phase 2 because they did not believe multi-stakeholder bodies were serving their interests. The Phase 2 Framework's recommendations were adopted, with some minor modifications, in the Surface Water Quantity Management Framework for the Lower Athabasca River, in March 2015 (Government of Alberta 2015c).

1.5.3 Data collection

Data collection methods are summarized here and reviewed in Chapters Two, Three and Four. Data sources used to undertake this research include semi-structured interviews, documents and personal observations. Data collection took place between August 2012 and November 2015. I made a total of eight visits to communities in the process of data collection. In October 2013, I visited Yellowknife and Fort Smith, NWT to interview key informants about transboundary water governance in general, as well as in support of data collection for cases of collaboration. In December 2013, I visited Fort St. John, British Columbia in support of my assessment of the EA and decision-making process for the Site C Dam in British Columbia. I visited Peace River, Alberta in January 2014 to attend EA hearings on the Site C dam, interact with interveners, and conduct interviews. I also made trips to Calgary and Edmonton, Alberta in January 2014 to conduct interviews in support of the case of the development of the Surface Water Quantity Management Framework for the Lower Athabasca River. Finally, in January 2015, I attended the Slave River and Delta Partnership Research and Open Houses in Fort Smith and Fort Resolution, NWT, where I spoke with participants of the SRDP and presented a poster of preliminary findings on my research. Field visits provided important contextual information as well as opportunities to interact informally with key actors in transboundary water governance in the MRB. They provided a valuable source of insight.

In total, 55 individuals were contacted for participation in this study. Thirty agreed to be interviewed. Interviewees were sought using purposeful and snowball sampling techniques. Individuals were contacted because their roles and involvement in the cases considered or transboundary water governance in general. They provided valuable, in-depth insights regarding

various aspects of transboundary water governance in the MRB. Interviewees provided information regarding experiences in and perceptions of various aspects of transboundary water governance such as power dynamics, contextual information and verified or clarified findings from document analysis.

Interviewees came from a variety of backgrounds including current and former federal, provincial and territorial government officials, representatives of Indigenous governments and employees of industry and ENGOs. Several key informants were senior government officials. Most were directly involved in ongoing governance initiatives. Many interviews had experience in several of the cases included in this study and so were asked questions about several different cases. Table 1.8 details interviewee backgrounds and interviews that support the analysis of each case. Interviews ranged from 30 minutes to approximately two hours. All interviews were semi-structured to allow for flexibility in questioning based on interview responses (Hay 2003). The interview guide used in the course of this research is available in Appendix 1. The interview guide was developed based on frameworks for each chapter and was implemented according to the experience and expertise of each interviewee. Following an interview guide facilitated comparisons between interviews and cases. However, the interview guide was revised iteratively in response to insights gained during data collection and the background of and nature of the interviewee's involvement in the cases considered.

Individuals who declined to be interviewed or did not respond to interview requests include provincial, territorial and federal government officials as well as representatives of Indigenous governments, ENGOs and industry. A number of factors likely limited the extent to which participants were willing to be interviewed. First, several of the groups contacted for involvement in this study are heavily involved in a number of other ongoing research projects. Research fatigue and capacity constraints may have played a role. Second, several major initiatives occurred simultaneously with data collection, including the negotiation of bilateral water management agreements between provinces and territories, the EA of the Site C dam and the development of the Surface Water Quantity Management Framework. The need for confidentiality may have limited the willingness of some individuals to be interviewed despite confirmation that interviews, if desired, would remain confidential. Extensive document analysis, participant observation (discussed below) and interviews conducted with key individuals directly involved in various aspects of transboundary water governance were used to address gaps resulting from denied interview requests.

Sixteen interviews were conducted in-person and 14 were conducted over the telephone. All but two interviews were audio-recorded and transcribed immediately following the interview. When interviewees requested that interviews not be recorded, detailed notes were taken. At times, some interviewees requested that certain statements be considered “off the record”, in which case those particular sections of the interview were not transcribed. Interview transcripts were returned to interviewees to verify the transcript before data analysis began.

Table 1.8: Interviews by background and case

Interviewee background	Total Interview Requests	Total Unique Interviews	Interviews by Case *				
			MRBB	PADEMP	SRDP	Site C EA	Lower Athabasca Framework
Territorial government	11	9	7	4	4	2	0
Provincial government	16	9	7	3	0	2	3
Federal government	10	5	5	3	2	1	1
Indigenous government	10	3	0	3	3	3	1
Industry	4	2	0	0	0	0	2
ENGO	4	2	0	1	0	2	2
Total	55	30	19	14	9	10	9

* Some interviewees provided data pertinent to more than one case. Therefore, the total number across cases does not sum to the total of unique interviews.

The University of Waterloo Office of Research Ethics approved all interviews (ORE # 19074), which were conducted in accordance with the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans* and the University of Waterloo *Statement on Human Research*. To conduct interviews in the Northwest Territories, a Scientific Research Permit from the Aurora Research Institute was required (License #15343). Therefore, all interviews conducted in the NWT received approval of and clearance from the Aurora Research Institute as well as the University of Waterloo Office of Research Ethics. All interviewees were provided with an information letter that detailed the study goals and a consent form to indicate they participated freely in the study, to provide consent for audio-recording and to indicate how they wished the interview to be reported in published material in the study. All interviewees participated freely. Many interviewees requested that interviews remain anonymous. Therefore, interviews will be

reported in this dissertation using codes to preserve the anonymity of each interviewee. Codes are specific to individual chapters and are reported as numbered confidential interviews (e.g., CI 1), as in Chapters Three and Four or numbered key informants (e.g., KI 1), as in Chapter Two.

A total of 296 documents were reviewed to support this research (see Appendix 2 for a list). One hundred and eighteen of these documents support analysis in Chapter Two, 160 supported Chapter Three and 251 supported Chapter Four. Many documents were relevant to more than one chapter (see Appendix 2). Documents included historical government documents, current government documents, news articles, the policy prescriptions of ENGOs, letters, policy documents of Indigenous governments, EA hearing transcripts and submissions made to the Canadian Environmental Assessment Agency. Documents were identified via internet searches, bibliographies and the recommendations of research participants. The documents included provided essential contextual information, insight regarding institutional design, or information on how power dynamics operated in various cases. For example, document analysis was critical to assessing power's third dimension in Chapters Three and Four. Document review verified, clarified and/or supplemented statements made by interview participations. Documents analysis provided an essential non-intrusive data collection method that was especially helpful in the context of this research. Publically available documents helped to address interview gaps. For example, there is an extensive publically available record of industry and ENGO interests and participation in the Site C EA and policy development regarding oil sands mining that supported analysis in Chapter Four.

Personal observations made during field visits and interviews provided additional sources of insight. Observations were uncontrolled in the sense that I did not restrict myself to observing a set of prescribed phenomena (Hay 2003). Rather, I took notes of observations during EA hearings and meetings that were used to verify relevant findings revealed through interviews and/or document analysis. For instance, they were used to confirm or add nuance to findings revealed through document and interview analysis.

1.5.4 Data analysis

Documents and interviews were organized and analyzed using the data analysis software NVivo QSR 10. Documents and interviews were coded in NVivo using a coding scheme grounded in the framework used for each paper. Personal observations were used to verify or confirm relevant findings from document and interview analysis. Qualitative content analysis was used to deductively analyze interviews and key documents to derive understandings about the overt and latent meanings of the texts. Qualitative content analysis is a systematic method that can be used

to identify and describe meaning of qualitative data (Schreier 2012). Qualitative content analysis encourages focusing on specific aspects of texts that relate to the research questions (Schreier 2012). A large number of documents are collected and read for context and then important passages are coded for analysis and interpretations (Cho and Lee 2014). As opposed to quantitative content analysis, qualitative content analysis permits a consideration of the latent meanings in text (Kohlbacher 2006), which is especially important for studies of power.

In the context of this study, frameworks were used to guide data collection and then developed as coding schematics to analyze data. In qualitative content analysis, data are organized by key themes, statements, concepts and ideas in a coding framework. The coding framework assists the analysis and interpretation of data. Specific categories (e.g., participation, preferences, agenda control) can be abstracted to correspond to theories (e.g., power's first or second dimension). Data collection for Chapter Two was guided by indicators related to the IAD framework (see Table 1.4). Data were analyzed according to performance criteria and features of adaptive transboundary water governance identified in Table 1.5 and discussed in more detail in Chapter Two. For Chapters Three and Four, indicators from collaborative environmental governance and transboundary water governance literatures were used to develop coding categories related to core themes of power's first, second and third dimensions (indicated in Table 1.6). Multiple indicators were used in the case of each dimension of power. For instance, text related to preferences, conflicts and decisions were coded separately but under the broad category of power's first dimension. Similarly, agenda-setting, information control and non-decisions were coded separately but under the more abstract category of power's second dimension. Patterns and themes that emerged in the process of analyzing data that did not correspond to the coding framework were coded inductively as permitted in qualitative content analysis (Schreier 2012). Results from inductive coding are not reported in each chapter but will be discussed in the concluding chapter. An important limitation to qualitative content analysis, as a primarily deductive approach to data analysis, is that it is not suitable for open-ended explorations of particular contexts (Cho and Lee 2014; Kohlbacher 2006). This was particularly the case in the course of this research, which favoured deductive data coding based on pre-established categories derived from Lukes' power theory and the collaborative and transboundary water governance literatures. As such, findings from deductive analysis are emphasized over emergent findings.

Trustworthiness is achieved in this study via multiple strategies (Lincoln and Guba 1985; Shenton 2004). Triangulation between documents, interviews and personal observations, as well as participant verification of transcriptions, help to make findings credible (Schreier 2012).

Descriptions of context permit assessments of transferability (Shenton 2004). Standardized coding, derived from existing, well-established frameworks, contributes to dependability (Shenton 2004). Finally, each chapter's description of methods and the consideration of study limitations in Chapter Five, help to ensure confirmability (Lincoln and Guba 1985).

1.6 Organization of thesis

The remainder of this thesis will be presented as follows. As mentioned above, each of Chapters Two, Three and Four, while they can be considered a conceptual whole, also stand alone as separate manuscripts for publication in academic journals. They have been prepared as co-authored publications (Morris, M and R.C. de Loë).

Chapter Two of this dissertation provides a detailed assessment of a RBO – the MRBB – using a modified IAD framework and several normative criteria related to sustainability and adaptive transboundary water governance. By adopting a single-case study design, it also offers a detailed, in-depth assessment of the role that the RBO has in contribution to adaptive transboundary water governance that directly addresses Objective 2 and contributes to addressing Objectives 1 and 4. This assessment offers rich empirical insights regarding the design and performance of an existing RBO that contributes to the transboundary water governance literature. Chapter Two is published in the journal *Ecology & Society* (Morris and de Loë 2016).

In Chapter Three, a detailed assessment of the ways in which power dynamics have impacted three collaborations in the MRB is presented. The collaborations take place at local, regional and basin-wide levels, facilitating a consideration of the role that multi-level collaboration plays in transboundary water governance in the MRB. Chapter Three directly address Objective 3 a) and contributes to achieving Objectives 1 and 4. Chapter Three provides an empirical and theoretical contribution to the transboundary water governance and collaboration literature. First, empirical insight regarding the role that collaboration plays in transboundary basins is provided by exploring three cases in detail. Second, by applying a power-based framework to collaborative processes, Chapter Three demonstrates that power-based analyses can usefully illuminate constraints on collaboration that may not be obvious. Chapter Three will be submitted to the journal *Environmental Policy & Politics*.

Chapter Four provides an analysis of major water use decisions within upstream jurisdictions in the MRB that have implications for downstream communities and governments. The focus of this manuscript corresponds to the contention in this dissertation that because jurisdictions typically retain significant autonomy to make resource management decisions within

their territories even when they sign interjurisdictional agreements, it is necessary to consider their internal water use decisions as a possible factor that can constrain and enable sustainable transboundary water governance. Chapter Four directly addresses Objective 3 b) and contributes to achieving Objectives 1 and 4. A power-based framework is used to assess the ways in which power dynamics impacted water use decisions within jurisdictions. This paper offers both an empirical and theoretical contribution to the transboundary water governance literature. First, it provides empirical evidence that power dynamics impact federal transboundary water governance. Second, it offers a fairly simple but effective framework for analyzing water use decisions within federal transboundary water systems. Chapter Four will be submitted to the journal *Water Alternatives*.

Finally, Chapter Five offers concluding remarks on the scope, purposes and contributions of this dissertation. It reiterates key academic contributions made by this dissertation and charts a research path forward. Chapter Five also includes my personal reflections on conducting transdisciplinary research.

References are listed at the end of this document, rather than at the end of each chapter, as required by University of Waterloo thesis guidelines. The interview guides and list of document reviewed for each chapter are included in Chapter Six.

Chapter Two

Cooperative and adaptive transboundary water governance in Canada's Mackenzie River Basin: status and prospects

2.1 Introduction

The Mackenzie River Basin (MRB) is one of the largest, relatively pristine riverine ecosystems in North America (Rosenberg International Forum on Water Policy 2013). It is also a site of increasing resource development within Canada, and a transboundary system in which three provinces, three territories, a federal government and Aboriginal governments (under Canada's constitution, Indigenous peoples are referred to as "Aboriginal") have responsibilities for water. We argue, as others have (Delli Priscoli and Wolf 2009; Garrick, *et al.* 2013), that transboundary water governance within federal countries can face challenges similar to those between sovereign states in the international context. Evidence for this assertion is easy to collect; consider conflicts over water use in the Apalachicola-Chattahoochee-Flint Basin in the United States (Meruelo 2007), the Narmada river system in India (Kumar 2013) or the Murray-Darling Basin in Australia (Bhat 2009). In the MRB, concerns regarding the downstream impacts of hydro-electric development have persisted for decades. More recently, the environmental impacts of increasing oil and gas extraction have emerged as major concerns.

To illustrate the scope and nature of these challenges, upstream hydro-electric developments have altered natural flow patterns to correspond to periods of high electricity demand. Oil sands extraction has resulted in habitat fragmentation and impacts to water quality; Indigenous peoples report deteriorating water quality and poor fish health downstream of oil sands mines (MRBB 2012). Changing temperatures in the MRB have impacted the timing of spring thaw, fall freeze-up and peak river flows; the basin's hydrology may also be impacted by increased permafrost thawing (MRBB 2012). These changes may impact the quality and quantity of water available for human settlements and resource development. Transboundary water governance that respects the interests of the diversity of Indigenous peoples in the MRB is also a key challenge. A coordinated and adaptive approach to transboundary governance may help to address uncertainties associated with climate change and increasing industrial development in the MRB as well as fostering greater inclusion in environmental monitoring and decision-making. How Canadians address the challenge of cooperative and adaptive governance in this basin can provide insights for both scholars and practitioners of transboundary water management.

Adaptive governance emphasizes learning and experimentation, which can foster conditions that help to deal with complexities and uncertainties in social-ecological systems (Chaffin, *et al.* 2014), including those that exist in transboundary water systems such as the MRB. Adaptive transboundary water governance is characterized by features such as incorporating a variety of knowledges - local, traditional and scientific - in monitoring and decision-making and institutions that are flexible to allow responses to new information (Raadgever, *et al.* 2008). Vertical and horizontal information sharing and the presence of nested institutions can help to facilitate adaptive transboundary water governance by enabling well-informed and coordinated management responses to take place at the appropriate scale (Akamani and Wilson 2011; Folke, *et al.* 2005; Green, *et al.* 2013). Joint institutions, such as river basin organizations, which operate on the scale of the bioregion, are considered key facilitators of adaptive governance in transboundary systems (De Stefano, *et al.* 2012; Green, *et al.* 2013). However, as Huitema and Meijerink (2014) point out, there is a great degree of variability in terms of river basin organization form and function. Thus, assessing the extent to which river basin organizations can contribute to adaptive governance requires considering their institutional design and performance. In this paper, we ask how well a river basin organization that operates in the MRB, the Mackenzie River Basin Board (MRBB), performs in terms of coordination, accountability, legitimacy and environmental effectiveness. Using these criteria of institutional performance, we also consider the extent to which governance based on river basin boundaries - a bioregional approach (Slocombe 1998) - contributes to adaptive governance in the MRB. Effectively enabling an adaptive, bioregional approach to governance requires appropriate institutions and a supportive political context (Folke, *et al.* 2005). Without accountability, legitimacy and evidence of effectiveness, sustaining interest in adaptive governance can be difficult (Cosens and Williams 2012). Thus, institutional design and performance can be critical to enabling adaptive governance.

The MRBB, a coordinating river basin organization, was established in 1997 under the Mackenzie River Basin Transboundary Waters Master Agreement to encourage cooperative management based on principles of ecosystem integrity, sustainability and respect for jurisdictional autonomy. In the next section, we provide an overview of the constitutional, physical and socio-economic setting for transboundary water governance in the MRB. In the section that follows, we address the first two guiding questions underlying the special issue through exploring the design of the MRBB, and the politics and strategies that resulted in this design. Our evaluation of the effectiveness of the MRBB in Section 3 addresses the third question underlying the special issue. Questions of coordination, accountability, legitimacy and

environmental effectiveness are linked to the design of the organization. Based on our evaluation of the performance of the MRBB, we conclude by considering the extent to which it contributes to a bioregional, adaptive approach to governance in the basin.

Our findings are based on several sources of information. A total of 118 documents, including government documents, technical reports, submissions to environmental assessment (EA) hearings, news articles and documents produced by Indigenous governments and environmental organizations inform our analysis. Nineteen semi-structured interviews with key informants directly involved in governance for water in the basin provided a rich source of data regarding experiences with and perceptions of the MRBB and transboundary governance in the basin. Interviews were transcribed verbatim and verified by participants. Personal observations made by the first author during EA hearings and meetings and the personal experiences of the second author, based on his role as a former member of the Northwest Territories' (NWT) Strategic Advisory Group of Experts regarding transboundary negotiations, also support our analysis. Interview data and policy documents were analyzed according to principles of institutional design and evaluation criteria related to coordination, accountability, legitimacy and environmental effectiveness discussed in Huitema and Meijerink (2014). Data were also considered for characteristics of adaptive transboundary water governance, including nested, multi-level design, the inclusion of multiple sources of information in monitoring and decision making and flexibility/responsiveness.

2.2 Case and context

Even in a country recognized globally for its considerable water resources, the MRB (Figure 2.1) stands out. It contains Canada's longest river system, at 4,241 km (MRBB 2003a). With an area of approximately 1.8 million km², the basin drains approximately one-fifth of Canada's land area (MRBB 2003a). The basin's headwaters are the Peace and Athabasca rivers, which begin in British Columbia and Alberta, respectively. Numerous lakes - including the largest lake entirely in Canada (Great Bear) and the deepest lake in North America (Great Slave), along with internationally-significant deltas and vast wetlands, are part of the basin's hydrology. The waters of the basin ultimately discharge from the Mackenzie River into the Beaufort Sea on Canada's northern coast.

Figure 2.1: The Mackenzie River Basin, Canada



The basin's terrestrial and aquatic ecosystems are nationally and internationally significant. In addition to containing some of the last expanses of nearly pristine wilderness on the North American continent, the MRB also has globally significant wetland, tundra and forest ecosystems; these provide habitat for numerous species that reside part or all of the year in the basin. Deltas provide critical staging and breeding zones for millions of migratory birds; examples include tundra swans and geese that use the Peace-Athabasca Delta on Lake Athabasca (Figure 2.1). The Mackenzie Delta on the Beaufort Sea, Canada's largest active delta at approximately 9,000 km² (Prowse, *et al.* 2009), is a critical habitat for species that include fish, beluga whales, moose and beaver (MRBB 2003a). The fish and wildlife resources of the basin are critical not only for their role in ecosystems, but also as a source of food for a significant portion of the basin's people, especially its Indigenous peoples (Government of the Northwest Territories 2010).

The MRB is sparsely populated relative to southern Canada. Its population in 2001 (the most recent date for which basin population data have been calculated) was an estimated 397,000 people - the majority of whom resided in the Alberta portion (MRBB 2003a). As in northern Canada as a whole (Prowse, *et al.* 2009), population growth and demographic change have been closely linked to resource development. Development of Alberta's oil sands, near the town of Fort McMurray (Figure 2.1), accounts for much of the basin's recent population growth. For example, between the 2006 and 2011 national census years, the population of Fort McMurray grew by approximately 30% (Statistics Canada 2012). Much of this population growth is due to the labour demands of oil sands mining and construction (Regional Municipality of Wood Buffalo 2012). Indigenous peoples, who comprised 15 percent of the 2001 population, have lived in the MRB for millennia. The proportion of the population that is Indigenous is highest in the less densely populated northern portions of the basin (MRBB 2003a), where communities tend to be small (fewer than 500 people) and located along coastlines, lakeshores and rivers (Prowse, *et al.* 2009).

Jurisdiction over the basin is shared and fragmented, with key actors including provinces, territories, the federal government and Indigenous peoples.

- Portions of the basin are located in three of Canada's provinces (Alberta, British Columbia and Saskatchewan) and three territories (Yukon, NWT, and Nunavut - although Nunavut is not typically considered a basin jurisdiction because its share of the basin's land area is so small) (Figure 2.1). Under the Canadian Constitution, provinces have primary responsibility for the management of water resources, and thus each province has its own institutional framework for governing water.
- The federal government is also a key basin jurisdiction because of its constitutionally-defined responsibilities relating to concerns such as fisheries, national parks, transboundary waters and Aboriginal peoples.
- The Yukon Territory and the NWT have received province-like powers from the federal government through devolution processes in 2003 and 2014, respectively.
- Indigenous peoples occupy a special place in Canada's society because of their historical, legal, treaty and constitutionally-defined rights. Hence, the fact that the basin includes the traditional territories, treaty areas and land claim settlement regions of First Nations, Métis and Inuvialuit (or western Canadian Inuit) peoples is critical to any discussion of transboundary water governance in the basin.

The MRBB was created in part to provide a coordinating function among these actors.

The basin is under pressure from a number of threats. A lack of adequate baseline environmental data in much of the basin has made tracking long-term environmental changes difficult (MRBB 2012). Climate change is an important current and future stressor on the basin's social and ecological systems (Schindler and Donahue 2006). Wolfe, *et al.*, (2012) anticipate declining spring freshet and summer discharge in the headwaters of the MRB. Some models indicate that annual discharge may increase in the Peace River region, with higher discharge in the fall and winter months but reduced discharge in the late summer and early fall (Schnorbus, *et al.* 2011). Modelling future Athabasca River flows indicates a trend of decreasing flows which is expected to continue because of declining glacier ice and snowpack at higher elevations (Sauchyn, *et al.* 2015). There is some uncertainty about the impacts of the climate change in the basin. In general, water quality and quantity available for human settlements and resource developments are expected to fluctuate, making an adaptive approach necessary in this basin (MRBB 2012).

Energy development projects located in the Athabasca and Peace sub-basins are additional sources of social and environmental change in the MRB. Fossil fuel extraction is predominant economic activity in the Athabasca sub-basin in Alberta. In 2014-2015, royalties collected from bitumen mining totaled approximately \$5 billion, over half of those collected by the province (Government of Alberta 2015a). Production from surface and in-situ oil sands mines increased by over 200 percent between 2000 and 2014, from 0.66 million bbl/day to 2.3 million bbl/day (Alberta Energy and Utilities Board 2001; Alberta Energy Regulator 2015); production is expected to reach approximately 4.8 million bbl/day by 2030 (Alberta Energy Regulator 2015).

Oil sands development figures prominently in Alberta's economy, but it has also created large-scale environmental disturbances. More than 600 km² of land is under development for oil sands mining and there are approximately 170 km² of tailings ponds in the region (MRBB 2012) (MRBB 2012), which contain naphthenic acids, polycyclic aromatic hydrocarbons, arsenic and other trace metals (Timoney and Lee 2009). The most significant source of water for oil sands mining is the Athabasca River; mining requires on average 3.1 barrels of water per barrel of oil produced (Canadian Association of Petroleum Producers 2015). Processed water is stored in tailing ponds which have been detected seeping into the Athabasca River and its tributaries (Timoney and Lee 2009). The scale and pace of oil sands development in Alberta is controversial because of local environmental impacts, including habitat fragmentation and destruction, pollution and water use (Hodson 2013) as well as impacts to the Aboriginal and treaty rights and contribution to Canada's greenhouse gas emissions (Mantyka-Pringle, *et al.* 2015). Concern

regarding the environmental impacts of oil sands extraction extends to the downstream NWT (AANDC and GNWT 2012). In the late 2000s and early 2010s, several reports critiqued monitoring programs in the oil sands region for failing to provide necessary data to conduct cumulative effects assessments (Auditor General of Canada 2011) or adequate sampling and baseline information to adequately assess industry's impact on the landscape (Kelly, *et al.* 2010; Oil Sands Advisory Panel 2010). In response, the federal government and province of Alberta cooperated to develop a multi-year Joint Oil Sands Monitoring Program in 2012 (Government of Canada and Government of Alberta 2012). The MRBB has not been directly engaged in this monitoring effort.

Electricity generated from hydro-electric power stations in the basin also is extremely important to the economy of British Columbia. Two stations located on the Peace River account for approximately 30 percent of generating capacity in the province (MRBB 2003a). A third dam was approved by the provincial and federal governments in the fall of 2014. The environmental impacts of hydroelectric facilities on the Peace River have been long-standing concerns for downstream communities and governments (NRBSB 1996), who raised concerns during the EA for the third dam in 2013 and 2014 (Government of the Northwest Territories 2013; Moore 2014; Parks Canada 2013). The Bennett Dam on the Peace River (Figure 2.1) has resulted in changes to seasonal patterns of stream flow - higher flows in winter and lower flows in the spring - that have long been thought to have negatively affected the ecology of the Peace-Athabasca Delta (Prowse and Conly 2000). The extent to which changes experienced and observed in the Peace-Athabasca Delta are caused by climate change or the dam's flow regulation is currently a matter of debate. Some studies suggest that climate drivers are responsible (Wolfe, *et al.* 2012) while others acknowledge that although climate change has had an impact, flow regulation is the more influential driver of downstream ecosystem disturbance (Beltaos 2014).

In summary, the MRB is a nationally significant bioregion. Critical ecological resources exist in a place that is immensely significant to Indigenous peoples, who have occupied the landscape for millennia. Major economic developments exist, and many more are planned. Inadequate monitoring and baseline information means considerable uncertainty exists about the extent of environmental changes resulting from industrial development and climate change. Uncertainties associated with the extent of environmental changes resulting from climate change and industrial development, and the multiple interests at stake in the MRB, make an adaptive approach to governance in this basin desirable.

2.3 Politics, strategies and institutional design

The jurisdictions that share the MRB have independent responsibilities for water resources. As a result, even though the basin is located entirely within Canada, the kinds of problems that are typical in shared international basins (Loures, *et al.* 2008) also exist in this case. Recognizing this challenge, the basin jurisdictions began working towards a more cooperative approach to water management in the early 1970s (Creery 1979). These efforts coincided with a period of national leadership from the federal government, and a relatively high degree of cooperation among the provinces and the federal government on water issues in Canada (Booth and Quinn 1995). This cooperative spirit has dissipated as the territories received province-like powers for resource management and cuts to federal environment ministries reduced the federal government's capacity for water-related matters (Clancy 2014). As noted above, although the federal government does possess constitutional jurisdiction for transboundary waters, in recent years it has largely deferred to sub-federal governments regarding transboundary waters (Saunders 2014). Work on the agreement that created the MRBB began in 1988 and proceeded through several iterations of negotiations and public comment. An agreement was drafted in the early 1990s and finalized in 1997 when the responsible Ministers from each jurisdiction signed the Mackenzie River Basin Transboundary Waters Master Agreement (henceforth referred to as the Master Agreement) (Government of Canada, *et al.* 1997). The Master Agreement reflects the preferred style of intergovernmental cooperation in Canada during the 1990s, as well as key principles that were shaping discussions around ecosystems and transboundary water resources in the international realm during this time, e.g., information exchange, cooperation among watercourse states, and an ecosystem approach (McCaffrey 2007; Slocombe 1998). Table 2.1 summarizes how these preferences and principles were expressed in terms of the five institutional design rules discussed in (Huitema and Meijerink 2014). Key underlying principles in Part C of the Agreement (Government of Canada, *et al.* 1997) include the following:

1. Managing the Water Resources in a manner consistent with the maintenance of the Ecological Integrity of the Aquatic Ecosystem;
2. Managing the use of Water Resources in a sustainable manner for present and future generations;
3. The right of each to use or manage the use of the Water Resources within its jurisdiction provided such use does not unreasonable harm the Ecological Integrity of the Aquatic Ecosystem in any other jurisdiction

4. Providing for early and effective consultation, notification and sharing of information on development and activities that might affect the Ecological Integrity of the Aquatic Ecosystem in another jurisdiction;
5. Resolving issues in a cooperative and harmonious manner.

Table 2.1: Rules underlying the institutional design of the Master Agreement and the Mackenzie River Basin Board

Rule-types	Rules in case study
Authority rules	The MRBB has no independent authority of its own beyond the mandate it received from the parties to the Master Agreement. Instead, its mandate focuses on coordination, facilitation, dispute resolution and information gathering and sharing.
Aggregation rules	Decisions are made by super majority of two-thirds of the members of the Board, although there are constraints on Aboriginal members (e.g., they are appointed at the pleasure of the respective Ministers and they cannot pass resolutions or action items without the support of some government members).
Boundary rules	The boundaries of the Board's mandate are defined by the hydrologic basin, and the signatories to the Master Agreement have relatively well accepted territorial and constitutional jurisdictions. Entry and exit rules are specified in the Agreement. Membership is limited to representatives of governments, and to Aboriginal peoples (who are not considered as representatives of the general public).
Information rules	The Board has a mandate to conduct research and to generate information that contributes to a whole basin perspective on problems of issues; thus, it has some scope to generate its own information. Discussions around the board table are private, and minutes of these discussions are not publicly available.
Pay-off rules	The annual budget for the board that was established in 1997, \$280,000, is provided by the basin jurisdictions according to a clear formula specified in the Master Agreement. The budget has not been changed since 1997, meaning that the present value of the budget is significantly less than in 1997 due to inflation.

The agreement does not define ecological integrity, sustainable management, or what constitutes cooperative management. Fulfilling these objectives depends on the substance of seven bilateral water managements to be negotiated between neighbouring jurisdictions under the broad framework of the Agreement. The MRBB can support the negotiation of these agreements, but it does not have an explicit negotiating role. As of October 2015, three bilateral agreements have been completed. One, between the Yukon and the NWT, was completed in 2000, and is considered by many to be outdated and in need of revision. In 2015, bilateral water management agreements were completed between the governments of Alberta and the NWT and British Columbia and the NWT. Four other bilateral agreements are currently being negotiated.

Section 2(D) of the Master Agreement created the river basin organization that is the focus of this article: the MRBB. The boundaries of the Master Agreement, and the jurisdiction of the

Board, were hydrologically-defined - and this boundary rule has not been contentious. When the agreement was negotiated the hydrological boundaries established in previous studies were accepted as constituting the MRBB's jurisdiction. Establishing the boundaries was apolitical as it was viewed as "a GIS [geographic information system] job and if somebody came and said the line needs to move a mile east or a mile west because they've now done more detailed GIS work . . . fine. That is not an issue" (Key Informant [KI] 4).

As defined by the Master Agreement, the Board has up to three officials appointed by the federal government and one each appointed by the provinces and territories. If member jurisdictions wish to exit the agreement, the Master Agreement specifies that one year's notice to all of the other jurisdictions must be provided. A distinctive feature of the board's membership is the provision for five Aboriginal members. These members are elected by Aboriginal organizations in each of the provinces and territories, and are then appointed by the respective jurisdictions. Several board members have suggested that the inclusion of Aboriginal members brings a necessary perspective to the board (KI 1, KI 4). However, the Board's aggregation rules require a super majority of two-thirds of members present to consent to a decision or undertaking. Therefore, in most cases Aboriginal members cannot pass resolutions or action items without the support of some government members.

The MRBB's overall mandate is to support the principles of the Master Agreement and to provide a forum to coordinate and facilitate information exchange between each jurisdiction. Specific duties relating to the underlying information rules are spelled out in the Master Agreement; these include monitoring the implementation of bilateral water management agreements that are to be completed between jurisdictions that share part of the MRB; creating State of the Aquatic Ecosystem Reports for the responsible Ministers every five years; reviewing the terms of the Agreement and making recommendations for revision to the Ministers at least every three years; encouraging consistent monitoring programs; and, recommending uniform water quality and quantity objectives. The board is also charged with considering the needs of Aboriginal peoples, keeping them informed of the MRB in culturally-relevant ways and incorporating traditional ecological knowledge and values. Payoff rules are clear-cut. The Master Agreement specified that the total annual costs to be shared by the parties shall not exceed \$280,000 (Part D, Section 3) - an amount that has not been increased since 1997.

The MRBB's mandate is broader than was considered ideal by the officials from Alberta and Saskatchewan who participated in the negotiation of the Master Agreement. These jurisdictions had prior experience with another Canadian internal transboundary agreement, the

1969 Master Agreement on Apportionment among Alberta, Saskatchewan, Manitoba, and Canada, which created the Prairie Provinces Water Board (PWBB). The 1969 agreement apportions the waters of the Saskatchewan River system in southern Canada, which flows through Alberta, Saskatchewan, and Manitoba (Percy 2012). It tasks the PPWB with ensuring that each jurisdiction receives its full allocation, facilitating information exchange and preventing and resolving disputes (Saunders and Wenig 2007). Board members from Alberta and Saskatchewan preferred the narrower scope of the PPWB (KI 7). However, with its focus on principles of ecological integrity and sustainable water management, the Mackenzie River Basin Transboundary Waters Master Agreement has a much broader scope than the 1969 Master Agreement on Apportionment for the Prairie provinces (Saunders 2012). The Government of the NWT believes this broader approach is more appropriate because of the more complex situation in the MRB (KI 2).

In terms of authority rules, the MRBB is an institution designed to facilitate and coordinate rather than to regulate. It does not have authority independent from the governments that created it. It does not issue licenses or make resource management decisions. It can influence decisions by providing information and acting as a "friend of the tribunal" in provincial, territorial, and federal public hearings (Donihee, *et al.* 2000). However, the MRBB has no authority to intervene in the parties' jurisdiction; indeed, Part G of the Master Agreement explicitly protects the "proprietary rights or interests of the Parties." This institutional design was purposeful. None of the jurisdictions wanted to cede their autonomy to make resource management decisions or to influence their development trajectory to a multijurisdictional management board (KI 4).

Despite some disagreement about the board's design and role, there was enough of a consensus that the Master Agreement was signed by the parties. Undoubtedly part of the reason for this agreement was the fact that the Master Agreement is non-binding, its language is vague and its principles rely upon the fulfillment of the bilateral water management agreements that were to be negotiated in future. This definitional vagueness and openness can be interpreted as desirable; it reflects principles of adaptive management related to flexibility and leaves options open for future water managers. However, without specific definitions and water quality or quantity targets or recommendations, the agreement's implementation is also vulnerable to fluctuations in the desire of governments to cooperate and adhere to the principles of the agreement. For example, in the years since the agreement was signed, major industrial developments, including the expansion of oil sands extraction and hydroelectric facilities, have raised significant concerns for downstream governments. In recent years, the federal government

prioritized increasing resource development in Canada; there are strong interests associated with expanding resource development in the MRB (Clancy 2014). Upstream hydroelectric developments, and oil sands development in Alberta, inspired the creation of the NWT's water strategy (Box 1), the success of which depends strongly on the existence of bilateral agreements that respect the NWT's concerns.

Box 2.1: The Northwest Territories Water Strategy

Aboriginal peoples residing in the NWT have a history of partnership with government in making decisions about land and water resources. This is demonstrated in the NWT's recent water strategy, *Northern Voices, Northern Waters*, which states "today, as in the past, the deeply held values of Aboriginal people have brought water issues to the forefront of the NWT" (GNWT 2010, 3). The water strategy, which was developed in partnership between the Government of the NWT and Aboriginal governments, recognizes the cultural, spiritual and historical importance of water to Aboriginal people and outlines a commitment to appropriately involve Aboriginals in implementing the water management strategy. In the words of one key informant, "A lot of our perspective is driven by the people who were born and raised and lived in the NWT since time immemorial which is the Aboriginal population" (KI 3).

In response to perceptions of deficiencies in the Master Agreement's implementation, the most downstream jurisdiction in the basin, the NWT, has recently been advocating for changes to the Board's membership and funding because it views the Board as ineffective, lacking independence from government, and missing needed authority (KI 2, KI 3). The NWT's Minister of Environment and Natural Resources, Michael Miltenberger, made several unsuccessful attempts to meet with the other Ministers to discuss reforming the Board within the confines of the Master Agreement (KI 5). However, because water is rarely a key issue for Ministers, and when it is, it competes with a host of other issues (Clancy 2014), the interjurisdictional consensus required to modify instructions given to the MRBB has not been forthcoming. The fact that provinces and territories have different perspectives on what the MRBB's role should be is also a factor.

As noted above, since the Master Agreement was signed in 1997, three bilateral agreements have been completed. In the case of the 2000 agreement between Yukon and NWT, the issues were relatively straightforward and the stakes much lower than is the case between BC and Alberta, or Alberta and NWT (Saunders 2012). The agreements signed in 2015 were the result of the NWT's strong desire to secure bilateral agreements. In an effort to reinvigorate and align the process of creating bilateral agreements, the *Bilateral Water Management Agreements Guidance Document* was created (MRBB 2009), largely under the leadership of the NWT (KI 3). The *Bilateral Guidance Document* (2009) provides common guidelines so that each of the bilateral

agreements to be negotiated will be complementary; several interviewees reported that it was helpful in the negotiation of the agreements (KI 9, KI 10).

The bilateral agreements completed in 2015 reflect some aspects of *Bilateral Guidance Document*. They include commitments to develop transboundary objectives for surface and ground water quality and quantity and aquatic ecosystem health. Objectives will be developed based on monitoring and learning plans developed by BMCs. The agreements also reaffirm the guiding principles of the Master Agreement. However, unlike the Bilateral Guidance Document which outlines a future role the Board may have that is specific to monitoring the implementation of the bilateral agreements (one of its responsibilities under the Master Agreement), the agreements do not assign the MRBB this responsibility. Rather, the agreements create BMCs, composed of government appointees, and assign them responsibilities associated with implementing the agreement and reporting on the progress of doing so. Perhaps more importantly for the purpose of this article is the limited role envisioned for the MRBB, which is mentioned only twice in the agreements: in relation to roles identifying basin-wide research priorities and in the context of helping to resolve disputes that have been referred to the MRBB (Government of Alberta and Government of the Northwest Territories 2015; Government of British Columbia and Government of the Northwest Territories 2015). The appendices acknowledge that the MRBB will have an oversight role in implementing the agreement, but is sparse on details regarding what that will entail.

The extent to which the MRBB will undertake basin-level research, resolve disputes and provide oversight is uncertain, in part because of the constraints under which it operates. As Donihee *et al.*, (2000) point out, even without the bilateral water management agreements, the MRBB could play a more active and engaged role in transboundary water governance in the basin. Why this has not occurred is explored in the next section.

2.4 Performance of the MRBB as a coordinating river basin organization

Evaluation of the performance of river basin organizations was a key goal of the papers in this special issue. In this section, we evaluate the MRBB relative to four interrelated performance considerations identified in (Huitema and Meijerink 2014) (i.e., coordination, accountability, legitimacy, and environmental effectiveness). This facilitates our consideration of the potential for a more adaptive approach to transboundary water governance in the MRB. Except as noted below, we have adopted the definitions of these terms as provided in Huitema and Meijerink (2014).

2.4.1 Coordination

Coordination is arguably one of the MRBB's most important functions. However, despite the Master Agreement's promotion of a more holistic approach to management of the waters of the basin, the kind of coordination that the Board can undertake is circumscribed by the authority rules contained in the Master Agreement (Table 2.1). To illustrate, nothing in the wording of the Master Agreement requires or permits the MRBB to respond proactively to developments in any jurisdiction even if these developments have transboundary implications (Donihee, *et al.* 2000). The Board could play a legitimate role as an intervener in provincial planning and regulatory processes to provide information or advance general principles. However, advancing specific positions supporting or opposing particular projects would run contrary to the Agreement's clauses relating to cooperation and respect for each of the parties' jurisdiction (Donihee, *et al.* 2000).

Concern for jurisdictional interests has meant that at times, the MRBB struggles to adopt a whole-basin perspective, according to several interviewees (KI 1; KI 3; KI 7). Although the MRBB provides a forum to share information, one interviewee commented that there is no mechanism or requirement that other jurisdictions modify internal management procedures in response to concerns raised at meetings (KI 11). This is reinforced by provisions of the Master Agreement that protect jurisdictional autonomy to make resource management decisions. In fact, coordinating the sometimes competing interests that exist in the basin regarding industrial development has been a challenge. For example, flow regulation by hydroelectric facilities in British Columbia has been a long-standing concern for downstream jurisdictions Alberta and the NWT (NRBSB 1996). Yet, when British Columbia approved its third dam on the Peace River, the project's approval conditions did not incorporate the immediate downstream concerns regarding the adequacy of proposed minimum flows from the dam (British Columbia Environmental Assessment Office 2014b; Moore 2014).

The Master Agreement does permit jurisdictions to strengthen the coordination function through bilateral agreements. For instance, the bilateral agreements completed in 2015 contain specific requirements and obligations regarding notification and consultation. Significantly, they assign notification and consultation functions to the BMCs. It is possible that the experiences and perspectives from each of the separate BMCs could be brought to the MRBB. However, the agreement and appendices are silent on whether the BMCs will coordinate with one another or the Board. This omission is a concern because coordination and vertical information sharing via nested institutions are key components of adaptive transboundary governance.

Dispute resolution is a common function of river basin organizations in other parts of the world (Huitema and Meijerink 2014). By helping to resolve disputes, river basin organizations can support coordinated approaches to the governance of shared basins. The MRBB can play a role in resolving disputes when questions or disputes relating to the Master Agreement are brought directly to the Board by a member (Donihee, *et al.* 2000) or a BMC (Government of Alberta and Government of the Northwest Territories 2015; Government of British Columbia and Government of the Northwest Territories 2015). However, reflecting the limited and carefully constrained role that the parties to the Master Agreement wanted when it was negotiated, the Board can only issue conclusion and recommendations in such cases, and the parties involved need not respond. Furthermore, as Saunders (2012) notes, the Master Agreement does not permit either a judicial role or any form of binding arbitration - meaning that the dispute resolution procedures it contains are weak. The pattern of avoiding binding, judicial dispute resolution was replicated in the recently completed bilateral water management agreements.

The Board has a mandate to recommend objectives for water quality and quantity, which is another avenue for coordination that would support a bioregional perspective. However, it does not have the authority to ensure or require that the basin jurisdictions have common policies (KI 4). Completed bilateral water management agreements do contain provisions to develop specific surface and ground water quality and quantity objectives and biological objectives. Objectives have yet to be determined, but will be based on learning plans developed and implemented by BMC (Government of Alberta and Government of the Northwest Territories 2015; Government of British Columbia and Government of the Northwest Territories 2015). However, the bilateral agreements indicate that monitoring and reporting associated with water quality and quantity objectives will be undertaken by BMCs, not the MRBB, which may challenge a bioregional approach to governance in the basin.

The MRBB has a mandate to conduct research and to generate information that contributes to a bioregional perspective on water-related issues. In fact, this is one of the two roles assigned to the MRBB in the bilateral agreements. In a thorough assessment of the Master Agreement from a legal perspective prepared for the Board, Donihee, *et al.*, (2000) suggested that bilateral agreements are not necessarily required for the Board to address basin-wide issues relating to the sustainable use of water resources or aquatic ecosystems in a more proactive fashion. Despite this opinion, the Board has not pursued this opportunity. Instead, it has focused its energy on the production of State of the Environment reports; submissions of these to the Ministers is required every five years under the terms of the Agreement. Two such reports have been submitted

(MRBB 2003a; MRBB 2012). The second report was several years overdue; it provided a brief overview and summary of key issues in the basin raised in the first report (MRBB 2012).

The Board has a special mandate to involve Aboriginal peoples in its deliberations, and to integrate traditional knowledge, an important feature of the agreement that can contribute to adaptive governance in the basin. Aboriginal Board members are explicitly not representatives of the general public. Instead, they are supposed to represent the interests of Indigenous peoples in the provinces/territories from which they were appointed. This is a complex task because of the diversity of Indigenous peoples in each jurisdiction; as noted, the basin is home to distinct First Nations, Métis and Inuvialuit peoples. Due to the existence of land claims agreements in the territories that assign specific governance functions to Indigenous peoples, the legal position of Indigenous peoples in those jurisdictions differs from the position of Indigenous peoples in the provincial portions of the basin. Practical challenges also exist relating to the ability of the Aboriginal members of the Board to participate in its activities. For instance, resources to support capacity building have been insufficient (KI 7). Most significantly for the subject of coordination, the role that has been permitted to the Aboriginal Board members has been described as "token" by a senior territorial official (KI 2); this is completely unacceptable from the perspective of NWT, the interviewee suggested, where Aboriginal governments are viewed as partners with the territorial government (Box 1).

The Board's performance of its coordination functions should not be surprising in light of the constraints under which it operates. For its day-to-day work, the Board has a Secretariat with a staff of one person (MRBB 2013). Interviewees emphasized that the budget of the MRBB, which has not been increased since 1997, is too limited to undertake significant original research. Additionally, as a former Executive Director noted, the different jurisdictions have struggled to come to agreement on what research initiative should be undertaken with the limited funds that are available (KI 7). He attributes this in part to the Board's composition. Along with several other interviewees, he noted that the Board is dominated by bureaucrats, and that this can work against a broader perspective because the government members are focused too strongly on the interests of their own jurisdictions. Funds also have been insufficient to coordinate the various monitoring programs within the basin jurisdictions (KI 5). The fact that the recent monitoring program instituted in 2012 for the oil sands due to public and scientific concerns is a joint initiative between Canada and Alberta (Government of Canada and Government of Alberta 2012), and does not involve the MRBB, raises questions about the relevance of the Board, and the strength of the political commitment to shared management of the basin. The Government of the

NWT (2012) has requested (unsuccessfully) that Aboriginal partners be involved in the implementation of the monitoring program. In 2014, the Auditor General of Canada reviewed the monitoring program's performance and noted that, "further efforts are needed to meet commitments to engage stakeholders, including First Nations and Métis, and incorporate TEK [traditional ecological knowledge]" (Auditor General of Canada 2014, 17).

2.4.2 Accountability

How accountability should be evaluated in a case such as the MRBB is complicated and contested. The MRBB was created by Ministers from the respective jurisdictions. It exists at the pleasure of these Ministers and is formally accountable only to them; from this perspective, a former Board member suggested, accountability is not a concern (KI 4). In contrast, other interviewees pointed to larger accountability questions. For example, the respective Ministers are under no obligation to present reports from the Board to their respective legislatures, or to the general public (KI 3). Hence, the Ministers themselves are not regularly accountable for the success or failure of the Board to achieve its mandate, or for the extent to which the terms of the Master Agreement are met (KI 5). The fact that water is rarely a key priority for Ministers (Clancy 2014), with perhaps the more recent exception of Minister Miltenberger, has contributed to the low level of political attention the Board has received.

The Board's accountability to Indigenous peoples in the basin also is an important question that deserves consideration (KI 5). In terms of the legal text of the Agreement, the Board is not specifically accountable to Indigenous peoples in the same way it is accountable to the Ministers. From the perspective of the NWT, however, the question of accountability to Indigenous peoples is less clear cut. As noted previously, Aboriginal governments are viewed as partners by the government of the NWT (Box 1). This stands in contrast to the general perspective of the provincial and federal governments in Canada towards Indigenous peoples (Phare 2009). Gaps in mechanisms to engage the public and uneven approaches to engaging Indigenous peoples in the basin may challenge adaptive governance.

Key informants reported varying levels of satisfaction regarding the extent to which the Board was fulfilling its mandate. Referring to the kinds of issues discussed above, some interviewees suggested that the Board was not particularly effective in fulfilling its mandate under the Master Agreement, and, importantly, was not being held to account. For example, the Board is required to submit reports annually. However, it did not publish any annual reports during the years 2007-2011 and fulfilled its overdue reporting requirements with an update in 2013 (MRBB 2013). As noted earlier, the MRBB was late in delivering its second State of the

Aquatic Ecosystem reports. The Board also has a specific mandate to incorporate traditional ecological knowledge, but has struggled to do so according to interviewees. In a recent report, the Board itself acknowledged that, "when compared with the availability of western science, Traditional Knowledge is underrepresented in all areas of the Mackenzie River Basin" (MRBB 2012, 10).

These kinds of concerns speak to accountability, in the sense that historically it does not seem to have mattered to all the signatories to the Master Agreement whether or not the Board fulfills its mandate. In fairness, however, it must be emphasized that it is entirely within the power of the basin jurisdictions (with the consent of all parties) to increase the Board's budget, to change the instructions given to government members regarding their role on the Board, to encourage the Board to expand its activities within its mandate, to provide it with the support it would need to integrate traditional ecological knowledge more effectively - or even to reconstitute it through a new agreement. Any of these activities would require the consent of all basin jurisdictions. Although most jurisdictions agree that modifying the budget is necessary, agreement on the precise nature of the changes has not been forthcoming (KI 3; (MRBB 2013)).

2.4.3 Legitimacy

As in the case of accountability, multiple perspectives exist regarding the legitimacy of the MRBB. The concept of "legitimacy" is conventionally defined as the approval of institutions by those subject to their actions (Gearey and Jeffrey 2006; Suchman 1995). The MRBB has the legitimacy that flows to bodies constituted under agreements entered into by parties that themselves have legitimacy. It certainly has not exceeded its mandate, or even (arguably) reached the limits of its mandate (Donihee, *et al.* 2000; Saunders 2012).

Legitimacy is often evaluated in terms of "inputs" and "outputs" (Huitema and Meijerink 2014). On the input side, the Board has provided a forum for the parties to share information. Discussions around the board table are private, and minutes of these discussions are not publicly available. Thus the MRBB creates a safe environment in which dialogue can occur and contentious issues can be discussed (KI 3; KI 6). The fact that it has a poor track record of engaging the general public within the basin, or indeed being known to residents of the basin - a problem identified by several respondents also does not undermine its legitimacy from this perspective; this kind of engagement was not sought by the signatories to the Master Agreement, although strengthening ties to the public may be necessary to establish a more adaptive approach in the basin. Where the MRBB clearly falls short on the input side is in meeting the requirement to engage Aboriginal peoples and to make effective use of traditional ecological knowledge. The

Board itself identified this as a deficiency (MRBB 2012). The Board's Traditional Knowledge and Strengthening Aboriginal Partners Committee, has been working to encourage best practices in gathering and incorporating traditional knowledge in environmental monitoring and assessment to address this deficiency (Stevenson 2012).

On the "output" side, the Board falls short relative to its specific mandate to provide annual reports and State of the Environment reports every five years. Numerous relevant concerns relating to output legitimacy were identified above. Importantly, some interviewees pointed to the slow pace at which bilateral agreements have been developed as evidence of the Board's ineffectiveness. This criticism is unfair, we suggest, because the Master Agreement assigns the Board no role in the negotiation of the bilateral agreements. The rate of progress in negotiating the bilateral agreements has been determined entirely by the signatories to the Agreement, rather than by the Board.

2.4.4 Environmental effectiveness

The Master Agreement includes protection of the ecological integrity of the MRB as a guiding principle, but the recently completed bilateral water management agreements assign responsibilities for monitoring and reporting on environmental performance to BMCs, which are separate from the MRBB. Poor or limited baseline data and inadequate monitoring have made evaluating environmental performance within the basin difficult (MRBB 2012). As a result, assessing the environmental performance of the MRBB is challenging because of gaps in knowledge regarding pre and post-MRBB environmental conditions. Unfortunately, these gaps in knowledge may challenge adaptive governance, which requires ecological baselines that can be used to measure changing ecosystem dynamics. However, it is important to remember that the MRBB does not have the authority to intervene directly in the environmental decision-making of the parties. Any evaluation of the environmental performance of the Board must be conducted with reference to the constraints under which it functions. Ultimately, it is the provinces, territories and federal government that are responsible for environmental outcomes within the basin. Their responsibilities are being pursued through the bilateral agreements and BMCs, within which the MRBB is not given an ongoing role.

2.5 Conclusions

A bioregional approach was established in the MRB in 1997, with the signing of the Master Agreement and creation of the MRBB. However, based on our assessment of the MRBB's coordination, accountability, legitimacy and environmental effectiveness, we question whether a

bioregional, adaptive approach has been achieved in this basin. Our concerns are based on several pieces of evidence. First, the fairly marginal role the MRBB has historically played in the basin, and the recently completed bilateral agreements which assign the Board very limited roles, suggest that it may not play an engaged and active role in promoting bioregional governance in the basin. Second, challenges associated with including traditional knowledge invite questions regarding the extent to which knowledge from multiple sources will meaningfully inform monitoring and decision making. That the bilateral agreements acknowledge that traditional knowledge, along with scientific and local knowledge, will inform the creation of specific water quality, quantity and biological objectives is a positive improvement in terms of the inclusion necessary to contribute to adaptive governance. However, the agreements have not yet been implemented. Furthermore, because there is no indication in the agreements that the BMCs will coordinate with one another, or with the Board, there is considerable uncertainty regarding the extent to which a nested, multi-level approach has been achieved. Finally, although the Master Agreement that created the Board can be characterized as flexible, because it avoids precise definitions and leaves details to be specified by bilateral agreements, that openness has also formed the institutional context in which industrial developments with transboundary implications have continued to expand in upstream portions of the MRB. This leads us to our concluding reflections: although institutional design that facilitates coordination is necessary, it is far from sufficient. Ultimately, institutions work according to the political contexts in which they are embedded.

Consider first the MRBB, the only institution designed to coordinate at the scale of the bioregion. Its limited financial support, staffing and the desire of jurisdictions to maintain autonomy to make decisions about resource development without external interference has resulted in it playing a reactive and limited role in the basin. Jurisdictions have not opted to strongly reinforce a bioregional approach through the bilateral agreements. Instead of reinvigorating the Board to play a more proactive role through recently completed bilateral agreements, BMCs are assigned many of the MRBB's core functions of coordination and monitoring. The bilateral agreements and appendices are silent on whether coordination will occur between and among the BMCs and the MRBB. Therefore, the extent to which vertical and horizontal information sharing will occur as the agreements are implemented, is uncertain. This omission is unfortunate; as one interviewee remarked, sufficiently protecting and, in some cases, restoring the ecosystem integrity requires a much more cooperative and inclusive collaborative effort than has been forthcoming (KI 17). The creation of BMCs alongside the MRBB does create a multi-level design and, at face value, provides a nested approach to bioregional governance.

However, the Board's limited mandate and funding mean that it cannot proactively respond to emerging issues in the basin. The interjurisdictional consensus required to alter the MRBB's instructions and funding arrangements has not been forthcoming. Furthermore, capitalizing on the nested approach will likely require a much more inclusive and coordinated approach than has existed.

As several interviewees pointed out, concerns to respect jurisdictional autonomy have meant that underlying issues associated with how hydroelectric facilities are operated, and the pace and scale of oil sands development, are not up for discussion at the interjurisdictional level (KI 3; KI 18). As noted previously, the federal government tends not to intervene in resource matters perceived to be provincial (Saunders 2014), and in recent years has pursued increasing resource development, which critics suggest has restricted its agenda for environmental protection (Clancy 2014). The fact that the MRBB has struggled to meaningfully incorporate traditional knowledge is also another deficiency considering the importance of including a variety of knowledges in monitoring and decision-making to adaptive governance. The Board's work to address this shortcoming is promising. The fact that traditional knowledge, along with scientific, social scientific and local knowledge, may be used to develop transboundary water quality and quantity objectives indicates a desire and willingness to incorporate multiple sources of information in the implementation of bilateral management agreements. However, it is important to recognize that the provinces and territories approach consultation with Indigenous peoples very differently and these differences may challenge the meaningful inclusion of Indigenous peoples and traditional knowledge across the entire basin. Historical and current power asymmetries have made including traditional knowledge difficult in the past (Stevenson 2012), and the bilateral agreements do not directly address Canada's colonial legacy, such as the significant disparities in health, education and income that exists between Indigenous and non-Indigenous Canadians (Truth and Reconciliation Commission of Canada 2015).

We close by returning to one of the underlying themes of this special issue: the importance and limitations of institutional design. The constraints under which the MRBB operates exist by design. At the time the Master Agreement was negotiated, the jurisdictions desired an institution to coordinate information exchange but with no authority to intervene in interjurisdictional matters. The consensus that existed regarding principles of ecosystem integrity and sustainable water management fell apart when momentum and resources were insufficient to fully implement the agreement (KI 1). The interjurisdictional cooperation and willingness to collaborate that existed in the 1970s and 1980s has greatly diminished today. The federal government has been

hesitant to play a leadership role in environmental matters. This hesitance is compounded by recently completed devolution agreements with the territories, through which responsibilities of resource management in the territories were transferred from the federal government to the territorial governments. Furthermore, in recent years, it has pursued a policy of reducing regulatory burdens for industry, including restricting the scope and application of federal environmental protections for water (Clancy 2014).

Paradoxically, this case study illustrates that while institutional design that facilitates coordination is necessary, it is far from sufficient. The presence of a river basin organization does not necessarily result in adaptive governance. The ability to effectively coordinate and to manage the MRB according to principles of ecosystem integrity and sustainability depends strongly on the desire of the jurisdictions to do so. As we have demonstrated, that desire has not always been consistent in the MRB. The bilateral agreements represent a renewed commitment to the principles of the agreement and perhaps a new beginning for cooperative and adaptive governance in the basin. The extent to which they can contribute to a bioregional, adaptive approach to governance in the basin will require addressing deficiencies associated with including traditional knowledge and coordinating the various interests at stake in resource development in the basin. It will certainly require coordination between separate BMCs, either organically or through the MRBB. Achieving this level of coordination could make governance in the MRB a positive example of an adaptive governance regime that proactively responds to emerging threats in the basin.

Chapter Three

A power analysis of the role of collaboration in transboundary water governance in Canada's Mackenzie River Basin

3.1 Introduction

Collaborative approaches to environmental governance are valued for a number of reasons. Proponents claim they provide opportunities for representatives from multiple sectors – private, public, civil society, Indigenous – to work together to address shared problems (Holley, *et al.* 2012). Collaboration encourages pooling resources, sharing knowledge and learning, to accomplish collectively what participants may struggle to do individually (Gray 1989). In contexts of complexity and uncertainty, collaboration can encourage participants to explore innovative and adaptive solutions (Innes and Booher 2010; Margerum 2011). These qualities of collaboration suggest it may be appropriate for governance in transboundary water systems, which are characterized by multiple jurisdictions, interests, values and perspectives, complex and uncertain social-ecological dynamics, and upstream-downstream asymmetries (Birdsong 2008). In federal and international transboundary watersheds, multi-level collaborations may contribute to adaptive and inclusive governance (Green, *et al.* 2013; Raadgever, *et al.* 2008). However, the potentially positive role of collaboration may be tempered by power dynamics in transboundary systems. Power – the ability to create or prevent change (Sayer 2012) – is critical to what collaboration can actually achieve in transboundary systems.

The collaborative water governance literature tends to focus on more obvious dimensions of power, such as inclusion and agenda control (Brisbois and de Loë 2015). In contrast, the transboundary water governance literature highlights the less obvious ways in which power works, such as through ideas and values that prevent overt conflict (Zeitoun and Warner 2006). Unlike the collaboration literature, which considers the roles of non-governmental actors, the transboundary water governance literature focuses on the interactions of governments, and thus, less is known about the role of collaboration in transboundary contexts. Collaboration that involves non-governmental actors may have a key role encouraging adaptive transboundary water governance (Akamani and Wilson 2011). Non-governmental actors may also be positioned to challenge existing power asymmetries in transboundary systems (Zawahri and Hensengerth 2012). This paper contributes to the literatures on collaboration and transboundary water governance by considering the role of multi-level collaborations that involve non-governmental actors in transboundary contexts. The focus is on two related questions: to what extent, and how,

do power dynamics impact collaboration in a transboundary context; and, based on this power analysis, what is the role of multi-level collaboration in transboundary water governance? Both questions are addressed through a multiple case study of collaboration in an important federal transboundary basin: Canada's Mackenzie River Basin (MRB).

The MRB drains approximately one-fifth of Canada's land mass. It is a jurisdictionally-complex basin in which territorial, provincial, federal and Indigenous governments have important responsibilities for water. The MRB is also ecologically complex; it has three major deltas, some of the deepest lakes in North America and habitat for numerous species at risk, including the Whooping Crane and Woodland Caribou. Numerous environmental non-governmental organizations (ENGOS) are interested and involved in various aspects of governance for water in this basin because of the immense ecosystem services it provides (Anielski and Wilson 2009; WWF-Canada 2009). At the same time, the MRB is the site of increasing resource development within Canada, including fossil fuel extraction and hydroelectric development. Development pressures, coupled with social and environmental changes resulting from climate change, are creating significant governance challenges in this basin (MRBB 2012). Hence, it provides an ideal setting for exploring the role of collaboration in transboundary water governance.

3.2 Transboundary water governance, collaboration and power

When political boundaries intersect water bodies, significant challenges can result for governments, ENGOS, and industries that manage, use, value and share water. Institutional fragmentation, conflicting values and uses of water, sovereignty and power dynamics make transboundary water governance challenging. Climate change, population growth and increasing industrial development further complicate water management and create the need for adaptive and flexible approaches to governing transboundary waters (Cooley and Gleick 2011; Falkenmark and Jägerskog 2010). These kinds of challenges exist to different degrees in international and sub-federal transboundary water bodies throughout the world (Delli Priscoli and Wolf 2009). A body of literature has grown that emphasizes cooperation and coordination between governments to prevent and reduce conflicts and to contribute to environmental sustainability in transboundary water systems. However, power analysis of international transboundary basins reveal that cooperation and conflict can coexist and that cooperation is not necessarily universally beneficial (Zeitoun *et al.* 2011). Thus, it is necessary to consider contextual and power-related factors that can constrain cooperation over transboundary waters.

Powerful actors can benefit from geographic position and superior material, technical and financial capacity as well as less obvious power dynamics such as the ability to determine the scope of factors to be considered in discussions about transboundary water governance (Zeitoun and Warner 2006). More powerful actors also benefit from underlying ideas and norms regarding values that inform decisions about water uses in transboundary systems. Power analyses of transboundary water interactions emphasize the importance of considering underlying power dynamics even in apparently cooperative contexts. However, this literature has a government-centred focus that neglects the roles of industry, ENGOs and members of the public (Lopes 2012). This focus neglects to consider that the roles of non-governmental actors that are increasingly involved in environmental governance in multiple forums and at multiple levels (Andonova and Mitchell 2010), which can have important roles in transboundary water governance (Gerlak 2015; Zawahri and Hensengerth 2012).

The transboundary water governance literature's treatment of non-governmental actors can be contrasted with that of the collaboration literature. Collaboration, by definition, involves a variety of state and non-governmental actors sharing resources, learning from one another, and working together on shared problems to inform policy or practice (Ansell and Gash 2007; Emerson, *et al.* 2012). Collaboration is a label assigned to a broad class of governance activities, including collaborative planning exercises that emphasize ideals of deliberative democracy (Innes and Booher 2010), collaborative public management between various government agencies and members of the public (McGuire 2006), and collaborative environmental governance that is concerned with inclusion, learning and consensus-based decision making at a variety of scales (Margerum 2011). The theme that unites these perspectives is an emphasis on the involvement of a variety of governmental and non-governmental actors, resource sharing and developing solutions to common problems. Collaboration is celebrated for encouraging learning about diverse perspectives and creating innovative solutions participants find acceptable, even in contexts of power asymmetry or high stakes decision-making (Ansell and Gash 2007; Emerson, *et al.* 2012; Innes and Booher 2010). However, as noted previously, and discussed below, attention to power dynamics in this literature is limited.

In transboundary water systems, collaboration can take place for a variety of reasons, such as monitoring programs at the local level (Raadgever, *et al.* 2008), developing recommendations for governments (Cosens 2010), or conducting basin-wide planning activities (Berardo and Gerlak 2012). In large transboundary basins, collaboration may provide local information that feeds into higher level decision making processes (Green, *et al.* 2013), providing decision-makers

with a greater diversity of information (Raadgever, *et al.* 2008). Others suggest that collaboration can result in more inclusive and improved transboundary water governance that better respects the diversity of interests, rights and values in transboundary basins (Dore 2014). In this respect, Raadgever, *et al.* (2008) include collaboration as a key component of adaptive transboundary water governance. Nested, multi-level collaborations that are inclusive, share information vertically and horizontally, and have the power to act at appropriate scales, can contribute to adaptive approaches to transboundary water governance (Akamani and Wilson 2011; Green, *et al.* 2013). Adaptiveness is a key component of sustainable water governance (Pahl-Wostl 2007) and environmental governance in general (Lockwood, *et al.* 2010). Therefore, multi-level collaborations (e.g., collaborations that take place among a variety of actors at local, regional and basin-wide levels) are posed to make a significant contribution to governance in transboundary water systems.

While power features prominently in the transboundary water governance literature, it receives much less attention in the collaboration literature. Brisbois and de Loë's (2015) systematic review of the collaborative water governance literature found that when power is considered, it is often in the most obvious ways, such as inclusion, resources to participate or government retention of decision-making authority. Such analyses neglect the more difficult but potentially more significant dimensions of power discussed below (e.g., agenda-setting and discursive power). In several models of collaboration, power is considered a part of the contextual environment alongside other variables examined (Ansell and Gash 2007; Emerson, *et al.* 2012). Some studies of power tend to focus on how power dynamics operate within collaborative processes (Purdy 2012), neglecting to consider how collaboration intersects with broader political and economic forces that inform the context in which collaboration takes place. Empirical studies suggest that a closer investigation of the impact of power dynamics on collaboration is warranted. Even if power is not explicitly named, it is apparent that power-related effects are present in numerous cases. For example, evidence from collaborations in Australia (Holley, *et al.* 2012), Canada (Norman and Bakker 2008) and South Africa (Mirumachi and Van Wyk 2010) suggest that governments are sometimes unwilling to share decision-making authority with collaborative groups. Kallis, *et al.* (2009) suggest that collaboration is not always inclusive of marginalized interests. Industry actors have been found to have greater influence over agenda-setting than other participants in collaborative processes (Cook 2015). Broader political and economic contexts in which collaborations exist may constrain the outcomes they can produce (Brisbois and de Loë 2016). These kinds of challenges relate to power dynamics within and outside of collaborative forums. They suggest that despite the presence of well-facilitated process or interdependencies

between participants, power dynamics can influence the outcomes of collaboration. This insight is particularly pertinent to assessing the influence of power dynamics on collaboration in transboundary water systems. The ability to contribute to adaptiveness in transboundary contexts rests, in part, on the ability of collaborations to produce outcomes that impact decisions at various levels within transboundary systems (Akamani and Wilson 2011; Green, *et al.* 2013).

There are a number of different approaches to conceptualizing power within the social sciences. Definitions of power are related to views on whether power is a capacity exercised by agents, endowed in structures that determine or strongly influence actions, and whether power should be understood as zero or positive-sum (Dowding 2012; Haugaard 2012). Behavioural (Dahl 1957), structural (Gould, *et al.* 2004) and post-structural approaches to power (Digeser 1992) offer different perspectives on the matters above. Steven Lukes' (2005) power theory provides the foundation for this paper because it is helpful for analysing resource management contexts that have the appearance of inclusivity and agreement (Caine and Krogman 2010), such as collaboration. Lukes' power theory is an agent-centred approach premised on the notion that it is possible to assign responsibility for domination that occurs intentionally or unintentionally by individuals or groups (Hayward and Lukes 2008).

Lukes suggests that power works through three overlapping dimensions. In power's most obvious form, what Lukes refers to as the first dimension, a powerful actor prevails in decisions. This dimension of power is often associated with or referred to as the pluralist perspective on power (Dahl 1957). In collaborative processes, power's first dimension may appear in the extent to which participants feel as though their voices are being heard and interests considered during collaboration (Purdy 2012). The financial, technical and legislative resources available to participants to make and implement their decisions also evince power's first dimension (Holley, *et al.* 2012). Powerful actors prevail in decisions but they can also determine decision-making agendas so that decisions contrary to their interests never occur, or so that relevant concerns are not considered part of the decision-making agenda (Bachrach and Baratz 1962). This less apparent form of power is the second dimension in Lukes' theory. In collaboration, power's second dimension may manifest in limitations to the scope of decision-making, activities assigned or information that is available to collaborative groups as well as who participates in collaboration (Cook 2015; Huxham and Vangen 2005). The third dimension of power is what Lukes considers the most insidious and most effective – this form of power works through underlying values and ideas that support the view of the status quo as natural, beneficial and inevitable. To the extent that these beliefs and values are adopted, overt conflict is avoided.

Benefiting from this form power does not necessarily require active participation in collaboration. To assess how power's third dimension impacts collaboration it is necessary to consider the broader context in which collaboration is situated – how do the ideas and values advocated by collaborative groups intersect with ideas and values dominant in the broader political context? Are those ideas compatible or do they conflict? If they conflict, which ideas are predominant in decisions? Ultimately, the three dimensions of power impact the outcomes collaborations are capable of achieving. Table 3.1 provides definitions of each form of power as well as indicators used to assess power dynamics in this study.

Table 3.1: Power indicators

Form of power (2005)	Indicators	Examples	Identification/evidence
1 st dimension: the ability to prevail in decisions (Dahl 1957; Lukes 2005)	• Observable conflicts over decisions • Observable preferences	• Financial and technical capacity (Holley, <i>et al.</i> 2012) • Capacity to make and implement decisions (Holley, <i>et al.</i> 2012; Purdy 2012) • Inclusion of various perspectives (Kallis, <i>et al.</i> 2009)	• Policy documents, policy prescriptions of non-governmental organizations and Indigenous governments • Interview data
2 nd dimension: the ability to set the agenda (Bachrach and Baratz 1962; Lukes 2005)	• Observable conflicts over the decision-making agenda • Conflicts about information excluded from decision-making • Decisions not to act (non-decisions)	• Control of the decision-making agenda (Cook 2015; Purdy 2012) • Control of information used in collaboration (Purdy 2012) • Participants invited/allowed to collaborate (Purdy 2012)	• Policy documents, policy prescriptions of non-governmental organizations and Indigenous governments • Interview data
3 rd dimension: discursive power - the ability to construct, impose and/or benefit from dominant ideas (Lukes 2005)	• Ideas presented as universally beneficial and desirable	• Ability to construct, represent or benefit from an idea (Purdy 2012) • Political and economic context in which collaboration is embedded	• Policy documents, speeches • Social, political and economic context

3.3 Empirical context: the Mackenzie River Basin

The MRB (Figure 3.1) provides an excellent context in which to explore the impact of power dynamics on and the role of collaboration in transboundary water systems. The MRB is a large, northward draining system. Its headwaters begin in the Peace and Athabasca sub-basins, which emerge in the provinces of British Columbia and Alberta, respectively. The Peace and Athabasca Rivers meet at the Peace-Athabasca Delta (PAD) in Alberta. Approximately 80% of the delta is located within Wood Buffalo National Park. At the delta, the Peace River turns north to become the Slave River, which flows into the Northwest Territories (NWT) and discharges into Great Slave Lake. The Mackenzie River drains Great Slave Lake's northwestern corner, and receives flows from the Liard and Peel Rivers, which flow from upstream British Columbia and the Yukon, respectively, before discharging into the Arctic Ocean's Beaufort Sea.

The MRB contains numerous large freshwater lakes and boreal, tundra and delta ecosystems. Deltas in the basin provide important staging and breeding grounds for a significant number of migratory birds, including the endangered Whooping Crane, which resides for part of the year in the PAD (MRBB 2003b). The ecosystems in the MRB provide habitat for species including moose, caribou, beaver and muskrat, which are important components of the traditional livelihoods of Indigenous peoples in the basin. The MRB has been recognized for its international significance in an era in which freshwater ecosystems are among the most rapidly degrading in the world (Rosenberg International Forum on Water Policy 2013).

The MRB's ecological complexity is matched by its jurisdictional complexity. There is overlapping and fragmented jurisdiction for water in this basin. The provinces and territories have the majority of decision-making authority for water in Canada; they are responsible for water allocation, land use planning and energy development. Canada's federal government also has important water related responsibilities for fisheries, navigation, and national parks in the MRB. In addition to the provincial and federal governments, Indigenous peoples also have important rights and responsibilities to water in the MRB (Phare 2009).

Industrial developments in upstream jurisdictions British Columbia and Alberta, coupled with climate warming, are key drivers of change in the MRB (MRBB 2012). Changes in the timing of freeze-up, thaw and peak river flows have been observed in the MRB and are anticipated into the future (MRBB 2012). Two existing hydroelectric facilities operated by a crown corporation, BC Hydro, on the Peace River in British Columbia, provide approximately

30% of the province's generation capacity (MRBB 2003b). A third dam was approved in November 2014. Currently, many downstream residents, including Indigenous peoples with rights to fish, trap and hunt in the PAD, are concerned that upstream flow regulation has been a contributing factor in a multi-decadal drying event observed in the PAD (Carver 2012).

Figure 3.1: The Mackenzie River Basin, Canada



Oil sands mining within Alberta is another major industrial project in the MRB. The Athabasca sub-basin in Alberta contains the world's third largest proven oil reserve (Alberta Energy 2014). Over 600 km² of land, including 170km² of tailings ponds, are currently under development in the Athabasca sub-basin (MRBB 2012). Oil sands mining is expected to increase from 2.3 to 4.8 million barrels of oil per day within the next 15 years (Alberta Energy Regulator 2015). Surface and in-situ mining has fragmented terrestrial ecosystems and impacted water resources within the Athabasca sub-basin. The nature and extent of pollution resulting from oil sands mining is currently a matter of scientific debate (Hodson 2013). Recent studies have linked

oil sands mining with the presence of contaminants downstream, including mercury, polycyclic aromatic hydrocarbons and arsenic (Kelly, *et al.* 2009; Kelly, *et al.* 2010; Kurek, *et al.* 2013). Others, however, suggest that some contaminants attributed to oil sands mining are deposited via natural sources in the air and water (Hall, *et al.* 2012; Wiklund, *et al.* 2012). Downstream communities in Alberta and the NWT are concerned about the risks posed by upstream oil sands mining. Concerns related to upstream development were driving forces in the creation of the collaborative groups we assessed.

3.4 Methods

A multiple case study approach was used in this study to support an in-depth exploration of power dynamics and to allow for cross-case comparison among different cases (Gerring 2007; Yin 2009). Cases were selected according to several criteria. First, all cases had to be situated within the geographic boundary of the MRB. Second, the cases had to conform to the characteristics of collaboration outlined in Section 1.1, including the participation of government and non-governmental actors, resource sharing and working together to solve common problems. Data accessibility and the willingness of key informants to participate also informed selection of the cases. The cases that met these criteria include the Slave River and Delta Partnership (SRDP), the Peace-Athabasca Delta Ecological Monitoring Program (PADEMP), and the MRBB. The SRDP is a relatively local, community based collaboration. PADEMP is a regional, interjurisdictional collaboration focused on the PAD, whereas the MRBB operates at the scale of the MRB. The cases, a mix of a local partnership, regional program and basin-level board, provide an opportunity to consider if and how power dynamics impact collaboration at different levels. They facilitate our consideration of how power dynamics impact multi-level collaborations in transboundary basins, which has been identified as a key feature of adaptive transboundary water governance in the literature (Akamani and Wilson 2011; Green, *et al.* 2013; Raadgever, *et al.* 2008). The cases are described in more detail below.

3.4.1 Case studies

3.4.1.1 The Slave River and Delta Partnership

The SRDP was created in 2010 as a part of the Government of the NWT's water stewardship strategy (Government of the Northwest Territories 2011). The partnership was designed, in part, to address local community concerns about the impacts of upstream developments on ecosystem health. Supporting and including traditional and local knowledge in community-based ecosystem monitoring is a specific objective in the partnership (AANDC and GNWT 2012). Local

community members had been concerned for many years about the impacts of developments in upstream jurisdictions such as pulp mills and hydroelectric facilities and more recent oil sands development activities. The SRDP includes federal, territorial and Aboriginal governments, municipalities, members of the public and a research institute and is open to anyone who wants to participate. A steering committee determines key monitoring priorities and paid staff undertake monitoring. Decisions about monitoring priorities are determined collectively by members of the SRDP. To date, monitoring has focused on water quality, fish health and general aquatic ecosystem health. The SRDP also engages with academic research institutions to undertake additional monitoring and communicates research findings to members of the communities in the Slave River watershed.

3.4.1.2 The Peace-Athabasca Delta Ecological Monitoring Program

PADEMP was formed in 2008 under the leadership of Parks Canada, the federal agency with jurisdiction in Wood Buffalo National Park; this agency serves as the chair of PADEMP. PADEMP was created because there was a need for consistent, ecosystem-based monitoring that includes western science and traditional knowledge and that included local residents in determining monitoring priorities in the region. Concerns regarding the impact of upstream activities, including hydroelectric facilities in British Columbia (NRBSB 1996), and oil sands mining in Alberta (Parks Canada 2011) on the ecology of the PAD also inspired the creation of PADEMP. Further, the conveners of PADEMP recognized that collecting baseline information about the state of the delta was necessary to permit measuring the extent of future changes anticipated as a result of climate change, hydroelectricity generation and oil sands mining. A steering committee including Indigenous governments, federal, territorial and provincial governments and ENGOs directs PADEMP's activities (Macmillan 2013). They work together to determine monitoring priorities, undertake monitoring and discuss vulnerabilities in the PAD. Key work undertaken by PADEMP includes relationship building between the partners, collecting and synthesizing existing information on the delta, work on developing a Vulnerability Assessment Report for the PAD and coordinating activities with other monitoring groups in the region (Macmillan 2013).

3.4.1.3 The Mackenzie River Basin Board

The MRBB is the oldest of the three collaborative cases included in the study. It was created by the 1997 Mackenzie River Basin Transboundary Waters Master Agreement (Government of Canada, *et al.* 1997), which also details the key roles and responsibilities of the MRBB. The agreement includes guiding principles relating to ecological integrity, sustainable water use and

the prevention of harm. Key roles for the MRBB include coordinating information sharing among jurisdictions, developing state of the environment reports, incorporating traditional knowledge, and communicating with Aboriginal peoples in the basin in culturally appropriate ways. The MRBB has 13 members – one representative per province and territory, one Aboriginal member per province and territory, and three representatives from the federal government. To date the MRBB has produced two State of the Aquatic Ecosystem Reports (MRBB 2003b; MRBB 2012), a Bilateral Water Management Guidance Document (MRBB 2009), and a report on best practices in incorporating traditional knowledge into environmental monitoring and assessments (Stevenson 2012). It has also supported the development of bilateral water management agreements among provinces and territories in the basin that contain specific water quality, quantity and biological objectives.

3.4.2 Data collection and analysis

Data used in the analysis were derived from semi-structured interviews, document analysis and personal observations. Twenty-six semi-structured interviews were conducted in support of this research. Seventeen interview participants were involved in or knowledgeable about more than one of the collaborative groups studied. Nine interviews support our analysis of the SRDP, fourteen for PADEMP and nineteen for the MRBB. Interviewees were current or former employees of provincial, territorial, federal governments, Indigenous governments and ENGOs. They were contacted based on their involvement in the collaborations studied. Interviews were conducted between August 2012 and May 2015. All interviews but one were audio-recorded. Recorded interviews were immediately transcribed verbatim and returned to participants to verify the transcript. In addition to interviews, 160 documents, including policy documents, published studies, news articles, meeting minutes, ENGO publications, Indigenous government publications and transcripts of regulatory hearings, were reviewed. Additional sources of insight include personal observations made at meetings, open houses and regulatory hearings attended by the first author.

A qualitative content analysis approach was used in this study to explore if and how power dynamics impacted collaboration. Qualitative content analysis is useful for interpreting large quantities of qualitative data for meanings which may not be explicit in the text (Schreier 2012), such as power dynamics. Power theory and empirical findings from the collaboration literature were used to generate categories – first-, second- and third- dimensional power (identified in Table 3.1) and associated indicators – to deductively code interview transcripts and documents. Collectively, these dimensions of power can impact the roles assumed and outcomes achieved by

collaboration in the basin. Reports of feelings of inclusion in collaboration, or resources to undertake collaborative activities, were coded as ‘first dimensional power’, the ability to prevail in decisions. Concerns associated with restricted agendas, the ability to influence policy decisions or exclusion were coded as manifestations of power’s second dimension – the ability to set the agenda. Finally, dominant ideas or underlying values expressed by the collaborative groups were coded as power’s third dimension, discursive power, and compared against broader ideas and values in the contexts in which collaborations were embedded, particularly against justifications or ideas expressed in support of resource use decisions participants in collaborations were concerned about.

Using various data sources, including documents, interviews and personal observations, facilitated triangulation to ensure study rigor. Data were coded and analyzed using the qualitative data analysis software NVivo QSR 10. After coding was complete, results were compiled and compared to draw out findings across the three cases. Given the nature of the cases we included in this study, which included a local partnership, regional program and a basin-level board, systematic cross-case comparisons were inappropriate. To address this issue, we considered how power dynamics impacted each case and compared findings across the levels at which collaborations were situated (local, regional, basin-wide). Such an analysis is relevant to the transboundary water governance literature that identifies linkages between collaborations at different levels as desirable. We then considered how our power-based analysis corresponded to key themes in the collaboration literature regarding inclusion, information sharing, and adaptive and innovative solutions and what our findings implied for the role of collaboration in transboundary contexts.

3.5 Findings

In this section, we present findings based on our analysis of first-, second- and third-dimensional power, as organized in Table 3.1. We report evidence that all three forms of power acted as constraints on collaboration in the MRB. In the next section, we consider our findings based on a cross-case analysis and offer some concluding reflections on the role of collaboration in transboundary systems.

3.5.1 The ability to prevail in decisions

The ability to prevail in decisions is the most obvious manifestation of power. It also tends to be considered most often in studies of collaboration for water (Brisbois and de Loë 2015). There are multiple ways in which power’s first dimension can impact collaboration (Table 3.1). Here, the

emphasis is on financial capacity and the extent to which participants reported that their perspectives and interests were considered in collaboration. Each of these factors can contribute to the ability to prevail in decisions – power’s first dimension.

Adequate funding is essential to ensuring the collaborations have capacity to undertake their programs (Holley, *et al.* 2012). Notably, participants in all three collaborations reported struggling for adequate funding. The MRBB is the only group for which there is consistent funding. Each of the participating governments contribute to the MRBB’s \$280 000 budget, which has not been adjusted for inflation since the MRBB was created in 1997. Attempts to increase funding have not been successful (MRBB 2013). For both PADEMP and the SRDP, securing consistent, multi-year funding has been a challenge (Confidential interview [CI]14; CI 19; CI 20). The partnerships rely, in part, on external sources to fund monitoring programs. Reliance on periodic, external funding impacts their abilities to undertake multi-year planning (CI 20; CI 26). Ultimately, this places the work that the collaborative monitoring programs can do in a precarious position. For example, one participant in PADEMP reported that “we would like to have a program coordinator position and staff but it’s difficult to do when we don’t know year to year what our resources are going to be” (CI 14). It is also true that many participants in the SRDP and PADEMP struggle for capacity to attend and contribute to meetings, which is another constraint on collaborative activities (CI 19; 20; 22; 25).

Coding revealed that many of the participants in each of the collaborations were satisfied with the extent to which their interests and perspectives were heard, a noteworthy finding. For instance, one key informant in the MRBB case reported that despite having a much smaller population and being a downstream government, one positive aspect of the MRBB is that, despite these differences, each representative has an equal say in decisions undertaken by the MRBB (CI 15). A key informant involved in PADEMP reported that excellent facilitation has resulted in an inclusive model where various interests and perspectives are heard, which made PADEMP, in this person’s view “a mini-metaphor for how things could be done well” in the region (CI 24). This perspective is reinforced by PADEMP reports that emphasize participants are satisfied that useful information that addresses their concerns is shared and discussed during PADEMP meetings (Straka, *et al.* 2014). A participant in the SRDP reported observations that collaboration is breaking down barriers and that “there is no silo here. Everybody talks” (CI 22). Another participant in the SRDP reported feeling included despite representing a relatively smaller organization (CI 21).

There was one important exception to the generally positive view of inclusivity of views and perspectives in the collaborations considered. Several key informants from the MRBB case reported perceptions that, historically, Aboriginal members of the MRBB participate as observers and are not always fully engaged (CI 4; 5). For example, one former Executive Director of the MRBB reported that during his tenure he observed that Aboriginal participants “weren’t really listened to, or given a whole lot of credibility” (CI 4). This is a deficiency that the MRBB has been working to address. For example, in 2009 it formed that Traditional Knowledge and Aboriginal Partnerships Steering Committee, in part to develop mechanisms to include Aboriginal peoples and traditional knowledge in Board activities (MRBB 2013). However, challenges associated with the appointment of Aboriginal representatives persist. There are diverse Indigenous peoples within the basin, including Cree, Dene, Métis and Inuvialuit, who have quite different perspectives and interests. Selecting one individual to represent all Indigenous peoples in each jurisdiction is problematic for that reason. Challenges associated with including Indigenous representatives and traditional knowledge in the case of the MRBB exist in contrast to PADEMP and the SRDP. For instance, interviewees reported that there was “strong involvement for . . . First Nations” (CI 25) and “they tend to do things quite inclusively with First Nations and Métis” (CI 24) in PADEMP and the SRDP.

3.5.2 Agenda-setting power

The second dimension of power is more subtle than the first, and regards the ability to prevent decisions or actions contrary to one’s interests from taking place. This power dynamic works through mechanisms such as the conscious exclusion of issues, failing to take action when it is possible to do so, and restricting or controlling access to information. It may also manifest in actors who are excluded or decline to participate in collaboration (Table 3.1). In this section, the focus is on agendas collaborative groups assume, participants involved and the information available to fulfill their mandates.

Although many participants from all three cases indicated that they were satisfied with the extent to which their interests and perspectives were heard in collaborations, it is important to acknowledge the narrow scope of decision-making allocated to the three collaborative programs. The collaborations make decisions about monitoring priorities, indicators and means by which to share and present information. These are all important roles. However, they are disconnected from the major development decisions in the basin that create the need for collaboration across jurisdictional boundaries. Decisions about upstream developments, such as a recently approved oil sands mine expansion (JRP 2013) or hydroelectric dams (British Columbia Environmental

Assessment Office 2014b) are made outside of collaborations. The agendas of collaborative groups considered in this paper do not include influencing those decisions.

Key informants involved in PADEMP reported that one of the most difficult issues the group faced was whether to play an advocacy role, and thus to make recommendations to governments regarding protection of the ecological and cultural integrity of the PAD (CI 14; 24). In the words of one interviewee,

some of the participants wanted PADEMP to be able to make recommendations to government that would support ecological integrity in the delta and the cultural integrity of the delta. However, because we have government participants in the program, there was some – there is a concern for some government members about government making recommendations to itself . . . we just about lost the whole thing over that (CI 14).

The reluctance of some government participants to assume an advocacy role resulted in a more restricted agenda of undertaking monitoring, sharing information and making recommendations to Parks Canada to support its management plan for Wood Buffalo National Park. Importantly, Parks Canada does not have jurisdiction over the development decisions happening upstream of the Park. As a result, members of PADEMP do not have the mandate to present a collective voice on behalf of PADEMP in regulatory hearings about upstream development decisions, despite the interest of many participants in doing so. For example, despite longstanding concern that upstream flow regulation on the Peace River in British Columbia has contributed to a multi-decadal drying event in the PAD, PADEMP did not provide or present a collective voice based on that perspective at recent regulatory hearings for the third dam. In the words of one interviewee “nobody spoke for PADEMP” (CI 24) at the hearings. In fact, connecting decision-makers with information discussed within PADEMP has been identified by participants as a future priority (Straka, *et al.* 2014).

Key informants involved in the SRDP reported different perspectives on the scope and ownership of the monitoring group’s agenda. One participant indicated that having local communities participate heavily in the program results in a feeling of local ownership (CI 22), a perspective that is reinforced by public statements about the SRDP (Bell 2011b). Another interviewee observed that,

right now the model of community-based monitoring is government or universities have an idea of what they want to monitor, they go into the community and discuss it and the community will support it or suggest changes and then the organization will do monitoring and involve

community in aspects of that. The community isn't actually driving the process (CI 13).

This observation speaks to an underlying power dynamic regarding who actually determines monitoring agendas. The differences in perspective highlight different interpretations of the agenda the SRDP has assumed. It also reflects an underlying tension related to power's second dimension – uncertainty about which actors actually determine the SRDP's monitoring agenda. The fact that some of the major concerns that inspired the creation of the SRDP related to upstream hydroelectric facilities and oil sands mining (AANDC and GNWT 2012) are outside of the government of the NWT's jurisdiction also complicates the kinds of actions and activities it can engage in to ensure the ecological integrity of the Slave River and Delta. For example, the Government of the NWT requested, unsuccessfully, that a recent environmental assessment (EA) of a third hydroelectric dam on the Peace River in British Columbia should include considerations of effects downstream to the Slave River and Delta (GNWT 2013).

In the case of the MRBB, members indicated that it is an effective forum to share perspectives and information. However, one interviewee pointed out that although perspectives and interests can be shared, there is no way to track whether or not they impact decisions being made upstream (CI 11). Analysis of interview transcripts revealed that concerns related to the pace and scale of development activities within upstream jurisdictions have not been considered appropriate topics of discussion in the MRBB (CI 15; 18). For instance, one former Board member stated that,

Alberta was, if nothing else, completely consistent from day one that nothing they will discuss will be done in a way that jeopardizes the economic model of the oil sands. Similarly, British Columbia had the same overarching concern when it came to the Bennett Dam . . . they were not prepared to bring into discussion at all the economic model of the Bennett Dam (CI 15).

This restriction on items for discussion is compounded, in part, by the MRBB's mandate, which protects each jurisdiction's autonomy to make resource management decisions (Government of Canada, *et al.* 1997). From the perspective of inclusive transboundary water governance, this is an important limitation to the MRBB's role in the basin. It also reflects the strong interest of governments to protect their jurisdictional interests from unwanted intrusion by their neighbours. In fact, the MRBB could adopt a much more engaged role in the basin but has opted for a more conservative approach of providing State of the Aquatic Ecosystem Reports (Morris and de Loë 2016) (Chapter Two). A legal opinion provided to the board regarding its role in governance in

the basin indicated the MRBB could provide information about the basin as a “friend of the tribunal” in EA hearings in the basin or more strongly advocate the principles of the Master Agreement that created the MRBB (Donihee, *et al.* 2000). However, the predominance of civil servants on the board has impacted the MRBB’s scope because, at times, members of the MRBB are collectively unable to see past the interests of their own jurisdiction and consider the needs of the basin (CI 1; 4; 5). The constrained role that the MRBB has assumed is also undoubtedly related to the relatively small amount of funding to which it is allocated (Morris and de Loë 2016).

It is also important to consider who does not participate in collaboration, or who is excluded from participating. In the case of PADEMP, industry does not participate, despite its influence on the regional landscape and despite the request of at least one industry organization to be involved. In responding to the request, members of PADEMP’s exercised their power to exclude industry. Concerns that industry might misuse information discussed within PADEMP and or unduly influence PADEMP’s objectives and agendas resulted in the decision to decline the request to participate (CI 24). It is important to note that industry has a significant presence in other monitoring programs in the oil sands region. In fact, several government interviewees reported that industry has many avenues to influence other monitoring programs (CI 25; 26). Coding revealed that not having industry participate allows participants to share information freely (CI 24, 25, 26). The absence of industry may contribute to one of PADEMP’s strengths, in that it is identified as a community-driven effort (CI 25). One interviewee reported that PADEMP “is...one of the multi-stakeholder organizations that does have pretty good buy-in from a range of participations – everyone from First Nations and Aboriginal peoples all the way through to different levels of government” (CI 26).

In considering participation, it is also of note that Parks Canada, which manages the federal Wood Buffalo National Park, the largest national park in Canada which straddles the Alberta-NWT border (see Figure 3.1) and receives water from upstream where major hydroelectric, pulp mill and oil sands developments are taking place, does not have a seat on the MRBB (Government of Canada, *et al.* 1997). This is despite the fact that Parks Canada was heavily involved in interjurisdictional monitoring initiatives that preceded the creation of the Board (NRBSB 1996) and has an obvious interest in development activities upstream. Thus, the official perspective of Parks Canada is missing from the MRBB. In contrast to PADEMP and the MRBB, the SRDP has a relatively open and inclusive model of participation. Officials involved in guiding the program indicated that any participant who indicated a desire to become involved in the

SRDP would be permitted to do so (CI 19; 20), a perspective that is reinforced by public invitations to attend SRDP activities (Bell 2011a).

Another aspect of power considered was the information available to collaborations. Proponents of collaboration suggest that it encourages information sharing and blending. The ability to create innovative and adaptive solutions rests on adequate information (Emerson, *et al.* 2012). One of the ways in which power's second dimension works is through decisions not to collect pertinent information or the absence of essential information. If information is unavailable to collaborative participants, yet it could have been made available, power's second, agenda-setting dimension is at work. It is notable, then, that information deficiencies regarding ecological baseline information existed in the broader context of all three cases (Dagg 2012; MRBB 2012; Straka, *et al.* 2014). This expression of power resulted from the broader political and economic contexts in which collaborations are embedded, and not power within the collaborative processes themselves. However, it is an important deficiency because of the need for quality ecological baseline data to measure the extent of environmental changes occurring in the region, which is of concern for many of the participants in collaboration. The most striking information deficiency was apparent in the case of the MRBB. Board members acknowledge that the commitment to consider and include traditional knowledge is uneven across jurisdictions (CI 3; 5; 11). A government representative stated that, "If you look at our history – have we been utilizing traditional knowledge very well? I would say 'no'", although this person indicated efforts were being made to address this deficiency (CI 3). Despite the explicit mandate to do so, the MRBB has struggled to collect and include traditional knowledge in its activities, which is related to institutional biases that favour western science over traditional knowledge (Stevenson 2012).

This deficiency, of the MRBB, contrasts with the PADEMP and SRDP, both of which prioritized including traditional knowledge early on in program development, so that Indigenous peoples were included as partners in program design. For example, one participant in PADEMP reported that "we didn't want traditional knowledge to be an afterthought, or an add on. We wanted both ways [western science and traditional knowledge] of looking at the world to be considered from the start of the program" (CI 14). In reference to the SRDP, an interviewee reported that "from the very beginning it was all of the Aboriginal groups that were involved" along with scientists and local communities (CI 20). As a result, participants reported positive experiences associated with the inclusion of traditional knowledge. For example, although there are challenges reporting and incorporating traditional knowledge and western science, one interviewee stated that PADEMP has "done a great job" of incorporating traditional knowledge in

its work (CI 24). Another interviewee involved in the SRDP reported that “all of those knowledge systems [local, traditional and scientific] are part of what we’re doing” [CI 20].

3.5.3 Discursive power

Discursive power is the least obvious form of power. It works in very subtle ways, and is evident in ideas that disguise underlying asymmetries or are presented as universally beneficial and desirable. Assessing discursive power requires considering the broader context in which collaboration is situated and necessarily requires description. None of the collaborative groups have regulatory decision-making powers. They generate and share information. These are important roles but they do not directly inform major decisions about resource development being made in the basin. Therefore, to address discursive power the focus shifted to comparing the underlying ideas driving collaboration with those influencing major development decisions. The ideas promoted by the collaborations, as evident in the materials they produce and their work products, emphasized protecting ecological integrity and promoting sustainability. For example, PADEMP’s official mandate is to develop “a collaborative approach to long-term monitoring and reporting on the health of the Peace-Athabasca Delta, using both Western Science and Traditional Knowledge, in support of effective environmental stewardship” (PADEMP 2015). The SRDP is nested within the NWT’s water strategy, which has as its primary goal that waters within the NWT remain clean, abundant and productive for all time (AANDC and GNWT 2012). Part of the MRBB’s mandate is to fulfil the underlying principles of the Master Agreement, which include the protection of ecological integrity and encouraging sustainable water use (Government of Canada, *et al.* 1997).

The predominant ideas in these collaborations are tempered by the other dimensions of power – the funding and the scope of decision-making available to them. How they intersect with key decisions about development in the basin underscores their roles in the basin. Decisions to proceed with development are made even when there are significant, adverse, and in some cases, irreversible environmental impacts and significant and adverse impacts to traditional use by Indigenous peoples. In justifying decisions, provincial decision-makers refer to jobs and economic growth; they tradeoff ecological integrity for expanding energy development. For example, the review panel of the most recently approved oil sands mining expansion in the Lower Athabasca region found that the project would create significant, adverse impacts to “wetlands, traditional plant potential areas, wetland-reliant species at risk, migratory birds that are reliant on wetland-reliant or species at risk, and biodiversity” and significant adverse cumulative effects on Aboriginal traditional land use, rights and culture (JRP 2013, 5). Yet, it recommended the

project's approval because of the significant economic benefits that would accrue to the province of Alberta, a recommendation that was ultimately accepted by the provincial decision makers (JRP 2013). In neighbouring British Columbia, a third hydroelectric dam on the Peace River was approved for construction, despite a review panel's finding that building that dam "would significantly affect the current use of land and resources for traditional purposes by Aboriginal peoples" and contribute to significant cumulative effects on "fish, vegetation and ecological communities, wildlife, current use of lands and resources for traditional purposes, and heritage" (JRP 2014, v). Despite these findings, and opposition to the dam by local First Nations and First Nations leadership in BC (First Nations Summit 2014), the provincial and federal governments approved the project. In particular, the provincial government justified the decision by appealing to sentiments that electricity generated by the dam will fuel economic growth in the province (Clark 2014).

The ideas about growth and economic development that are used as justifications for approving major resource developments contradict the ideas promoted by each of the collaborative groups related to ecological integrity, the maintenance of traditional livelihoods and sustainability. The fact that the collaborations were created in response to the pace and scale of upstream development decisions, but have been unable to successfully influence the rationale for major development decisions, suggests that power's third dimension has acted as a constraint on the outcomes they produce. This problem was acknowledged by some participants who suggested that context is a constraint on collaboration. For instance, one interviewee stated that, "Alberta is a wicked landscape. There is a lot of money and interests at play" (CI 24). Another reflected, in reference to sustainability and ecosystem integrity as guiding principles in the Master Agreement: "so what? It's all about money and power and control" (CI 13).

3.6 Multi-level collaborations in a transboundary context

Here we draw out findings across the cases related to power dynamics and multi-level collaboration in a transboundary context. While certain power dynamics were present across cases, such as constraints on finances and the ability to influence resource development decisions, it is important to recognize differences between these collaborations. They provide an opportunity to consider how power impacts collaboration at different levels, and implications for the potential of multi-level collaborations to contribute to adaptive transboundary governance. Ultimately, this analysis informs our consideration of the role of collaboration in transboundary basins and the extent to which they contribute to sustainability in transboundary water systems.

The SRDP is a local, community based monitoring program. The involvement of government as a convener, funder and facilitator of the SRDP had significant implications. For example, questions remain about the extent to which the SRDP is truly community-driven. However, unlike the other three collaborations, there is a clear conduit of influence between the work that the SRDP does and water management in the NWT, because it is nested within the NWT's water policy. For example, monitoring of benthic invertebrates undertaken and supported by the SRDP is informing the implementation of the NWT's bilateral water management agreement with Alberta (Government of Alberta and Government of Northwest Territories 2015). However, as discussed above, the NWT is not always successful in having its concerns addressed in regulatory proceedings for upstream activities that could potentially impact ecosystems within its jurisdiction, as has been found in the case of upstream dams in British Columbia (Sanderson, *et al.* 2012).

Power dynamics within the regional collaboration, PADEMP, were a bit more complex. A finding that emerged is that PADEMP itself is viewed positively by participants in the program and this may be linked to the absence of industry. Participants within PADEMP exercised decision-making and agenda-setting power by declining industry requests to become involved in PADEMP. However, pathways of influence between PADEMP and government policies and development decisions impacting the PAD, a role desired by some participants, are less clear. In part, this is because PADEMP's agenda was influenced by government members hesitant to make policy recommendations to the governments they represent. This hesitancy resulted in the compromise that PADEMP would make recommendations to Parks Canada for developing its management plan for Wood Buffalo National Park. However, one of the reasons PADEMP was formed was because of concerns about the ecological and cultural integrity of the PAD and although it has been involved in some monitoring within the Delta there is no collective PADEMP voice in major development decisions. Major decisions about oil sands mining and hydroelectric facilities upstream are outside of Parks Canada's jurisdiction.

The historic failure to adequately consider and include traditional knowledge in MRBB activities is evidence of power's second dimension acting as a constraint on the outcomes the MRBB produces. Struggles to incorporate traditional knowledge at the basin-wide level also contrast with the relative success or strengths of the regional and local collaborative groups PADEMP and SRDP. It is undoubtedly compounded by deficiencies in funding to the Board. This observation speaks to an underlying theme with respect to the MRBB – the unwillingness, and inability, of participating governments to empower the Board to play the role envisioned in

the Master Agreement. According to the Board's mandate, bound by the 1997 Master Agreement, the Board can recommend uniform water quality and quantity objectives, participate in regulatory hearings to provide information on the basin and the principles of the Master Agreement. The Board has been hesitant to play this role. This is a clear example of non-decision making power typical of power's second dimension. It is buttressed by a political and economic context in which provincial autonomy to make decisions about resource development is highly valued.

We observe that pathways of policy influence are less clear as collaborations are scaled up. Ultimately, limited evidence that collaborations influence resource management decisions introduces uncertainty about the extent to which multi-level collaborations contribute to an adaptive and inclusive approach to transboundary water governance in the MRB. Some of the assumed benefits of collaboration in transboundary contexts are that information and perspectives can flow between multi-level processes to enable well-informed policy decisions that are inclusive of the variety of interests and perspectives in transboundary basins (Akamani and Wilson 2011; Green, *et al.* 2013). However, in the cases discussed in this paper, power dynamics, including limits to funding, constraints on agendas and information, and values predominant in broader political and economic contexts, have tempered the extent to which collaborations are able to influence governance processes at other levels. For instance, collaborations have not directly informed or influenced major water use decisions regarding hydroelectric facilities or oil sands development, despite the fact that they were created in response to concerns about the pace and scale of development upstream. Therefore, there is a fundamental disconnect between the conditions that created the need for collaboration and what collaboration is currently capable of producing in the MRB.

3.7 Discussion and conclusion

Collaboration is valued in transboundary water systems because it may encourage inclusive and better informed transboundary water governance (Akamani and Wilson 2011; Green, *et al.* 2013). Theories of power suggest that power dynamics can result in governance activities that advantage certain interests over others through the ability to prevail in decisions, determine agendas and benefit from underlying ideas. Although power analyses have featured in the transboundary water governance literature, less is known about how power dynamics impact collaboration. Findings from this research suggest that power dynamics warrant exploration when considering the roles that collaboration actually plays in transboundary water governance. Our research confirms that limited funding, the influence of government participants, information gaps and underlying ideas that reinforce major development decisions in the basin constrain what collaborations do in the

MRB. This research also adds empirical findings related to the role of discursive power and broader political and economic contexts as a constraint on what collaborations achieve.

Our findings regarding the relatively strong influence of government members as agenda-setters, are consistent with observations regarding the dominant role of governments in collaboration (Brisbois and de Loë 2016; Hardy 2010; Holley, *et al.* 2012). Critically, this finding reinforces the fact that governments are not like other participants in collaboration: they have much greater capacity to fund, set agendas and make resource management decisions as compared with other participants. Partly as a result of government involvement in collaborations in the MRB, they are playing roles of information generators, disseminators and facilitators. These are important, even necessary, roles but they are not directly feeding into major development decisions upstream that have encouraged the creation of the SRDP and PADEMP, and certainly do not exceed the MRBB's potentially expansive mandate. This highlights deficiencies in the ability of multi-level collaborations to influence or undertake decisions at appropriate scales, a key mechanism of adaptive transboundary water governance (Green, *et al.* 2013) and sustainable water governance (Pahl-Wostl 2007). The collaborations we studied simply do not possess the power to directly inform development decisions. Our research therefore adds an important caution to the transboundary water governance literature that celebrates multi-level institutional arrangements. There is a need to consider the ways in which power impacts multi-level collaborations in transboundary contexts.

This points to a final observation about the ways in which power dynamics impact collaboration in transboundary contexts. Rather than treating power asymmetries as another contextual consideration, it is necessary to systematically consider the various ways in which power dynamics impact collaboration. Furthermore, it is essential to consider the broader governance context in which collaborations are embedded (Brisbois and de Loë 2016). Political and economic contexts may create the need for collaborations to exist, but they can also act as a constraint on the outcomes they produce. In the context of the MRB, concerns to preserve jurisdictional autonomy and values associated with jobs and economic growth produced by major resource developments, constrain the outcomes collaborations can produce. Considering context as a possible constraint provides a more comprehensive understanding of the roles that collaboration plays and how they intersect with other key decision-making initiatives.

It is possible that, over time, the collaborative monitoring programs will have greater influence over development decisions in the basin. Both PADEMP and the SRDP are relatively recent collaborations. They may provide momentum toward a transformation in governance or

principles of resource management decision-making in the basin that puts ecological integrity, Aboriginal rights and title and treaty rights and reconciliation, as primary concerns. They are current positive examples of ways in which traditional knowledge can be incorporated in collaborations in the basin. To the extent that they are able to influence resource management decisions and enable action to promote their values, they may contribute to the more sustainable approach to transboundary water governance in the MRB that multi-level collaboration promises. However, that role is currently tempered by existing power dynamics in the basin.

Chapter Four

A power-analysis of federal transboundary water governance: water use decisions in upstream jurisdictions as constraints on sustainability

4.1 Introduction

Achieving sustainability, the maintenance and/or promotion of ecosystem integrity and human well-being, is a critical governance challenge. In transboundary water systems, where water crosses international and/or federal political boundaries, sovereignty, institutional fragmentation and competing values for and uses of water complicate transboundary water governance. Social and environmental changes resulting from population growth, industrial development and the impacts of climate change on water add complexity. Power dynamics among the actors involved in transboundary water governance may further challenge sustainability. Power, the ability to achieve preferable outcomes (Lukes 2005) by creating or preventing a change in policy or practice (Sayer 2012), is not distributed equally among actors involved in transboundary water governance (Zeitoun and Warner 2006). Power imbalances can make it difficult or impossible to achieve characteristics of governance that contribute to sustainability, such as legitimacy, transparency, inclusion, fairness, integration, equity, capability and adaptability (Lockwood, *et al.* 2010).

Growing concern regarding freshwater scarcity, pollution and the impacts of climate change has informed a body of scholarship that encourages completing interjurisdictional water management agreements in both the international (Elhance 2000; Eliasson 2015; Tir and Stinnett 2012) and federal contexts (Draper 2007; Muys, *et al.* 2007). Reflecting this concern, much of the transboundary water governance literature assesses interactions at the interjurisdictional level and the development and implementation of water management agreements among government actors. This focus sits uneasily with acknowledgements that environmental politics, including transboundary water governance, takes place across multiple local, regional, national and international levels (Andonova and Mitchell 2010; Newell 2008; Suhardiman and Giordano 2012). Even when governments complete interjurisdictional agreements, they may retain significant autonomy to make decisions about resource management with potential transboundary implications within their jurisdictional boundaries. Extending analysis in transboundary settings to jurisdictional level decision-making can offer a needed perspective on constraints and opportunities for sustainable transboundary water governance. A power analysis can help to

reveal interests that are advantaged in resource management decisions made within jurisdictions. Principles of governance that contribute to sustainability can be used to consider if and how power dynamics constrain sustainable transboundary water governance.

In this paper, we undertake a power analysis of two major water use decisions within upstream jurisdictions in a federal transboundary water system. The decisions involve a large hydroelectric dam and the development of water withdrawal rules for oil sands mining. Our analysis reveals that power dynamics that impact decisions within jurisdictions confer advantages to the proponents of increasing resource development through decisions, agenda-setting and underlying ideas. We suggest these power dynamics, which impacted resource management decisions within jurisdictions, constrain governance that contributes to sustainability at the interjurisdictional level – particularly inclusion, transparency and fairness.

4.2 Transboundary water governance, levels and power

The transboundary water governance literature is populated with both case studies and large N quantitative studies that analyze the actions of governments at the interjurisdictional level. Analyses have identified factors that influence the negotiation of water management agreements (Dinar 2009; Lindemann 2008), ideal features of agreements (Draper 2007; Klot, *et al.* 2001; Raadgever, *et al.* 2008) and whether transboundary institutions are resilient or can deal with water variability (Dinar, *et al.* 2015; Tir and Stinnett 2012). They have also assessed the content of international water treaties (Conca, *et al.* 2006; Giordano, *et al.* 2014), federal transboundary water management agreements (Burchi 2008) and whether federal transboundary agreements mitigate or contribute to risks associated with water variability (Garrick, *et al.* 2013). In general, successful transboundary water governance is viewed as an outcome when cooperative agreements or treaties regarding transboundary waters are completed (Bernauer 2002). However, assumptions that cooperation is necessarily beneficial are challenged by scholars who point out that power asymmetries may result in cooperation that disguises conflicts (Zeitoun, *et al.* 2011), leading to unsustainable transboundary water governance. Furthermore, the presence of an agreement does not ensure its implementation or that it will actually influence internal, jurisdictional level decision-making (Conca, *et al.* 2006) or that it will enable effective transboundary water governance (Warner and Zawahri 2012).

Power analyses of transboundary water governance have illuminated that cooperation and conflict can coexist. However, they exhibit the government-centric and interjurisdictional focused tendencies typical in the broader transboundary water governance literature (Lopes 2012; Suhardiman and Giordano 2012). This focus results, in part, from a concern for the negotiation of

water management agreements in the international context, a responsibility that is the domain of sovereign states (Blatter and Ingram 2000). Jurisdictions retain significant decision making authority regarding waters that flow within their territory even when they sign interjurisdictional water management agreements. Hence, their internal decision-making processes warrant consideration (Warner and Zawahri 2012), and may in fact be crucial factors that can constrain and enable possibilities for more sustainable transboundary water governance. By assessing the multiple levels of governance involved in transboundary water systems, a more nuanced and comprehensive perspective on the ways in which power impacts transboundary water governance is possible (Suhardiman and Giordano 2012).

In federal countries, multiple levels of government are involved in transboundary water governance. Federalism – characterized by the division of authority and some autonomy between central and decentralized governments, each of which are democratically elected (Anderson 2008) – complicates transboundary water governance by assigning responsibilities for water to more than one level of government. When sub-federal governments, such as provinces and states, have jurisdiction for water comparable to those of countries, transboundary water governance can be prone to challenges similar to those in the international context (Delli Priscoli and Wolf 2009; Garrick, *et al.* 2014), including power dynamics. However, this view is not universally accepted. For example, Zeitoun, *et al.* (2011) argue that the presence of a central government and well-developed regulations within federal countries make federal transboundary water systems unlike their international counterparts. Given the enormous variability in how responsibility for water is assigned to different levels of government in federations around the world, there likely is support for both perspectives on this issue in different empirical examples.

Unfortunately, explicit power analyses of sub-federal transboundary water systems are sparse. There is a wide range of variability in the world's 28 federal countries (Anderson 2008), with varying degrees of decentralization and willingness on the part of federal governments to intervene or even test the limits of their own jurisdiction regarding water (Garrick, *et al.* 2014). Furthermore, while it is true that there are well developed laws and regulations within countries and sub-federal jurisdictions that do not exist at the international level, institutions within jurisdictions may be power-laden in ways that can advantage certain interests over others (Raik, *et al.* 2008). How those advantages are distributed and accumulate may lead to unsustainable transboundary water governance within federations. Empirically assessing how power dynamics impact federal transboundary water governance is thus an important contribution to the literature.

Perhaps one of the reasons that power analysis of federal transboundary water governance is relatively sparse is because of the conceptual diversity that exists regarding theories of power in the social sciences. Power can be understood as a capacity exercised by agents (Dahl 1957), endowed in structures (Gould, *et al.* 2004) or productive and totalizing (Digeser 1992). Some scholarship on power in the international context has adopted a framework of hydro-hegemony based on Lukes' and Gramscian power theories applied in the international context (Zeitoun and Warner 2006). While the framework on hydro-hegemony is informative, it was developed in relation to conflict-prone regions in the Middle East and North Africa and may be less applicable to federal contexts where sub-federal governments typically do not possess authority for military matters. Although overt military conflicts over water are rare in the international context (Wolf 1998), the potential threat of violence alters power dynamics as it is among the many tactics that might be used by the powerful to achieve their interests (Zeitoun and Warner 2006). Importantly, this does not mean that power dynamics do not impact federal systems - only that how they do may be different from the international context. To assess power dynamics in a federal context, we adopt a framework based on Steven Lukes' power theory (see Table 4.1) because it is useful for assessing how power impacts resource management decisions (Caine and Krogman 2010), the focus of this paper.

Lukes argues that the ability to achieve preferable outcomes rests on three overlapping dimensions of power (Lukes 2005). The first dimension of power is based on Dahl's (1957) perspective that power is exercised when an actor prevails in policy decisions despite opposition. It can be observed by attending to who participates in decision-making and who prevails. Bachrach and Baratz (1962) critique this dimension of power by pointing out power dynamics can result in issues being organized out of policy discussions, either by conscious restriction on decision-making agendas or the hesitancy of actors to raise issues perceived to be contrary to a powerful actor's interests. The power to restrict decision-making agendas by excluding issues is what Lukes refers to as power's second dimension and what we call agenda-setting power. It can be identified by attending to which interests are considered in policy processes or decision-making, whether actors object to constraints on decision-making, and decisions not to take action when it is possible to do so. Information deficiencies and institutional biases can also evince power's second dimension. Lukes argues that it is a mistake to conflate power with conflict over policy decisions or policy making agendas. Power is also a capacity of institutions and organizations which can result in certain interests never being fully realized and articulated. Power's third dimension can prevent conflict from ever taking place. While the first two dimensions focus on observable conflicts over decision making and non-decision-making,

respectively, and can be observed, the third dimension is concerned with cultural factors that may socialize individuals to accept the status quo as natural, immutable and beneficial, even when it is contrary to their actual interests. The third, more difficulty to identify, dimension works through dominant ideas and values that disguise latent conflicts and existing inequities (Lukes 2005).

Table 4.1: Power indicators

Dimension of power	Indicators	Examples	Evidence/data
1 st : the ability to prevail in decisions (Dahl 1957; Lukes 2005)	• Observable conflicts over decisions • Observable preferences	• Major water infrastructure projects (Zeitoun and Warner 2006) • Geographic position (Cascão and Zeitoun 2010; Dinar 2009) • Financial and technical capacity (Cascão and Zeitoun 2010)	• Policy documents, hearing transcripts, publications produced by Indigenous governments and ENGOs • Interviews • Personal observations
2 nd : the ability to set the agenda (Bachrach and Baratz 1962; Lukes 2005)	• Observable conflicts over the decision-making agenda • Conflicts about information excluded from decision-making • Decisions not to act (non-decisions)	• Appeals to international norms/international law (Zeitoun, <i>et al.</i> 2011; Zeitoun and Warner 2006) • Scope of factors to be considered/included in agreements or discussions about transboundary water governance (Feitelson 2002; Zeitoun and Warner 2006) • Actors/interests that benefit from institutional fragmentation (Suhardiman and Giordano 2014)	• Policy documents, hearing transcripts, publications produced by Indigenous governments and ENGOs • Interviews • Personal observations
3 rd : discursive power - the ability to construct, impose and/or benefit from dominant ideas (Lukes 2005)	• Ideas presented as universally beneficial and desirable	• Ability to construct dominant ideas about which uses of water and management arrangements are beneficial (Feitelson 2002; Zeitoun, <i>et al.</i> 2011) • Political and economic context	• Policy documents and speeches, specifically arguments/justifications for major water use decisions

Given the enormous diversity that exists in terms of the decentralization of responsibilities for water in federations, achieving governance that contributes to sustainability in federal transboundary water systems may be challenged by power dynamics. In federal systems, sub-federal governments can retain significant decision-making authority for water that flows within jurisdictional boundaries. Therefore, we investigate the ways in which power dynamics impact internal water use decisions within sub-federal governments that may have implications for transboundary water systems. Doing so enables us to consider the ways in which power dynamics constrain and enable sustainable transboundary water governance in federations.

Importantly, there is no universal blueprint to achieve sustainability. Sustainability, premised on the notion that ecological degradation and social inequalities are integrally related, requires governance arrangements that address both problems (Gibson, *et al.* 2005). Given the extent of water degradation and pollution worldwide (Vörösmarty, *et al.* 2010), enabling sustainability is an urgent governance challenge (Pahl-Wostl, *et al.* 2012). However, achieving sustainability can be complicated by power dynamics (Newell 2012). It is possible to assess the extent to which governance contributes to sustainability using established criteria. In this paper, we draw on criteria proposed by Lockwood, *et al.* (2010) to assess the extent to which major water use decisions, and the power dynamics implicated in those decisions, act as a major

Table 4.2: Governance principles for sustainability: criteria and evaluative questions

Criteria	Evaluative questions
Legitimacy	Do actors have the authority to govern based in legislation or stakeholder acceptance?
Transparency	Are decision-making processes visible? Is the reasoning behind decisions apparent? Is information related to decisions and performance publicly available?
Inclusiveness	Are there opportunities to participate in and impact governance processes?
Fairness	Are decisions free of systematic bias? Are the distributions of costs and benefits associated with decisions adequately considered?
Integration	Is there coordination across and between different levels of government? Do different government agency policies align?
Capability	Can individuals or organizations deliver on their commitments?
Adaptability	Are new sources of knowledge and learning incorporated? Are threats, risks and opportunities anticipated? Is governance reflective?

Source: Adapted from Lockwood, *et al* 2010.

constraint on governance that contributes to sustainability. The criteria include legitimacy, transparency, inclusiveness, fairness, integration, capability and adaptability. Corresponding evaluative questions are identified in Table 4.2. Other sustainability assessments exist that incorporate biophysical criteria (cf. Gibson 2006; Wiek and Larson 2012). The criteria elaborated by Lockwood, *et al.* (2010) emphasize social dimensions of governance that may be impacted by power dynamics.

4.3 Empirical context: the Peace and Athabasca Rivers

The Peace and Athabasca rivers emerge in the Rocky Mountains of British Columbia and Alberta, respectively. They converge in northern Alberta at the Peace-Athabasca Delta (PAD), a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site and a Wetland of International Significance under the Ramsar Convention. Approximately 80% of the PAD exists in Wood Buffalo National Park (NRBSB 1996), which is managed by the federal agency Parks Canada. It also encompasses the traditional territories of local First Nations and Métis who exercise constitutionally-protected treaty and Aboriginal rights to fish, hunt and trap in the delta and surrounding areas. As shown in Figure 4.1, the Peace River turns northward, is joined by outflow from the PAD, and becomes the Slave River which drains into Great Slave Lake in the Northwest Territories. On its journey from the northwestern corner of Great Slave Lake to the Beaufort Sea within the Northwest Territories, the Mackenzie River is joined by the Liard and Peel Rivers, which flow from British Columbia and the Yukon Territory, respectively.

At 1.8 million km², the MRB drains approximately one-fifth of Canada's land mass.

Jurisdiction for water in the MRB is divided as follows:

- Three provinces (Alberta, British Columbia and Saskatchewan) and three territories (Yukon, the Northwest Territories and Nunavut), have the majority of water use decision-making authority and distinct legislation and policy pertaining to water under Canada's constitution and devolution agreements;
- The federal government has constitutional responsibilities for matters such as transboundary water resources, First Nations, navigation, fisheries and national parks;
- Indigenous peoples, called Aboriginal peoples in Canada's Constitution, have treaty rights and Aboriginal rights and title in the basin, the exercise of which depends on adequate quality and quantity of water (Phare 2009).

Figure 4.1: The Mackenzie River Basin, Canada



Although the federal government possesses potentially broad powers for water governance, in practice it has largely deferred to the provinces, which have specific powers over water related to ownership of land and natural resources and jurisdiction for property (Saunders 2014). Therefore, upstream-downstream asymmetries and coordination challenges exist in the MRB as they do in the international context, because Canada is a highly decentralized federation in which the provinces and territories assume primary roles for water governance (Saunders and Wenig 2007). Concerns regarding upstream hydroelectric development in British Columbia have persisted for decades (NRBSB 1996). More recently, the pace and scale of oil sands development in upstream Alberta have emerged as a major concern downstream in the NWT (AANDC and GNWT 2012). In addition to the governments and Indigenous peoples, ENGOs and industry actors also have strong interests in how the basin is governed.

In 1997, governments in the MRB signed the Mackenzie River Basin Transboundary Waters Master Agreement (the Master Agreement) in response to perceived coordination

challenges. The Master Agreement encourages governments to cooperatively manage the MRB according to underlying principles of maintaining ecological integrity, ensuring sustainable use, prior notification of developments and the right of each jurisdiction to use water so long as it does not harm neighbouring jurisdictions (Government of Canada, *et al.* 1997). It includes commitments to use traditional knowledge and to communicate with Aboriginal peoples in the basin in culturally-relevant ways. The Master Agreement also creates provisions for the negotiation of bilateral water management agreements currently being completed. The Master Agreement contains many forward-looking principles but it is non-binding. The provinces and territories retain significant decision-making authority regarding water and can complement, contradict or challenge the principles of the agreement in their internal decision-making. Given their proprietary, legislative and regulatory authority over water, and the geographic positions that British Columbia and Alberta enjoy relative to their downstream neighbours (Figure 4.1), the ways in which power dynamics impact the provinces' internal water use decisions can have significant implications for transboundary water governance outcomes.

The Peace and Athabasca basins are home to the majority of the MRB's population (MRBB 2003b). They also host some of the most significant industrial developments currently underway in Canada. There are two major dams on the Peace River in British Columbia. A third, the Site C Dam, was recently approved (British Columbia Ministry of Environment 2014). The existing dams provide approximately 30% of British Columbia's 12000 MW of generating capacity, to which the Site C Dam will contribute an additional 1100 MW (BC Hydro 2014b). The Williston Reservoir, the fourth largest reservoir in the world (Church 2014), created by the Bennett Dam, is a significant asset in British Columbia's integrated electricity system; it is the largest of British Columbia's two multi-year storage reservoirs and can be used flexibly to match generation with demand, making it an incredibly valuable resource (BC Hydro 2003a).

Oil sands extraction is a predominant economic activity in the lower Athabasca watershed. Production from the oil sands is expected to grow from 2.3 to 4.8 billion barrels of oil per day by 2030 (Alberta Energy Regulator 2015). There are six surface mines and approximately three times as many in-situ mines within the Athabasca sub-basin in Alberta. The economic implications of oil sands mining are significant for the provincial and federal governments. In 2013-2014, the government of Alberta collected approximately \$5 billion in royalties from bitumen mining operators, which represents approximately 56% of the total non-renewable resource royalties collected in the province (Government of Alberta 2015b). The Canadian Energy Research Institute estimates that within the next twenty-five years the government of

Alberta will collect approximately \$300 billion in oil-sands related taxes and \$600 billion in oil sands royalties (Canadian Energy Research Institute 2014). The federal government is estimated to collect approximately \$570 billion in oil-sands related taxes.

The cumulative effects of flow regulation from hydro dams on the Peace River (Creery 1979; Peace Athabasca Delta Committee 1970) and water quality and quantity impacts of oil sands mining in the Athabasca sub-basin have figured prominently in downstream concerns (AANDC and GNWT 2012). Much of that concern has centered on impacts to the PAD and the Slave River and Delta. Flows on the Peace River are regulated according to electricity demand in British Columbia; in general, flows are higher in winter and lower in spring and summer than they would have been without regulation (Prowse, *et al.* 2002). Flow regulation on the Peace River has long been believed to be a significant driver in a multi-decadal drying event currently being experienced in the delta (Adams 1996; Peace Athabasca Delta Committee 1970). There are conflicting scientific perspectives on whether that drying is the result of natural variability and climate change (Wolfe, *et al.* 2012) or is due to a combination of climate change and flow regulation (Beltaos 2014).

Flow regulation is also believed to impact sedimentation in downstream jurisdictions. For example, a longitudinal study of the impacts of flow regulation on sediment transport in downstream reaches of the Peace River indicates a trend of increasing sediment deposition. Regulated flows are insufficient to transport sediment throughout the river system, resulting in the creation of sandbars and accumulated sediment at tributary mouths downstream in Alberta, which can negatively impact river ecology and navigability (Church 2014). Monitoring programs in the Slave River and Delta detect higher than expected levels of total dissolved solids, organic carbon, potassium, sulphate and phosphorous in the spring and summer seasons and no change in other substances such as calcium, magnesium, sodium and hardness, which is believed to be linked to upstream flow regulation (Sanderson, *et al.* 2012).

Water withdrawals from the Athabasca River, although they are a small fraction of the Athabasca's average annual flow (Government of Alberta 2015c), are of concern based on river navigability, impacts to the Athabasca portion of the delta (Candler, *et al.* 2010) and the timing of withdrawals (Lebel, *et al.* 2011). For instance, Parks Canada, which manages Wood Buffalo National Park, has stated that, "the Athabasca River Delta is far more sensitive to changes caused by oil sands development than the mainstem Athabasca River" (Parks Canada 2011, 10). It is important to acknowledge that the Peace River is by far the greater influence on flows in the

Slave (Sanderson, *et al.* 2012). However, both rivers have important roles in recharging the PAD (Prowse, *et al.* 2002; Wolfe, *et al.* 2006).

There is conflicting evidence and scientific perspectives regarding the extent to which contaminants present in the Athabasca region are the result of oil sands extraction (Hodson 2013). Some studies link the deposition of contaminants such as mercury and polycyclic aromatic hydrocarbons with the onset and increase in oil sands extraction (Kelly, *et al.* 2009; Kurek, *et al.* 2013). Others suggest that some contaminants attributed to oil sands extraction activities are naturally occurring or the result of other industrial processes (Hall, *et al.* 2012; Wiklund, *et al.* 2012). Regardless, there are serious concerns about the impacts of oil sands development on downstream communities in the NWT. For example, the 170km² of tailing ponds in the Athabasca region, some of which are adjacent and leak into the Athabasca River, contain toxic compounds including naphthenic acids, polycyclic aromatic hydrocarbons and metals (Timoney and Lee 2009). A failure of one of these ponds would have catastrophic impacts on the transboundary environment (Grant, *et al.* 2010). The nature and extent of contaminant deposition has figured strongly in downstream concerns (AANDC and GNWT 2012).

In response to the pace and scale of development in the region and at the request of Indigenous governments and ENGOs, the UNESCO World Heritage Committee requested that provincial and federal governments conduct an assessment of cumulative impacts of hydroelectric facilities and oil sands mining on the PAD (UNESCO 2015). Given the extent of concerns regarding upstream development activities on downstream jurisdictions, the ways in which water is used in upstream jurisdictions has transboundary implications. Concerns about upstream development have been expressed by downstream communities, governments and international organizations. As we will demonstrate in our findings section, the ways in which power dynamics have influenced water use decision making in upstream jurisdictions constrains sustainability at the interjurisdictional level. Specifically, power dynamics confer advantages to the proponents of increasing resource development and marginalize alternative interests and perspectives.

4.4 Methods

This purpose of this paper is to assess if and how power dynamics impact water use decisions within British Columbia and Alberta in the Peace and Athabasca sub-basins, and then to consider implications for governance that contributes to sustainability in federal transboundary water systems. To achieve this purpose, we adopted a multiple-case approach to undertake detailed, in-depth analysis of evaluative questions (Gerring 2007; Yin 2009). The analysis presented in this paper draws evidence from two cases of water use decisions on the Peace and Athabasca Rivers

(Figure 4.1). The first case is the environmental assessment (EA) for the Site C Dam on the Peace River in British Columbia, including subsequent provincial and federal approvals and the provincial decision to invest in building the dam. The second case considered is the development of the Surface Water Quantity Management Framework (the Framework) for the Lower Athabasca River. Cases were selected according to several criteria. First, the water use decisions made in each case pertain to key governance pressures in the basin that have transboundary implications (MRBB 2012). They are also relatively recent decisions undertaken according to each province's internal policy priorities – the cases are situated entirely in one upstream jurisdiction. Data accessibility was the final criterion used to select both cases.

4.4.1 Case studies

4.4.1.1 The Site C Dam

The Site C Dam on the Peace River will be constructed and operated by BC Hydro, a crown corporation that serves approximately 95% of the province's population, and owns and operates the existing dams on the Peace River. It will sit approximately 60 km upstream of the British Columbia-Alberta border and create a reservoir that will flood approximately 83 km of the Peace River Valley. At approximately 1 km long and 60 metres high, with a reservoir of approximately 165 million m³, the Site C Dam is a large dam (World Commission on Dams 2000). Importantly, Site C's operation will be coordinated with the two existing dams (Figure 4.1) to capitalize on water storage provided by the Williston Reservoir, which, at capacity, can store approximately 74 km³, a volume much greater than the average annual inflow of 1080 m³/s. The Site C Dam has been considered an option to generate electricity since the 1950s, when British Columbia pursued the "two rivers" policy of locating all of major hydro projects on the Columbia and Peace Rivers (Loo and Stanley 2011). The project was initially reviewed and rejected by the British Columbia Utilities Commission (BCUC) in the early 1980s and again in the early 1990s based on the finding that the energy generated by Site C was not needed in the province at the time (BCUC 1983).

BC Hydro's case for building the dam rests on several key premises. The load forecasting conducted by BC Hydro anticipates a 40% increase in electricity demand within the next 20 years, due to population growth and economic expansion. BC Hydro estimates that demand-side management will not eliminate the need for additional generation in the province (BC Hydro 2014b). Another premise upon which BC Hydro's case rests are claims that the environmental impacts of building Site C are significantly less than alternatives because of its ability to capitalize on preexisting dams. BC Hydro argues that the Site C Dam can deliver "35 per cent of

the energy produced at the W.A.C. Bennett Dam, with only 5 per cent of the reservoir” (BC Hydro 2014b, 33). Finally, BC Hydro maintains that the Site C project is the least expensive of alternatives considered, including wind, solar and smaller run of river projects, because costs are reliable and will decline over time.

While the province of British Columbia has primary jurisdiction to allocate water to hydroelectric dams and to approve their construction, the federal government also has responsibilities under Canada’s constitution for navigation and fisheries that a major dam could impact. Therefore, a cooperative, joint environmental review process was established to assess the project’s potential social, cultural, heritage and environmental effects (JRP 2014). In Canada, EAs are key decision-making tools intended to identify and minimize adverse impacts associated with development. Twenty-three Indigenous groups, five ENGOs and one individual were eligible for funding to participate in the various stages of the EA (Canadian Environmental Assessment Agency 2012a; 2012b). Many more groups participated without funding. The governments of Alberta and the Northwest Territories participated in a technical working group on downstream effects to inform the EA process (BC Hydro 2013b). The government of Alberta submitted comments to the EA office throughout the EA process (Harrison 2012a; 2012b; 2012c; Moore 2013; 2014).

A report prepared by the Joint Review Panel (JRP), which provided recommendations regarding whether, and under what conditions, the dam should be built, was released in May 2014 (JRP 2014). In November 2014, the provincial and federal governments announced their approvals and conditions for the Site C project’s construction and operation (Aglukkaq 2014; British Columbia Environmental Assessment Office 2014b) and in December 2014, the province of BC announced its decision to invest in the \$8.8 billion project (Clark 2014). The EA process took place over 4 years, from when the province announced the Site C dam would be reviewed in 2010, to when it announced its investment decision.

4.4.1.2 The Surface Water Quantity Management Framework for the Lower Athabasca River

The second case considered in this paper is the development of the Surface Water Quantity Management Framework for the Lower Athabasca River (the Framework) within Alberta. This framework establishes cumulative water withdrawal rules for the Lower Athabasca River. The Athabasca River is important ecologically as the longest free-flowing river in Alberta and the largest direct contributor of flows to the PAD (Lebel, *et al.* 2011). Flows in the Athabasca support Aboriginal navigation and the exercise of treaty rights to hunt, fish and trap in traditional

territories. The Athabasca River is also the largest source of water for oil sands mining, which requires approximately 3.1 barrels of water to 1 barrel of oil produced (Canadian Association of Petroleum Producers 2015). Water used by industry that cannot be returned to the river because it is heavily contaminated is stored in large tailing ponds in the region. Tailing ponds and the water quantity and water quality impacts of oil sands mining are concerns for the downstream NWT (Grant, *et al.* 2010; Sanderson, *et al.* 2012)

The Framework contributes to Alberta's Land Use Policy, which requires the creation of land use plans to manage cumulative effects in seven land use areas, including the Lower Athabasca region. A Land Use Plan establishes broad goals for a region, to which air, water quality, water quantity and biodiversity management frameworks developed under the auspices of the Land Use Plan contribute. The plan for the Lower Athabasca region is one of the province's key strategies to manage the cumulative impacts of oil sands development in the Lower Athabasca region (Government of Alberta 2012).

Rules established in the Framework were several years in the making. The government of Alberta first identified environmental flows policies as necessary to manage the cumulative impacts of growth of the oil sands industry in 1999 (Alberta Environment 1999). In the early 2000s, the Cumulative Environmental Management Association (CEMA), a multi-stakeholder advisory committee comprised of the oil sands industry, ENGOs, Indigenous groups, and the provincial and federal governments was tasked with developing recommendations for an environmental flows policy for the Lower Athabasca River (Clipperton 2005). Several factors, including increasing attention to oil sands water-use issues highlighted by ENGOs (Woynillowicz and Severson-Baker 2006), academics (Schindler, *et al.* 2007), government advisors (Oil Sands Ministerial Committee 2006) and EA review panels associated with oil sands mining expansion (JRPa 2004a; JRPb 2004b), made developing an environmental flows policy a priority issue. When CEMA was unable to provide consensus-based recommendations, Alberta Environment and the federal Department of Fisheries and Oceans issued a provisional water withdrawal rule-set based on CEMA's work (Alberta Environment and Department of Fisheries and Oceans Canada 2007). They acknowledged that a second phase would be necessary to undertake additional studies and make recommendations for protecting the Lower Athabasca River over the long term. This work was assigned to the Phase 2 Framework Committee (P2FC), which ultimately developed the recommendations accepted by the government of Alberta in the Framework.

The P2FC began its work in 2008. Several Indigenous groups who were involved in the earlier process withdrew from CEMA in 2007 and declined to participate in Phase 2, in part because they believed that earlier process did not sufficiently integrate their concerns and interests (JRP 2007). The Mikisew Cree First Nation (MCFN) and Athabasca Chipewyan First Nation (ACFN) opted to provide their own recommendations to government (Candler, *et al.* 2010). The Fort McKay First Nation and Fort Chipewyan Métis participated. Three ENGOs who were not involved in the earlier process did participate in the P2FC. All six mining companies (Suncor, Syncrude, Canadian Natural Resources Limited, Imperial Oil, Shell and Total) with operations that withdrawal water from the Athabasca River participated in the process, as did representatives of the provincial and federal governments. The P2FC provided non-consensus recommendations to the government in 2010 (Ohlson, *et al.* 2010). The P2FC's recommendations were reviewed by a federal science advisory committee in the spring of 2010 (Canadian Science Advisory Secretariat 2010). In 2013, engagement sessions regarding a draft of the Framework, which was based on the P2FC's recommendations, were held with ENGO and industry participants in the P2FC. Separate sessions were held with First Nations and Métis in 2014. In March 2015, Alberta released the Framework, which adopts the withdrawal rules recommended by the P2FC (Government of Alberta 2015c).

The Framework dictates weekly rules for water withdrawals from the Lower Athabasca River that is based on flow. Flows in the Athabasca River vary inter and intra-annually, with low flows usually experienced in the mid-winter months and higher flows in late spring/early summer. Generally, withdrawals are restricted as flows decrease. During the summer to late fall months, when flows are greater than 111.6 m³/s, up to 29 m³/s may be withdrawn from the Athabasca River. During the winter, the maximum amount that may be withdrawn is 16 m³/s and only if flows are greater than 270 m³/s. In all seasons, if flows drop below 87 m³/s, no more than 4.4 m³/s may be withdrawn – 2 m³/s each for Suncor and Syncrude and 0.2m³/s each for Shell and Canadian Natural Resources Limited. Other operators, including Total and Imperial Oil, are not permitted to withdraw water if flows drop below 87 m³/s.

The Framework also identifies indicators that will be used to track changes over time. Indicators include upstream water use, river flow, oil sands water use, seasonal flow exceedances and Aboriginal navigation. Adaptive management triggers are used to detect whether conditions are within the range of variability assumed during the development of the withdrawal rules. Adaptive management triggers, if triggered, require a management response, which may include additional monitoring or modifications to the withdrawal rules (Government of Alberta 2015c).

Adaptive management triggers include upstream water use, long-term seasonal flows, oil sands water use, cumulative oil sands water use relative to flow, high oil sands water use during low summer/fall flows, ecological indicators and a preliminary Aboriginal Navigation Index (Government of Alberta 2015c). Importantly, the Framework also acknowledges that rules are intended to “augment and complement . . . future transboundary commitments” with the NWT (Government of Alberta 2015c, 9).

4.4.2 Data collection and analysis

Data used to conduct this analysis include semi-structured interviews and extensive review of policy documents, press releases and submissions to the EA agency. The first author interviewed nineteen individuals either directly involved in the development of the P2FC’s recommendations and the Framework or in other aspects of transboundary water governance in the MRB. Nine interviews support the P2FC case, whereas ten regarded transboundary water governance in general in the MRB and support our analysis of the Site C dam case. Interviewees were contacted because of their involvement in the P2FC case or transboundary water governance; they include representatives of industry, ENGOs, Indigenous organizations and provincial, territorial and federal governments. All interviews were audio-recorded, transcribed verbatim by the first author and returned to participants for verification. A substantial amount of data regarding the Site C EA was available through the Canadian EA registry, where all submissions received during the EA were posted. Furthermore, many documents regarding the P2FC are publicly available. A total of 251 documents were analyzed for this study. Personal observations made and informal conversations had when the first author attended the EA hearings for the Site C dam in December 2013 and January 2014 supplement data collected for the Site C case. Data were stored and organized in NVivo QSR10, which was also used to code data according to themes in Table 4.1.

Qualitative content analysis was used as a systematic method to identify the ways in which power impacted water use decisions for each case (Schreier 2012). Data were coded according to themes and indicators associated with the three dimensions of power identified in Table 4.1. Findings are detailed in section 4.5 of this paper. Coding data from each case according to the same categories facilitated our cross-case analysis and allowed for more generalized findings (Schreier 2012) regarding the ways in which power dynamics within jurisdictions can impact sustainability at the interjurisdictional level. After compiling our findings across cases, we considered whether they operated as a constraint or enabler of governance that contributes to sustainability, using Lockwood, *et al.*’s (2010) criteria identified in Table 4.2. Section 4.6 highlights findings from this analysis that had significant implications for several of the criteria.

4.5 Results

In this section, we present our findings for each case according to the dimensions of power identified in Table 4.1. We discuss evidence that power dynamics, in each dimension, favored the proponents of increasing resource development. In the following section, we discuss how these findings suggest that water use decisions act as a constraint on sustainability at the interjurisdictional level.

4.5.1 The power to prevail in decisions

In both cases, water use decisions advantaged the proponents of resource development, despite opposition. In the case of the Site C Dam, the decision to proceed with the EA and the decision by the provincial and federal governments to grant BC Hydro the environmental approvals necessary to build the dam, were met with considerable opposition. The government of Alberta, because of concerns regarding downstream impacts, indicated that it preferred a bilateral agreement to be completed under the Master Agreement before BC proceeded with the dam's assessment (Chabaylo 2010). Following announcements that the dam would proceed to the EA phase, 16 First Nations issued a declaration to the provincial government, stating that they were opposed to the dam and would use all lawful means to oppose its approval and construction (Doig River First Nation, *et al.* 2010). Several First Nations voiced their opposition to the dam consistently throughout the EA based on impacts to Aboriginal and treaty rights, impacts to wildlife and the perceived inadequacy of BC Hydro's consideration of alternative means of generating power (Treaty 8 Tribal Association 2014). They were joined by ENGOs and local landowners who opposed the dam based on losses to agricultural land, their homes, impacts on wildlife and doubts about whether building the dam is necessary (Francis and Bishop 2014; Howard and Johnston 2014; Peace Valley Landowner Association 2014). Potential impacts to the PAD also featured strongly in downstream First Nations opposition to the dam (Carver 2012). However, as described above, building the Site C Dam was touted by BC Hydro as the preferred option to meet growing electricity demands in British Columbia based on its relative cost effectiveness and environmental performance (BC Hydro 2014b).

BC Hydro's receipt of federal and provincial environmental approvals and the provincial government's decision to invest the \$8.8 billion necessary to build the dam, are evidence of BC Hydro's interests in building the dam prevailing over others. In response to the provincial and federal approvals, several First Nations groups denounced the decision, requesting that the provincial and federal governments "immediately cease proceeding with the proposed Site C Dam project" (First Nations Summit 2014). Local landowners and First Nations launched six

separate legal challenges of the decision in provincial and federal courts (Axmann and Cytrynbaum 2015b). Four challenges were dismissed and two were withdrawn (Axmann and Cytrynbaum 2015a; Junger and Hill 2015). However, as of mid-2016, opposition to the decision to approve the Site C dam persists.

The decision to adopt the P2FC's non-consensus recommendations in the Framework also favoured the interests of oil sands mining companies. Industry operators argued that the recommended rule set was an acceptable balance of social, environmental and economic objectives. One interviewee reported that the biggest success of the P2FC process was that "government has virtually adopted it [the recommendation] verbatim" (Confidential interview [CI] 1). ENGOs dissented on the basis that the rule set was not sufficiently precautionary and protective of the ecosystem at low flow conditions (Dyer 2014; Lebel, *et al.* 2011). They requested that withdrawals should cease at the low-flow threshold – 87m³/s – rather than allow an exemption for certain operators. ENGO representatives requested that an ecosystem base flow, below which no withdrawals would be permitted, should be implemented. They were joined by Indigenous groups (Fekete 2014) and the federal science advisory committee, which agreed that at a certain threshold, water withdrawals from the Athabasca should cease (Canadian Science Advisory Secretariat 2010). Review panels of new oil sands mines also encouraged governments to adopt an ecosystem base-flow, a recommendation that the government of Canada accepted (Government of Canada 2008). Ultimately, because the P2FC's recommendations were adopted in the Framework, the interests of industry prevailed over ENGOs and Indigenous participants. The process also did not directly include residents of the NWT, who were interested in being engaged in the process (Straka, *et al.* 2014).

4.5.2 The power to set the agenda

The second dimension of power is the ability to determine the agenda in ways that are preferable to a powerful actor's interests. This may result in a decision to exclude issues or information or ensure they are considered irrelevant in a decision-making process. Ultimately, controlling the decision making agenda can prevent articulating and debating alternatives or issues that may challenge a powerful actor's interests. The second dimension of power is also evident in decisions not to act when it is possible to do so (Lukes 2005). Here, we present evidence that power's second, agenda-setting dimension advantaged the proponents of increasing resource development in the Peace and Athabasca river basins.

The government of BC created a regulatory environment conducive to approving the Site C dam. Site C was exempt from review by the BCUC, an arm's-length agency designed to regulate

BC's utilities. The BCUC has explicit responsibilities for reviewing load forecasting and cost estimates of energy projects – two of the major premises upon which BC Hydro's case for the dam rested (BC Hydro 2014b). Over three decades ago, the BCUC reviewed and rejected the Site C dam on the basis that the power it would generate was not needed. Throughout the EA, a number of participants requested that the proposal for the Site C Dam be subject to review by the BCUC (Boon and Boon 2014; Johansson 2014; Treaty 8 Tribal Association 2014). This was a position with which the review panel agreed. One of the JRP's recommendations to the BC government was that, if BC decides to move forward with the dam, it should require the BCUC to review BC Hydro's load forecasting and costs estimates. The panel noted it did not have the time or resources to undertake a rigorous investigation of these components of the Site C project's environmental impact statement (JRP 2014). The BC government considered this recommendation to be beyond the scope of the panel's mandate (British Columbia Environmental Assessment Office 2014a). The BCUC could have provided a thorough assessment of BC Hydro's load forecasting and cost estimates but because the BC government exercised its agenda setting power to exclude it from the process.

The information BC Hydro was *not* required to submit in the environmental impact statement also benefited its case for the dam. Throughout the EA, numerous participants in the EA process, including local and downstream First Nations and Métis organizations, the government of Alberta, Parks Canada, Environment Canada and ENGOs, requested that BC Hydro provide a cumulative effects assessment that included the impacts of the existing dams (Environment Canada 2012a; Fraser 2012; Kyle 2012; Treaty 8 Tribal Association 2012). Downstream governments and First Nations and Métis argued that this cumulative effects assessment should extend to the PAD (Environment Canada 2012b; Harrison 2012b; MacMillan 2012). The government of the NWT requested that the effects assessment extend to the Slave River and Delta (Government of the Northwest Territories 2013). Local and downstream First Nations and ENGOs also argued that cumulative effects should be measured according to a pre-industrial baseline (Athabasca Chipewyan First Nation and Mikisew Cree First Nation 2014; Deninu Kue First Nation 2014; Howard and Johnston 2014; Treaty 8 Tribal Association 2014). Instead, BC Hydro provided a narrative description of changes experienced since the two dams were constructed and conducted a cumulative effects assessment based on a current baseline. The assessment did not include cumulative impacts to the PAD. Many participants considered this assessment deficient. For example, Environment Canada, a federal agency, noted that, "the narrative provided by BC Hydro in the EIS [environmental impact statement] lacks important information about known effects of flow regulation on the hydrology of the PAD and Lake

Athabasca” (Environment Canada 2013, 11). Representatives of downstream First Nations argued that the EA process “was nothing more than providing the optics that issues were being dealt with” and indicated that BC Hydro ignored concerns associated with historic, current and future impacts to the PAD from upstream hydro facilities (Canadian Environmental Assessment Agency and British Columbia Environmental Assessment Office 2014, 117).

BC Hydro argued that there was insufficient evidence to provide a cumulative effects assessment based on a pre-dam baseline, a position that was rejected by the review panel (JRP 2014). The absence of information about the cumulative effects of the existing dams benefited BC Hydro in important ways. Many participants, including local and downstream First Nations, argued that there are current, ongoing and unresolved impacts associated with the operation of the existing dams which a new dam would compound (Athabasca Chipewyan First Nation and Mikisew Cree First Nation 2014; Treaty 8 Tribal Association 2014). The previous two dams were not subject to environmental reviews typical of current standards, raising, in the Treaty 8 Tribal Association’s view, questions about the ethics of building another dam based on a regime that was never rigorously reviewed for impacts. Their representatives stated that, “by constructing a third dam that relies on the continuation of ... adverse effects, BC Hydro appears content to foreclose the possibility of remedying these ongoing adverse effects in the future” (Treaty 8 Tribal Association 2014, 102). The failure to conduct a fulsome cumulative effects assessment also raises questions about the environmental performance of Site C relative to alternatives, particularly as the significant impacts of building the two existing dams were essentially grandfathered in to the current assessment.

Finally, the government of Alberta indicated throughout the EA process that it was concerned that the operation of the Site C dam will exacerbate negative impacts associated with flow regulation downstream in Alberta (Moore 2013). In several submissions to the JRP, representatives of Alberta wrote that designated minimum flow releases of 390 m³/s from the Site C dam were expected to be inadequate to protect Alberta’s interests (Moore 2013; 2014). Specifically, in its final submission to the JRP, the government of Alberta stated that its concerns regarding flows “were *not* adequately addressed” during the EA and that, as specified, minimum design flows “will cause undue risk to Alberta infrastructure” (Moore 2014, 3), a concern downstream residents have reported to public servants in Alberta (CI 2; 3). Despite voicing their concerns, approvals for the dam accepted design flows proposed by BC Hydro (British Columbia Environmental Assessment Office 2014b). The government of Alberta was unable to set the decision-making agenda regarding flow releases in a way that protected its interests.

The development of the Framework for the Lower Athabasca was constrained in ways that excluded lower-growth possibilities for oil sands development. Members of the P2FC, whose recommendations were adopted in the Framework, only deliberated options that corresponded to a high-growth scenario for oil sands mining (Ohlson, *et al.* 2010). Withdrawal rules considered during the process corresponded to a full-build out scenario of oil sands mining requiring average cumulative demands of 16 m³/s and peak demand of 29 m³/s (Ohlson, *et al.* 2010). While considering a high-growth scenario may be prudent planning, it also eliminated alternatives that entailed scaling back production in the oil sands, which several participants indicated may be desirable. For example, one participant reported that “we thought that some scenarios should have included reducing production and that was off limits. So, really that was a flaw in the process because we think that’s a responsible and viable option but the government and industry weren’t willing to entertain that” (CI 4). In contrast, representatives of industry reported that they did not perceive any constraints on interests or issues up for discussion in the P2FC (CI 1; CI 9). Ultimately, this constraint benefited industry and governments interested in expanding oil sands mining in the region.

The P2FC did not achieve consensus on recommendations provided to governments. One of the reasons that they failed to achieve consensus was because of exemptions to the low flow cutoff (CI 4; CI 5). Two license holders, Syncrude and Suncor, can each continue to withdraw 2 m³/s of water at the low flow threshold. CNRL and Shell can continue to withdraw 0.2 m³/s of water to prevent infrastructure from freezing. Therefore, a total of 4.4 m³/s can continue to be withdrawn when flows are at 87 m³/s. Syncrude and Suncor both hold senior licenses to withdraw water from the Athabasca River that were issued during the 1960s. Under Alberta’s prior allocation system, they hold senior rights to withdraw water. During the P2FC process, whether the senior licenses could be amended and whether the Committee had the authority to recommend doing so was a subject of disagreement among participants (Ohlson, *et al.* 2010). Several participants thought that there should be a complete cutoff at 87 m³/s, that doing so would be precautionary and within the rights of province, which ultimately owns the resource (Lebel, *et al.* 2011; CI4; CI5). They also suggested that the low-flow threshold is a 1-in-100 year flow event and that the probability of frequent restrictions is unlikely (Alberta Wilderness Association *et al.* 2015). However, others put forward the position that it was not within the P2FC’s mandate to consider restrictions on water licenses (Ohlson, *et al.* 2010). Ultimately, the government of Alberta opted not to implement potential regulatory tools or assert its ownership of water to cut off withdrawals at 87 m³/s. The federal government also failed to adopt recommendations regarding an ecosystem base flow cutoff with it had agreed to do in response to previous EAs

(Government of Canada 2008) and the science review process (Canadian Science Advisory Secretariat 2010). Both the government of Alberta and the government of Canada exercised their power to not require restrictions on senior license holders, which ultimately favored the interests of those industry actors.

The ACFN and MCFN did not participate in the P2FC process. They provided separate recommendations to government, which were based on flows necessary to navigate a fully loaded boat with an outboard motor (Candler, *et al.* 2010), the preferred way to access hunting and fishing areas in the Athabasca River and delta, during the spring, summer and late fall seasons. Navigation in the Athabasca River is central to the ability of the ACFN and MCFN to practice constitutionally-protected Aboriginal and treaty rights to hunt, fish and trap in the delta. Information gathered from river users by independent consultants indicate that at flows of 1600 m³/s members of the ACFN and MCFN can freely navigate the Athabasca River and delta. However, at 400 m³/s, river users report significant disruptions in navigation and access to preferred fishing and hunting grounds (Candler, *et al.* 2010). The ACFN and MCFN argued that when they cannot navigate the Athabasca River during critical hunting and fishing times, their treaty rights are negatively impacted. When flows are permitted at the lower threshold of 400m³/s in the late summer and fall seasons, requirements to consult and accommodate the ACFN and MCFN arise because of adverse impacts to treaty rights (Candler, *et al.* 2010). Under Canadian law, governments cannot infringe upon treaty rights without appropriate justification and a clear and reasonable purpose. In any case, as soon as treaty rights may be impacted governments have a duty to consult with affected Indigenous peoples.

The government of Alberta responded to the ACFN and MCFN's recommendations by including Aboriginal navigation as an indicator and developing an Aboriginal Navigation Index as an adaptive management trigger in the Framework. Recall that indicators serve as an early warning system that conditions may be changing whereas adaptive management triggers require a management response such as additional study or new rules about withdrawals. Alberta intends to include the ACFN and MCFN in monitoring and tracking river conditions (Government of Alberta 2015c).

The inclusion of Aboriginal navigation as an indicator and an Aboriginal Navigation Index as an adaptive management trigger represents an effort to include concerns raised by the ACFN and MCFN. In fact, government interviewees indicated that concerns raised during Indigenous engagement sessions resulted in the most significant revisions to the Framework (CI 6; CI 7). However, questions remain about the extent to which the Framework will protect rights to

navigation during the hunting season. For instance, the ACFN and MCFN indicated that late summer and fall are especially critical for river navigation but that it is also during these seasons when most disruptions are experienced (Candler, *et al.* 2010; CI 8). The withdrawal rules for the summer/fall season in the Framework stipulate that at weekly flows of more than 111.6m³/s, up to 29m³/s of water may be withdrawn. The Framework also contains a statement that cumulative withdraws may eventually exceed this limit, which was also the upper threshold considered during the Phase 2 process. According to a representative of the MCFN, this was “a giant red flag for us” (CI 8); although Aboriginal navigation is considered in the Framework, rules do not restrict withdraws to protect Aboriginal navigation, despite requests by the ACFN and MCFN that they do so. The failure to include the necessary tools to do so indicates power’s second dimension, and parallels the unwillingness to adopt a complete cutoff at the low flow 87m³/s threshold.

4.5.3 The power of ideas

The proponents of increasing resource development in the Peace and Athabasca sub-basins benefited from underlying ideas that create the context and rationale for the water use decisions considered in this paper. Power’s third dimension is the most difficult to identify because of the subtle, less obvious ways in which it works. To assess power’s third dimension, we considered arguments used to justify the water use decisions and the broader context in which they are embedded. Underlying ideas associated with the positive economic benefits of increasing resource development reinforced the advantage of the proponents of expanding hydroelectricity development and oil sands mining in the Peace and Athabasca river basins.

When the government of British Columbia announced its approval of the Site C Dam in November 2014, it asserted that “Site C is in the public interest and the benefits provided by the project outweigh the risks of significant adverse environmental, social and heritage effects” (British Columbia Ministry of Environment 2014). The federal government’s approval contained a similar statement that “the environmental effects of the proposed Site C Clean Energy Project are justified in the circumstances” (Aglukkaq 2014). The relevant circumstances appear to be the transparent, thorough review process, the “jobs and economic growth” the construction of the project will provide, and consultation with First Nations. The federal minister’s statement also referred to the lower greenhouse gas emissions the project will generate relative to alternatives. When Premier Christy Clark announced the province’s decision to invest \$8.8 billion in the dam in December 2014, she referred to five principles that guided the decision: necessity; affordability; reliability; sustainability and; conservation (Clark 2014). While she referred to

necessity, she did not provide a clear explanation for how the BC provincial government had determined that the power the dam would generate was needed on the timeline laid out. Instead, Premier Clark relied heavily on the argument that investing in Site C will ensure economic growth, wealth and opportunity for British Columbians (Clark 2014).

Importantly, the review panel for Site C found that in light of the significant, adverse environmental, social and heritage impacts, and impacts to traditional use by First Nations, that approving the project could only be justified by a clear and unambiguous need for the power that the dam will generate (JRP 2014). It also stated that BC Hydro had not demonstrated the need for the power on the timeline considered. Economic benefits, as well as the relatively lower greenhouse gas emissions the project will generate, stood in as justifications for approving the dam rather than a clear and unambiguous need for the electricity generated by the dam. The province's approval of Site C and its failure to subject BC Hydro's load forecasting to independent review, rested upon ideological ideas about the benefits of increasing resource development. It is possible to envision that a much different decision would have been reached if reconciliation with First Nations in BC, premised upon the international benchmark of prior, informed consent, were the foundational idea informing the decision.

Similar appeals to economic benefits were made in decisions regarding expanding oil sands mining and Alberta's broader energy development strategy, to which the Framework contributes as a tool to manage cumulative effects. For example, the Lower Athabasca Regional Plan claims that, "the responsible development of Alberta's oil sands resource is the platform for continued economic growth and success that brings with it tremendous benefits to the people of Alberta" (Government of Alberta 2012, 25); this goal that is taken from Alberta's 2008 energy strategy (Government of Alberta 2008).

In Alberta, determining whether a project is in the public interest requires considering environmental, social and environmental impacts. In recommendations for approving oil sands mines, review panels justify approving expanding oil sands mines by referring to the economic benefits that will accrue to Alberta and Canada as a result of increasing oil sands mining. This is despite the fact that the cumulative impacts of oil sands mining in the Lower Athabasca region are creating significant and adverse impacts to wetlands, wetland species at risk and migratory birds, biodiversity and Aboriginal rights and culture, and potentially irreversible impact to wetlands and wetland dependent species (JRP 2013). As one legal scholar has noted, "for projects that are extensive in scope promising benefits over a long period of time such as oil sands development, the presumed interests of the public at large in the development of the resource

appears to be insurmountable” (Low 2011, 38). The public interest is equated with economic benefits and economic growth.

Justifying controversial energy developments by appealing to economic benefits associated with industrial development is an ideological argument that disguises existing inequities. The economic benefits of oil sands mining are not equitably distributed within Alberta, which has the highest level of income inequality (Flanagan 2015) and the highest gendered income inequality (Lahey 2015) in all of Canada. Furthermore, the presence of unresolved concerns regarding consultation and accommodation with First Nations in the Lower Athabasca region mean that there are outstanding legal and ethical issues regarding the impacts of the pace and scale of oil sands development (Mantyka-Pringle, *et al.* 2015). These factors suggest it is reasonable to question how and why pursuing and facilitating a high growth scenario for oil sands mining is desirable and in the public interest, given existing financial inequities and impacts to Aboriginal and treaty rights. Yet, the fact that economic benefits stand in as justification disguises the existing sources of controversy over development in this region. It is possible to envision that entirely different decisions would be reached if biodiversity preservation and/or reconciliation with First Nations were the underlying ideas informing decisions.

4.6 Analysis and discussion

In this section, we compare findings across cases, linking evidence regarding how power dynamics impacted major water use decisions with implications for sustainable transboundary water governance. In relatively pristine basins such as the MRB, identifying power-related challenges to achieving sustainability can help to address governance deficiencies and enable governance that contributes to sustainability. In this section, we draw out findings related to transparency, inclusiveness and fairness as critical procedural aspects of governance that contributes to sustainability (Lockwood, *et al.* 2010). We have made inferences about the extent to which these characteristics of governance have been met based the power analysis we conducted. As detailed in Table 4.2, transparency regards whether decision-making processes are visible, reasoning behind decisions apparent and information about decisions publically available. Inclusion refers to opportunities to participate in and the ability to *influence* decisions about resource management. Fairness is met if decisions are free of systemic biases and distributions of costs and benefits are considered. In the following, we argue that the ways in which power was expressed in the water use decisions we considered worked as constraints on these characteristics of governance that contributes to sustainability.

4.6.1 Power dynamics and sustainable transboundary water governance

In both the case of the Site C dam and the development of the Framework, concern about the transboundary impacts of resource development associated with each decision existed. The most direct evidence that downstream concerns were excluded from serious consideration in policy decisions is presented in case of the Site C Dam. Concerns regarding the impacts of flow regulation on downstream jurisdictions have existed for several decades and date back to when the construction of the first dam was completed in 1968 (Creery 1979; Peace Athabasca Delta Committee 1970). Downstream governments and residents had opportunities to participate in the EA process but they had limited influence on the actual decision that was reached. The failure to incorporate concerns expressed by the governments of Alberta and the NWT and federal agencies such as Parks Canada related to flow regulation throughout the EA process provides a vivid example of how power dynamics worked in the decision to approve Site C. Specifically, power dynamics within BC's internal decision-making process worked to exclude downstream concerns from impacting the decision to approve the dam. We suggest these reflect aspects of power's second dimension related to the ability to influence institutional arrangements so that decisions contrary to a powerful actor's interests are not reached (Bachrach and Baratz 1962; Lukes 2005). The failure to include and incorporate these interests in decisions about development is a constraint on sustainability – specifically, inclusion of downstream interests was not achieved. Importantly, the ways in which power operated as a constraint on inclusion also impacted transparency. Valuable information about the cumulative effects of the existing dams was not included in the EA, creating open questions about the justification for approving Site C – particularly its environmental performance relative to alternatives and cumulative effects on downstream jurisdictions.

There were opportunities for representatives from various sectors to participate in the development of the Framework. However, unlike the case of Site C dam, there was no direct involvement of the downstream government of the NWT. As discussed above, some residents of the NWT indicated they believed they should have been engaged in the process (Straka, *et al.* 2014). The absence of direct engagement with the NWT can be explained by the fact that although there are concerns about oil sands development on the NWT downstream, the Peace River is by far the larger contributor to the Slave River's flow. Water withdrawals on the Athabasca River are currently very small relative to the Athabasca River's average annual flow (Government of Alberta 2015c). Withdrawals are unlikely to have a significant negative impact on the total volume of water delivered to the NWT. Although the NWT was not directly involved in the development of the Framework, downstream interests and transboundary obligations were

recognized in the final policy document. For example, the Framework acknowledges that its rules will add to and complement transboundary commitments with the NWT (Government of Alberta 2015c). This admission exists in stark contrast to the unwillingness of British Columbia to accommodate Alberta's concerns about minimum design flows, the NWT's concerns that the Slave River and Delta should be included in the effects assessment, and longstanding concerns about the cumulative effects of flow regulation on the PAD. Constraints related to agenda-setting,

Table 4.3: Summary of power analysis findings

Power	Findings: the Site C case	Findings: the Framework
1 st dimension: the ability to prevail in decisions	• BC Hydro receives provincial and federal approvals to build the Site C dam despite opposition from local landowners, ENGOs, First Nations and downstream First Nations and governments	• The government of Alberta adopts the non-consensus recommendations made by the P2FC, on which First Nations and ENGOs dissented but industry reportedly was satisfied
2 nd dimension: the ability to set the agenda	• BC Hydro's load forecasting and cost estimates exempt from BCUC review • The environmental impact statement submitted by BC Hydro excludes the cumulative effects of existing dams • The government of Alberta is unable, despite its submissions to the JRP, to alter BC Hydro's proposed minimum designed flow from the Site C Dam, which is accepted in provincial approvals	• The P2FC did not consider low-growth oil sands scenarios, despite the preference of some participants to do so • The ACFN and MCFN declined to participate in the P2FC • The government of Alberta was unwilling to assert its authority to modify/amend senior water licenses to implement a full water withdrawal cut-off • The federal government is unwilling to take action to encourage the implementation of an ecosystem base flow, despite its acceptance of recommendations to do so from a review panel and a science review committee
3 rd dimension: the ability to construct/impose and/or benefit from dominant ideas	• The government of BC approves the construction of the Site C dam, touting its environmental performance relative to alternatives and its role in promoting economic growth, despite the fact that the review panel found that the need for the dam had not been laid out on the timeline established by BC Hydro and concerns about significant impacts to Indigenous peoples	• Oil sands mining is identified as a priority activity in the Lower Athabasca region and is supported by the Framework • Continued expansion is justified as being in the public interest based on jobs and economic growth derived from increasing resource extraction, marginalizing concerns about income inequality in Alberta and Aboriginal rights and title and treaty rights

such as the unwillingness of industry or government to entertain scaling back production or the hesitance of the provincial government to update historic water licenses, do suggest issues with inclusivity – as in the Site C case, ENGO and First Nations participants did not achieve their objectives.

The more important power dynamic associated with the development of the Framework is the assumption that a full-build out scenario for oil sands development is desirable and beneficial. This relates to our findings associated with power's third dimension and is consistent across both cases. Appeals to the economic benefits of expanding resource development justify highly controversial decisions that have significant, and in some cases, irreversible ecological impacts and significant impacts to Aboriginal and treaty rights and the traditional cultures of Indigenous peoples in the Peace and Athabasca sub-basins. The economic imperative of increasing resource development despite significant, negative impacts may not be compatible with the Master Agreement's vision of maintaining ecosystem integrity and sustainable water management. Therefore, ideas expressed to justify the decisions may be among the most significant constraints on achieving sustainability at the interjurisdictional level. Findings regarding inclusion, transparency and how power's third dimension operated in both cases, evince that decisions were not free of systemic biases, a significant challenge to enabling governance that contributes to sustainability.

Making decisions that incorporate the multiple interests present in water governance presents a formidable challenge in many contexts. Water, a multi-use resource, is valued for a diversity of reasons, some of which compete. It is unlikely that all actors will be equally satisfied with a given decision. However, when decisions repeatedly favour certain interests over others, it indicates a structural pattern that may prevent alternative interests from being realized. In both cases, we found that the proponents of increasing resource development achieved their interests via decisions, despite opposition. In the case of Site C, there has been consistent and vociferous opposition to the dam as well as concerns raised by downstream governments about the impacts of flow regulation on downstream environments. The Framework's non-consensus recommendations that were adopted by the Alberta government also favoured the interests of industry who supported the recommendations, with ENGOs and First Nations dissenting. The predominant influence of interests associated with industrial development should be interpreted in a context in which governments have committed to upholding principles of ecological integrity and sustainable water management via an interjurisdictional agreement. In considering the cases of water use decisions, it is clear that the interjurisdictional agreement is not a major influencing

factor on decisions. The predominance of industry interests and assumed benefits of economic growth suggest an inherently biased context.

4.6.2 Assessing power-related challenges within federations by analyzing internal water use decisions

Our findings reveal that even in a federation characterized by apparently cooperative intergovernmental relations, power dynamics can act as a constraint on sustainable transboundary water governance. Examining water use decisions within jurisdictions is critical to appreciating this perspective. It is within jurisdictions that major water use decisions are made that can impact downstream environments.

Our findings also challenge perspectives in the transboundary water governance literature that federal transboundary water systems are fundamentally dissimilar from their international counterparts because of the presence of a central government that can intervene in sub-federal disputes (Zeitoun, *et al.* 2011). Whether a federal government actually does this, is in part, a function of power dynamics and levels of decentralization. We demonstrate that, in the cases considered here, the presence of a federal government does not guarantee its intrusive involvement in interprovincial affairs. The federal government did not intervene to protect or promote Alberta's interests, or downstream First Nations and Métis interests, in the Site C case. It also failed to adopt its own recommendation regarding an ecosystem base flow for the Lower Athabasca River. This can be explained, in part, by the general unwillingness of the federal government to intervene in environmental matters perceived to be provincial unless there is a clear electoral advantage (Harrison 1996).

In both cases, we found that the proponents of industrial development prevailed in decisions, agenda-setting and benefited from underlying ideas. This is despite the existence of well-developed legislation and regulations regarding EAs and water allocation that enable a broader set of interests and actors to be involved in decisions. This brings us to another point, increasingly acknowledged in the transboundary water governance literature: the need to expand the scope of consideration beyond governmental actors (Lopes 2012; Suhardiman and Giordano 2012). In both the case of the Site C and the Framework, ENGOs and industry actors had key roles in the process. Advantages to industry are foiled by the limited success ENGOs achieved. This is not to suggest that ENGOs did not gain anything from participating. However, they did not achieve key objectives. Considering their participation enriches consideration of how power dynamics are challenged and/or reinforced in transboundary systems. Case studies such as those

presented in this paper also help to contribute to a more empirically-informed perspective on the power-related challenges associated with federal transboundary water governance.

4.7 Conclusion

We began this article by pointing out that many studies of transboundary water governance focus on interjurisdictional level interactions. However, we argue that the jurisdictional level warrants closer consideration. Particularly when jurisdictions retain the autonomy to make resource management decisions that can have transboundary impacts, it is necessary to consider their internal decision-making processes. A power analysis can help to reveal who prevails, sets the agenda and benefits from underlying ideas in conflicts over resource management. We have also argued that federal transboundary systems are not immune to challenges that arise because of power dynamics. Therefore, the case studies presented in this paper relate to water use decisions within sub-federal governments.

Our power analysis revealed that decisions about resource management made within sub-federal governments in transboundary systems constrained governance that contributes to sustainability at the interjurisdictional level. Specifically, procedural criteria related to transparency, inclusiveness and fairness were not achieved. We have also demonstrated that even apparently cooperative federal transboundary systems can be prone to challenges associated with power dynamics. A variety of governmental and non-governmental actors are involved in contestations over resource management within sub-federal jurisdictions in federal transboundary water systems. While there are important contextual differences between international and federal transboundary systems, it is a mistake to assume that federal systems are not challenged by power asymmetries. Assessing how power impacts resource management decisions within sub-federal governments can help to illuminate improvements that can enable a more sustainable governance future. So long as upstream jurisdictions make decisions with about water use that do not adequately consider and incorporate the interests of communities downstream, sustainability will be challenged. A sustainable way forward would be to meaningfully incorporate and consider downstream concerns in future decision-making.

Chapter Five

Conclusion

This purpose of this chapter is to review research findings presented individually in each chapter and to integrate them into this study's conceptual whole. To do so, the research purposes and study objectives are first reviewed. Next, major research findings from each chapter are presented. In section 5.3, the significant, original contributions to knowledge made by this research and possible, preliminary recommendations for practice, are discussed. The limitations of this study and future areas of research are contemplated in section 5.4. Finally, the chapter concludes with reflections on conducting this research.

5.1 Purpose and objectives

The purpose of this research was to explore factors that constrain and enable sustainable transboundary water governance in a multi-level, federal context. To achieve this purpose, multi-level governance processes were identified and assessed. A single case study was used to consider the design and performance of an interjurisdictional institution. Multiple case studies were used to assess the ways in which power dynamics impacted collaboration and water use decisions. The assessment of institutional design and performance and power analyses collectively facilitated a consideration of the roles and contributions of multi-level governance processes to sustainable transboundary water governance in a federal context. This research was undertaken in the empirical context of Canada's Mackenzie River Basin (MRB).

In the course of this study, four specific research objectives were pursued:

1. Identify the jurisdictional levels at which federal transboundary water governance takes place in the MRB, Canada.
2. Consider the design and performance of an interjurisdictional river basin organization (RBO), the Mackenzie River Basin Board (MRBB), in the MRB.
3. Determine the ways in which first-, second- and third-dimensional power dynamics, according to Lukes (2005) impact a) collaboration and b) water use decisions within jurisdictions in the MRB.
4. Assess the role and contribution of a) the MRBB, b) collaboration and c) water use decisions within jurisdictions to sustainable transboundary water governance within the MRB.

5.2 Major findings

This section highlights findings from each of the manuscripts. Chapter Two assesses the design and performance of the Mackenzie River Basin Board (MRBB), an interjurisdictional RBO that coordinates at the scale of the MRB. The assessment of the design and performance of the RBO reinforced the need to consider multi-level governance processes, which was undertaken in Chapters Three and Four. Chapter Three considers the ways in which power dynamics impact multi-level local, regional and basin-wide collaborations in the MRB and discusses their roles in transboundary water governance. The limited roles played by the RBO and other collaborations reinforced the need to consider major water use decisions undertaken within upstream jurisdictions as a possible constraint on governance that contributes to sustainability in transboundary water systems. Therefore, Chapter Four assesses the ways in which power dynamics impacted major water use decisions regarding a hydroelectric dam in upstream British Columbia and a management framework for water withdrawals for oil sands mining in Alberta.

In Chapter Two, a detailed case study of the MRBB, which is the only institution designed to coordinate jurisdictions in the MRB at the scale of the basin, was presented. A modified IAD framework (Huiteima and Meijerink 2014; Ostrom 1986) was used to assess the design of the MRBB. Normative criteria including coordination, legitimacy, accountability and environmental effectiveness were used to consider the board's performance. Additional criteria related to multi-level design, knowledge integration, flexibility and responsiveness (Akamani and Wilson 2011; Folke, *et al.* 2005; Green, *et al.* 2013; Raadgever, *et al.* 2008) facilitated a consideration of the extent to which the MRBB contributes to adaptive governance in the basin. Adaptiveness is a key component of governance that contributes to sustainability (Lockwood, *et al.* 2010; Pahl-Wostl 2007).

Chapter Two demonstrates that the MRBB is a coordinating RBO, with no authority independent of the governments that created it. Its role is to facilitate information exchange and to support implementation of the Master Agreement that created the Board. The Board's institutional design facilitates coordination, and could contribute to legitimacy and accountability but contextual factors have resulted in mixed results regarding whether and to what effect the Board achieves these objectives. Concerns to preserve jurisdictional autonomy have limited the extent to which the Board coordinates the different interests and perspectives of basin jurisdictions. A lack of resources and political attention has meant that in some years the Board has failed to produce Annual Reports, timely updates to the State of the Aquatic Ecosystem Reports, and has struggled to include traditional knowledge; these deficiencies raise questions

about its legitimacy. The Board is formally accountable only to respective Ministers, whose attention to the Board has been intermittent over the years. Finally, a lack of environmental baseline data in the basin prevents evaluation of the board's environmental effectiveness. However, it is worth noting that environmental management is not a role assigned to the board. Environmental management is the preserve of the respective provinces and territories.

It is entirely possible that the board could play a more proactive role in the Basin. For instance, it could advance the general principles that underlie the Master Agreement in regulatory decisions or policy development within the provinces and territories (Donihee, *et al.* 2000). However, the hesitance of governments to empower the Board to play that role has meant that it has a relatively marginal and reactive role in the basin. Modifying the MRBB's funding arrangement or role in the basin requires the consensus of the six jurisdictions that are party to the Master Agreement that created the board. The interjurisdictional consensus required to empower the board has not been forthcoming.

The board's role is further in question with the completion of Bilateral Water Management Agreements between Alberta and the Northwest Territories and British Columbia and the Northwest Territories, which envision a limited role for the board in the implementation of the agreements. The Bilateral Agreements create Bilateral Management Committees (BMCs) which will assume several of the Board's core functions, including monitoring the implementation of the agreements. A multi-level design exists in the MRB but the extent to which it will facilitate adaptiveness is currently uncertain. Intent to coordinate BMCs with one another or the board is not mentioned explicitly in any of the agreements or appendices to the agreements. Finally, the board's limited resources and limited use of traditional knowledge in board activities raise questions about the extent to which it can integrate knowledge and proactively respond to emerging issues in the basin. These factors limit the extent to which the MRBB contributes to an adaptive, basin-wide approach to governance in the MRB.

A key finding from Chapter Two is that good institutional design is necessary but insufficient to realize effectively coordinated and adaptive transboundary water governance that contributes to sustainability. Given the relatively limited role the board has played in the basin, the findings also emphasized the need to consider governance processes beyond the interjurisdictional in transboundary water systems as potential factors that can constrain or enable sustainable transboundary water governance. This is a concern reflected in recent scholarship on transboundary water governance, which emphasizes the need to consider transboundary water systems as multi-level systems (Cosens 2010; Warner and Zawahri 2012). Therefore, Chapters

Three and Four assess collaboration and water use decisions made within jurisdictions as possible factors that constrain and enable sustainable transboundary water governance.

In Chapter Three, multiple-case studies of collaboration in the MRB are presented. Characteristics such as inclusion, knowledge sharing, learning and the development of innovative and adaptive solutions to intractable problems may make collaboration ideal in transboundary settings (Dore 2014; Dore and Lebel 2010). Further, inclusion of relevant actors at various levels may enable well-informed solutions to develop at appropriate levels within large basins, which may contribute to adaptive transboundary water governance (Green, *et al.* 2013; Raadgever, *et al.* 2008), and thus, sustainability. However, the relative paucity of attention to issues of power in the collaborative water governance literature (Brisbois and de Loë 2015), especially as compared with the transboundary water governance literature (e.g., Lopes 2012; Warner and Zawahri 2012; Zeitoun, *et al.* 2011; Zeitoun, *et al.* 2013), mean that the potential contribution of collaboration in a transboundary setting is uncertain. In response to this shortcoming in the literature, Chapter Three presents a power-analysis framework to consider the ways in which power dynamics impact three collaborations in the MRB, which also facilitated a consideration of the role of collaboration in the basin. The three collaborations considered are the Slave River and Delta Partnership (SRDP), which is a relatively local, community-based ecosystem monitoring program in the Northwest Territories, the Peace-Athabasca Delta Ecological Monitoring Program (PADEMP), a regional, community-based ecosystem monitoring program and the MRBB, which operates at the scale of the basin.

The power analysis resulted in several key findings related to how power dynamics impacted collaborations and their roles in the MRB. The first key finding that emerged is that many participants are satisfied with the extent to which their perspectives are heard and considered in the collaborations. For example, several key informants involved in different cases reported that despite representing relatively smaller organizations, they felt as though their interests were considered in the collaborative process. This finding is consistent with observations that collaboration facilitates positive reflections from participants related to process (Koontz and Thomas 2006). It also reinforces one of the potential benefits of collaboration in transboundary settings related to inclusion (Dore 2014). However, assessing power's second and third dimensions revealed constraints on the roles that collaborations assume in the basin that emerged from existing power dynamics. Government actors have key roles determining the agendas assumed by the collaborations. For instance, instead of playing proactive or advocacy roles, as desired by some participants, collaborations play roles of information generation and sharing, as

preferred by some government participants. As such, power dynamics act as a constraint on the outcomes that can be produced by collaboration by enabling relatively powerful government actors to restrict the agendas they assume.

One of the potential benefits of collaborations in transboundary settings is to encourage information sharing between different levels and to enable well-informed responses at the appropriate level (Green, *et al.* 2013). Clear conduits of information sharing between the collaborations and provincial/territorial/federal resource management institutions exist in the cases of the SRDP and PADEMP. The SRDP is the local-level collaboration that is nested within the government of the Northwest Territories' water stewardship strategy. Recommendations made by PADEMP are intended to inform Parks Canada's Management Plan for Wood Buffalo National Park. These linkages may be necessary to enable the identification and solving of potential problems at the appropriate level (Green, *et al.* 2013; Raadgever, *et al.* 2008). However, there is no evidence that either Parks Canada or the Government of the Northwest Territories have successfully impacted upstream water use decisions related to hydroelectric facilities or oil sands mining that have created the need for collaboration. This finding speaks to an underlying power dynamic related to what objectives collaborations can actually achieve in the basin. Promoting and enhancing ecological and cultural integrity likely requires influencing decisions undertaken upstream that threaten both. If power is considered as the ability to achieve preferable outcomes, either by creating or preventing change, collaboration in the basin is marginalized by resource management decisions undertaken outside of collaborative forums. This finding highlights the importance of considering the political context in which collaborations are embedded. Others note the importance of local contextual factors (Koontz 2005) or broader institutional environments in which collaborations exist (Ananda and Proctor 2013; Emerson, *et al.* 2012). Using a power analysis framework, Chapter Three concludes that power dynamics in broader political and economic contexts act as a constraint on what collaborations can achieve and the roles that they assume. This finding is consistent with recent literature on collaborative water governance in Canada that emphasized the need to consider directly how political and economic contexts impact collaboration (Brisbois and de Loë 2016). It adds additional empirical evidence that contextual environments constrain what collaboration achieves. Well-facilitated and well-designed processes may not be sufficient to overcome contextual constraints.

Findings from Chapter Three, regarding the fact that collaborations are disconnected from major water use decisions that created the impetus for collaboration, reinforced the need to consider the ways in which power dynamics impact water use decisions in upstream jurisdictions

as a factor that can constrain and enable sustainable transboundary water governance. The role of political processes within jurisdictions has recently emerged as a key concern in some strands of the transboundary water governance literature (Suhardiman and Giordano 2014; Warner and Zawahri 2012; Zawahri and Hensengerth 2012). Chapter Three is, in part, a response to deficiencies in the transboundary water governance literature that has been concerned primarily with interjurisdictional interactions and governments (Akamani and Wilson 2011; Blatter and Ingram 2000; Lopes 2012). It also responds to a gap in the transboundary water governance literature related to the ways in which power dynamics may impact federal transboundary water systems, as discussed in the introductory section of Chapter Four.

Chapter Four presented a cross-case analysis of two major water use decisions undertaken in upstream provinces. The water use decisions are related to key pressures on the MRB (MRBB 2003b; MRBB 2012) and were undertaken within one jurisdiction. A power analysis reveals interests advantaged by decisions, agendas and underlying ideas and values in the provinces, and permits consideration of the ways in which governance that contributes to sustainability may be challenged. The first case regarded the environmental assessment (EA) and decision regarding the Site C hydroelectric dam on the Peace River in British Columbia. The second case involved the development of the Surface Water Quantity Management Framework for the Lower Athabasca River (the Framework), which dictates weekly rules for cumulative oil sands water withdrawals from the Athabasca River.

The power analysis presented in Chapter Four resulted in several key findings related to how power dynamics impacted the major water use decisions. In both cases, the resulting decisions favoured the proponents of increasing resource development in the Peace and Athabasca river basins. Despite considerable local and downstream opposition, the provincial and federal governments approved the construction of the Site C dam. The Framework adopted the non-consensus recommendations of a multi-stakeholder committee. Environmental non-governmental organizations (ENGOS) and Indigenous governments dissented on the basis that the recommendations were not sufficiently protective of the aquatic ecosystem of the Athabasca River or treaty rights. The proponents of increasing resource development also benefited from information and alternatives not considered in each of the cases. For instance, the EA of the Site C dam did not include a cumulative effects assessment based on a pre-industrial case nor did it include a cumulative effects assessment of the downstream Peace-Athabasca Delta (PAD), which was a major concern for downstream governments and Indigenous peoples. Approvals for the Site C Dam's operation ignored downstream Alberta's interests regarding minimum flows necessary

to protect Alberta's infrastructure. In the case of the Framework, the government of Alberta declined to assert its authority to revise senior water licenses on the Athabasca River. Furthermore, water withdrawal rules correspond to a high-growth scenario for oil sands mining, despite perspectives that curtailing growth should have been an option that was considered. Finally, for both cases, the major resource decisions are justified by the economic growth and jobs that will result from increasing resource development. This is despite the fact that there is evidence of substantial, negative impacts to ecosystems, Aboriginal land use and cultures and that there are considerable uncertainties about where the benefits of resource development actually accumulate.

The ways in which power dynamics impacted major water use decisions represent a constraint on the transparency, inclusivity and fairness necessary for governance that contributes to sustainability (Lockwood, *et al.* 2010). A lack of inclusion was clearest in the case of the Site C Dam, where concerns about the downstream impacts of upstream development have existed for decades. Despite these concerns, the government of British Columbia has proceeded with building the dam and in the process perpetuated current and historical grievances associated with existing dams, upon which Site C's operation will depend. Failing to include or incorporate the concerns expressed by downstream residents and governments resulted in key informational deficiencies. These ultimately benefited BC Hydro's case for the Site C Dam, and resulted in a lack of transparency regarding the assumed justification for the dam – namely, that it has fewer environmental impacts than alternatives.

In contrast, the rules developed for oil sands withdrawals acknowledge Alberta's transboundary commitments with the NWT, even though residents and government officials were not directly involved in the development of the Framework. However, the inability of ENGOs and Indigenous governments to achieve a full water withdrawal cut-off and constraints on the agenda assumed by the P2FC suggest issues with inclusion. The bigger challenge associated with inclusion in the case of the Framework is whether it is truly the case that increasing oil sands development, which the Framework facilitates, is in the public interest as assumed. Concerns about irreversible impacts on ecosystems, negative impacts to Aboriginal and treaty rights and existing income inequalities in Alberta raise questions about whether the jobs and economic growth provided by oil sands development is truly in the public interest. Concerns regarding inclusion and transparency also speak to fairness – whether decisions are free of systemic bias. In both cases, developing governance arrangements that contribute to sustainability may require integrating and considering the diversity of perspectives that exist regarding resource

development in the basin and to prioritize reconciliation with Indigenous peoples. Such a path forward would require challenging dominant ideas in the current political and economic context that jobs and economic growth associated with resource development trump environmental concerns and reconciliation.

Collectively, the findings from each chapter emphasize the need to consider transboundary water systems as multi-level and multi-actor. An exclusive focus on interjurisdictional agreements and interactions cannot reveal the multiplicity of other factors that can impact transboundary water governance. Broadening analysis permits a more fulsome consideration of the factors that constrain and enable governance that contributes to sustainability in federal transboundary water systems. Chapter Two details the relatively limited role, despite its potential, that the interjurisdictional institution has played in transboundary water governance in the MRB. Insufficient funding, a lack of explicit linkages among multi-level institutions embedded under the MRBB, and challenges associated with incorporating traditional knowledge, make the extent to which the MRBB contributes to adaptive transboundary water governance, a key criterion associated with sustainable water governance, uncertain. Chapter Three demonstrates that although participants report many positives associated with collaboration, such as inclusion, one of the major shortcomings of collaborative activities is that they are disconnected from major water use decisions made within the basin that have created the need for collaboration. A power analysis reveals the dominant roles played by government actors and the constraints of broader political and economic contexts. It also highlighted the need to consider water use decisions made within jurisdictions as a possible constraint on sustainable transboundary water governance. Chapter Four demonstrates the important role of jurisdictional-level decision-making, particularly when jurisdictions retain the authority to make resource management decisions within their territories despite potential transboundary implications. Power dynamics resulted in decisions that were not inclusive of the variety of interests and perspectives regarding transboundary water governance, which ultimately challenged the achievement of transparency and fairness, which are critical procedural aspects of sustainable transboundary water governance.

5.3 Contributions

5.3.1 Academic contributions

This study makes several contributions to the academic literature. First, it makes an empirical contribution to the transboundary water governance literature by considering the roles of multi-level governance processes in a federal context. Second, it makes a theoretical contribution to the literature by highlighting the evaluative and explanatory benefits of using a power-analysis

framework to consider federal transboundary water governance. Third, using a power-analysis framework to consider collaboration strengthens the collaboration literature's treatment of power.

This study's consideration of specific multi-level governance processes adds empirical contributions to the transboundary water governance literature. For instance, the assessment of the RBO, adds to the transboundary water governance literature an assessment of the design and performance of RBOs in context. Chapter Two provides a detailed, in-depth case study which facilitates a consideration of the extent to which RBOs contribute to adaptive transboundary water governance. The multi-case study presented in Chapter Three provides an empirical contribution to the transboundary water governance literature that considers collaboration a potentially desirable approach to governance in transboundary basins. Finally, the analysis of water use decisions in upstream jurisdictions adds to the literature that is increasingly interested in the role of political processes within jurisdictions as possible constraints on transboundary water governance.

One of the major critiques of the transboundary water governance literature identified in this study is that it tends to focus on interjurisdictional-level interactions and the roles of governments in particular (Akamani and Wilson 2011; Blatter and Ingram 2000; Lopes 2012). This focus sits uneasily with increasing recognition and acknowledgements that transboundary water governance takes places across scales and levels and involves a range of governmental and non-governmental actors (Cosens 2010; Dore 2014; Dore and Lebel 2010; Gerlak 2015). This study, by considering the roles and contributions, and the involvement of a variety of actors in, an interjurisdictional institution, collaborations at local, regional and basin-wide levels and water use decision within jurisdictions in a federal context, makes a substantive contribution to the transboundary water governance literature. Considering the role of multi-level governance processes contextualizes the contributions of interjurisdictional institutions. In the cases considered, jurisdictions retained autonomy for resource management decisions which have significant impacts on transboundary water governance. There is only so much to be learned from assessing interjurisdictional institutions and interactions; accounts of transboundary water governance that consider only one level will inevitably be incomplete.

An additional shortcoming associated with the transboundary water governance literature is that it tends to neglect power-related considerations in federal transboundary water systems. In general, federal transboundary systems have not received the scholarly attention that their international counterparts have (Garrick, *et al.* 2014). This is despite the fact that federal transboundary systems are prone to water use and allocation conflicts also seen in the

international context (Bhat 2009; Iyer 2013; Weibust 2014b), which suggest that power dynamics are at play. This study challenges assumptions that federal systems are not plagued by problematic manifestations of power because of well-developed regulations or the presence of a central government that can intervene in sub-federal disputes. Given the high degree of variability in terms of decentralization in the world's 28 federal countries (Anderson 2008) and that there are over 300 watersheds intersected by federal political boundaries (Garrrick, *et al.* 2013), there is much to be learned from assessing empirical cases. This dissertation, by using a power-analysis framework to consider transboundary water governance in a federal context, makes substantive theoretical and empirical contributions to the literature. First, it develops and uses a simple but effective power analysis framework, and demonstrates the evaluative and explanatory value of using such a framework to study a federal context. Second, it highlights the ways in which power dynamics impact federal transboundary water governance in an empirical case. Specifically, power dynamics can privilege interests associated with expanding resource development despite concerns about potential impacts to downstream communities and jurisdictions. Findings from this research directly challenge assumptions in the international transboundary water governance literature about how power dynamics may or may not impact federal contexts (Zeitoun, *et al.* 2011).

Individual and multiple-case studies in this study also make specific contributions to the transboundary water governance and collaboration literatures. For instance, the assessment of the design and performance of an interjurisdictional RBO undertaken in Chapter Two contributes to the transboundary water governance literature that considers RBOs as key facilitators of adaptive transboundary water governance (Cooley and Gleick 2011; De Stefano, *et al.* 2012; Green, *et al.* 2013; Suhardiman and Giordano 2012). Chapter Two highlights the necessity of considering the design and performance of interjurisdictional institutions in their political contexts – institutional design that can facilitate coordination is necessary but insufficient to realize an adaptive, basin wide approach to transboundary water governance. Chapter Two also extends Huitema and Meijerink's (2014) performance criteria associated with RBOs by adding characteristics of adaptive transboundary water governance. Given the diversity that exists in the RBOs in the world (Huitema and Meijerink 2014), the study offers a substantive empirical contribution based on a detailed case study.

Many of collaborative environmental governance's promised benefits associated with inclusivity and adaptiveness are premised on the notion that collaboration can work well in contexts of power asymmetry (Ansell and Gash 2007; Fish, *et al.* 2010). Sometimes, these

assumptions are supported by studies that either ignore power or do not engage with the extensive literature on theories of power (Brisbois and de Loë 2015). As discussed in Chapters One and Three of this dissertation, the collaboration literature's treatment of power has not been very well connected to the extensive debates regarding theories of power that might inform power-based assessments. Chapter Three, using a power analysis framework derived from theory, considers the ways in which power impacts collaboration and strengthens the collaboration literature's consideration of power. It demonstrates the utility of a simple, but effective power-based analysis framework. Findings from Chapter Three reinforce observations regarding potentially dominant roles that government actors assume as agenda-setters, which is consistent with observations that governments are often dominant actors in collaborations (Hardy 2010; Holley, *et al.* 2012). It confirms the need to consider the distinct powers possessed by governments that are not available to other actors in collaboration. Findings from Chapter Three also demonstrate and confirm the necessity of considering how collaborations operate in their political and economic contexts, and the extent to which they intersect with governance processes at other levels. This is a concern others share (e.g., Ananda and Proctor 2013; Brisbois and de Loë 2015; Holley, *et al.* 2012; Koontz 2005). Explicitly considering power-related constraints in broader political and economic contexts contextualizes what collaborations can actually achieve, a key power-related concern.

Considering the impact of power dynamics on collaboration facilitated an assessment of the role of multi-level collaborations in transboundary contexts. Multi-level collaborations may contribute to adaptive and inclusive transboundary water governance (Akamani and Wilson 2011; Green, *et al.* 2013; Raadgever, *et al.* 2008). However, the relative paucity of power-based assessments of collaboration mean that collaborations may not be as appropriate as assumed in transboundary contexts characterized by power asymmetry. Findings from this research suggest that power dynamics constrain the contributions collaborations can make in transboundary contexts. Specifically, the disconnect that exists between what collaborations intend to achieve and the relative lack of success in influencing major resource management decisions that have created the need for collaborations, suggest that they may not be playing a role of empowering well-informed, responsive institutions. Again, this finding reinforced the need to consider the broader political and economic contexts in which collaborations in transboundary systems are embedded as constraints on or enablers of what collaborations can achieve.

Finally, Chapter Four provides an assessment of how power dynamics impacted water use decisions within jurisdictions in a federal transboundary water system. It also considers the implications of how power dynamics impacted decisions within jurisdictions for governance that

contributes to sustainability in transboundary systems. It adds to the literature a consideration of political processes within jurisdictions as possible constraints on transboundary water governance. Previous studies have argued that it is important to consider domestic political processes when considering transboundary water governance outcomes (Warner and Zawahri 2012) and that it is necessary to consider power within multi-level governance contexts (da Silveria and Richards 2013). Empirical research has identified that institutional fragmentation within jurisdictions can result in challenges to sustainable transboundary water governance (Suhardiman and Giordano 2014). However, the lobbying efforts of non-governmental actors may also encourage the adoption of practices and policies within jurisdictions that can enable more sustainable transboundary water governance (Gerlak 2015; Lopes 2012; Zawahri and Hensengerth 2012). Chapter Four adds an additional empirical case study that demonstrates that power dynamics within jurisdictions can result in resource management decisions that lack inclusivity, transparency and fairness and act as a constraint on sustainable transboundary water governance. These dynamics existed despite the presence of a federal government and well-developed regulations and legislation within each jurisdiction. Findings from Chapter Four address a key deficiency in the transboundary water governance literature regarding the lack of systematic assessments of how internal political processes can impact transboundary water governance outcomes (Warner and Zawahri 2012).

One of the overarching goals of this study was to consider the role and contributions that the MRBB, collaboration and major water use decisions make to governance that can enable sustainability in the MRB. Much of the literature suggests that RBOs such as the MRBB, as enablers of adaptiveness, can play key roles contributing to sustainability in transboundary contexts (Cooley and Gleick 2011; e.g., De Stefano, *et al.* 2012; Green, *et al.* 2013). The analysis presented in this dissertation in Chapter Two suggests that the MRBB plays a coordinating role among government actors at the scale of the basin that is beneficial. However, inadequate resources, a historic inability to incorporate traditional knowledge in MRBB activities, the reluctance of government participants to adopt a basin-wide vision for the MRB, mean that it is not playing a proactive, basin-wide coordinating role required to contribute to adaptive governance. Empowering the board, providing sufficient resources and making explicit linkages between the MRBB, BMCs and perhaps local level collaborations may address some of the MRBB's current shortcomings.

Chapter Three's analysis of the MRBB adds power dynamics as a critical factor that constrains what the MRBB can achieve. It also highlights the important roles that local and

regional level collaborations play, by adopting models of inclusivity and working with local Indigenous peoples as partners. However, one of the expected contributions of collaborations that contribute to sustainability in transboundary systems is the ability to influence decisions being made at other levels (Green, *et al.* 2013). Constraints on the agendas assumed by collaborations, and the fact that decisions are being made in upstream jurisdictions where collaborations have relatively limited influence, impeded their ability to meaningfully impact decisions in ways that can contribute to sustainability. This finding reveals the need to consider power dynamics when assessing the contributions multi-level collaborations make to transboundary water governance. Empowering collaborations to make explicit policy recommendations to the MRBB or associated governments may work to address some of these deficiencies.

The importance of internal political processes in jurisdictions in transboundary systems has emerged as a key concern (Warner and Zawahri 2012). The analysis in Chapter Four reveals that they may operate as among the most significant constraints on achieving governance that contributes to sustainability. Specifically, the ability to prevail in decisions, determine the agenda and benefit from underlying decisions advantaged the proponents of increasing resource development. Power dynamics made achieving transparency, inclusiveness and fairness at the interjurisdictional level difficult, by leaving critical information out of the discussion, by failing to incorporate the relevant concerns of downstream actors and through decisions systemically biased in favour of development interests. If decisions made within jurisdictions act as major constraints on governance that contributes to sustainability, significant gains may also be made at these locations.

Others have highlighted that ENGOs can play critical roles by providing information (Hensengerth and Zawahri 2012) or lobbying governments to adopt environmental policies in transboundary basins (Gerlak 2015; Lopes 2012). Findings from this study suggest that non-governmental actors can have important roles to play to encourage governance that contributes to sustainability in the MRB. In the cases of collaboration or in the development of the Framework, although some participants did not achieve the objectives they had intended, they did report benefiting from the process and were able to make improvements to existing governance arrangements. For instance, even though, at the time that the Framework was being developed, there was a widespread perception that the government of Alberta was not serious about considering, and even biased against, environmental interests, interviewees stated that there was still benefit in participating in the policy development process because it offered an avenue to influence government policy. Although industry's interests were advantaged in the process,

environmental and Indigenous groups made small, incremental gains. The Framework recognizes the value of a withdrawal cut-off limit and has incorporated an Aboriginal Navigation Index (Government of Alberta 2015c), as a result of interests expressed by ENGOs and Indigenous governments. Similarly, even if the collaborations such as PADEMP are not playing advocacy roles, they are improving relationships and providing a positive example of ways to incorporate traditional knowledge in ecosystem monitoring (Chapter Three). Such gains can be discounted using a power-analysis framework that considers power as dominating, as discussed in section 5.4. However, they may be critical for enabling the long-term project that enabling sustainability is. Therefore, one important limitation to the power theory used in this dissertation is the inability to tease out gains made by actors even when they do not achieve their preferred outcomes.

It is also true that enabling greater sustainability in the MRB will likely require the addition of biophysical criteria to sustainability assessment criteria. Given the rapid pace of resource development in this basin, and anticipated environmental changes, adequate biophysical metrics can help to identify thresholds and limits to development. It is possible that, even if governance principles associated with sustainability are achieved, biophysical limits could be tested. Furthermore, although Lockwood *et al.*'s (2010) criteria are helpful as a general guide to consider if and how governance contributes to sustainability, criteria based on the expectations and desires of the inhabitants of the MRB would certainly enrich the discussion. This is particularly important in light of the MRB's Indigenous population, who have constitutionally-protected Aboriginal rights and title and treaty rights in the basin and may have entirely different expectations and desires regarding sustainability. Furthermore, it may be the case that, using alternative principles reveals important implications of power not revealed using Lockwood *et al.*'s (2010) general criteria.

This study also confirms a well-known weakness of the IAD framework with respect to power. As others have argued (Clement 2010), it is necessary to supplement the IAD framework with power theory to tease out power dynamics in action situations. Using a power theory can highlight issues such as inclusion, resources and the perspectives adopted by participants as constraints that can be challenged and possibly changed.

5.3.2 Recommendations for practice

In this section, a few recommendations for practice are offered to practitioners of transboundary water governance in federations. The recommendations emerge directly from the research undertaken for this study. Given the fact that there are over 300 federal transboundary watersheds in the world (Garrick, *et al.* 2013), some of these recommendations may be helpful for other

federal contexts. However, as this research has demonstrated, and as I firmly believe, context is vitally important to consider and should inform the practices adopted. Additional case studies, or comparison of the unique context of the MRB with other federal contexts, may reveal the extent to which these recommendations could be generalized for or transferred elsewhere.

Good institutional design is insufficient

The Master Agreement that created the MRBB, and the institutional design of the MRBB itself, generally reflects what was considered best practice in international transboundary water governance in the 1990s (Giordano and Wolf 2003; McCaffrey 2007). For instance, the Master Agreement iterates a commitment to ecological integrity, sustainable resource management and preventing harm to neighbouring jurisdictions. It created an interjurisdictional board intended to implement the Master Agreement that operates at the scale of the basin; the board is also intended to engage and communicate with Aboriginal peoples in the basin in culturally-relevant ways. The Master Agreement also reflects the political realities of a highly decentralized federation: it acknowledges the importance of jurisdictional interests by protecting jurisdictional autonomy to make resource management decisions. Without such an admission, it is unlikely the jurisdictions would have been willing to sign the Master Agreement.

Despite this design, the MRBB has not realized its potential to be a proactive force for a coordinated, basin-wide vision in the MRB. Understanding why requires considering the political context in which the institution is embedded. Federal involvement in water in general declined through the 1990s and was eventually replaced with, what critics suggest is, a pro-industry perspective less sympathetic to environmental concerns (Clancy 2014). In matters related to transboundary waters, the federal government is satisfied to defer to the provinces and territories (Saunders 2014) whose interests can vary significantly. The level of government that could adopt a broader, basin wide perspective did not possess the political will or capacity to strongly advocate such a vision. Furthermore, as discussed in Chapter Two, jurisdictional representatives on the Board have historically been more interested in protecting their jurisdiction's interests than considering the basin as a whole. These factors constrained interest in empowering the Board to play a proactive role in the basin.

Interest in the MRBB was renewed again in the late 2000s and early 2010s as the government of the Northwest Territories pursued its *Water Stewardship Strategy* and former Government of the Northwest Territories Minister of Environment and Natural Resources Michael Miltenberger prioritized developing bilateral water management agreements with upstream jurisdictions. While that renewed interest and commitment is positive, it reflects a key

vulnerability in the sense that political commitment to transboundary water or the MRBB can wax and wane as other political priorities take over. This observation is especially pertinent given the newly completed Bilateral Water Management Agreements. Like the Master Agreement and the MRBB, they contain many promising principles and commitments to interjurisdictional cooperation; they reinforce the principles that underlie the Master Agreement. Many of the specifics of each agreement have yet to be detailed by the Bilateral Management Committees created by the Agreements. The Bilateral Agreements may provide additional incentive to prioritize the Master Agreement and further embed transboundary water governance in the MRB as a political priority. However, as other economic issues take precedence commitment to and enthusiasm for the Bilateral Agreements could wane as did enthusiasm for the Master Agreement and MRBB. Although good institutional design is necessary, it is insufficient: the will and desire of governments to effectively implement and empower institutions is required to realize a coordinated, adaptive approach to transboundary water governance that contributes to sustainability.

This brings me to an observation about the need to make linkages between the BMCs and MRBB explicit. As discussed in Chapter Two, the Bilateral Agreements and Appendices indicate no explicit commitment to coordinate among the BMCs and the Board. For practical reasons, doing so may be desirable. For instance, what Alberta and British Columbia agree to implement on the Peace River could directly affect the Slave River Alberta shares with the Northwest Territories. Yet, they will have separate BMCs. Coordinating the BMCs and MRBB may also be advisable as a strategy to enable a coordinated, basin wide and adaptive approach to governance in the basin. The nested institutions may collectively achieve what the MRBB cannot. Similar commitments, governance structures and principles articulated in the respective Bilateral Agreements and parallel operating procedures for BMCs may facilitate such an approach. Coordination may take place informally. It may also not take place at all. Detailing explicit commitments to coordinate could make certain what is currently uncertain. However, as discussed above, merely making the intention to coordinate BMCs with one another and the Board will likely not be sufficient to actually realizing the coordination that may be necessary for a proactive, adaptive approach to governance in the MRB.

It is necessary to explicitly consider the transboundary implications of jurisdictional-level decisions

It is not always the case that resource management decisions made on water bodies that flow into different political jurisdictions should engage interjurisdictional discussions or institutions. Doing

so would likely be costly for governments that are constrained for resources. However, it may also be equally, or even more costly, to not directly address resource management issues within jurisdictions that have transboundary implications. Cases considered in this study offer important insights in this regard. Both the Site C Dam and the Framework were decisions made entirely within the upstream jurisdictions of British Columbia and Alberta, respectively. Although the federal government had some responsibilities, the primary jurisdiction is with the provinces. The decisions also regard resource management activities that have raised concerns in downstream jurisdictions.

Although the EA of Site C provided opportunities for downstream governments and communities to be involved in the process, they had limited influence in important matters related to minimum flows, cumulative effects assessment and the spatial boundaries of the effects assessment, which did not include the PAD nor the Slave River and Delta as requested by some participants. Failing to consider and include the transboundary interests at stake on the Peace River may prolong what has already been a multi-decadal conflict over flow regulation. In fact, the government of British Columbia has a pattern of ignoring or not directly engaging with interjurisdictional committees concerned with the downstream impacts of flow regulation on the Peace River. By failing to adequately consider its operation of the hydroelectric dams as a transboundary issue and act as such, the government of British Columbia has prolonged this conflict. Unresolved issues related to its cumulative effects and operating procedures for the Site C Dam will persist until the government of British Columbia and BC Hydro directly address the issue.

The development of the Framework offers an interesting contrast. The government of the NWT and residents of the NWT were not directly involved in the development of the Framework. Although there are numerous concerns about the potential impacts of expanding oil sands mining on the downstream NWT, water withdrawals from the Athabasca River are relatively small and unlikely to directly influence flows in the Slave River, to which the Peace River is the major contributor. Transboundary concerns regard the scale and pace of oil sands development and the extent and possibility of contamination from oil sands mining. Although the government of the NWT was not directly involved in the development of the Framework, the government of Alberta did indicate that it considered the NWT's interests related to water quantity in the development of the Framework. The Framework explicitly acknowledges that Alberta must meet transboundary commitments with the NWT (Government of Alberta 2015c). Although the Framework could easily be considered entirely a jurisdictional issue, the government of Alberta proactively

identified the potential transboundary implications of water withdrawals. Again, this is in contrast with the government of British Columbia's actions regarding the Site C Dam, and its newly developed Northeast Water Strategy (Government of British Columbia 2015). The Northeast Water Strategy contains no recognition of transboundary commitments with or obligations to neighbouring NWT or Alberta. This is notable because northeastern British Columbia is where the majority of hydraulic fracturing, with its high water demands and potential water contamination issues, is taking place in the province. There is room to improve by proactively identifying and responding to potential downstream interests. Doing so may resolve potential problems before they emerge and become intractable.

The ways in which potential transboundary issues were dealt with in the Bilateral Agreements may offer a productive and proactive model useful for other jurisdictions and in other resource management contexts. The model adopted should be considered further for its possibilities. In the MRB, governments addressed the issue of when resource management within jurisdictions become an interjurisdictional, transboundary problem by identifying water quality, quantity and biodiversity thresholds and objectives in Bilateral Water Management Agreements (Government of Alberta and Government of the Northwest Territories 2015; Government of British Columbia and Government of the Northwest Territories 2015). Thresholds, if triggered, require varying degrees of action ranging from jurisdictional to interjurisdictional actions. Although specific thresholds and objectives are still to be determined, they may provide a productive and proactive way to address potential problems on transboundary waters. However, much depends on the actual thresholds as well as the political commitment to implement and enforce the agreements. As discussed above, history has shown that the enthusiasm to do so in the basin has waxed and waned. This reinforces that good institutional design is necessary, but insufficient.

Consider governance processes at different levels and how they interact

Considering transboundary systems as multi-level allows for an assessment of where impact and influence can be achieved. For those concerned with enabling more sustainable transboundary water governance, based on this study's results, there are many gains to be made by working at – and potentially more leverage available – at the jurisdictional level. This is reinforced by observations from the Framework discussed in Chapter Four. Although ENGOs and Indigenous governments did not fully realize their interests, they articulated concerns, perspectives and options that might serve to lead to a more sustainable future. For instance, although the recommendations ultimately adopted by the government of Alberta were non-consensual, with

ENGOS and Indigenous governments dissenting, the Framework does make an important incremental step forward by acknowledging that there might be value in adopting an ecosystem-based flow policy in the Athabasca River and identifying a threshold at which most water withdrawals must cease. Similarly, although the government did not adopt an Aboriginal Base Flow or Aboriginal Extreme Flow as requested by some Indigenous governments, Aboriginal navigation was included as a trigger in the Framework's monitoring program. There may be incremental gains to be made within jurisdictions that a focus on the interjurisdictional level would not reveal.

Considering multi-level dynamics can also reveal constraints on particular processes that might not be apparent at one analytical level. For example, although participants in collaboration may report positive perceptions about their involvement in collaborative activities, considering how collaboration intersects with over governance processes may lead to different assessments about their effectiveness. That was particularly important for the cases of collaboration considered in this study, because they were designed and developed in response to the pace and scale of major resource management decisions. Although they have created some positive outcomes, the collaborations have not directly influenced the major resource development decisions that created the need for them. Considering how governance processes intersect may allow for organizations to prioritize activities in particular processes to realize maximum effect.

5.4 Study limitations and ideas for future research

The purpose of this research was to assess factors that constrain and enable sustainable transboundary water governance, focusing on the multiple levels at which important transboundary water governance processes occur in a federal context. In this section, I reflect on limitations of this study and present ideas for future research.

In the course of identifying and assessing the various multi-level governance processes included in this study I made eight field trips throughout the MRB. I balanced coverage and depth with the time and resource constraints of completing a doctoral program and traveling in Canada's north. I made efforts to seek out additional interviews with representatives from a number of sectors, including government, Indigenous organizations, industry and ENGOS. Additional interviews with industry and Indigenous organizations might have been beneficial. Capacity constraints, participant fatigue (several of the groups I contacted have been extensively involved in other research projects) and ongoing resource management decisions and bilateral negotiations limited the extent to which participants were willing to be interviewed. The extensive document analysis I undertook revealed many of the perspectives and interests I sought

through interviews, but as I learned in the interviewing processes, interviewees provide rich, in-depth data that adds to and strengthens document analysis. Interviews may have provided additional perspectives and nuance I was unable to access. A different study design, such as participatory research, or spending more time in each community I visited, may have facilitated more interviews.

Chapters in this dissertation adopted a power analysis perspective based on Lukes' power theory, which views power as domination (Lukes 2005). This perspective was necessary to consider the ways in which interests are advantaged through various governance processes in more and less obvious ways. A different perspective, which considers the potentially empowering role of power dynamics (Raik, *et al.* 2008), might also offer interesting insights regarding multi-level transboundary water governance in this context. Although I am certain of the evaluative and explanatory value of the power analysis framework I adopted, viewing power as zero-sum meant that some of the benefits achieved by less powerful actors were not always captured in the power analyses I conducted. It was not always clear that power dynamics resulted in absolute losses or gains.

I also think there are gains to be made by explicitly analyzing and considering the roles that non-governmental organizations play in federal transboundary water governance. This is something I did partially by considering their roles in collaboration and water use decisions. I think an explicit assessment, perhaps based on a framework such as Betsill and Correll's (2001), could provide more insight on the nature of the roles and contributions they provide in transboundary contexts that might not be captured adequately in the study design I used. Throughout the course of my research, I wondered if non-governmental actors were able to articulate concerns not politically possible for government actors. For instance, ENGOs and Indigenous governments have frequently critiqued the environmental impacts of oil sands mining and the operation of hydroelectric facilities in the MRB. Several government officials from different jurisdictions reported that bringing up the economic model of oil sands development or the operation of hydroelectric facilities in interjurisdictional discussions is politically unavailable to them. I believe that this concern stemmed from a concern that doing so would cause negotiation partners to walk away from transboundary discussions. ENGOs and Indigenous organizations are not bound by the same constraints. They may be able to bring up interests and perspectives unavailable to governments but that could potentially impact transboundary water governance processes over the long term. Explicitly considering their roles and contributions

could provide greater insight into factors that constrain and enable transboundary water governance.

This dissertation used established principles of governance that contribute to sustainability, rather than defining what sustainable transboundary water governance means in the context of the MRB, to make assessments. This approach was premised on the assumption that it is possible to measure the extent to which governance contributes to sustainability using established criteria, and that doing so is an important contribution toward furthering sustainability. The result of this approach is that I have not defined what sustainability is in the context of the MRB. I adopted this approach for several reasons. First, an important critique of the concept of sustainability is that it is static and does not reflect insights from systems ecology indicating that ecological systems are dynamic (Benson and Craig 2014). Given the extent of environmental uncertainties in the MRB, a stationary definition of sustainability may not be entirely appropriate in this context. However, a broad vision of ecosystem integrity and human well-being is a valuable normative goal that I believe should be pursued in this context. The criterion adaptiveness included in the principles of governance that contributes to sustainability reflects the need to recognize the possibility of social and environmental changes. Second, the purpose of this dissertation was to assess governance, using social criteria. Measurements of sustainability require biophysical criteria and were outside of the scope of this dissertation's objectives. Finally, if I were to define sustainability in the context of the MRB, despite the reservations mentioned above, I believe it would be more appropriate to adopt a participatory action research study design. Given the history of colonialism in Canada and regional tensions inherent in this large and diverse federation, defining sustainability in the MRB requires an inductive, ground-up approach. The definition of sustainability in the MRB should be grounded in the desires and interests of people who live there, blended with established sustainability assessment criteria that include biophysical criteria.

Finally, several of the cases I considered in this dissertation are relatively recent. For instance, PADEMP was formed in 2008 and the SRDP in 2010. The analysis presented in this dissertation is based on a snapshot of the relatively short period of time that they have been operating. When more time has passed, a longitudinal study design may provide a more nuanced analysis of their roles and contributions to transboundary water governance. This would require studying these collaborations over the long-term, which was not possible at the time this research was conducted. As discussed in the concluding section of Chapter Three, some of the potential benefits these collaborations bring to transboundary water governance, such as models of

inclusivity and alternative perspectives on governance in the MRB, may be realized over the long-term.

5.5 Research reflections

The School of Environment, Resources and Sustainability at the University of Waterloo offers a unique intellectual environment which contributed directly to the way in which this study was undertaken. First, the School's emphasis on sustainability as a valuable normative goal that can be pursued by assessing policy and governance contributed directly to the study objectives and assessments made in each of the empirical chapters. Second, the School's transdisciplinary orientation directly informed the identification of the study problem and the research design, frameworks and methods used in the course of this research.

It is important to acknowledge that there are a variety of perspectives regarding what transdisciplinary research requires and entails (Pohl 2010; Wickson, *et al.* 2006). Several key assumptions associated with transdisciplinarity informed this research. The first is that research should address socially relevant problems (Hirsch Hadorn, *et al.* 2006; Pohl 2010). The socially relevant problem addressed by this study is factors that constrain and enable governance that contributes to sustainability. Given the pace and scale of worldwide water degradation, this is a very real problem. The second key characteristic of transdisciplinary research is that it emphasizes using the appropriate tools, regardless of disciplinary convention, to address the practical problems associated with sustainability (Pohl 2010). This orientation encouraged the use of concepts and frameworks from disciplines such as sociology, political science and geography in the course of this research. For example, concepts related to institutional design, multi-level governance, scale, level and power were particularly helpful to achieve this study's objectives. An intellectual environment that encouraged synthesizing useful concepts and insights from diverse disciplines was incredibly helpful throughout the course of this research, and resulted in the study I achieved and report in this dissertation.

One of the other characteristics of transdisciplinary research – the use of participatory research approaches that integrates multiple knowledges (Hirsch Hadorn, *et al.* 2006; Lang, *et al.* 2012; Pohl 2010) – did not directly inform this study. Such an approach requires the integration of practitioner and lay perspectives throughout research. Importantly, this is not a consistent characteristic of transdisciplinary research (Pohl 2010), but it may be an important one that differentiates it from other approaches. Research that does integrate practitioner and lay perspectives can likely offer insights unavailable in this study; they may also more directly address practical problems practitioners encounter in their work. Such an approach is incredibly

valuable for that reason. In future efforts, I look forward to incorporating multiple knowledges and exploring the possibilities for participatory research to contribute to the long-term project of making progress toward governance that contributes to sustainability.

Chapter Six

6.1 Semi-structured interview guide questions

For participants in the Mackenzie River Basin Board (MRBB):

- For how long and in what capacity have you been involved with the MRBB?
- What is the role and involvement of Aboriginal members on the MRBB? Do the Aboriginal members receive support for travel and other costs associated with their membership on the MRBB?
- How well does the MRBB function in terms of fulfilling its original mandate as specified in the 1997 *MRBTWMA*? Can you provide examples?
- One of the really unique things about the Mackenzie River Basin Board is that it is to consider the concerns and needs of Aboriginal people by providing culturally appropriate communication and incorporating traditional knowledge and values. What strategies or work has the Board adopted or undertaken to provide culturally appropriate communication and incorporate traditional knowledge and values? How well has the Board performed these tasks?
- How effective has the MRBB been at coordinating between the various basin jurisdictions? By coordinating I mean assisting in avoiding contradictory policies and conflicts about shared water. Please provide examples.
- Is the MRBB sufficiently accountable and transparent (and to whom)? If not, what could be done to improve transparency and accountability?
- Do you think the MRBB is contributing effectively to shared governance of the basin? If no, what reforms are needed? If yes, can you elaborate on why you think the MRBB is contributing effectively?
- What key activities or initiatives have you been involved with as a member of the MRBB?
- In your experience, what are the MRBB's main strengths or successes?
- Are there areas in which you think the MRBB could improve?
- What are some of the challenges or obstacles the board faces?
- In your experience, has the MRBB been an effective forum to voice your organization's interests?
- Does every actor who has an interest or stake in what the MRBB does have representation on the board?
- In your experience, do all members have equal say in determining the MRBB's activities, directions or focus areas?
- Do factors external to the MRBB impact the work that it does?
- Is there anything about the MRBB that my questions have not addressed or that you think I should be aware of?

For participants in the Slave River and Delta Partnership (SRDP) and/or the Peace-Athabasca Delta Ecological Monitoring Program (PADEMP):

- For how long have you been involved with SRDP/PADEMP?
- What is your organization's role in the SRDP/PADEMP?
- How did your organization become involved in the SRDP/PADEMP?

- Are all of the actors who have an interest or a stake in the work of the SRDP/PADEMP involved? Is there a group you would like to be involved but is not?
- In your experience, what are some of the main strengths or successes of the SRDP/PADEMP? What are some of the areas in which the SRDP/PADEMP could improve (if any)? What would need to happen to make those improvements?
- How often does the SRDP/PADEMP meet?
- How is data/information shared within the group [SRDP/PADEMP]?
- Does SRDP/PADEMP share information with the Joint Oil Sands Monitoring Group (JOSM) or any other external groups or individuals? Is information from JOSM shared with PADEMP/SRDP?
- Are you satisfied with the level of information sharing that currently occurs between the different monitoring groups (such as JOSM or other community based monitoring efforts) within the Peace-Athabasca-Slave basin?
- In your experience have all of the actors involved had equal influence in the activities of the SRDP/PADEMP (e.g., determining key monitoring priorities and metrics, having their interests heard)?
- Does the SRDP/PADEMP collectively have the resources required to carry out monitoring and communications?
- Do you have the resources necessary to fulfill your organization's role in PADEMP/SRDP? If not, what changes are necessary to support your role?
- How has the SRDP/PADEMP included traditional knowledge? Are you satisfied with the way that traditional knowledge has been incorporated in the SRDP/PADEMP's work?
- Do factors outside of the process impact the work that the SRDP/PADEMP is able to do?
- Is there anything about the SRDP/PADEMP that my questions have not addressed or that you think I should know?

For participants in the Phase 2 Framework Committee (P2FC)/Surface Water Quantity Management Framework for the Lower Athabasca:

- How and why did you become involved in the Phase 2 Framework Committee (P2FC)?
- Did you have the support (technical and financial resources, or time) necessary to do the work required to engage in the P2FC process? If not, where did you get support?
- Did you feel that all of the relevant actors were present in the process? If not, which actors do you think should have been there but were not?
- Were you able to bring up all of your, or your organization's interests, regarding the management of water withdrawals in the Lower Athabasca in the P2FC process? If not, which issues were left out of the discussion?
- Did all actors involved in the P2FC have equal say in determining the final recommendations?
- Did events external to the P2FC impact or influence the work that you were doing as a part of that process?
- [For some industry representatives] Was it difficult for your organization to accept the 0.2m³/s withdrawal allowance (to prevent freezing at Canadian Natural Horizon) in the event that the 87m³/s low flow scenario is reached?
- What do you consider to be the main success(es) of the P2FC process? What from the P2FC experience would be worthwhile to replicate in other water management contexts?

- In retrospect, is there anything that you think could have been improved upon in the P2FC process? If you had to do it again, is there anything you would suggest should be done differently?
- How does the P2FC compare to other water governance or environmental governance processes you have been or are currently involved in?
- Is there anything that is top of mind for you regarding the P2FC process that my questions have not addressed?

[For some government officials]

- What is your role in developing the Surface Water Quantity Management Framework for the Lower Athabasca River?
- What additional steps were necessary to develop the Management Framework after the Phase 2 Committee released its recommendations? [Wasn't originally intended to be part of the LUF]
- How did your organization navigate the non-consensus nature of the P2FC recommendations and the recommendations provided by the ACFN and MCFN in the As Long as the Rivers Flow document and any other recommendations you might have received [DFO]?
- Were alternative water withdrawal rules to what the P2FC recommended considered at any time during the development of the Surface Water Quantity Management Framework?
- The P2FC report documents that scientific and legal uncertainty contributed to areas of non-consensus. Has your organization taken any steps to resolve that scientific and legal uncertainty that led to the non-consensus recommendations? That is, have there been any studies of under what conditions historic Water Resources Act licenses may be cut off or revised? Or what a scientifically verified cut off threshold is? Do you envision that work taking place?
- How many stakeholder engagement sessions have you had in support of developing the Framework?
- How many engagement sessions have you had with Aboriginal organizations?
- Have there been any other forms of engagement in support of developing the framework?
- Did the feedback you received during the engagement sessions impact the development of the framework? If so, how? Can you point to specific examples?
- How did the participation of industry stakeholders impact the framework? Were there differences in perspectives between senior and junior license holders?
- How did the participation of the ENGOs impact the development of the framework?
- How many engagement sessions have you had with Aboriginal organizations?
- How has your engagement with Aboriginal organizations impacted the development of the framework?
- What has been the biggest challenge in developing the framework?
- Where does finalizing the framework figure into your organization's current list of priorities?
- Did emerging transboundary obligations with the NWT impact the development of the water management framework?

6.2 List of documents reviewed

Number	Name	Date	Source	Chp 2	Chp 3	Chp 4
1	Death of a Delta: A Brief to Governments	1970	Peace-Athabasca Delta Technical Committee	•	•	•
2	Mackenzie River Basin Study Report	1981	Environment Canada	•	•	•
3	Northern Rivers Basin Study Report to the Ministers	1996	Northern Rivers Basin Study Board	•	•	•
4	Canada-Alberta-Northwest Territories Response to the Northern River Basins Study Report to the Ministers 1996	1997	Government of Canada Government of Alberta Government of the Northwest Territories	•	•	•
5	Peace-Athabasca Delta Technical Studies: Final Report	1996	Peace Athabasca Technical Studies Committee	•	•	•
6	Peace-Athabasca Delta Technical Studies: Recommendations	1996	Peace Athabasca Technical Studies Committee	•	•	•
7	Mackenzie River Basin Transboundary Waters Master Agreement	1997	Government of Canada Government of Alberta Government of British Columbia Government of Saskatchewan Government of the Northwest Territories Government of the Yukon	•	•	•
8	News Release: The Mackenzie River Basin Transboundary Waters Master Agreement	1997	Government of British Columbia	•		
9	MRBB History: History of Intergovernmental Cooperation	2010	Mackenzie River Basin Board	•	•	•
10	Report to the Ministers 2004-2006	2006	Mackenzie River Basin Board	•	•	
12	Report to the Ministers 2006-2007	2007	Mackenzie River Basin Board	•	•	
13	Report to Ministers April 1, 2007-March 31 2012	2012	Mackenzie River Basin Board	•	•	
14	Report to Ministers 2012-2013	2013	Mackenzie River Basin Board	•	•	
15	Report to the Ministers 2013-2014	2014	Mackenzie River Basin Board	•	•	
16	Mackenzie River Basin State of the Aquatic Ecosystem Report 2003	2003	Mackenzie River Basin Board	•	•	
17	Mackenzie River Basin Board's	2012	Mackenzie River Basin	•	•	

Number	Name	Date	Source	Chp 2	Chp 3	Chp 4
	2012 Issues Report		Board			
18	Strategic Plan	2006	Mackenzie River Basin Board	•	•	
19	Bilateral Water Management Agreements Guidance Document	2009	Mackenzie River Basin Board	•	•	
20	Towards a New Current of Thought: Best Practices for Gathering and Incorporating Traditional Knowledge into Environmental Monitoring and Assessment	2012	Mark Stevenson, Prepared for the Mackenzie River Basin Board Traditional Knowledge and Strengthening Partnerships Steering Committee	•	•	•
21	Traditional Knowledge and Strengthening Partnerships (TK/P) Steering Committee Terms of Reference	No Date	Mackenzie River Basin Board	•	•	
22	Defining a Role for the Mackenzie River Basin Board: A Review of Key Considerations and Options	2000	Canadian Institute of Resources Law, prepared for the Mackenzie River Basin Board	•	•	
23	Prior Notification and Consultation Requirements in the Management of Transboundary Water Basins	2000	Canadian Institute of Resources Law, prepared for the Mackenzie River Basin Board	•	•	
24	Alberta-Northwest Territories Memorandum of Understanding Bilateral Water Management Agreement Negotiations	2007	Alberta Environment GNWT Environment and Natural Resources Indian and Northern Affairs Canada	•	•	•
25	British Columbia-Alberta Memorandum of Understanding Bilateral Water Management Agreement Negotiations	2005	Alberta Environment British Columbia Ministry of Water, Land and Air Protection	•	•	•
26	Yukon-Northwest Territories Transboundary Water Management Agreement	2002	Government of Yukon Government of the Northwest Territories Government of Canada	•	•	
27	Draft Statement of Options regarding the NWT-Alberta Bilateral Transboundary Water Agreement	2012	Government of the Northwest Territories	•	•	
28	NWT Preliminary Interest Statements	2012	Government of the Northwest Territories	•	•	
29	NWT Negotiating Principles for the NWT-Alberta Bilateral Transboundary Water Agreement	2012	Government of the Northwest Territories	•	•	
30	Transboundary Water	2015	Government of the	•	•	

Number	Name	Date	Source	Chp 2	Chp 3	Chp 4
	Management Agreements Update		Northwest Territories			
31	FAQ: Intentions Documents for Northwest Territories–British Columbia and Northwest Territories-Alberta Bilateral Water Management Agreements	2014	Government of the Northwest Territories	•	•	
32	Summary of Differences in the NT-AB BWMA and NT-BC BWMA	2014	Government of the Northwest Territories	•	•	
33	Mackenzie River Basin Bilateral Water Management Agreements Between the Government of Alberta and the Government of the Northwest Territories	2015	Government of Alberta Government of the Northwest Territories	•	•	•
34	Appendices: Mackenzie River Basin Bilateral Water Management Agreements Between the Government of Alberta and the Government of the Northwest Territories	2015	Government of Alberta Government of the Northwest Territories	•	•	•
35	Mackenzie River Basin Bilateral Water Management Agreement Between the Government of British Columbia and the Government of the Northwest Territories	2015	Government of British Columbia Government of the Northwest Territories	•	•	•
36	Appendices: Mackenzie River Basin Bilateral Water Management Agreement Between the Government of British Columbia and the Government of the Northwest Territories	2015	Government of British Columbia Government of the Northwest Territories	•	•	•
37	Landmark Transboundary Waters Agreement to Monitor Downstream Impacts of Tar Sands Development	2014	Natural Resources Defence Council	•	•	•
38	BC-Alberta Bilateral Agreement and the Site C Dam	2010	Alberta Environment	•	•	•
39	Canada’s Great Basin: Presumed Abundance and Revealed Neglect in the Mackenzie Watershed	2011	Walter & Duncan Gordon Foundation	•	•	•
40	Northern Lifeblood: Empowering Northern Leaders to Protect the Mackenzie River Basin from Oil Sands Risks	2010	Pembina Institute	•	•	•
41	Back to the Mack: The fight for the northern headwaters of Canada’s longest river system continues	2014	The Walrus (Chris Wood)	•	•	•

Number	Name	Date	Source	Chp 2	Chp 3	Chp 4
42	Rosenberg International Forum - The Mackenzie River Basin: Report of the Rosenberg International Forum's Workshop on Transboundary Relations in the Mackenzie River Basin	2013	Rosenberg International Forum on Water Policy	•	•	•
43	Resolving Water Use Conflicts: Insights from the Prairie Experience for the Mackenzie River Basin	2012	C.D. Howe	•	•	•
44	Managing the Mackenzie: Negotiating a Future with the Basin in Mind	2012	Canadian Institute of Resources Law	•	•	•
45	Special Edition: Water Management in the Northwest Territories	2011	FLOW Monitor	•	•	•
46	The Real Wealth of the Mackenzie Region: Assessing the Natural Capital Value of a Northern Boreal Ecosystem	2009	Canadian Boreal Initiative	•	•	•
47	Keeping the Peace II: Draft Watershed Plan	2007	Keepers of the Water	•	•	•
48	Resolution	2007	Keepers of the Water	•	•	•
49	Elders' Resolution	2007	Keepers of the Water	•	•	•
50	Declaration – One Land One People	2012	Keepers of the Water		•	•
51	Water Restrictions on the Athabasca River and Impacts to First Nation and Metis Communities	2015	Keepers of the Water		•	•
52	To Add Wood Buffalo National Park to Endangered World Heritage Sites List: Mikisew Cree First Nation Petitions UNESCO	2014	Mikisew Cree First Nation Canadian Parks and Wilderness Society	•	•	•
53	Convention Concerning the Protection of the World Cultural and Natural Heritage - World Heritage Committee, Thirty-ninth Session	2015	United Nations Educational, Scientific and Cultural Organization	•	•	•
54	Treaty 8 First Nations File Lawsuits to Protect Sacred Lands, Stop Site C Dam	2015	West Coast Environmental Law		•	•
55	Securing Environmental Flows in the Athabasca River	2011	World Wildlife Fund Canada			•
56	Canada's Rivers at Risk	2010	World Wildlife Fund Canada	•		•
57	Press Release: Surface Water Quantity Management	2015	Alberta Wilderness Association			•

Number	Name	Date	Source	Chp 2	Chp 3	Chp 4
	Framework for the Lower Athabasca River		Pembina Institute South Peace Environment Association World Wildlife Fund- Canada			
58	Letter, re: Surface Water Quantity Management Framework for the Athabasca River	2014	Pembina Institute			•
59	Athabasca River a Case Study in Oil Sands Development	2013	Troy Media			•
60	Oil and Troubled Waters: Reducing the Impact of the Oil and Gas Industry on Alberta's Water Resources	2003	Pembina Institute	•	•	•
61	Oil Sands Fever: The Environmental Implications of Canada's Oil Sands Rush	2005	Pembina Institute			•
62	Troubled Waters, Troubling Trends: Technology and Policy Options to Reduce Water Use in Oil and Oil Sands Development in Alberta	2006	Pembina Institute			•
63	Down to the Last Drop: The Athabasca River and Oil Sands	2006	Pembina Institute			•
64	Running Out of Steam? Oil Sands Development and Water Use in the Athabasca-River Watershed	2007	University of Alberta Environmental Research and Studies Centre			•
65	Letter, Phase 2 Framework Committee Non-consensus Water Management Rules Recommendation	2012	WWF-Canada			•
66	Press release: Non Consensus on Water Withdrawal Recommendations for the Lower Athabasca River	2010	WWF-Canada			•
67	Toxic Liability: How Albertans Could End Up Paying for Oil Sands Reclamation	2010	Pembina Institute			•
68	Forecasting the Impacts of Oil Sands Expansion	2013	Pembina Institute		•	•
69	News Release: AWA Joins Lower Athabasca River Withdrawal Framework Process	2008	Alberta Wilderness Association			•
70	News Release: Athabasca River At Risk	2010	Alberta Wilderness Association			•
71	Behind the Oil Curtain- Athabasca River Monitoring and Tar Sands Development	2010	Alberta Wilderness Association		•	•

Number	Name	Date	Source	Chp 2	Chp 3	Chp 4
72	Environmental Incidents in Northeastern Alberta's Bitumen Sands Region 1996-2012	2013	Treeline Ecological Research Global Forest Watch Canada		•	•
73	In the matter of BC Hydro and in the matter of the Joint Review Panel for Site C Clean Energy Project: Written Submission	2013	Yellowstone to Yukon Conservation Initiative			•
74	Atlas of Land Cover, Industrial Land Uses and Industrial-caused Land Changes in the Peace Region of British Columbia	2012	Global Forest Watch Canada			•
75	In the matter of BC Hydro and in the matter of the Joint Review Panel for Site C Clean Energy Project: Final Argument	2014	Yellowstone to Yukon Conservation Initiative			•
76	Final Submission to the Site C Joint Review Panel	2014	Clean Energy Association of British Columbia			•
77	Submission of the Environmental Law Centre to the Alberta Utilities Commission Re: Regulatory Process for Hydroelectric Power Generation Development	2010	Alberta Environmental Law Centre	•	•	•
78	Letter to Prime Minister Pierre Trudeau and Premier Clark re: Site C Dam and the Human Rights of Indigenous Peoples in the Peace Valley	2015	Amnesty International			•
79	This Was Our Valley	1989	Brush Education			•
80	Taking the Reins: The Case for Slowing Alberta's Bitumen Production	2013	Parkland Institute	•	•	•
81	Total Joslyn North Mine 2010 Project Update Review	2010	Bothe Consulting			•
82	Surface Water Quantity Management Framework for the Lower Athabasca River	2014	Aqua Environmental Associates			•
83	Letter to Stacey Smythe, Consultation on the Surface Water Quantity Management Framework	2014	Mikisew Cree First Nation Industry and Government Relations			•
84	Letter to Minister Mel McKnight – Summary of Key Issues	2011	Mikisew Cree First Nation Athabasca Chipewyan First Nation		•	•
85	Request for Review of the Lower	2013	Athabasca Chipewyan			•

Number	Name	Date	Source	Chp 2	Chp 3	Chp 4
	Athabasca Regional Plan		First Nation			
86	Request for Review of the Lower Athabasca Regional Plan	2013	Chipewyan Prairie Dene Industry Relations Corporation			•
87	Request for Review of the Lower Athabasca Regional Plan	2013	Fort McKay First Nation & Fort McKay Metis Community Association			•
88	Proposal to Develop Athabasca Chipewyan First Nation and Mikisew Cree First Nation Traditional Land and Resource Use Management Plans	2010	Athabasca Chipewyan First Nation Mikisew Cree First Nation			•
89	Mikisew Cree First Nation Applauds UNESCO decision on Wood Buffalo National Park	2015	Mikisew Cree First Nation	•	•	•
90	Government and Industry Relations: Spring Newsletter	2015	Mikisew Cree First Nation			•
91	Update on MCFN Settlement Agreement regarding BC Hydro's Site C Project	2015	Mikisew Cree First Nation			•
92	Review of Hydrologic & Geomorphic Downstream Impacts of Site C	2012	Aqua Environmental Associates			•
93	A Changing Way of Life: An Assessment of the Impacts of the W.A.C. Bennett Dam on the People of Fort Chipewyan and the Peace-Athabasca Delta	1996	Stuart Adams & Associates	•	•	•
94	Proposed Site C Clean Energy Project	2013	James Freedman Kyle Law Corporation			•
95	Draft EIS Guidelines for BC Hydro's Proposed Site C Dam	2012	James Freedman Kyle Law Corporation			•
96	Environmental Impact Statement Guidelines for the Proposed Site C Project	2012	James Freedman Kyle Law Corporation			•
97	Submission to the BC Environmental Assessment Office and the Canadian Environmental Assessment Agency	2012	Deninu Kue First Nation			•
98	Site C Project, Review and Comments on EIS Guidelines	2012	Fort Chipewyan Metis Local 125			•
99	Little Red River Comments on the draft BC Hydro Environmental Impact Statement Guidelines	2012	Little Red River Cree First Nation			•
100	Comments on the Draft Environmental Impact Statement Guidelines	2012	Smith's Landing First Nation			•

Number	Name	Date	Source	Chp 2	Chp 3	Chp 4
101	Comments on the Draft Environmental Impact Statement Guidelines	2012	Treaty 8 Tribal Association			•
102	Comments on Site C – Draft EIS Guidelines	2012	Treaty 8 Tribal Association			•
103	Site C Hydroelectric Project on the Peace River	2012	Assembly of First Nations			•
104	Site C – Submission on Draft Environmental Impact Statement	2012	Deninu Kue First Nation			•
105	Site C – Submissions on Draft Environmental Impact Statement	2012	James Freedman Kyle Law Corporation			•
106	Site C Clean Energy Project: Environmental Impact Statement Comments	2012	Fort Chipewyan Metis Local			•
107	BC Hydro's Site C EIS – SLFN Comments	2013	Smith's Landing First Nation			•
108	BC Hydro's Site C EIS – Comments of the Treaty 8 First Nations	2013	Treaty 8 Tribal Association			•
109	Support for Treaty 8 First Nations' Position Relating to the Proposed Site C Dam	2013	First Nations Summit			•
110	Athabasca Chipewyan First Nation Report on Peace River Knowledge and Use for BC Hydro's Proposed Site C Project	2013	Firelight Group Research Cooperative and Athabasca Chipewyan First Nation			•
111	Final Submissions of Mikisew Cree First Nation and Athabasca Chipewyan First Nation to the Joint Review Panel – Environmental Assessment of the Proposed Site C Project	2014	James Freedman Kyle Law Corporation	•	•	•
112	Final Submissions to the Joint Review Panel Regarding the Environmental Assessment of the Proposed Site C Project	2014	Deninu Kue First Nation	•	•	•
113	Closing Comments	2014	Smith's Landing First Nation	•	•	•
114	Site C Clean Energy Project Joint Review Panel Hearings – Summary Report	2014	Treaty 8 Tribal Association	•	•	•
115	News Release: Approval of Site-C Dam Project a Major Step Backwards in Provincial Government Relations with BC First Nations	2014	First Nations Summit			•
116	Steward Phillip: Trudeau Government Must Kill Site C Dam Project to Show it Cares	2015	The Province			•

Number	Name	Date	Source	Chp 2	Chp 3	Chp 4
	about Natives					
117	How Low Should We Go? Athabasca River Water Use	2010	Suncor Energy			•
118	Oil Sands Water Mining Water Management Agreement for the 2012-2013 Winter Period	2012	Oil Sands Developers Group			•
119	Oil Sands Water Management Agreement for the 2014-2015 Winter Period	2014	Canadian Natural Resources Limited and others			•
120	Backgrounder	2010	Cumulative Environmental Management Association			•
121	BC Hydro Annual Report	2013	BC Hydro			•
122	BC Hydro Annual Report	2014	BC Hydro			•
123	Integrated Resource Plan: Meeting B.C.'s Future Electricity Needs	2013	BC Hydro			•
124	Environmental Impact Statement Executive Summary	2013	BC Hydro	•	•	•
125	Site C Clean Energy Project: Business Case Summary	2014	BC Hydro			•
126	Environmental Assessment of the Site C Clean Energy Project: Closing Submission of BC Hydro and Power Authority	2014	BC Hydro	•	•	•
127	Technical Memo – Peace- Athabasca Delta	2013	BC Hydro	•	•	•
128	Technical Memo – Spatial Boundary Selection	2013	BC Hydro	•	•	•
129	Response to Dr. Carver's Report filed by ACFN and MCFN on November 25, 2013	2013	BC Hydro			•
130	Response to Working Group and Public Comments on the Site C Environmental Impact Statement	2013	BC Hydro			•
131	Peace Water Use Plan Committee Report: Peace Water Use Plan	2003	BC Hydro	•	•	•
132	Athabasca Chipewyan First Nation Inquiry: WAC Bennett Dam and Damage to Indian Reserve 201	1998	Government of Canada - Indian Claims Commission	•	•	•
133	<i>Water Act</i>	1999	Government of Alberta	•	•	•
134	Water for Life	2003	Government of Alberta	•	•	•
135	Water for Life: A Renewal	2008	Government of Alberta	•	•	•
136	Water for Life: Action Plan	2009	Government of Alberta	•	•	•
137	Our Water, Our Future: A conversation with Albertans –	2014	Government of Alberta	•	•	•

Number	Name	Date	Source	Chp 2	Chp 3	Chp 4
	Summary of Discussions					
138	Our Water, Our Future	2014	Government of Alberta	•	•	•
139	<i>Alberta Land Stewardship Act</i>	2009	Government of Alberta	•	•	•
140	Lower Athabasca Regional Plan 2012-2022	2012	Government of Alberta	•	•	•
141	Solving the Performance Puzzle; Lower Athabasca Regional Plan (LARP) Performance Backgrounder	2012	Government of Alberta			•
142	Surface Water Quantity Management Framework for the Lower Athabasca River	2015	Government of Alberta			•
143	Review of the Potential for Expanded Hydroelectric Production in Northern Alberta	2013	Alberta –Standing Resource Committee on Resource Stewardship	•	•	•
144	<i>Oil Sands Conservation Act</i>	2000	Government of Alberta			•
145	Regional Sustainable Development Strategy for the Athabasca Oil Sands Area	1999	Government of Alberta			•
146	Regional Sustainable Development Strategy for the Athabasca Oil Sands Area: Progress Report	2001	Government of Alberta			•
147	Fort McMurray-Athabasca Oil Sands Subregional Integrated Resource Plan	2002	Government of Alberta			•
148	Mineable Oil Sands Strategy	2005	Government of Alberta			•
149	Investing in our Future: Responding to the Rapid Growth of Oil Sands Development	2006	Government of Alberta			•
150	Athabasca River Water Management Framework: Alberta's Regulatory Backstop to Protect the Athabasca River	N.D.	Government of Alberta			•
151	Energy Strategy: Launching Alberta's Energy Future	2008	Government of Alberta			•
152	Water Management Framework: Instream Flow Needs and Water Management System for the Lower Athabasca River	2007	Alberta Environment Department of Fisheries and Oceans			•
153	Statement of Concern Rejection of Oil Sands Environmental Coalition – Briefing Note	2009	Alberta Environment			•
154	Alberta's Interests: the Site C Clean Energy Project	2011	Government of Alberta	•	•	•
155	Metis Elders Knowledge Gathering Workshop	2012	Government of Alberta	•	•	•

Number	Name	Date	Source	Chp 2	Chp 3	Chp 4
156	Site C Draft Environmental Impact Statement Guidelines (letter from Robert Harrison to CEAA)	2012	Government of Alberta			•
157	Alberta's Comments to Amended EIS Guidelines for Site C Project (letter from Robert Harrison to CEAA)	2012	Government of Alberta			•
158	Alberta's Comments to the Site C EIS (letter from Robert Harrison to CEAA)	2013	Government of Alberta			•
159	Adequacy of the Site C EIS (letter from Robert Harrison to CEAA)	2013	Government of Alberta			•
160	Submission of Her Majesty the Queen in Right of Alberta in Relation to B.C. Hydro and Power Authority's Proposed Site C Clean Energy Project	2013	Government of Alberta			•
161	Closing Remarks of Her Majesty the Queen in Right of Alberta in Relation to B.C. Hydro and Power Authority's Proposed Site C Clean Energy Project	2014	Government of Alberta	•	•	•
162	Operating Procedures for Influencing Freeze-Up and Break Up of the Peace River at the Town of Peace River, Third Edition	2006	Alberta – British Columbia Joint Task Force on Peace River Ice	•	•	•
163	Report of the Auditor General of Alberta	2014	Auditor General of Alberta	•	•	•
164	Report of the Commissioner of the Environment and Sustainable Development: Monitoring Water Resources	2010	Auditor General of Canada	•	•	•
165	Assessing Cumulative Environmental Effects of Oil Sands Projects	2011	Auditor General of Canada	•	•	•
166	Report of the Commissioner of the Environment and Sustainable Resource Development: Environmental Monitoring of Oil Sands	2014	Auditor General of Canada	•	•	•
167	Quenching the Peace-Athabasca Delta	2005	Environment Canada	•	•	•
168	Environment Canada Comments on the draft Environmental Impact Statement (EIS) Guidelines for the Proposed Site C Clean Energy Project	2012	Environment Canada			•

Number	Name	Date	Source	Chp 2	Chp 3	Chp 4
169	Environment Canada Response to BC Hydro Responses to Government Agency Comments	2012	Environment Canada			•
170	Site C Clean Energy Project Draft EIS Guidelines Review Table	2012	Parks Canada			•
171	Site C Draft EIS Guidelines – PCA Comments re: BC Hydro Responses to Public, Aboriginal and Government Agency Comments	2012	Parks Canada			•
172	Site C Hydro Environment Impact Statement – Technical Review	2013	Environment Canada			•
173	Site C Clean Energy Project – Environment Canada Written Submission	2013	Environment Canada	•	•	•
174	Parks Canada Comments on the Site C Clean Energy Project Environmental Impact Statement	2013	Parks Canada	•	•	•
175	Adequacy of Responses to Information Requests/Comments Submitted by Parks Canada on the Draft Environmental Impact Statement (EIS) for the Site C Clean Energy Project	2013	Parks Canada			•
176	Parks Canada’s Submission to the Joint Review Panel for BC Hydro’s Site C Clean Energy Project	2013	Parks Canada	•	•	•
177	Decision Statement Issued under section 54 of the Canadian Environmental Assessment Act, 2012 for the Site C Clean Energy Project	2014	Government of Canada	•	•	•
178	Minister Leona Aglukkaq, Minister of Environment, Statement on the Governor in Council’s Determination that the Environmental Effects of the Proposed Site C Project are Justified in the Circumstances	2014	Government of Canada	•	•	•
179	Federal/provincial Consultation and Accommodation Report: Site C Clean Energy Project	2014	Government of Canada		•	•
180	Response to the Environmental Assessment Report of the Joint Review Panel on the Kearl Oil Sands Project – Recommendation 4	2008	Government of Canada			•

Number	Name	Date	Source	Chp 2	Chp 3	Chp 4
181	Science Evaluation of Instream Flow Needs for the Lower Athabasca River	2010	Government of Canada			•
182	Parks Canada Agency Water-related Role and Activities in the NWT and Northern Alberta	2010	Parks Canada	•	•	•
183	Wood Buffalo National Park of Canada Management Plan	2010	Parks Canada		•	
184	Re: Jackpine Mine Expansion Project – Review of Adequacy of Environmental Assessment Information	2011	Parks Canada		•	•
185	A Foundation for the Future: Building an Environmental Monitoring System for the Oil Sands	2010	Oil Sands Advisory Panel	•	•	•
186	Joint Canada – Alberta Implementation Plan for Oil Sands Monitoring	2012	Government of Canada Government of Alberta	•	•	•
187	Managing the Cumulative Effects of Natural Resource Development in B.C.	2015	BC Auditor General			•
188	Environmental Impacts of Shale Gas Extraction	2014	Council of Canadian Academies	•	•	•
189	Site C Report & Recommendations to the Lieutenant Governor-in-Council	1983	British Columbia Utilities Commission			•
190	<i>Clean Energy Act</i>	2010	Government of British Columbia			•
191	A Water Sustainability Act for B.C. – Legislative Proposal Overview	2013	Government of British Columbia	•	•	•
192	<i>Water Sustainability Act</i>	2014	Government of British Columbia	•	•	•
193	Northeast Water Strategy: Ensuring the Responsible Use and Management of Northeast British Columbia’s Water Resources	2015	Government of British Columbia	•	•	•
194	British Columbia’s Natural Gas Strategy: Fueling B.C.’s Economy for the Next Decade and Beyond	2012	Government of British Columbia	•	•	•
195	Press Release: Site to Provide More Than 100 Years of Affordable, Reliable Clean Power	2014	Government of British Columbia	•	•	•
196	BC Government Questions and Answers – Site C FID – Clean	2014	Government of British Columbia	•	•	•

Number	Name	Date	Source	Chp 2	Chp 3	Chp 4
	Energy Announcement					
197	Site C Granted Environmental Assessment Approval	2014	Government of British Columbia	•	•	•
198	Environmental Assessment Certificate #E14-02	2014	Government of British Columbia	•	•	•
199	EAO Executive Director's Response to the Joint Review Panel Report for BC Hydro's Site C Clean Energy Project	2014	Government of British Columbia			•
200	Press Release: B.C. and the Northwest Territories Sign Transboundary Water Management Agreement	2015	Government of British Columbia	•	•	•
201	25 Year Saskatchewan Water Security Plan	2012	Government of Saskatchewan	•	•	•
202	Water for Nature, Water for People – Yukon Water Strategy and Action Plan	2014	Government of Yukon	•	•	•
203	Highlights: Final Recommended Peel Watershed Regional Land Use Plan	2011	Peel Watershed Planning Commission	•	•	•
204	Yukon Government Response on the Recommended Peel Watershed Plan	2012	Government of Yukon	•	•	•
205	Moving Forward on Land Use Planning for the Peel Watershed Region	2013	Government of Yukon	•	•	•
206	Northern Voices, Northern Waters NWT Water Stewardship Strategy	2010	Government of the Northwest Territories	•	•	•
207	NWT Water Stewardship Strategy Implementation Progress Report – April 2011- March 2013	2013	Government of the Northwest Territories		•	
208	ENR Update: Implementing the NWT Water Stewardship Strategy	2011	Government of the Northwest Territories		•	
209	NWT Water Stewardship Strategy Implementation Workshop – Summary Report	2013	Government of the Northwest Territories		•	
210	NWT-Wide Community Based Water Quality Monitoring Program	2014	Government of the Northwest Territories		•	
211	Enhancing Community-Based Aquatic Monitoring: Workshop Recommendations	2011	Cygnus Environmental		•	
212	Water Strategy Report Card	N.D.	Government of the Northwest Territories		•	
213	Our Water, Our Life: Building	2011	Government of the		•	•

Number	Name	Date	Source	Chp 2	Chp 3	Chp 4
	Partnerships to Assess the Health of the Slave River and Slave River Delta		Northwest Territories Government of Canada			
214	State of the Knowledge of the Slave River and Slave River Delta	2012	Pembina Institute; Prepared for the Slave River and Delta Partnership		•	
215	Personal communications regarding Slave River and Delta Partnership Funding	2015	Name withheld to preserve anonymity		•	
216	Community-based Monitoring Funding Opportunities	2012	Government of the Northwest Territories		•	
217	We Care About Our Water	2012	Government of the Northwest Territories		•	
218	Report Summary: Slave River Water and Suspended Sediment Quality in the Transboundary Reach of the Slave River, Northwest Territories	2012	Government of Canada	•	•	•
219	Water and Suspended Sediment Quality of the Transboundary Reach of the Slave River, Northwest Territories	2012	Government of Canada	•	•	•
220	Water Science News – Peace-Athabasca Delta Environmental Monitoring Program	2010	Government of Canada		•	
221	Peace-Athabasca Delta Ecological Monitoring Program Update	2013	One River News		•	
222	Obed Mountain Mine Process Water Release - Update	2014	Government of Alberta		•	
223	Muskrat Monitoring in the Peace-Athabasca Delta	2015	Parks Canada		•	
224	Update: BC Hydro's Proposed Site C Hydroelectric Project	2014	Parks Canada		•	•
225	The Flow: News From the Peace-Athabasca Delta Ecological Monitoring Program – PADEMP Newsletter	2014	Peace-Athabasca Delta Ecological Monitoring Program		•	
226	Maintaining Connections: Learning Through Monitoring in the Peace-Athabasca Delta	2014	Parks Canada		•	
227	Peace-Athabasca Delta Ecological Monitoring Program Forum #3 Agenda	2015	Parks Canada		•	
228	Personal communications regarding PADEMP funding	2015	Name withheld to preserve anonymity		•	
229	Peace-Athabasca Delta	2013	Parks Canada		•	

Number	Name	Date	Source	Chp 2	Chp 3	Chp 4
	Ecological Monitoring Program Backgrounder					
230	State of the Watershed	2015	Mighty Peace Watershed Alliance		•	•
231	Terms of Reference for the Peace and Slave Watershed Integrated Watershed Management Plan	2015	Mighty Peace Watershed Alliance		•	
232	Traditional Knowledge Overview for the Athabasca River Watershed	2011	Brenda Parlee		•	•
233	Athabasca River Instream Flow Needs Scoping Study	2005	Cumulative Environmental Management Association			•
234	Instream Flow Needs Screening Study – Delta Region Lower Athabasca River Literature Review & TEK Collection Final Report	2007	Cumulative Environmental Management Association – Dillon Consulting Limited			•
235	CEMA In-stream Flow Needs Determination Workshop – Athabasca River	2005	Watershed System Group, Inc.			•
236	Estimating Effects of Water Withdrawals from the Lower Athabasca River IFNTTG Final Report	2010	Laughing Water Arts & Science, Inc.			•
237	Lower Athabasca River Phase 2 Water Management Framework – Process Guidelines	2008	Compass Resource Management			•
238	Surface Oil Sands Water Management Summary Report	2005	Alberta Technology and Science, Inc.			•
239	Phase 2 Framework Committee Report	2010	Compass Resource Management Solander Ecological Research			•
240	As Long as the Rivers Flow: Athabasca River Use, Knowledge and Change	2010	Firelight Group Research Cooperative, with the Athabasca Chipewyan First Nation		•	•
241	Press Release: CEMA's Recommendations for Water Withdrawal from the Athabasca	2010	Cumulative Environmental Management Association			•
242	Decision 2004-009	2004	Government of Alberta Government of Canada (Joint Review Panel)			•
243	EUB Decision 2004-005	2004	Government of Alberta			•

Number	Name	Date	Source	Chp 2	Chp 3	Chp 4
			Government of Canada (Joint Review Panel)			
244	EUB Decision 2006-126	2006	Government of Alberta Government of Canada (Joint Review Panel)			•
245	EUB Decision 2007-013	2007	Government of Alberta Government of Canada (Joint Review Panel)			•
246	Report of the Joint Review Panel – Shell Canada Energy Jackpine Mine Expansion Project	2013	Government of Alberta Government of Canada (Joint Review Panel)	•	•	•
247	Report of the Joint Review Panel – Site C Clean Energy Project – B.C. Hydro and Power Authority	2014	Government of British Columbia Government of Canada (Joint Review Panel)	•	•	•
248	Participant Funding Program – Aboriginal Funding Envelope – Funding Review Committee’s Report on the Allocation of Federal Funds for the Environmental Assessment of the Site C Clean Energy Project	2012	Government of Canada – Canadian Environmental Assessment Agency			•
249	Participant Funding Program: Regular Funding Envelope – Funding Review Committee’s Report on the Allocation of Federal Funds for the Environmental Assessment of the Site C Clean Energy Project	2012	Government of Canada – Canadian Environmental Assessment Agency			•
250	3 rd revision (Certified) Hearing Transcript Volume 1: December 9, 2013, Fort St. John, British Columbia	2013	Government of Canada – Canadian Environmental Assessment Agency Government of British Columbia – British Columbia Environmental Assessment Office			•
251	3 rd revision (Certified) Hearing Transcript Volume 2: December 10 2013, Fort St. John, British Columbia	2013	Government of Canada – Canadian Environmental Assessment Agency Government of British Columbia – British Columbia Environmental Assessment Office			
252	Final (Certified) Hearing Transcript Volume 3: December 11, 2013, Fort St. John, British Columbia	2013	Government of Canada – Canadian Environmental Assessment Agency Government of British			•

Number	Name	Date	Source	Chp 2	Chp 3	Chp 4
			Columbia – British Columbia Environmental Assessment Office			
253	Revised Final (Certified) Hearing Transcript Volume 4: December 12, 2013 – General Session, Fort St. John, British Columbia	2013	Government of Canada – Canadian Environmental Assessment Agency Government of British Columbia – British Columbia Environmental Assessment Office			•
254	Final (Certified) Hearing Transcript Volume 6: December 13, 2013 – General Session – Hudson’s Hope, British Columbia	2013	Government of Canada – Canadian Environmental Assessment Agency Government of British Columbia – British Columbia Environmental Assessment Office			•
255	Final (Certified) Hearing Transcript Volume 8: December 16, 2013 – West Moberly Community Session	2013	Government of Canada – Canadian Environmental Assessment Agency Government of British Columbia – British Columbia Environmental Assessment Office			•
256	Final (Certified) Hearing Transcript Volume 15: January 9 2014 – General Hearing Session in Dawson Creek, British Columbia	2014	Government of Canada – Canadian Environmental Assessment Agency Government of British Columbia – British Columbia Environmental Assessment Office			•
257	Final (Certified) Hearing Transcript Volume 14: January 8, 2014: General Public Hearing Session in Dawson Creek, British Columbia	2014	Government of Canada – Canadian Environmental Assessment Agency Government of British Columbia – British Columbia Environmental Assessment Office			•
258	Final (Certified) Hearing Transcript Volume 16: January 10 2014 General Hearing Session in Peace River, Alberta	2014	Government of Canada – Canadian Environmental Assessment Agency Government of British Columbia – British Columbia Environmental Assessment Office			•
259	Final (Certified) Hearing Transcript Volume 17: January 10, 2014 Day 1 – Topic-Specific Session Aquatic and Downstream Environment in Peace River,	2014	Government of Canada – Canadian Environmental Assessment Agency Government of British			•

Number	Name	Date	Source	Chp 2	Chp 3	Chp 4
	Alberta		Columbia – British Columbia Environmental Assessment Office			
260	Final (Certified) Hearing Transcript Volume 18: January 11, 2014 – Day 2 of the Topic-Specific Session Aquatic and Downstream Environment in Peace River, Alberta	2014	Government of Canada – Canadian Environmental Assessment Agency Government of British Columbia – British Columbia Environmental Assessment Office			•
261	Final (Certified) Hearing Transcript Volume 28: January 23, 2014 Close of Hearing, Fort St. John, British Columbia	2014	Government of Canada – Canadian Environmental Assessment Agency Government of British Columbia – British Columbia Environmental Assessment Office			•
262	The Sixty-Storey Crisis: The Story Behind BC Hydro's Worst Nightmare	1999	B.C. Business Magazine		•	•
263	Alberta Natives Vow to Fight Site C	2005	Vancouver Sun	•	•	•
264	Help Needed on Fish Health Study	2011	Slave River Journal		•	
265	River Health Monitoring Plan Needs Local Input	2011	Slave River Journal		•	
266	Council Compiling Slave/Peace Watershed Report	2013	Northern Journal		•	
267	Paddle Power	2013	Alaska Highway News			•
268	Treaty 8 Opposes Site C Legacy Deal	2013	Alaska Highway News			•
269	B.C. Hydro's Site C Dam Faces Fiscal, Regulatory Minefield	2013	Globe & Mail			•
270	Site C to Top Next B.C. Government's Energy Agenda	2013	The Northern Journal			•
271	PRRD Shares Concerns Over Site C	2013	Alaska Highway News			•
272	New Study Launched on Slave River	2013	Northern News Services		•	
273	Anxiety over Site C Running Deep in Alberta and NWT	2013	Globe & Mail	•	•	•
274	Alberta Aboriginals Oppose B.C. Hydro's Site C Dam Project	2013	The Canadian Press	•	•	•
275	B.C. Hydro Underestimating Site C Dam's Impact, Environment Canada Says	2013	Globe & Mail			•

Number	Name	Date	Source	Chp 2	Chp 3	Chp 4
276	Last First Nation Withdraws from Joint Oil Sands Monitoring Program	2014	Sweetgrass News		•	•
277	Looking For Answers in the Rivers of the Great Slave Basin	2014	WWF-Canada	•	•	•
278	First Nation Challenges to Hydroelectric Development – A Tale of Two Provinces	2014	Wilmms & Shier Environment Aboriginal Energy Law			•
279	Researchers, Public Network at Slave River Open House	2015	The Northern Journal		•	
280	NWT, Alberta Ink “Unparalleled” Water Management Deal	2015	My Yellowknife Now	•	•	•
281	Head of Review Panel Repeats Call for Delay to B.C. Hydro’s Site C	2015	Globe & Mail			•
282	B.C. Government Should Have Deferred Site C Dam Decision, Says Chair of Joint Review Panel	2015	DeSmog Canada			•
283	‘Dereliction of Duty’: Chair of Site C Panel on B.C.’s Failure to Investigate Alternatives to Mega Dam	2015	DeSmog Canada			•
284	Site C Dam ‘Devastating’ for British Columbians, Says Former CEO of BC Hydro	2015	DeSmog Canada			•
285	First Nations in B.C. Worry Site C Dam Will Obliterate Their Heritage	2015	Globe & Mail			•
286	Legal Bills Continue to Pile For Local First Nations Challenging Site C in Court	2015	Energetic City			•
287	Site C is Hardly a Done Deal as Ottawa Reviews First Nations Issues	2015	Globe & Mail			•
288	Trudeau Government Must Kill Site C Dam Project to Show it Cares About Natives	2015	The Province			•
289	First Nations Pour Cold Water Over Government’s Site C Dam Hunting Offer	2015	The Province			•
290	Opinion: Why First Nations are Fighting Site C in Court	2015	Vancouver Sun			•
291	First Nations Want Trudeau to Act on Site C	2015	Alaska Highway News			•
292	Indigenous Communities to Meet with Alberta over Oil Sands Consultation	2015	Globe & Mail	•	•	•
293	B.C., N.W.T. to Jointly Manage	2015	The Province	•	•	•

Number	Name	Date	Source	Chp 2	Chp 3	Chp 4
	Mackenzie River Basin, More Deals in The Works					
294	ACFN, MCFN Drop Suit Against Site C Dam After BC Hydro Concession	2015	Fort McMurray Today			•
295	First Nations Chief Tracks Down Cabinet Ministers to Protest Site C Dam	2015	Globe & Mail			•
296	First Nations Release Open Letter Decrying Proposed Site C Dam	2015	The Vancouver Observer			•
Total				118	160	251

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