DELIBERATING ENVIRONMENTAL POLICY:
INFORMATION SEEKING AND USE IN CANADA’S HOUSE OF COMMONS STANDING COMMITTEES

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DISSERTATION
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Abstract
This case study examines the information practices of Canada’s elected federal representatives who work together within House of Commons standing committees to deliberate environmental issues. We now have new methods to access data on government activities due to the availability of more structured government information online and the work of the open data movement. These resources help to shed new light not just on what policy makers claim they are doing, but what their observable actions demonstrate.

It is well understood and well documented that scientific research evidence does not, in and of itself, direct the development of science-related legislation or regulation. Particularly in the context of democratic governance, the role of such information is continually weighed against potentially conflicting economic, political, infrastructural, and constituent considerations. But a question that remains is when do we see scientific information playing a more central role in policy considerations, and when less? Relative to other kinds of input, are systematic patterns evident?

This dissertation compares the deliberative consultation practices of committees that studied environmental issues over three recent parliamentary sessions. It analyzes the patterns and nature of sources consulted and begins to ascertain the place of scientific expertise within this mix. Problem structure and framing typologies are applied as a means of examining the role of political context and values in source selection.

Results show that committees classified information sources as being either stakeholders or experts. When studying controversial topics, committees seemed to consider an objective examination of information to involve consulting a numerical balance of sources among politically conflicting source types. Committees whose mandates focus on environmental policy oversight generally sought a greater proportion of scientific information sources per study than committees with economic imperatives. At the individual study level, studies framed as economic problems generally relied less on science sources regardless of committee or type of government, and more on industry sources. By contrast studies framed in terms of scientific uncertainty or public accountability consulted fewer industry science sources and relied more on academic or government science sources respectively. During the majority government period a much more limited set of value frames were evident, with an economic frame applied to more than half the environmental policy studies. Across government periods, the proportion of science sources drawn from lobbyist and government networks is negatively associated with the length of a study. This may be explained by the difference in the nature of the problems examined during shorter and longer studies. As deliberative information environments, committees are expected to serve multiple purposes. In practice the result is that the system’s stated aim of assessing information in-depth as a mechanism for improving policy may conflict with other democratic or politically strategic aims.
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“... Would you rather have a minister with the ability to make judgments based not only on scientific evidence as it exists, but also on the evidence brought forward by fishermen from organizations that you represent, evidence that is not necessarily scientific-based, but based on generations of experience of being on the water?”

—Gerry Byrne, Liberal Member of Parliament, Standing Committee on Fisheries and Oceans meeting (June 2008)

“I am trying to find in your presentation this afternoon a statement that Canada should base its target setting on scientific evidence. I can understand economic analyses are needed, but should we not also take scientific evidence into account?”

—Bernard Bigras, Bloc Québécois Member of Parliament, Standing Committee on Environment and Sustainable Development meeting (October 2009)

“What we need, as policy makers, are cold, hard scientific facts. Public values and opinions are important to us, as elected officials, but I would suggest that restricting what scientists do to objective facts, and reporting them in a manner that we can put into the decision-making mix, is more appropriate.”

—Robert Sopuck, Conservative Member of Parliament, Standing Committee on Fisheries and Oceans meeting (March 2012)

“I have a question about science, because we hear all the time about sound science. It seems that science is just kind of like a unicorn, this mythical creature. What do you believe? Is it debatable?”

—Ruth Ellen Brosseau, NDP Member of Parliament, Standing Committee on Agriculture and Agri-Food (May 2013)
CHAPTER 1. INTRODUCTION

Policy makers … inhabit a culture that stresses the importance of experience and insight, and this culture is always at play when deciding how much to defer to “guidelines written by academic types.” The social science that is needed to understand the use of science is not research about the consequences of those decisions: it is research about the decision process itself. This is true whether it is an individual decision maker … or, as is more often the case in policy decisions, a group-based decision. (U.S. National Research Council 2012, 58)

Can careful observation of policy makers’ information behaviours help us to better understand how scientific information sources are integrated into their discourse and reasoning?

This dissertation examines how Canada’s elected federal representatives work collectively within House of Commons standing committees to study and make recommendations about environmental policy and environmental issues. From arctic climate monitoring to environmental impact assessment to closed containment aquaculture to a national conservation plan, Canadian members of parliament study dozens of significant environmental issues each parliamentary session.¹ Genuine deliberation of such complex topics requires an informed analysis of social, economic, and environmental considerations (Jasanoff 1987; McNie 2007; Oh and Rich 1996). At the federal level, the main multi-party forum that exists for such deliberative practices is not the politically charged parliamentary debates, but rather House of Commons standing committees (McInnes 1998). In these more intimate environments, elected representatives from all official parties are mandated to collaboratively seek, review, and evaluate information from a range of sources in order to assess existing government practices and inform future policy decisions.²

In recent years, scientists, journalists, and environmental groups have raised concerns about the treatment and use of research findings within Canadian policy circles particularly with regard to environmental issues. Concerns centre around a perceived misuse of scientific information for policy purposes—that is, inappropriately citing scientific information to justify policy arguments, and increasingly, suppressing

¹ All these examples are taken from the 41st Parliament, Session 1 (June 2, 2011 – September 13, 2013)—one of the sessions examined in this study.
² Canada’s parliament is bicameral, and non-elected members of the Senate also review policy via their own committees. This dissertation focuses on the work of House of Commons standing committees for several reasons: they are comprised of elected officials directly responsible to constituents, and they are generally the first multi-party deliberative body to examine policy. A detailed introduction to Canada’s federal legislative system is beyond the scope of this dissertation. However, interested readers can explore the “About Parliament” website: http://www.parl.gc.ca/AboutHowPrlWorks.aspx?Language=E.
relevant information that might detract from political arguments (Hoag 2008; Goldenberg 2012; Greenwood and Sandborn 2013; Michaels et al. 2002; “Science in Retreat.” 2008; Semeniuk 2015; Spears 2013). At the same time, Inuit, Métis and First Nations communities in Canada have noted that their traditional knowledge is too often overlooked or dismissed by policy makers, even when deliberating issues that will directly impact their lives, lands, and livelihoods. Similarly, various stakeholders such as fishermen or individuals with particular health issues have demanded that their own experiential knowledge be recognized as legitimate sources of information at the policy table (Adam and Kneeshaw 2011; Chapin et al. 2004; Canada. Parliament. House of Commons 2010a; Canada. Parliament. House of Commons 2012a).

That scientific evidence does not, in and of itself, direct the course of science-related legislation or regulation is well understood and well documented. Various factors impact the usability of such findings for regulatory or political purposes, and the role of such information is continually weighed against potentially conflicting economic, political, infrastructural, and constituent considerations. But a question that remains is: when do we see scientific research playing a more central role in science-related policy considerations in Canada, and when less?

In the realm of library and information science there is an increasing interest in moving beyond a focus on individual information users, toward an examination of the socially constructed aspects of collaborative information-seeking and information behaviour. Meanwhile, policy researchers have noted a dearth of empirical data to support theoretical contentions regarding the use of research evidence in Canadian policy making (Howlett, 2009; Landry, Lamari, & Amara, 2003). The research that does exist focuses primarily on government agencies rather than elected representatives. It is rare to see an examination of deliberative bodies as information use environments. My intention with this dissertation is to contribute a data-rich observational case study of the role of various types of information sources in the collective, deliberative activities of Canadian parliamentarians, concentrating specifically on environmental issues. How do different sources and types of information factor within Canada’s primary venue for serious, multi-party deliberative inquiry? How might the values and frames that political representatives bring to the process influence their collective information-seeking processes?

I concentrate on the information behaviours of elected officials who are meant, at least theoretically, to represent constituent and public interests in policy deliberation and decision-making. The results indicate that Canadian policy makers have preconceived notions about different types of sources. They verbally make distinctions between stakeholder sources and expert sources, however in practice it is not clear that
they observe the same distinctions when evaluating the information that different sources provide. When studying controversial environmental issues, policy makers expressed a preference for sources that could present them with a political balance of opposing views. It appears they considered an objective examination of information to involve consulting an equal number of sources among these various conflicting sources. Committees whose mandates focus on environmental concerns generally sought a greater proportion of scientific information sources per study than committees with economic imperatives. At the individual study level, studies framed as economic problems generally relied less on science sources regardless of committee or type of government, and more on industry sources. By contrast studies framed in terms of scientific uncertainty, social progress, or public accountability consulted fewer industry science sources and relied more on academic, environmental organizations, or government science sources respectively. During the majority government period a much more limited set of value frames seemed to dominate, with an economic frame applied to more than half the environmental policy studies.

Across government periods, the proportion of science sources drawn from lobbyist and government networks was negatively associated with the length of a study, such that very brief studies generally relied more on network science sources. This may be explained by the difference in the nature of the inquiries undertaken in shorter and longer studies. As deliberative information environments, committees are expected to serve multiple purposes. In practice the result is that the system’s stated aim of assessing information in-depth as a mechanism for improving policy may conflict with other democratic or politically strategic aims. It is not clear, however, that the policy makers taking part in these deliberative activities recognize the difference between these informational aims.

These dissertation findings lay the groundwork for future investigations that can focus on the discourse taking place in the committee environment, permitting the questions that different MPs pose during specific studies, the responses they receive, and the outcomes of these deliberative activities to be viewed and understood in a broader light.

1.1 Canadian Context

Although there are a variety of topics that one could consider when examining the role of scientific research evidence relative to other kinds of information at the policy table, this dissertation looks specifically at environmental policy deliberations in Canada. The environment represents a major and paradoxical issue in Canada. While economic anxieties may shift its relative importance in the public mind, the environment and
its protection—including how these relate to industry practices and public health—remain a primary science-related policy issue. All evidence indicates that the country’s environmental record is a poor one, yet Canadians have long viewed themselves as environmental leaders (Weibust 2009; Boyd 2003; Cheadle 2013).

Canadians have been polled regularly over the years to gauge their unprompted perceptions of the “most important national issue of concern.” The environment consistently ranks in the top three. Indeed, prior to 2008 and the global financial downturn the environment regularly outranked jobs/economy (Nanos Research Group 2013).3 Similarly, a 2011 Environics poll found that, unprompted, Canadian respondents ranked environmental issues as “the most important world issue,” ahead of economic/financial challenges or war/conflict.4 Despite this, when asked to identify the most serious problem facing Canadians themselves, the leading response in the same poll switched to the economy and unemployment by a landslide (43%), with environmental issues dropping to fourth in relative importance at only 6 percent.

In surveys that directly pit environmental concerns against economic concerns, a 2013 Angus Reid poll of Canada, the U.S., and Great Britain found that 60 percent of Canadians surveyed support protecting the environment even at the risk of “hampering economic growth.”5 In 2009, 64 percent of Canadian respondents indicated that environmental initiatives should remain a high priority despite the weakening economy. Still, long-established regional differences are always evident; residents in the provinces of Quebec and British Columbia were most likely to say the environment should remain a high priority, while those in the Prairies and Alberta were most likely to think the government should focus on economic growth. Correspondingly, half of all Conservative voters (49%) felt governments should focus on economic growth, while a significant majority (73%) of all other voting blocs said that environmental issues “should remain as high a priority” (Harris/Decima 2009).

What all this suggests is that environmental issues—and the values that determine their management—represent science-related policy considerations that regularly conflict with constituents’ economic priorities and interests. This conflict is in turn likely to impact how elected representatives weigh information’s value and relevance in the process of decision-making.

3 Since then it has slipped dramatically in relative importance as a national issue.
4 Combining “Environment/pollution/global warming”.
5 Compared with 49% of U.S. respondents and 44% in Britain (Angus-Reid Public Opinion, April 12, 2013).
The standing committees of Canada’s House of Commons are broadly considered to be the most participatory and deliberative component of its system of democratic governance (McInnes 1998). Within this system, small groups of elected representatives (committees) are expected to concentrate on becoming experts in environmental and related issues in order to have the means to reasonably justify government decisions and support the delivery of well-informed policy.

Each committee is essentially expected to represent public interest and oversight of particular government agencies (see Appendix I. Committee Mandates). These domain-specific standing committees are mandated to evaluate relevant bill proposals and accordingly approve them as is, or recommend clause revisions. They are also authorized to investigate issues within their particular purview, which may culminate in a final report in which the issues are discussed and recommendations are provided to government. If so inclined, committees may also decide to study topics for their own enlightenment, without the intention of immediately producing a deliverable or shareable outcome. Such inquiries occasionally include responding to specific constituent requests. Whether examining proposed legislation or other policy concerns, each standing committee collectively decides among its members the nature of the questions that need to be addressed, and the types of resources required to effectively answer these questions.

Standing committees are considered central to the operations of the House of Commons for at least three basic reasons. Officially:

- They allow for the detailed examination of complex matters which is more easily done in small groups rather than an entire assembly;
- They offer an opportunity for Members to hear from Canadians and experts on topics of national concern and to have these representations placed on the public record; and
- They provide a means for Members to probe into the details of policies and programs. (Canada. Parliament. House of Commons 2013)

Several different committees study issues that have direct bearing on the environment: the Standing Committee on Environment and Sustainable Development, the Standing Committee on Fisheries and Oceans, the Standing Committee on Natural Resources, and the Standing Committee on Agriculture and Agri-Food. However, it must be said that there are occasions when environmental policy considerations end up on the table of some rather surprising committees. In parliamentary session 41-1 (2011–2013), for
example, the Standing Committee on Foreign Affairs and International Development conducted a close examination of arctic climate change issues justified as a study of Canada’s “arctic foreign policy.” Meanwhile, a long-ensuing battle concerns the Conservative government’s omnibus budget bills, which have had direct ramifications on several major pieces of environmental legislation. In the ordinary management of affairs, it is only the Standing Committee of Finance that examines budget legislation. Obviously, we would not expect a committee concerned primarily with a fiscal bottom line to focus on understanding and deliberating complex environmental management issues when reviewing such legislation.

Unlike politicians in some Western democracies, a large number of Canada’s federal MPs do not come from what we might term a “political class.” Studies show that Canadian MPs have considerably less experience on average than in the U.S. and England (Franks 1987; Matland and Studlar 2004). Upon being elected, around one-third of Canadian MPs are political greenhorns. They may be anything from young college students to real estate agents, radio hosts, lawyers, business executives, or brick masons. These politicians quite regularly end up serving on committees that examine topics for which they have little background or expertise (Samara Canada 2010a; Canada. Library of Parliament 2011a). In fact, while parties may try to place party members with useful backgrounds on appropriate committees, it is understood and expected that MPs with diverse histories and a range of experience levels will gain much of their knowledge and understanding of policy issues by serving on relevant standing committees.

Although the power of the executive often impedes the direct influence of committee inquiry and recommendations, it is nonetheless through these committees that the broadest array of stakeholders and topical experts can contribute information to Canada’s democratic decision-making process. From the point of view of a researcher interested in information behaviour, these complexities highlight the importance of examining just how such infrastructural, political economic, and social contexts influence information-seeking and use.

1.1.2 Committees as information use environments

Parliament is well recognized as a venue for highly charged political soapboxing rather than as a forum for any form of “enlightened” critical analysis or debate. Formally, however, information exchanges within

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6 During the period examined, there were 308 ridings (electoral districts), each represented by one member of parliament. An additional 30 electoral districts are coming into effect with the October 2015 federal election.
committees must be seen as distinct from those that occur in House of Commons debates. Inflammatory political banter can also be seen in committees, particularly during highly publicized or televised meetings. Yet the historical, stated purpose behind these small-scale, representative committees has been a claim that they allow for a more functional forum for genuine information sharing and exchange (Franks 1971). In the 1960s, major reforms to committee structure and scope were made in the hopes that standing committee reports would “assume a critical significance related more closely to the national interest as a whole than to simple political differences” and that “debate in the standing committees [would] be well-informed and pertinent, and their members … influential in the areas of their specialized expertise” (Canada. Parliament. House of Commons 1968). A further set of committee reforms occurred in the 1980s, enabling standing committees to investigate issues of their own choosing among other changes (Stillborn 2009).

Fairly rigid infrastructural and institutional constraints seem likely to impact information behaviour in the committee environment. Much as in other domains, time constraints regularly impede or limit committees’ examinations of issues on the table (Oh and Rich 1996; Bielak et al. 2008). Another central factor is the make-up of committees. Committee composition reflects the overall representation of different political parties in the House of Commons. Decision-making at the committee level therefore depends on whether the governing party has majority or minority status, as well as on the needs, priorities, and relative capacities of each official party along with the constituent interests of individual representatives. The executive may be rendered virtually impotent during minority governments, or may wield extraordinary influence during majority rule depending on the priorities of the Prime Minister’s Office (PMO).  

By design, each committee is assigned Library of Parliament (LOP) support. LOP research analysts compile background information for committees and individual MPs upon request; they may, if asked, help to identify major and emerging issues, suggest possible study topics, as well as recommend relevant experts; they may brief witnesses in advance to explain committee expectations; and they are largely responsible for drafting committee reports (Finsten 1996). Additional information services are sometimes provided by LOP

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7 As just one example, in the case of the 2012 omnibus budget bill C-38 mentioned above, extensive pressure by opposition parties led the government to convene a special sub-committee to concentrate on environmental legislation impacts of the bill. Despite the sub-committee’s 22 hours of information work in which they questioned various stakeholders and experts, zero amendments to the bill were proposed in the final analysis due to the majority status of the Conservative Party and party whip practices in Canada—that is, the executive made it clear to Conservative MPs serving on this committee that there was no room for accommodation. Indeed, during the 41-1 Conservative majority session the committees studied in this dissertation approved every bill they were mandated to review without recommending a single amendment.
reference librarians to individual parliamentarians. In 2011–2012, the LOP reported that it had received 832 research requests and 358 reference and information requests from House of Commons committees:

The Library assisted 47 standing committees during parliamentary sittings by supplying weekly briefing notes and analyses required to examine legislative and budgetary issues. Library analysts also supported the standing committees by drafting reports under the supervision of the Chair and committee members. Over half of all the work completed by analysts was done in support of parliamentary committees. (Canada. Library of Parliament 2012, 10)

The value of these services has been confirmed by MPs themselves, who have independently noted the importance of the LOP as an informational support system in both exit interviews and surveys (Hardy 2013; Samara Canada 2010b). On paper, the public servants who support committee work are expected to “act as a countervailing source of information to that provided by those with vested interests, such as departmental officials, interest groups, and lobbyists” (Finsten 1996, 17).

However, the roles that analysts play vary from committee to committee based on the direction that they receive from the committee’s chair and its members. There appear to be no formalized standard policies or procedures that regulate the function of analysts across all committees. Their particular areas of expertise are also likely to impact the type of information services provided.

While standing committees can turn to the Library of Parliament for foundational context and reference, primarily they follow a historically determined information-seeking route—one that relies on “the questioning of witnesses as their basic technique for gathering information” (Franks 1971, 466). Generally speaking, committee structure and practice employ a court-style, legalistic approach to evidentiary hearings rather than a measured evaluation of bodies of research evidence that proponents of “evidence-informed” policy making might favour (Howlett 2009). Oral testimony at committees comes from stakeholders and expert witnesses. Prior to the commencement of each study, the committee meets to discuss the inquiry’s scope. A subcommittee meets in camera to negotiate which witnesses will be invited to testify. This process is highly political. Subcommittees follow the same compositional pattern as committees themselves. If there is a majority government, representatives of the government party will outnumber the other parties in subcommittee, which means that the selection of witnesses will depend on the government’s pre-disposition toward genuine inquiry or sources likely to support the governing party’s objectives (McInnes 1998).
In the case of bill reviews, government ministers and their chief departmental officers are typically called upon to present the reasoning behind a government bill or policy in general. Ministers may be accompanied by expert civil servants such as government scientists. Committees have the legal authority to compel witnesses to provide testimony (known as “evidence”) either live or via video feed, and to respond to committee members’ questions. However, there is a significant limitation in this information-seeking process. The once less explicit policy of expecting civil servants to toe the line has since become reified as the so-called duty of loyalty requirement for public servants. Since 2003, the Public Service Employment Act demands that civil servants subscribe to this policy by oath. The concept is conjured as a means of ensuring the “impartiality” of government employees to perform their duties no matter which political party is in power. As a practice used to control their ability to speak openly on matters of public interest it has been successfully defended several times in Canadian courts (Furi 2008). While very recently Canadian librarians expressed shock to see such wording in the new Library and Archives Canada Code of Conduct, duty of loyalty has been an effective legal instrument to prevent public commentary by government scientists for many years—an issue at the heart of criticisms about the independent legitimacy of government science (Hutchings, Walters, and Haedrich 1997; Gatehouse 2013).

As just one example of how this impacts committee work, when the Standing Committee on Environment and Sustainable Development conducted its statutory review of the Canadian Environmental Assessment Act in 2011, at the study’s commencement the committee chair cautioned members to avoid asking government employees for expert opinions that might compromise their professional positions:

> Particular attention is paid to the questioning of public servants. The obligation of a witness to answer all questions put by the committee must be balanced against the role that public servants play in providing confidential advice to their Ministers. The role of the public servant has traditionally been viewed in relation to the implementation and administration of government policy, rather than the determination of what that policy should be. Consequently, public servants have been excused from commenting on the policy decisions made by the government.

> So as they make their presentations, followed by your questions, perhaps you could keep that in mind and to respect the position the agency is in. (Canada. Parliament. House of Commons 2011)

In principle, committees are also open to receiving and reviewing briefs submitted by any interested party regardless of who is explicitly invited to present evidence. However, it’s unlikely that individuals or groups
who are not already tracking parliamentary activities will independently become aware of committee studies, even if relevant to them. Therefore, onus is on committee members and their staff to summon appropriate resources. One question of interest in this dissertation is how this factor might impact the range of sources consulted. Some have suggested that the more policy makers interact with researchers, the more likely they are to actually consult them (Amara and Lamari 2001; McInnes 1998). Policy insiders also indicate that testimony from witnesses who have fostered relationships with committee members are likely to carry more weight (McInnes 1998), and that there is a reliance on local witnesses as a matter of convenience (Franks 1987).\footnote{The challenge of geographic availability may be less prevalent today with the increasing use of teleconferencing technologies in committee meetings.}

For the above reasons, one step in the analysis conducted here involves comparing witness data to data from the government’s lobbyist registry to see whether and when lobbying activities appear to be a significant categorical variable. While lobbying may not be the only major method of interacting with federal officials, it is certainly the type of interaction most often accused of impacting policy outcomes. It is also possible that the above factors lead to a reliance on government representatives and bureaucrats, who can be expected to have stronger network ties than other potentially relevant sources.

Invited witnesses present their evidence in an opening statement (typically they are given 10 minutes), after which committee members question them in a fairly regulated and timed fashion. Witnesses’ written briefs and their oral testimony constitute the major body of information that is cited by committees in their deliberation and written reports. A majority, though not all, standing committee evidentiary hearings are open to the public and on public record. In these cases, transcripts in both French and English are posted on the government website. Audio and sometimes video recordings are also sometimes accessible. Likewise, standing committees’ final reports and government responses to these reports are publicly available. On the other hand, background reports prepared by the Library of Parliament for committees or individual MPs serving on committee are for some reason considered confidential. These are not included in the public record. The work of LOP analysts, in other words, is largely invisible.

In a traditional information-seeking scenario, we like to imagine that users will try to seek out the “best” information sources to resolve their questions; at the same time we know—based on extensive empirical evidence—that generally a user’s determination of “best information” does not match that of the

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information professional, and instead tends to mean the most convenient and accessible information source (Case 2012; Barry and Schamber 1998; Leckie, Pettigrew, and Sylvain 1996). In the case of parliamentary committees, while most convenient and accessible certainly plays a role given geographic, resource, and time constraints, political aims are clearly a key factor. What a Conservative Party member views as an appropriate source to answer the question, “What should we prioritize in our regulations designed to address greenhouse gas emissions?” and what a Green Party member views as an appropriate source will likely be very different.

The question then is, as MPs serving on committees work to inform themselves, how do such political priorities impact their information behaviours? What happens when they must work together, exposed to the same sources, hearing and evaluating the same information?

1.2 Research Questions and Significance

In How To Think About Information, Dan Schiller calls upon us to consider: “What social forces structure information? How have they developed? Over what range of ‘systems’ do they operate?” (2006, 5). Here this line of questioning is applied to Canada’s parliamentary system, a system that arguably has not been exposed to the same level of scrutiny as other nations, including U.S. legislature. Canada’s House of Commons standing committees represent interesting information use environments in that their organizational structure centres around information seeking, sharing, and use. There are built-in incentives and motivations to focus on information tasks, as well as a very particular information system in place.

Contextual factors are now well-recognized as key to understanding perceived information needs and behaviours. Previous researchers have focused on how individual policy makers choose and evaluate relevant information in the course of decision-making. Yet the actions of individual policy makers cannot be understood independent of the systemic constraints of Canada’s political system and culture. Accordingly, the focus here is on the systemic variables.

The general question is: What purposes do different sources and types of information serve within Canada’s political system? Within this broader research question, a central interest is the role that scientific information plays in political deliberations, specifically:

Q1. Relative to other types of information, when do we see scientific sources playing a more central role in environmental policy deliberations in Canada, and when less?

Q2. Which types of scientific sources are consulted and under what circumstances?
Significant science bodies have recently called on researchers to move away from seeking evidence of research use in policy outcomes and instead concentrate on examining policy makers’ processes of becoming informed (U.S. National Research Council 2012). Policy researchers have pointed to the need for a closer examination of the types of information and sources of information that influence policy (Howlett 2009; Oh 1997; Landry, Lamari, and Amara 2003). They’ve also noted that much of the empirical work and theory in this regard has been informed by a U.S. model that does not adequately reflect the cultural and infrastructural realities of other countries (Colebatch and Radin 2006). In the case of environmental issues, a key difference between the United States and Canada has to do with federal authority and jurisdiction. The United States’ regime is considered to be more centralized, and researchers have shown how involvement “from above” in the U.S. has systematically influenced state environmental policies. By contrast, Canada’s constitution limits federal jurisdiction in ways that severely limit its ability to nationally standardize, regulate, or enforce environmental responsibility (Weibust 2009).

Critics in Canada contend the Canadian government is decreasing spending on scientific research generally and particularly research that does not directly contribute to economic growth (e.g. environmental monitoring/climate change research, etc.), that it is discouraging government-funded scientists from sharing information with the public, and, most important to this dissertation, that the current government is demonstrating less respect and value for the informational input of the scientific community in general—particularly those outside of industry—in policy development and legislation (Michaels et al. 2002; Spears 2013; “Science in Retreat.” 2008; Greenwood and Sandborn 2013; Goldenberg 2012; De Souza 2012; Semeniuk 2015; Keith 2015). A longer term concern expressed by some within the scientific community and beyond is the apparent lack of independence of much of the science that is used to inform policy. They have presented empirical examples demonstrating that government science is not independent science, but for a variety of reasons is hindered by political and industry pressures (Hutchings, Walters, and Haedrich 1997; Ellis 2001; Leslie 2012; Rosenau 2006).

The data collected and analyzed in the course of this research is intended to provide an initial stepping stone on a path of better understanding how one particular Western, liberal democratic state approaches information use in its implementation of deliberative governance. It’s important to note that while “the red thread of information” (Bates 1999) is central to my project, the aim is not to develop a generalizable theory or explanation regarding parliamentarians’ information utilization broadly construed. Instead, the objective
is to capture information use patterns of parliamentary committees in order to contribute to our understanding of political behaviours—particularly as these pertain to environmental issues.

Historically speaking, like many modern liberal democracies, Canada’s governance structure is founded on rationalist, Enlightened notions concerning its processes of deliberation and policy making. Central to this ideology is the importance of the diffusion of knowledge—information exchange and analysis. How can we usefully examine the potentially insurmountable challenges inherent in a system that tries to democratically evaluate information when participating actors have competing or contradictory notions of common goods or common needs, when some information is more salient due to the influence (power) of the source itself rather than the information’s content, and when the amount of seemingly relevant information is too much to process, further contributing to an already unbalanced system of information transfer?

This dissertation aims to make explicit some of the contextual variables that impact information behaviours within the collaborative political environment being examined. The interest here is largely “democratic,” not technocratic. We now have new methods to access and analyze data on government activities due to the availability of more structured government information online and the work of the open data movement. These resources may help to shed new light not just on what policy makers claim they’re doing, but what their observable actions demonstrate. Putting the question of how different types of information are assigned political value—when they are used and when they are not used—into conversation with existing discourses regarding science communication, political theory, decision-making research, and so on has the potential to provide a useful new lens with which to view practices of governance. In this way, the information science perspective may offer unique insights to a larger, transdisciplinary topic.

In the discussion of my results, I incorporate some informed reflections on the potential relevance of these findings to other domains, and discuss the applicability and limitations of approaching contextual information use questions using existing theoretical tools from library and information science as well as cognate disciplines. As the research conducted here is, to my knowledge, one of the first to make extensive use of structured federal data sources as observational evidence, I will also discuss the potential of this data for future research.

I view the information-seeking practices of elected politicians in performance of their duties as a kind of quintessential case study within library and information science. It provides unusually rich observational access to a socially significant real-world scenario. There are recognizable contextual constraints impacting
how information is sought and used. Demographic and personal characteristics of those involved are also accessible. Transcripts documenting many of the formal information-seeking processes of these committees provide a unique opportunity to observe information behaviours from multiple perspectives.

As a research topic it also explores—and challenges—some of the implicit and explicit assumptions of the information disciplines. Examining how information behaviours play out within a state-level formal democratic system potentially encourages us to pay more attention to some of the fundamental rhetoric and values that underlie the LIS fields. We are sometimes guilty of playing down the ideological nature of our assumptions about the role of information in society. This rhetoric proposes almost without question that “good” information organization, access, and use are fundamental to a rational evaluation of our problems, and that a well-functioning democratic system requires such well-informed, rational decision-making (Dervin 1994). It’s worth acknowledging that this is to a large extent a value-based proposition rather than an evidence-supported reality. A key question is whether it even makes sense to foreground rational epistemic objectives in the context of deliberative governance. Is this the primary, or most significant, purpose of such practices?

Dervin and Nilan once pointed to a paradigm shift in information needs and uses research, outlining the discipline’s move toward alternative approaches for thinking about “the definitions of information and need, the nature of information use, the utility of different approaches for studying information behaviors, and the consequences of using different models for prediction” (1986, 12). This dissertation proposes a step back from information use investigations that aim to directly support professional information provision. Instead, it views information use for socio-political ends as a starting point for examining how we live together in the world. It attempts to bridge current interests in the political economy of information with information behaviour research. It also hopes to support the cross-pollination of ideas across much more distant fields of scholarship.
CHAPTER 2. DEFINITIONS AND LITERATURE REVIEW

Words such as “information” or “democracy” often suffer from ambiguous usage, particularly in library and information science fields. This chapter begins by defining how a few key terms and concepts will be used in this dissertation. The discussion then moves on to reviewing theoretical and empirical findings on information use in policy settings drawn from several different disciplines, all of which informed this research.

2.1 Environmental Policy in Context

Q. Some people around Ottawa think there’s only one choice between the economy and the environment. We happen to think we can do both. Do you see the economy and the environment as winners for Canadians now and in the future, with investments in clean energy, renewables, and efficiency?

— Claude Gravelle, NDP Member of Parliament

A. It seems to me that a good government combines the two without making too much of a fuss of what label to put on their policies ...

— James Cameron, Chairman, Climate Change Capital
(Natural Resources Committee, Innovation in the Energy Sector Study, Nov. 20, 2012)

Environmental policy has been described in the literature as “any course of action deliberately taken [or not taken] to manage human activities with a view to prevent, reduce, or mitigate harmful effects on nature and natural resources, and ensuring that man-made changes to the environment do not have harmful effects on humans” (McCormick 2001, 21). Research on information practices in policy areas such as the environment should be distinguished from examinations of what is usually referred to as science policy. Science policy has been more precisely described as “policy for science”—that is, government regulations and objectives meant to support scientific research activities and infrastructure, often with a socio-economic “innovation” aim (Stine 1986).

This dissertation refers to environmental policy as “science-related policy,” in that policy makers are expected to incorporate “science for policy” rather than “policy for science” in their efforts to make thoughtful and informed decisions about environmental issues. Several different policy areas can be considered to be science-related in this way. Policy problems are generally recognized as being both social and political constructs (Hisschemöller and Hoppe 1995). Whether we choose to label something
“environmental policy,” “economic policy,” or “health policy,” in practice its scope will be defined by the sets of values and issues deemed relevant by those involved. As the committee witness James Cameron and many others have expressed to standing committee members over the years, policy issues do not exist in silos.

This dissertation avoids a narrow view of what may constitute “environmental policy.” Instead, it examines all studies in which significant environmental considerations are articulated by participants themselves, as well as those topics that major environmental organizations in Canada include in their purview. To avoid the need for grammatically awkward qualifications throughout this dissertation, I use the phrase “environmental policy” as a blanket term for all policy inquiry in which environmental issues are presented as a significant consideration, not just for those policies aimed at environmental protection.

2.2 Democracy and Deliberation

Often used and rarely qualified in LIS literature, the term “democracy” has been flexibly interpreted as meaning anything from individual rights and freedoms to the socio-economic priorities of a particular nation or culture to processes for empowering the disenfranchised. Dervin is one of few researchers within the discipline to explicitly articulate one dominant meaning for democracy as “collectively produced actions and/or policies, in any setting, designed in some way by constituent members, either directly or through mediation by representation” (Dervin 1994, 370). This dissertation employs the term similarly, with the setting in this case being more narrow simply by virtue of the topic of study.

Much of the discourse regarding the use of various forms of knowledge in policy making relies on underlying assumptions rooted in political philosophy and political theory. In political theory, definitions of democracy and its component elements are obviously fundamental, contested, and sophisticated—dating back to Plato and Socrates. A full examination of the various arguments and nuances is beyond scope of this dissertation. However, due to the significance of these concepts in describing how Western democratic bodies tend to organize and view themselves as well as how policy researchers view these bodies, it is worthwhile to provide at least one summary from the realm of political theory:

Democracy is an ideal of self-government, of a group of actors ruling themselves as members of a political community. Expressions of this ideal describe systems for taking authoritative action, on behalf of members, about matters of shared concern. Three features characterize these expressions: membership rules, political equality, and binding collective decisions. Membership rules delimit the group of participants who are
to govern themselves. Membership might be defined by individuals contracting to form an exclusive association for mutual economic gain, by persons within a given territory who share a common language, history, and rituals and who define themselves as a distinct national or ethnic community, or by representatives of independent political states agreeing to give up some sovereign authority to form a mutually beneficial federation. Political equality has two democratic components. First, members of a democratic association are presumed to be roughly equal with respect to certain minimum capabilities for reasoning and making moral distinctions relevant to public affairs. Second, the interests of each member are generally to be given equal consideration in authoritative judgments. (King 2003, 25)

As we can see, central to this more refined representation of democracy as a form of organized governance are expectations regarding who has the right to participate, with specific emphasis being placed on members’ “minimum capabilities for reasoning and making moral distinctions relative to public affairs.” Another important emphasis is that the interests of all members should be given essentially equal weight by those who have the authority (by social contract) to make decisions on their behalves. In formal governance models, we expect practices of deliberation—“a process of careful and informed reflection on facts and opinions, generally leading to a judgment on the matter at hand” (Ibid.)—to be one principal means by which such democratic constructs are implemented.

King (2003) proposes three ways in which we might justify the value of deliberation in supporting legitimate democratic governance:

First, deliberation may have epistemic value, improving the quality of information available to participants in the democratic process and improving the quality of judgments about matters of shared concern. Second, deliberation may be transformative, shaping beliefs and opinions toward consensus. Third, deliberation may follow from a conception of justice that constrains political authority by requiring that procedures be justified in terms of reasons acceptable to those burdened by exercises of power authorized through these procedures. (24)

He notes that the first two motivations are limited in practical terms by challenges such as scale and complexity of policy problems, and asserts that the third deliberative purpose appears to be the most persuasive and feasible. It’s notable that Canada’s standing committees aim to use their deliberative environment for all three of these objectives. Canada, as a representative democracy, offers limited opportunity for the public to participate in the deliberative activities of government. Members of parliament are tasked with representing this public and its interests. In committee work, they call upon ministers and
public servants to report on government activities, proposed regulations, and agendas specifically in order to hold these bodies to account. In the same political space, however, committees are expected to deliberate issues of public concern for epistemic purposes—to make sure that good information is obtained, used, and documented for the public record so that it can be accessed in the future (Canada. Parliament. House of Commons 2013). Finally, as a multi-party forum directly engaged with policy development and review, committees are the place where deliberation and inquiry in theory aim to move Canada’s diverse political representatives toward consensus, given that in the final analysis they are expected to collectively produce policy recommendations and bill amendments (Stillborn 2009).

Although nuanced philosophical concepts may underlie deliberative government practices, it is not a given that participants themselves recognize the various distinctions. At the same time, scholars who focus on whether research evidence is effectively used by policy makers may not give due consideration to the system’s historically grounded basis. That is, given their focus on rational decision-making, such scholars may not sufficiently acknowledge that democratic processes must not only try to use sound reasoning, but also address the relevant moral distinctions and alternative perspectives of all legitimate political members. These latter characteristics are at the heart of current discussions regarding the “democratization of knowledge,” in which popular and situational experiences are seen as equally valid and important, if not more so, than forms of knowledge emanating from institutions formerly considered to be authoritative sources such as academia.

2.3 Information vs. Evidence

Analyses of information use in public policy making are not new. Studies of the information needs of legislators and policy makers gained momentum in the 1970s, primarily due to the interest in developing information systems to support growing government bureaucracies. The topic seemed to lose appeal for information science researchers by the late 1980s. Nonetheless, information use in the policy domain has continued to be a topic of interest in other disciplines such as policy studies and science communication. Fundamentally, interest in this research area stems from a historically premised notion about the superior value of political judgments believed to be well-reasoned and informed judgments rather than mere whimsy (to be extreme) or, more realistically, reactions to political-economic pressures to the exclusion of other considerations.
Today, this view of political decision-making is usually described as evidence-informed policy making (Howlett 2009). Howlett is specific in countering criticisms that evidence-informed policy making is impractically rationalistic or “a return to early ideas about technocratic, expert-driven policy making.” He notes that it more aptly should be seen as:

... a compromise between political and technocratic views of policy making. That is, it relies on the notion of policy making not as a purely rational affair but as an exercise in pragmatic judgment, whereby political, ideological or other forms of “non-evidence-based” policy making are tempered by an effort on the part of policy specialists to “speak truth to power”—to present evidence to policy makers that supports or refutes specific policy measures as appropriate to resolve identified policy problems. (Howlett 2009, 156)

It is important in this context for us to consider the terms information and evidence more explicitly. Howlett, in the quote above, implies that information-as-evidence has something to do with truth. He directly associates the term with scholarly research conducted by specialists, and appears to presumptively assign a truth value to such research findings. This is contrasted against “non-evidence” such as political or other ideological views. Taking the distinction further, the term “evidence-informed” indicates that there are other ways to become informed, with evidence being one type of information only. Howlett and his social science colleagues are essentially grounding their understanding and use of the term in the reasoning process traditionally associated with the scientific method (Furner 2006).

However, their conceptual distinctions do not appear to be shared by parliamentary committees. Notably, sources of information consulted in the course of committee work are referred to as witnesses, and all testimony that witnesses present to committees is referred to as evidence. In committee work, what constitutes evidence is never formally articulated except by implication: it is what witnesses provide. What can we take from this? The concept of witnesses suggests an observational role. In practice, witnesses may share their personal or professional experiences and observations, expectations of government or society in general, ideologies, political or socio-economic objectives, as well as research findings. All of this information is equally deemed to be “evidence” that should be taken into account by the committee.

In this sense, committees seem to follow a classical conception of evidence as information whose purpose is to support argumentation of some kind, much as in the judiciary tradition. Information use for the purpose of building an argument is implied in the very process and practice of committee work. That said, while parliamentary structures such as committees draw largely on a glossary drawn from court proceedings, it is
not clear that they assign value to evidence in the same manner as the judicial process. In legal practice, various formal categories of evidence—oral, documentary, circumstantial, etc.—are meant to be evaluated according to prescribed rules regarding the relative merit of different forms of evidence (Furner 2006). To be clear, I wish to make a distinction here between the social science literature that focuses on the use of research evidence in policy making, historical conceptualizations of the term evidence in different domains, and policy makers’ current use and engagement with this same term.

Taking this further, we should also turn to our own disciplinary distinctions. In library and information science, an undercurrent to enduring questions concerning the kinds of information we should collect, preserve, make public, meaningfully associate with other information objects, and so on is an often unexpressed premise that such sources serve as evidence—proof, in some capacity, of our lives and the world in which we live. Briet (1951) is one of the first to explicitly discuss the notion of documents as information artefacts that present evidence “in support of a fact” (Buckland 1997). This idea is explored more fully in archival studies, wherein information objects are valued for their potentially long-term evidentiary social functions—as mechanisms that may support accountability, trust, and advocacy, for example. In these contexts, it is specifically the process of ensuring the existence of an enduring record that transforms information or data into evidence (Gilliland-Swatland 2000).

These conceptual ambiguities may explain some of the disconnects we face in examining the information behaviours of policy makers. It is therefore important to clarify how the terms information and evidence will be used in this dissertation. Using Taylor’s information use environment (IUE) framework as a structure for examining information practices in the committee context, I restrict my study to “formal information—both oral and recorded—which is sought in the context of recognized problems or concerns” (Taylor 1991, 220). Taylor’s description of formal information dovetails nicely with the parliamentary committee system’s unarticulated concept of evidence.

This dissertation also makes a particular distinction when it comes to categorizing scientific sources of information. It is common in policy studies and science communications literature to look at how social science research broadly construed is perceived, accessed, and used in political decision-making. Here I distinguish between scientific sources that provide information about the physical nature of the environment and ecosystems in which we function, and other forms of expertise that may nonetheless have bearing on environmental policy such as economic science or political science. This codification of information sources will be further clarified in Chapter 4: Data Collection.
2.4 Information Use Environments

The understanding that information behaviours and needs are highly dependent on context has led to fairly broad acceptance of domain-specific studies as articulated by Hjørland and Albrechtsen (1995). Tellingly, however, today standard survey texts such as Case (2012), which reviews information behaviour literature in terms of populations studied, notes no significant LIS research on legislators or other policy makers either in discussions of occupation-specific information behaviours or social role studies (e.g. voter, student, patient, etc.).

Taylor (1991) is one of few scholars in library and information science to examine the information environment of legislators as a unique population with particular information needs. His research motivation is largely that of a systems developer interested in supporting the information needs of users in particular settings. As such, he takes a fairly typical systems approach to analyzing information work and processes. Taylor’s framework proposes that researchers examine four dimensions of what he terms “information use environments”: user characteristics, setting, types of problems, and characteristics of information relevant to the resolution of problems. Yet he recognizes that legislature as an information use environment (IUE) is not one that an automated information system or retrieval tool is likely to address, noting that the “primary products” of politicians are “highly value-laden decisions” (239). The role of values in the collective activities of Canada’s standing committees is a crucial, but challenging, consideration. This dissertation attempts to address these considerations by integrating two value-oriented problem typologies drawn from science communication and environmental decision-making literature (Nisbet 2010; Turnhout, Hisschemöller, and Eijsackers 2008; Hoppe 2011).

The aim of Taylor’s IUE framework is to help us to examine in a systematic way the situational factors that appear to impact the sources and kinds of information that users themselves deem relevant. Of the four factors, he identifies the setting itself and the nature of the problems addressed as the “principal definers” of information use: “Legislatures in democratic societies are unique institutions in terms of information and its movement, power and influence, complexity and trade-offs, and problems and decision making” (1991, 239). He contrasts this to the information use environments of professions such as doctors or engineers, “whose education, background, personal predilections” are likely to have an equal or greater impact on how they frame their information problems and solutions.
As a theoretical framework, the concept of information use environments has limitations and strengths, and some adaptations to this model are necessary in the context of Canada’s House of Commons standing committees. Specifically, Taylor’s model reflects U.S. legislature and focuses on legislators as individual information seekers; it does not consider legislative settings that operate as collaborative information use environments. In his focus on the U.S. Senate as an IUE, he notes that it is largely a verbal culture and that this is an important informational component; this maps very well to Canadian parliamentary activities, including the committee system. Taylor also describes Congress—in contrast to the executive branch—as being a collegial culture rather than hierarchical (at the time). According to Canada’s MPs, while levels of civility differ somewhat from committee to committee, in the past decade or so they have seen a significant change from collegial inter-party exchanges to more partisan, top-down practices (Blidook 2012; Samara Canada 2010b; Stillborn 2009).

2.5 Use of Research Evidence in Policy Making

One of the most comprehensive studies of U.S. legislators’ beliefs regarding the utility of scientific and technical information was conducted by Jones et al. (1996). Their three-stage analysis of legislatures in all 50 states included extensive survey and interview data. In general, legislators claimed that while scientific or technical information and analysis was needed, it was rarely considered to be the most significant or definitive part of the equation. Rather, “the opinions of constituents are usually more important” (Jones, Guston, and Branscomb 1996, 5). Respondents felt that technical information is most important during the initial stages of drafting legislation, but less so when representatives are responding to proposed legislation or evaluating previous government actions. They deemed scientific expertise “somewhat important” for helping to decide which issues require attention in the short and long term, and “not important” in helping them to decide how to vote. Significantly, politicians deemed scientific information most important for preparing arguments supporting or opposing legislation; that is, it was not considered useful for agenda-setting, but only for supporting existing agendas.

Time pressures and “attitudinal barriers” were identified as potentially preventing legislators from formulating relevant research questions or assimilating relevant scientific and technical information. The authors conclude, essentially, that these resources need to be available early in the legislative process in order to be useful or effective; however, they also note that if it is introduced “too early” little uptake is evident. This comprehensive examination by Jones et al. is particularly relevant to this dissertation. Questions have been raised as to the extent to which U.S. findings can be applied beyond its borders.
Another open question is whether observational data will support findings rooted primarily in politicians’ self-reporting or not.

Oh and Rich (1996) analyze two bodies of empirical and theoretical research that look at information use of policy makers in terms of organizational constraints as well as from a communications perspective. The communications perspective considers information behaviour as a process of “knowledge translation” or transfer—usually between some kind of expert and the government officials of interest. A focus on “gaps” of understanding and a “two-communities” (Caplan 1979) model based on different epistemological perspectives and motivations are central to these investigations. Oh and Rich propose a new theoretical framework and begin to empirically evaluate it. Their model integrates the two formerly discrete approaches by trying to link multiple levels of variables expected to impact knowledge utilization, which they divide into “environment, organization, individual, and information.” In this we can see a direct parallel with Taylor’s conception, with a greater stress on systemic infrastructural constraints.

Landry et al. (2003) continue to build off of this framework. Concentrating on how government bureaucrats use academic research to inform policy work, Landry et al. develop and test a model that tries to account for 15 independent variables. They use data from a survey of over 800 professionals and managers in Canadian federal and provincial government agencies. Particularly relevant to this dissertation is their discussion of the limitations of studies that rely on people’s recollections to establish information use patterns, as well as their apt recognition of the difference between what they call an “engineering” approach to information behaviour questions as compared to a “socio-organizational” perspective (the focus of this dissertation). They again stress that information use in this context is unlikely to be directly instrumental (i.e., this research finding leads to this policy development). As in LIS information behaviour studies, these studies do foreground users’ agency. However, they also try to account for situational affordances and constraints that users themselves may not overtly recognize.

Researchers have generally consolidated the criteria that policy makers use to judge the usefulness of scientific information into three broad categories: salience, legitimacy, and credibility (McNie 2007). Salience, in this case, refers to the information’s direct relevance to decision-makers in terms of scope (e.g., temporal or geographic coverage, questions addressed). McNie offers the example that “policy makers in a small town are unlikely to find global climate models relevant to their decision-making needs” (20). In much the same way, Taylor notes that “information which does not recognize the importance of constituent and electoral factors in shaping legislative choice will probably be neglected” (242). For the most part
distinctions are made between instrumental and conceptual information; unlike government agencies, federal legislators rarely have a direct need for instrumental information meant to directly solve a problem. Since human interactions are the core method of information sharing in policy environments, one can’t necessarily separate the credibility and legitimacy of the information source from the content said source is trying to convey. While the scientific community may (idealistically, if not always in reality) interpret the credibility of research evidence based on perceived validity of the methods used, accuracy of results relative to a larger body of research or based on peer review, or the quality of study authors’ interpretations of results, policy makers generally cannot apply that kind of specialist judgment—hence their need to seek out scientific experts in the first place rather than simply doing a literature search. This leads to a reliance on other measures of credibility, such as whether a study was government or industry sponsored (McNie 2007). In this sense, a policy maker’s assessment of information’s legitimacy elides with a credibility assessment, whereas a scientist might distinguish between the credibility of the study as compared to the legitimacy of the source (e.g., transparency in process, independence, following norms/common rules of the field, etc.). On a federal decision-making level, we can imagine that the work of government scientists—which is more directly determined by agency needs—may therefore be better “primed” for policy use in terms of salience as well as legitimacy. However, as previously mentioned, the legitimacy of government science in Canada has been disputed by some in the scientific community, at least in certain sectors such as fisheries and marine science (Hutchings, Walters, and Haedrich 1997; Ellis 2001).

Thus far, we have little evidence regarding what information Canadian legislators consider to be relevant in helping them to execute their responsibilities. One difficulty is that researchers have tended to rely on surveys to gauge the perspectives of parliamentarians. Unfortunately, Canadian parliamentarians—particularly those in active government roles—generally demonstrate little responsiveness to researchers’ efforts. For example, a young researcher’s recent ambitious attempt to gather data regarding MPs’ information behaviours resulted in usable responses from a mere 63 of the 239 total surveys he distributed (Hardy 2013). This non-representative sample amounted to a response rate of 10.8 percent from the ruling Conservative majority party, and a 28 percent response rate from the official opposition (New Democratic Party). Given that the Conservatives hold over 54 percent of seats and the NDP over 33 percent, it is difficult to ascertain whether the responses received usefully depict reality on the Hill. In 2009, Jack Stillborn—a senior researcher of the Library of Parliament and presumably a respected insider in Ottawa—fared as well as could be hoped for when surveying former cabinet ministers to get their experienced
perspective on the ability of standing committees to impact policy decisions. Of 58 surveys distributed, 20 were returned (a 34 percent response rate).

2.6 The Scientization of Politics

We generally describe information use as falling along a spectrum from directly instrumental uses to abstract, conceptual uses. Different forms of information are expected to play an emergent and interactive, sense-making role early on in the consideration of a policy issue:

Those engaged in developing policy seek information ... from a variety of sources—administrators, practitioners, politicians, planners, journalists, clients, interest groups, aides, friends, and social scientists, too. The process is not one of linear order from research to decision but a disorderly set of interconnections and back-and-forthness that defy neat diagrams. (Weiss 1979, 428)

Research findings in particular appear to be more selectively used in the political arena to support existing agendas rather than helping to define them. Weiss (1979) suggests this happens more frequently when there are a “constellation of interests” to contend with and when political challenges have ensued for years, leading to hardened positions. This is in keeping with policy theorist Frank Fischer’s contention that “Ideological belief systems provide basic data for policy evaluation” (Fischer 1995, 8). In other words, political actors’ information needs are generally argumentative or justificatory in nature. Scientific research may be selectively used to justify policies supporting so-called innovation sectors such as the biotechnology industry. Related information may be dismissed or disregarded if it pits environmental risks against economic growth or job creation; or it may battle head to head, more or less evenly weighed against personal health narratives or consumer choice information when the issue is one of public health (Lomas and Brown 2009; Peekhaus 2013).

However, the above is already an oversimplification. We also need to account for the fact that the “language of science”—a discourse that is distinct from the appropriate interpretation of evidence as understood by the scientific community—can also be used to support political and economic interests and policy (Hutchings, Walters, and Haedrich 1997; Michaels 2008). This kind of practice either conveniently ignores or genuinely misunderstands the purpose and scope of scientific research. Both Michaels (2008) and Drake et al. (2004) offer examples of the different, conflicting conceptions of scientific evidence displayed by policy makers, legal experts, and scientists. Drake et al. discuss the challenges faced by U.S. government officials when they were sued by environmental groups for violating the Endangered Species Act. The court asked the
government to demonstrate that it had used “the best available science” in determining its course of action. According to the authors, the government agency had not based its policy decisions on science alone, but rather weighed in conjunction with other political and administrative priorities. Therefore, it struggled to meet the court’s request, and government scientists were put to the test to try to prove a pattern of scientific evidence in support of the agency’s decisions.

Michaels describes how the U.S. Supreme Court’s Daubert ruling has changed the way that scientific evidence is now evaluated in American courts, a change that has impacted the ability of government regulators to hold industry accountable for its behaviour. According to Michaels, under Daubert, if expert scientific testimony is challenged by the opposition pre-trial, it is left up to the judge to determine whether that testimony is “based on appropriate scientific methodology.” Michaels refers to this legal practice, in which a (non-expert) judge reviews each scientific study in a piece-meal fashion to evaluate its validity, as “the corpuscular approach.” The practice, he asserts, “conflicts with the nature of the scientific enterprise, which necessarily deals with the ‘weight of the evidence,’ not the ‘reliability’ of this or that piece of the whole” (Michaels 2008, 180).

Traditionally, those who have bemoaned a lack of understanding of scientific information in the context of policy have knowingly or unknowingly applied a deficit model to policy makers’ information practices. The deficit model tends to assume that if scientific information can be communicated more clearly or taught better, public behaviours and policy decisions will change accordingly, and more appropriately apply scientific evidence. Science communications scholars now argue that this is a misinterpretation of human reasoning processes. Instead, they point out that there is no technical difference between science policy debates and other types of policy conflict. They highlight the many decades of research in psychology and communications fields that demonstrate that people actually employ sophisticated, if not always conscious, mechanisms for managing information overload. “Instead of weighing and deliberating all issues, citizens rely heavily on their social values to pick and choose among ideologically friendly interpretations ... indeed, citizens often make up their minds about a topic in the absence of complete knowledge” (Nisbet 2010, 42).

This method of satisficing is both expected and practical. In addressing the scientific research community’s concerns, communications researchers like Nisbet focus on the need to “frame” communication of scientific information in ways that acknowledge the prevailing values that influence how policy issues are interpreted and processed.
Frames are described as “interpretative schema”—value-based lenses through which we make sense of information we encounter and connect it to previously acquired knowledge. We use these to filter and weigh the relative significance of various considerations and arguments we encounter. Nisbet notes that frames are “general organizing devices,” and are not equivalent to specific policy positions; individuals may hold different policy positions but share the same method for framing the policy problem (e.g. two sides of a debate might both frame the issue as a “morality/ethics” debate, but have different perspectives on what is morally wrong).

Drawing on decades of study on the role of value frames in policy making and decision-making, Nisbet has recently proposed a general typology of commonly applied frames used by policy makers, journalists, the public, and the scientific community—particularly in more contested policy areas:

**Table 1. Frames that consistently appear across science-related policy debates** (Nisbet 2010)

<table>
<thead>
<tr>
<th>Frame</th>
<th>Defines science-related issue as ...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social progress</td>
<td>Improving quality of life, or solution to problems. Alternative interpretation as harmony with nature instead of mastery, sustainability</td>
</tr>
<tr>
<td>Economic development/competitiveness</td>
<td>Economic investment, market benefits or risks; local, national, or global competitiveness.</td>
</tr>
<tr>
<td>Morality/ethics</td>
<td>In terms of right or wrong; respecting or crossing limits, thresholds, or boundaries.</td>
</tr>
<tr>
<td>Scientific uncertainty ... a matter of expert understanding; what is</td>
<td>Known vs. unknown; either invokes or undermines expert consensus, calls on the author of “sound science,” falsifiability, or peer-review.</td>
</tr>
<tr>
<td>Pandora’s Box/Frankenstein’s monster/runaway science</td>
<td>Call for precaution in face of possible impacts or catastrophe. Out-of-control, a Frankenstein’s monster, or as fatalism, i.e., action is futile, path is chosen, no turning back.</td>
</tr>
<tr>
<td>Public accountability/governance</td>
<td>Research in the public good or serving private interests; a matter of ownership, control, and/or patenting of research, or responsible use or abuse of science in decision making, politicization.</td>
</tr>
</tbody>
</table>
Table 1. Continued from p. 27

<table>
<thead>
<tr>
<th>Frame</th>
<th>Defines science-related issue as ...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Middle way/alternative path</td>
<td>Around finding a possible compromise position, or a third way.</td>
</tr>
<tr>
<td>Conflict/strategy</td>
<td>As a game among elites; who’s ahead or behind in winning debate; war; battle of personalities or groups.</td>
</tr>
</tbody>
</table>

By and large, Nisbet’s interests in framing have focused on encouraging scientists to examine how they frame research findings when communicating with various publics in the hopes of improving understanding and use. While it is not uncommon in social science circles to see theoretical discussions of what is needed to “bridge gaps” or “translate knowledge” between subcultures (e.g., Dahlstrom and Ho 2012; De Long and Fahey 2000; Drake, Steckler, and Koch 2004; Lomas and Brown 2009; Star and Griesemer 1989), this is not always seen as a legitimate practice by scientists themselves. Indeed the very concept of framing has raised the ire of many in the scientific community, who question the ethics of this approach. They view framing as akin to marketing, and believe that it only serves to perpetuate public distrust of science. However, we can imagine that how committee members themselves frame issues—without necessarily explicitly recognizing or acknowledging these frames—will impact the approach they take to seeking information. Such framing reflects underlying values and motivations that are likely to impact choices regarding what is important to know about and what sources might provide relevant information. For this reason, Nisbet’s proposed framing typology has been incorporated in my analysis of committee activities.

Hutchings et al. describe the selective use that politicians and bureaucrats make of scientific information as unacceptable forms of “interference,” going so far as to blame these extra-scientific actors for several “biological and socioeconomic catastrophes” (Hutchings, Walters, and Haedrich 1997, 1198) associated with Canada’s fishery collapses in the 1990s. The authors recount the process through which fisheries science tries to inform fisheries management from the perspective of the scientific community. Scientists assess the conditions of the marine ecosystem and use this data to model potential future scenarios. Research questions do not focus on how to best balance the well-being of marine life against the economic needs of the region or the political interests of government officials; this requires an interpretation of the evidence (fisheries management). The authors note an important point of contention when it comes to making use of “objective” scientific evidence: calculations of variability (which inherently involve a level of uncertainty)
are fundamental to science, but annoying to policy makers and easy to exploit. The nature of scientific practice is that the results of such calculations will vary depending on the data that is available and the variables that are recognized. It is then up to scientists to share their findings with peers and to compare their research with that of others so that these results can be collectively evaluated, debated, and ideally, the findings improved upon. Regulators, on the other hand, have constraints that render such ambiguities impractical. They would rather ignore questions of probability and be able to make claims of certainty. Their objective is to use science to justify their policy decisions. Hutchings et al. refer to this practice as “the portrayal of ‘science’ as science” (1203).

The authors also maintain that scientists working within government bodies face conflicts of interest that can impact their scientific practices. What’s notable is that the authors argue not that there is a one-way “translation problem” from scientists to policy makers (the more commonly researched issue), but rather, that a cyclical and cumulative problem exists. In one of the cases cited, politicians and bureaucrats are documented as having dismissed inconvenient data, publicly misrepresenting significant information regarding fish stock calculations as these would have complicated their regulatory objectives and political careers. This behaviour fed back into the actual conduct of scientific research, impeding data collection and sharing between government scientists and other researchers who relied on government reports. Government scientists who tried to contradict the official reports were reprimanded.

The cases described by Hutchings et al. come from within a policy infrastructure in which we would expect scientific evidence to have more influence and weight than might be seen in, say, legislature. However, the conclusions these scientific researchers reach is unequivocal: they see no room for sound, responsible use of scientific information when scientific practice is integrated within political bodies. While these authors conclude that independent scientific panels represent a better option, it seems inconclusive that this solution will lead to more informed decision-making; the issue it is most likely to resolve is that of scientists being muzzled or intimidated. Whether the freedom to speak publicly directly translates into that same scientific information finding due place at the policy table is not self-evident.

This view of the incompatibility of scientific expertise when incorporated within a policy environment is to some extent supported by the work of Turnhout et al. (2008), who have examined how and when various knowledge communities contribute effectively to environmental policy development, and when they do not. These authors raise caution about the commonly promoted idea that “effective boundary work” and “knowledge translation”—in which science communicators work hand-in-hand with policy makers—is the
best way to ensure that research knowledge is effectively used to address policy. Instead, they suggest that a better understanding of the policy problems (i.e. political conditions and considerations) at the outset can help determine whether research evidence can be used effectively or not, and whether it is better to contribute such knowledge through close boundary work or through a more hands off approach.

Turnhout et al. present a longitudinal, comparative case study in which they analyze different processes of policy–science interaction and boundary work. They apply and further develop a policy problem typology, which integrates insights on problem structure and policy–science interaction, building off of earlier research (Hisschemöller and Hoppe 1995; Rich 1997; Weiss 1991). In general, these scholars propose that scientific research evidence is used in certain ways depending on how users define the policy problem. Both the political infrastructure itself and the value framing that the parties involved bring to the process are expected to influence how problems are structured. They have applied their problem typology to multiple cases, primarily in Europe. Figure 1 summarizes the proposed typology.

**Figure 1. Problem structure typology and types of policy politics (adapted from Hoppe 2011)**

In this dissertation, I have chosen to apply this typology as my second method of exploring the “values challenge” and evaluate whether the observational data here seems to support their typology and notions of the role of expertise—at least in the case of environmental science expertise.
Much of this policy research focuses on the scientific community’s role, impact, and perspective, rather than on those of policy makers themselves. It is important to recognize that a rational, information-driven approach to resolving sociopolitical concerns is not a given. We should not necessarily expect groups of people or even formal societal constructs to function this way by definition. However, it is the case that many contemporary governmental structures have developed over time with this very aim; the House of Commons standing committees are, according to their own documentation, just such structures. What these structures have not formally acknowledged over the course of their development is the potential intractability of many political problems.

Hisschemöller and Hoppe (1995) present an intuitively interesting proposal. They suggest that policy makers prefer to define problems as structured, as this essentially makes it easier to recommend solutions. This requires that they minimize uncertainty and “trouble” by ignoring any possible sources of information that might incite conflict or conceptual messiness. By simplifying the nature of the issue, they make an intractable problem—one that probably requires other types of political intervention in order to meaningfully assess a democratically responsible direction to take—into a rationally solvable one. The authors indicate that this tendency may not be deliberate or consciously recognized, with the result being that the policy makers are likely to focus on resolving “the wrong problem.” This take on political problem identification and solutions is a particularly appealing hypothesis when thinking of the regulatory work of government bureaucrats (public servants). However, given the multiple aims and the structure of standing committee work, it is interesting to consider whether such practices might occur in that environment as well.

After all, standing committees are information environments, but ones in which political representatives are expected to directly hear from the full array of relevant stakeholders. Are there circumstances under which they limit the number or variety of voices at the table specifically in order to rein in conflict and make their objectives more manageable? Or do they instead end up with a large number of essentially unstructured problems, which these authors assert are simply not amenable to rationalistic resolutions.
CHAPTER 3. CONCEPTUAL FRAMEWORK AND SOURCES

In formulating a research plan for this dissertation, my aim has been to put the insights of disparate but complementary disciplines into conversation with one another. As the literature review in the previous chapter demonstrates there are notable overlaps, with various fields supporting each other’s findings and theories even while framing the problems in a different light or using a different level of analysis.

This chapter will discuss the hybrid conceptual framework developed for this study, outline the primary sources from which my observational data has been drawn, and describe the methods subsequently used to apply this framework to the data.

3.1 Conceptual Framework

The central research questions proposed have both quantitative and qualitative elements. It is not expected that an evaluation of categorical data sets will allow us to reach strong conclusions about why and how issues. However, a basic systematic accounting of what information sources are consulted and when in Canadian parliamentary circles has yet to take place, leading to much speculation without the necessary supporting evidence. Taking the time to assess these patterns should provide some foundational information onto which future analyses can subsequently build.

The constraints of infrastructure play a strong role in parliament’s official processes of consultation. This study does not attempt to account for the individual information-seeking of committee members outside of the committee structure, though there is good evidence that this occurs (Canada. Library of Parliament 2012; Canada. Library of Parliament 2011b; Samara Canada 2010b). Such information behaviours are not directly within the scope of this dissertation, but they are recognized as playing a role. My central interest here is to unpack what kinds of information-seeking are formally practised within Canadian legislature’s committee system. The intention is to examine whether systematic patterns of information behaviour are evident, and to begin to consider what these might indicate if they do indeed exist.

Given this study’s meta-level interest in committees as information use environments, Taylor’s model forms the backbone of my theoretical framework. Each of the two research questions is explored through the lens of Taylor’s four dimensions: (a) Sets of people; (b) Setting; (c) Problem types; (d) Problem resolutions. As previously discussed, Taylor does not consider whether collaborative information-seeking environments may involve different considerations than examinations of individual information seekers. This dissertation approaches the problem by defining sets of users by their dominant collective characteristics rather than
focusing on individuals’ varied demographic identities; therefore, to some extent the first two dimensions elide. Another gap in Taylor’s model is that it does not address how we might account for users’ value orientations, which have been identified by many scholars including Taylor as key to understanding information behaviours in policy making settings—and in the political uses of scientific sources of information more specifically. This study attempts to address the gap by incorporating the values-oriented typologies discussed in the previous chapter—Turnhout et al.’s policy problem structural typology (Turnhout, Hisschemöller, and Eijsackers 2008; Hisschemöller and Hoppe 1995), and Nisbet’s framing typology (Nisbet 2010). The purpose is to have a means by which to analyze whether information choices seem in any way associated with such value orientations.

At the systems level, Taylor describes the four dimensions of an IUE as essentially equal, without articulating a particular flow or relationship between these elements. Nonetheless, in his detailed descriptions of each component an obvious relationship emerges; components (a), (b), and (c) seem to describe the information-seeking environment with (d), problem resolution, representing the outcome of addressing an information problem within that setting (i.e., information use). The analytic framework that emerges is shown in Figure 2.

**Figure 2. Information Use Environment Model (based on Taylor 1991)**
3.2 Methods

Examining this study’s research questions requires determining and evaluating the contextual variables most likely to impact committee members’ consultation choices. No theoretical or empirical examinations of Canada’s legislature as a specific information system currently exist. Therefore, a necessary first step was to gather data and try to understand this environment at a general descriptive level. The data were then analyzed further to look for associations with and among variables of interest (primarily categorical data). I have been guided by Taylor’s (1991) suggested framework for analyzing a legislative information use environment as well as Oh and Rich (1996), Jones et al. (1996), and Howlett (2002). McNie’s (2007) discussion of the scientific information needs and expectations of decision-makers dealing with environmental policy also informed this work.

In all, the literature reviewed in the previous chapter identifies the following factors as being potentially relevant to policy makers’ information behaviours, particularly with regard to their use of scientific information sources:

1. Intention of information-seeking (strategic needs, enlightenment/conceptual needs, or directly instrumental needs)
2. Time constraints
3. Source type preferences generally related to accessibility (e.g. preference for verbal information may make social network factors important)
4. Perceived scope of topic
5. Perceived nature of problem (on a spectrum from purely political to purely technical)
6. Values

This study’s two research questions are therefore addressed by examining these variables in the context of our information use environment: Canada’s parliamentary standing committees.

Q1. Relative to other types of information, when do we see scientific sources playing a more central role in environmental policy deliberations in Canada, and when less?

This question is approached by analyzing the observational data to ascertain which factors appear to be associated with greater reliance or less reliance on science information sources relative to other sources consulted. Does the extent to which committees turn to science information sources differ:

- during majority or minority sessions?
- when lobbyist interest is high?
- depending on which committee we look at?
• when inquiries are shorter or longer?
• depending on how an inquiry is framed?
• depending on the nature of the study (policy problem typology)?
• depending on inquiry’s outcome (bill review, report, edification without a deliverable)?

Q2. Which types of scientific sources are consulted and under what circumstances?

This question is approached by analyzing the observational data to ascertain whether any patterns are evident in the distribution of information sources by category—again, we look for associations based on factors identified in the literature. What factors appear to be associated with the types of scientific information sources consulted? Are different patterns evident:

• during majority or minority sessions?
• when lobbyist interest is high?
• depending on which committee we look at?
• when inquiries are shorter or longer?
• depending on how an inquiry is framed?
• depending on the nature of the study (policy problem typology)?
• depending on inquiry’s outcome (bill review, report, edification without a deliverable)?

We may note that this set of variables is well represented by Taylor’s information use environment model:

<table>
<thead>
<tr>
<th>Sets of People</th>
<th>Setting</th>
<th>Problem Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Majority or Minority?</td>
<td>Committee mandate</td>
<td>Framing of issue (dominant value frame)</td>
</tr>
<tr>
<td>Social networks:</td>
<td>Time constraints</td>
<td>Problem conception (policy problem typology)</td>
</tr>
<tr>
<td>Lobbyists? Government?</td>
<td></td>
<td>Expected use (instrumental, strategic, conceptual)</td>
</tr>
</tbody>
</table>

The resulting analysis helps us to fill in the blanks in Taylor’s fourth dimension: Problem Resolution. We discover what kinds of information sources committee members choose to consult depending on the nature of the study.

3.3 Study Sample

Extensive structured data on federal activities exists beginning with parliamentary session 39-1, which commenced in April 2006. In order to sample equally from minority and majority government periods, data were drawn from three different parliamentary sessions:

1. 39th Parliament, 1st Session (April 3, 2006–September 14, 2007);
2. 39th Parliament, 2nd Session (October 16, 2007–September 7, 2008);

Observational data were collected from all studies in which environmental issues were examined by four standing committees whose work regularly involves such considerations. In addition to these committees, data from two special bill studies in which major amendments to environmental legislation were being proposed are compared (one in the majority session, one in the minority session).

During the first two sessions, the Conservative Party of Canada led a minority government under its current leader, Stephen Harper. Parliamentary session (41-1) represents the Conservative Party’s first majority government. The majority session (Table 2) involved the same duration of activity and the committees examined here conducted a similar number of studies addressing environmental considerations as during the two minority sessions combined (Table 3). In all, 20 studies from the Conservative majority 41-1 session are included, and 28 studies from the Conservative minority sessions (10 in 39-2, 18 in 39-1).

This does not mean that the only distinction between these samples is the governing party’s control over parliament. Apart from differences in the total number of studies per session, there is also a difference in the balance of committees that undertook studies relevant to environmental policy. In the minority sessions there were more bill reviews and purely informational studies with no final deliverables than in the one majority period, during which the same committees produced more reports. During the minority period, more studies undertaken by the Environment and Sustainable Development committee concentrated on climate change issues, while in the majority period the government re-directed environmental policy efforts toward conservation issues. Some small party distribution shifts also took place between the two minority periods. Here we make the assumption that the differences between majority control over the direction of inquiry versus the potential for more distributed source selection during the minority periods constitutes the most significant demographic variable within the system.

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9 Minority sessions 39-1 + 39-2 = (529 + 327) = 856 days; Majority session 49-1 = 834 days.
### Table 2. Studies Examining Environmental Issues During Majority Government Session

<table>
<thead>
<tr>
<th>Committee</th>
<th>Study</th>
<th>Final Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGRI</td>
<td>Losses in Bee Colonies</td>
<td>N</td>
</tr>
<tr>
<td>AGRI</td>
<td>Study of the Biotechnology Industry (appended to Growing Forward 2 report)</td>
<td>Y</td>
</tr>
<tr>
<td>ENVI</td>
<td>Urban Conservation Practices in Canada</td>
<td>Y</td>
</tr>
<tr>
<td>ENVI</td>
<td>Habitat Conservation in Canada</td>
<td>Y</td>
</tr>
<tr>
<td>ENVI</td>
<td>Study to Provide Recommendations Regarding the Development of a National Conservation Plan</td>
<td>Y</td>
</tr>
<tr>
<td>ENVI</td>
<td>Statutory Review of the Canadian Environmental Assessment Act</td>
<td>Y</td>
</tr>
<tr>
<td>ENVI</td>
<td>Bill S-15, An Act to amend the Canada National Parks Act and the Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act and to make consequential amendments to the Canada Shipping Act, 2001</td>
<td>N</td>
</tr>
<tr>
<td>ENVI</td>
<td>Plans for Ozone Monitoring Initiatives</td>
<td>N</td>
</tr>
<tr>
<td>ENVI</td>
<td>Invasive Terrestrial Species</td>
<td>N</td>
</tr>
<tr>
<td>ENVI</td>
<td>Mandate of Canada’s Oil Sands Innovation Alliance</td>
<td>N</td>
</tr>
<tr>
<td>BILL C-38</td>
<td>Report on Part 3 of Bill C-38 (Responsible Resources Development)</td>
<td>Y</td>
</tr>
<tr>
<td>FOPO</td>
<td>Northern and Arctic Fisheries</td>
<td>N</td>
</tr>
<tr>
<td>FOPO</td>
<td>Subject Matter of Clauses 173 to 178 (Fisheries Act) of Bill C-45, A Second Act to Implement Certain Provisions of the Budget Tabled in Parliament on March 29, 2012 and Other Measures</td>
<td>N</td>
</tr>
<tr>
<td>FOPO</td>
<td>Invasive Species That Pose a Threat to the Great Lakes System</td>
<td>Y</td>
</tr>
<tr>
<td>FOPO</td>
<td>Closed Containment Salmon Aquaculture</td>
<td>Y</td>
</tr>
<tr>
<td>RNNR</td>
<td>Innovation in the Energy Sector (Renewable &amp; Non-Renewable Energy Sources)</td>
<td>N</td>
</tr>
<tr>
<td>RNNR</td>
<td>Resource Development in Northern Canada</td>
<td>Y</td>
</tr>
<tr>
<td>RNNR</td>
<td>Current and Future State of Oil and Gas Pipelines and Refining Capacity in Canada</td>
<td>Y</td>
</tr>
</tbody>
</table>
Table 3. Studies Examining Environmental Issues During Minority Government Sessions


<table>
<thead>
<tr>
<th>Committee</th>
<th>Study</th>
<th>Final Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGRI</td>
<td>Growing Forward</td>
<td></td>
</tr>
<tr>
<td>AGRI</td>
<td>Bill C-33, An Act to Amend the Canadian Environmental Protection Act, 1999</td>
<td>N</td>
</tr>
<tr>
<td>ENVI</td>
<td>Bill C-377, An Act to Ensure Canada Assumes Its Responsibilities in Preventing Dangerous Climate Change</td>
<td>N</td>
</tr>
<tr>
<td>ENVI</td>
<td>Bill C-474, An Act to Require the Development and Implementation of a National Sustainable Development Strategy</td>
<td>N</td>
</tr>
<tr>
<td>ENVI</td>
<td>United Nations Framework Convention on Climate Change (UNFCCC) Conference (Bali, December 2007)</td>
<td>N</td>
</tr>
<tr>
<td>ENVI</td>
<td>Impact of Oil Sands Development on Present and Future Water Supplies</td>
<td>N</td>
</tr>
<tr>
<td>ENVI</td>
<td>Bill C-469, An Act to Amend the Canadian Environmental Protection Act, 1999 (Use of Phosphorus)</td>
<td>N</td>
</tr>
<tr>
<td>FOPO</td>
<td>Condition of the Eelgrass Beds in James Bay</td>
<td>Y</td>
</tr>
<tr>
<td>RNNR</td>
<td>Canada’s Forest Industry: Recognizing the Challenges and Opportunities</td>
<td>Y</td>
</tr>
<tr>
<td>RNNR</td>
<td>Nuclear Safety Issues, Including Safety Issues at the Chalk River Nuclear Reactor</td>
<td>N</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Committee</th>
<th>Study</th>
<th>Final Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGRI</td>
<td>Biofuel Strategy</td>
<td>N</td>
</tr>
<tr>
<td>BILL C-30</td>
<td>Bill C-30, Canada’s Clean Air Act</td>
<td>N</td>
</tr>
<tr>
<td>ENVI</td>
<td>Blue-Green Algae (Cyanobacteria) and their Toxins</td>
<td>Y</td>
</tr>
<tr>
<td>ENVI</td>
<td>The Canadian Environmental Protection Act, 1999 Five-Year Review</td>
<td>Y</td>
</tr>
<tr>
<td>ENVI</td>
<td>Coal Bed Methane</td>
<td>N</td>
</tr>
<tr>
<td>ENVI</td>
<td>Bill C-288, An Act to Ensure Canada Meets Its Global Climate Change Obligations Under the Kyoto Protocol</td>
<td>N</td>
</tr>
<tr>
<td>ENVI</td>
<td>Carbon Sequestration</td>
<td>N</td>
</tr>
<tr>
<td>ENVI</td>
<td>G8 Summit Debriefing on the Climate Change Developments</td>
<td>N</td>
</tr>
<tr>
<td>FOPO</td>
<td>Ensuring a Sustainable and Humane Seal Harvest</td>
<td>Y</td>
</tr>
<tr>
<td>FOPO</td>
<td>Marine Conservation Issues on the East Coast</td>
<td>N</td>
</tr>
<tr>
<td>FOPO</td>
<td>Bennett Environmental Incinerator Inc., Belledune, New Brunswick</td>
<td>N</td>
</tr>
</tbody>
</table>

38
### Table 3. Continued from p. 38

<table>
<thead>
<tr>
<th>COMMITTEE</th>
<th>Primary Source</th>
<th>Y/N</th>
</tr>
</thead>
<tbody>
<tr>
<td>FOPO</td>
<td>Gravel Extraction and Enforcement in the Fraser River</td>
<td>N</td>
</tr>
<tr>
<td>FOPO</td>
<td>Matters Relating to the Cheam First Nation</td>
<td>N</td>
</tr>
<tr>
<td>FOPO</td>
<td>Environmental Process Modernization Plan (EPMP)</td>
<td>N</td>
</tr>
<tr>
<td>FOPO</td>
<td>Science Renewal Initiative of the Department of Fisheries and Oceans</td>
<td>N</td>
</tr>
<tr>
<td>RNNR</td>
<td>Greening of Electricity Consumption in Canada</td>
<td>N</td>
</tr>
<tr>
<td>RNNR</td>
<td>The Oil Sands: Toward Sustainable Development</td>
<td>Y/N</td>
</tr>
<tr>
<td>RNNR</td>
<td>Natural Resources Sectors in Canada</td>
<td>N</td>
</tr>
</tbody>
</table>

COMMITTEE KEY: Agriculture and Agri-Food (AGRI) · Environment and Sustainable Development (ENVI) · Fisheries and Oceans (FOPO) · Natural Resources (RNNR)

#### 3.4 Primary Sources

The types of materials consulted include:

- **Transcripts of committee meetings on public record (see sample extract in Appendix II)**

  This material includes full documentation from most of the meetings for each study during which committees obtain their evidence. Out of 1,298 witness sources included in this study’s sample, less than ten provided their testimony *in camera*. It is possible to see what questions MPs ask of witnesses and of their own staff, what answers are received, comments regarding what information they feel is important to them as individual MPs and to the committee process, when MPs ask for further documentation to be sent to them on particular topics, etc. Audio and sometimes video recordings are also available online for many public meetings, which permits further verification of transcript copy if needed.

- **Minutes from all committee meetings, public and in camera**

  Minutes provide evidence of the rare cases when testimony is provided off the record, and clarify how many meetings are dedicated to committee debates and drafting of committee reports. In general, meetings in which committees draft their reports are not publicly available; only the minutes for these meetings are provided.

- **Committee reports**

  Written reports for any study undertaken with an objective of providing policy recommendations to the government. Information, opinions, and recommendations provided in such reports are often supported
using footnote citations of documentary and oral evidence. Any footnote described as “Evidence” or “Brief” comes from the evidentiary committee process.

- **Demographic data on members of parliaments**

  This includes number of terms served, some personal biographic information, professional and educational backgrounds, party membership, year of birth or birth date for all members of parliament.

- **Hansards from all parliamentary debates**

- **Lobbyist data**

Data from the following primary sources are used:


   Mulley’s database represents the backbone of his independently run Open Parliament website (Mulley 2013). As of 2006, the official parliamentary websites transitioned to a more structured XML data format. Mulley has processed and created new relationships among the data. The end result is that seemingly Byzantine government documentation and activities are now presented in a more contextualized and accessible fashion. In terms of committee data specifically, each witness and MP is uniquely identified and associated with each individual statement they have made on the record. Each statement is also coded by date, meeting, and time of statement. Transcripts from each committee meeting can either be read in a normal linear fashion from start to finish, or they can be filtered by study activity or the individual speaking. The data captures how often someone spoke, how long they spoke, how profusely they spoke, whether a particular phrase was used once or many times, and so on. In general, this provides a richer and more multidimensional model of a process that formerly was much less transparent. It also makes it much easier to assess the types of witnesses consulted over time, by committee, by session, and by individual study. This study does not make use of all such data points, but some of these may be useful for future research.


   Registration information disclosed by lobbyists includes basic information on lobbying organizations, corporations, lobbyist clients and their beneficiaries; as well as information on which public offices were contacted, in what form (oral or written), when, how often, and regarding what general subject.
Data extracts of the registry are available for download as csv files. The registry can also be searched online. For this study I used lobbyist data from the following files, cross-checked using the registry’s online database when conflicts or name ambiguities occurred:

- Registration_ConsultantLobbyistsExport.csv (created Thursday, November 21, 2013)
- Registration_InHouseLobbyistsExport.csv (created Thursday, November 21, 2013)
- Registration_BeneficiariesExport.csv (created Thursday, November 21, 2013)


   This site represents the source of the Open Parliament data, and all documentation can be found here in its original form and context.


   Provides access to demographic and background data on committees, parliamentary sessions, parties, and individual members of parliament.
CHAPTER 4. DATA COLLECTION

This chapter outlines the process of collecting and organizing committee data in preparation for analysis.

4.1 Tabulation of Witness Data

In the committee system, witnesses who appear before committee are the primary sources of information on which the members base their inquiries and evaluations. Developing a data set that properly represents these witnesses as information sources involved a series of steps, outlined below.

4.1.1 Identify studies of interest.

Committee material from all three sessions was surveyed in order to identify all studies in which environmental issues were included in committee considerations. The aim was to try to capture the full body of relevant studies undertaken by the committees in question during the sampled periods.

4.1.2 Identify types of sources typically consulted (categories).

A review and analysis of how the system itself categorizes source types was conducted in order to identify the types of sources that committees generally deem relevant and seek out. Based on an analysis of press releases and study reports, a set of seven discrete source types was identified: aboriginal, environmental NGO, academic/think tank, federal government, regional government, industry, other civic group. These categorizations are further supported by policy research examining federal committee work (Howlett 2002; Skogstad 1985).

4.1.3 Extract standing committee data from the Open Parliament PostgreSQL database.

SQL queries were conducted to generate custom tables of aggregated witness data for each committee study while simultaneously filtering out MP and staff data. Each table is a compilation of all witnesses, their title, their affiliation, and the date of the meeting(s) they attended. Witnesses who appear more than once in a study are counted discretely based on the number of meetings at which they appear. This is based on a review of transcripts, which indicated that multiple appearances generally occurred when the committee had decided the same source could provide helpful responses to new lines of questioning relative to the context of particular meetings.
4.1.4 **Compilation of all sources by session.**

Full witness lists were then aggregated into an Excel workbook, organized by individual study, committee, and parliamentary session (each session was placed on a separate sheet in the workbook). Witnesses’ positions and affiliations appear together as one column item in the PostgreSQL database. Using regular expressions this information was separated into two columns within the witness spreadsheets in order to permit matching with the lobbyist registry (see 4.1.6).

4.1.5 **Source categorization.**

An intensive manual process of researching each witness and organizational affiliation then ensued in order to: (a) place each source type in one of the seven identified categories, and (b) identify whether or not the source should be classified as a source of scientific information or not. Due to the varied backgrounds of the witnesses, it was not possible to rely on a standard set of biographical sources such as a Who’s Who compendium. First-level determinations were made based on the source’s title and a content analysis of their initial testimony. This was generally the easiest way to ascertain whether they were called to present a scientific perspective, and whether they identify their own credentials—a common practice among witnesses who wish to be recognized as experts. A typical example can be seen in the following extract, taken from the Fisheries and Oceans Standing Committee study examining closed-containment salmon aquaculture:

May 12th, 2010 / 4:35 p.m. Eric Hobson — President, Save Our Salmon Marine Conservation Foundation

Mr. Chair, committee members, thank you for the opportunity to speak with you today. My name is Eric Hobson. I’m president of the SOS Marine Conservation Foundation. I hold a bachelor’s degree in engineering from Carleton University.

I am co-founder of Northridge Petroleum Marketing, which was sold to TransCanada Corporation, and MetroNet Communications, which ultimately merged with AT&T Canada. I am a founding shareholder of over 50 companies. My success in business has allowed me to establish the SOS foundation. My love of the ocean comes from many childhood summers fishing near Vancouver Island with my father and grandfather.

For the record, I have no financial interest in the aquaculture industry or the development of closed containment. With me today is Dr. Andrew Wright. Andrew, would you please introduce yourself?
Hello. My name is Andrew Wright. I have a PhD in engineering from the University of Hull in England. I have over 50 patents to my name, and I’m a published peer-reviewed scientist.

I’ve been working on closed-containment aquaculture for the Save Our Salmon campaign for over two years now, approaching this as a working product every day. We have come to the conclusion that closed containment is economically and technically viable. (Canada. Parliament. House of Commons 2010b)

Second-level determinations for those sources not easily typed based on their testimony were achieved by accessing biographical data on the witness’s company or agency website; looking for evidence of published scientific research including dissertation research using Google Scholar and WorldCat; and if necessary, using professional social network resources such as LinkedIn.

Based on this, each witness was assigned a number between 0 and 2, where 0 = not a science source; 1 = science communicator (a documented professional role communicating relevant scientific information about the environmental issue in question); 2 = academically accredited and practising professional researcher. This designation was only given to those sources serving as experts on environment-related scientific topics. In cases where no clear biographical data could be identified, the witness was assigned a 0. It is important to note the distinction made here relative to other studies that look at the use of social science in policy making. My interest here is not the role of all possible types of expertise in informing political inquiry; rather, my interest is specifically to know when policy makers foreground the environment over other types of presumably legitimate policy concerns such as socio-economic or political considerations.

The above process resulted in the breakdown shown in Figure 3:
4.1.6 Identify sources with registered lobbyist status.

This was accomplished using the full name and affiliation of each source, which was matched against three spreadsheets taken from the federal government lobbyist registry. The lobbyist registry separates lobbyist identities by first and last names, therefore these columns were first concatenated in order to be able to match the full names against the data drawn from the PostgreSQL database. Excel’s built-in Match formula was used to find cell matches between the relevant lobbyist registry tables and the previously generated witness tables. Successful matches return as a value the row number from the source file where the match was obtained.
Each witness source was assigned a number between 0 and 2, where 0 = not a lobbyist, 1 = affiliation matches beneficiaries table, 2 = affiliation matches beneficiaries table and name matches either in-house or consultant lobbyist table. In some cases, matches were found for names but not beneficiary organization. There were several root causes. First, Excel’s matching method is limited by the fact that only exact strings are identified as matches. Thus, variations of the same organization name will lead to false negatives (e.g., “Canadian Wildlife Federation (CWF) / Fédération canadienne de la faune (FCF)” vs. simply “Canadian Wildlife Federation”). Similarly, personal names might differ between the two data sets (e.g., “Bob Friesen” vs. “Robert Friesen”), also resulting in false negatives. More rarely, different lobbyists may share the same name, thus returning a false positive. Therefore, the initial matching step was followed by an error-correction step. Spreadsheet results were filtered to find rows in which the beneficiary organization cell had returned a match without returning matches in either of the possible lobbyist fields, or vice versa. These cases could then be manually looked up in the lobbyist registry to determine whether the matching cell was a false positive or the non-matching cell was a false negative (Figure 4).

It is expected that the limitations of Excel’s matching formula may have led to an under-identification of lobbyists but there is little reason to expect false positives. Some manual verification and occasional correcting was conducted throughout the research process, as increasing familiarity with the data allowed me to intuit when lobbyist data may not be accurate. Nonetheless, due to these limitations this study may underestimate the role of lobbyist ties. A tally of lobbyist data is shown in Figure 5.
4.2 Assessment of Dominant Value Frames and Problem Types

After collecting and organizing all available structured data for the relevant studies, further qualitative analysis of study scopes and issue framing was conducted. For each study, the content of meeting transcripts and committee reports (when produced) were analyzed in order to ascertain dominant value frames and problem structure based on the work of Turnhout et al. (2008) and Nisbet (2010) described in Chapter 2. As I was solely responsible for this process and it was my first experience employing these two typologies, the process involved extensive consultation of previous literature in which these typologies were applied to try to ensure appropriate and consistent use. Based on the features that the authors described, each study was reviewed and subsequently assigned the labels deemed most relevant. Initially, typing of each study was conducted twice, with a break in-between as a means to control for potentially arbitrary categorizations. This process produced inconsistent results for eight of the 48 studies. This subset of studies was put aside and revisited later. In the third round, each typing matched one of the previous rounds, and this categorization was therefore selected as the final typing. In the end, one study conducted by the Environment and Sustainable Development Committee—Mandate of Canada’s Oil Sands Innovation Alliance—could not fairly be typed using the policy problem typology. A “Not Applicable (N/A)”
designation was therefore applied. Further discussion and assessment of these typologies can be found in chapters 5 and 6.

4.3 Other Relevant Study Descriptors

Apart from the descriptive processes outlined above, the following information about each study was also documented:

Political mix. Based on the parliamentary session in which a study took place, it was identified as either a Conservative Party majority study (+) or a Conservative Party minority study (−).

Number of meetings. Total number of meetings per study is used as a representation of study duration (time constraints). This count comprises only the meetings during which testimony was heard; it does not include committee meetings dedicated to drafting reports for those studies that led to a final deliverable.

Number of witnesses. Total number of witnesses consulted for each study is required in order to determine relative proportions of different types of sources and to help gauge the size of a study.

End use. An end use for each study was identified as one of three possible outcomes: Report; Bill review; Edification (i.e., no deliverable produced).

The above was then consolidated, providing a comparative overview of all 48 studies. The next chapter discusses the subsequent analysis of tabulated data.
CHAPTER 5. ANALYSIS AND FINDINGS

Having heard the comments about witnesses presenting two different pictures, I would like to ask Monsieur Choquette to acknowledge that when we have witnesses who present two different pictures, it’s very helpful to know the qualifications and the expertise of the witnesses when assessing their evidence.

— Stephen Woodworth, Conservative MP, Bill C-45 Study, Environment and Sustainable Development Committee, Nov. 19, 2012

This chapter presents an analysis of the data collected, with findings structured according to the conceptual framework outlined in Chapter 3. When appropriate, data analysis will be supplemented with specific contextual examples to help further illustrate or explain findings. While the aim is to uncover patterns in committee behaviours during the periods in question, the benefit of looking at a manageable number of committee studies (48) is that we have the opportunity to examine the reasons behind outliers. These are equally useful in helping to develop a picture of the sampled standing committees’ information practices during the past decade.

Examination of the tabulated data requires addressing the question: how do we determine when scientific sources play a more central role and when not? Here, we face a methodological challenge similar to that identified in citation analysis studies. Just as we cannot assume that a simple citation count for a given article is a meaningful measurement of informational value, we shouldn’t assume that all witness sources are qualitatively equal and are weighted equally by the committee as information users (Smith 1981). Perhaps a single science source provides all the technical answers that a committee needs for a particular study. In truth, the same can be said for all the sources consulted.

However, it’s also important to keep in mind how this tabulation differs from citation counts. Citations reflect the sources that authors have chosen to acknowledge after completing their research. The witness sources that are called to testify before committees reflect the range of sources actively sought and successfully retrieved. In other words, the committee members have an expectation of the kinds of information that witnesses will present, but they do not yet know what will be most of value to them. Therefore what we are ascertaining here is: what kinds of information sources do the committees think will be of use? Relative to other kinds of information, how big a role do they expect answers to science-related questions to play?
In keeping with the general LIS approach of foregrounding users’ agency in the information-seeking process, this dissertation research assumes that the committees are in the best position to determine the appropriate number of sources (amount of information) needed to address each problem situation. In general, we expect that their choices reflect how they value different sources of information and how they prioritize different sources when faced with systemic considerations such as time-related or political constraints. The reality is perhaps not quite so straightforward, in that it is not only the committee that is responsible for determining how many scientific sources will be consulted; the various organizations who appear before committees may themselves select which of their representatives will testify. This choice may be based on availability, established relationships with particular MPs, the stakeholder’s political needs more generally, as well as the advanced information they receive from the committee clerk or analyst regarding the committee’s interests. Thus stakeholder organizations are also responsible for the extent to which scientific expertise is provided. There is no way to determine these distinctions based purely on our observational data.

5.1 Descriptive Data Analysis

Descriptive data analysis began by evaluating the distribution of sources consulted according to type of source, and subsequently, calculating the proportion of all witness sources consulted in each study that served as sources of scientific information (“science sources”). The same calculations were made to ascertain the percentage of sources in each study identified as lobbyists. Although both science sources and lobbyist sources were initially ranked on a scale between 0 and 2, this level of distinction was determined to be too fine-grained given the limited data set; sources were therefore reclassified in a dichotomous fashion as being scientific sources of information if their rating was not equal 0, with the same distinction applied to the lobbyist data.

This resulted in the following breakdown (ordered from greatest proportion of science sources to fewest):

Table 4. Relative proportion of science and lobbyist sources per study

<table>
<thead>
<tr>
<th>Session</th>
<th>Committee</th>
<th>No. sources</th>
<th>Study topic</th>
<th>% Science sources</th>
<th>% Lobbyist sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>41-1 ENVI</td>
<td>4</td>
<td>Ozone Monitoring Initiatives</td>
<td>100.0</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>39-1 FOPO</td>
<td>1</td>
<td>East Coast Marine Conservation</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>39-1 FOPO</td>
<td>5</td>
<td>Science Renewal Initiative (Fisheries Dept.)</td>
<td>80.0</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>Session</td>
<td>Committee</td>
<td>No. sources</td>
<td>Study topic</td>
<td>% Science sources</td>
<td>% Lobbyist sources</td>
</tr>
<tr>
<td>---------</td>
<td>-----------</td>
<td>-------------</td>
<td>-------------------------------------------------</td>
<td>-------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>39-1</td>
<td>ENVI</td>
<td>6</td>
<td>Blue-Green Algae</td>
<td>66.7</td>
<td>33.3</td>
</tr>
<tr>
<td>39-1</td>
<td>ENVI</td>
<td>5</td>
<td>Coal Bed Methane</td>
<td>60.0</td>
<td>20.0</td>
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<tr>
<td>41-1</td>
<td>FOPO</td>
<td>31</td>
<td>Great Lakes Invasive Species</td>
<td>58.1</td>
<td>9.7</td>
</tr>
<tr>
<td>39-2</td>
<td>FOPO</td>
<td>9</td>
<td>Eelgrass Beds in James Bay</td>
<td>55.6</td>
<td>0.0</td>
</tr>
<tr>
<td>39-1</td>
<td>ENVI</td>
<td>9</td>
<td>Carbon Sequestration</td>
<td>55.6</td>
<td>44.4</td>
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<tr>
<td>41-1</td>
<td>ENVI</td>
<td>53</td>
<td>Habitat Conservation</td>
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<td>58.5</td>
</tr>
<tr>
<td>39-1</td>
<td>FOPO</td>
<td>4</td>
<td>Environmental Incinerator Inc., New Brunswick</td>
<td>50.0</td>
<td>25.0</td>
</tr>
<tr>
<td>41-1</td>
<td>FOPO</td>
<td>48</td>
<td>Salmon Aquaculture</td>
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</tr>
<tr>
<td>39-2</td>
<td>ENVI</td>
<td>9</td>
<td>Impact of Oil Sands Dvmt</td>
<td>49.2</td>
<td>27.8</td>
</tr>
<tr>
<td>41-1</td>
<td>ENVI</td>
<td>71</td>
<td>National Conservation Plan</td>
<td>46.5</td>
<td>49.3</td>
</tr>
<tr>
<td>39-2</td>
<td>RNNR</td>
<td>13</td>
<td>Chalk River Nuclear Reactor</td>
<td>46.2</td>
<td>23.1</td>
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<tr>
<td>39-2</td>
<td>ENVI</td>
<td>7</td>
<td>Bill C-469 (Phosphorus)</td>
<td>42.9</td>
<td>14.3</td>
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<tr>
<td>41-1</td>
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<td>17</td>
<td>Invasive Terrestrial Species</td>
<td>41.2</td>
<td>23.5</td>
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<td>41-1</td>
<td>AGRI</td>
<td>47</td>
<td>Biotechnology Opportunities</td>
<td>38.3</td>
<td>48.9</td>
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<tr>
<td>39-1</td>
<td>RNNR</td>
<td>40</td>
<td>Oil Sands: Sustainable Dvmt</td>
<td>35.0</td>
<td>30.0</td>
</tr>
<tr>
<td>39-2</td>
<td>ENVI</td>
<td>23</td>
<td>Bill C-377 (Climate Change)</td>
<td>34.8</td>
<td>52.2</td>
</tr>
<tr>
<td>39-1</td>
<td>FOPO</td>
<td>6</td>
<td>Environmental Process Modernization Plan</td>
<td>33.3</td>
<td>0.0</td>
</tr>
<tr>
<td>41-1</td>
<td>ENVI</td>
<td>4</td>
<td>Draft Federal Sustainable Development Strategy</td>
<td>33.3</td>
<td>0.0</td>
</tr>
<tr>
<td>39-1</td>
<td>ENVI</td>
<td>3</td>
<td>G8 Summit Climate Change</td>
<td>33.3</td>
<td>0.0</td>
</tr>
<tr>
<td>39-1</td>
<td>ENVI</td>
<td>115</td>
<td>EPA, 5-Year Review</td>
<td>33.0</td>
<td>41.7</td>
</tr>
<tr>
<td>39-2</td>
<td>ENVI</td>
<td>16</td>
<td>UNFCCC Conference Prep</td>
<td>31.3</td>
<td>6.25</td>
</tr>
<tr>
<td>39-1</td>
<td>ENVI</td>
<td>23</td>
<td>Bill C-288 (Kyoto)</td>
<td>30.4</td>
<td>52.2</td>
</tr>
<tr>
<td>39-1</td>
<td>RNNR</td>
<td>30</td>
<td>Natural Resources in Canada</td>
<td>30.0</td>
<td>60.0</td>
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<tr>
<td>41-1</td>
<td>ENVI</td>
<td>44</td>
<td>Urban Conservation Practices</td>
<td>29.5</td>
<td>18.2</td>
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<tr>
<td>41-1</td>
<td>RNNR</td>
<td>70</td>
<td>Innovation in the Energy Sector</td>
<td>27.1</td>
<td>61.4</td>
</tr>
<tr>
<td>39-2</td>
<td>ENVI</td>
<td>15</td>
<td>Bill C-474 (Sustainable Development Strategy)</td>
<td>26.7</td>
<td>13.3</td>
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<tr>
<td>41-1</td>
<td>ENVI</td>
<td>4</td>
<td>* Oil Sands Innovation Alliance</td>
<td>25.0</td>
<td>100.0</td>
</tr>
<tr>
<td>41-1</td>
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<td>85</td>
<td>Resource Development in Northern Canada</td>
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<td>39-1</td>
<td>RNNR</td>
<td>38</td>
<td>Greening Electricity</td>
<td>23.7</td>
<td>36.8</td>
</tr>
<tr>
<td>39-1</td>
<td>BILL C-30</td>
<td>85</td>
<td>Clean Air Act</td>
<td>23.5</td>
<td>44.7</td>
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<td>41-1</td>
<td>ENVI</td>
<td>39</td>
<td>EAA Statutory Review</td>
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<td>13</td>
<td>Bill S-15 (Offshore Petroleum)</td>
<td>23.1</td>
<td>38.5</td>
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<td>40</td>
<td>Canada’s Forest Industry</td>
<td>22.5</td>
<td>30.0</td>
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</table>
Table 4. Continued from p. 51

<table>
<thead>
<tr>
<th>Session</th>
<th>Committee</th>
<th>No. sources</th>
<th>Study topic</th>
<th>% Science sources</th>
<th>% Lobbyist sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>41-1</td>
<td>FOPO</td>
<td>9</td>
<td>Arctic and Northern Fisheries</td>
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<td>Cheam First Nation</td>
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<td>20.0</td>
</tr>
<tr>
<td>39-1</td>
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<td>5</td>
<td>Gravel Extraction / Fraser River</td>
<td>20.0</td>
<td>0.0</td>
</tr>
<tr>
<td>41-1</td>
<td>BILL C-38</td>
<td>35</td>
<td>Bill C-38 (Responsible Resources Development)</td>
<td>16.7</td>
<td>52.8</td>
</tr>
<tr>
<td>39-2</td>
<td>AGRI</td>
<td>18</td>
<td>Growing Forward</td>
<td>16.7</td>
<td>50.0</td>
</tr>
<tr>
<td>39-2</td>
<td>AGRI</td>
<td>28</td>
<td>Bill C-33 (EPA amendment)</td>
<td>14.3</td>
<td>35.7</td>
</tr>
<tr>
<td>41-1</td>
<td>ENVI</td>
<td>7</td>
<td>Bill C-45 Clauses 425 to 432</td>
<td>14.3</td>
<td>28.6</td>
</tr>
<tr>
<td>41-1</td>
<td>AGRI</td>
<td>15</td>
<td>Losses in Bee Colonies</td>
<td>13.3</td>
<td>20.0</td>
</tr>
<tr>
<td>39-1</td>
<td>FOPO</td>
<td>52</td>
<td>Sustainable Seal Harvest</td>
<td>11.5</td>
<td>3.9</td>
</tr>
<tr>
<td>39-1</td>
<td>AGRI</td>
<td>9</td>
<td>*Biofuel Strategy</td>
<td>11.1</td>
<td>100.0</td>
</tr>
<tr>
<td>41-1</td>
<td>RNNR</td>
<td>19</td>
<td>Oil and Gas Pipelines</td>
<td>10.5</td>
<td>36.8</td>
</tr>
<tr>
<td>41-1</td>
<td>FOPO</td>
<td>7</td>
<td>Bill C-45 Clauses 173 to 178</td>
<td>0.0</td>
<td>14.3</td>
</tr>
</tbody>
</table>

* Studies where 100% of sources are lobbyist sources.

Figure 6a. Percentage of science sources per study histogram
Figure 6b. Positive correlation between science source count and overall source count per study

Plotting the frequency distribution of science source percentages per study reveals that these proportions are not normally distributed, but positively skewed (Figure 6a). In other words, we cannot readily describe the average percentage of science sources consulted per study (35.6%) as representing the “typical share of science sought” and in general we cannot meaningfully describe sets of studies as using “less than average,”
“average,” or “greater than average” proportions of science sources based on standard deviations or similar parameters. We must find another way to qualify the relative role of science sources in committees’ consultation strategies. One obvious solution is to instead use the overall median (30.85%), and perhaps consider studies that fall below the second quartile mark (< 22.4%) as low in science proportions and those above the third quartile mark (> 47.2%) as high in science proportions.

Consider that if a committee chooses to consult just four sources, one of whom is a government scientist, then 25% of sources sought for that particular study are science sources. Of course, if a committee consults 40 sources in total, they would need 10 scientists to demonstrate the same proportion. It would be unwise to assume our science sources have such a nice neat linear relationship to our overall witness counts (particularly if we keep in mind the point raised earlier that even one source of technical information may be deemed sufficient). We need to determine whether a relationship in fact exists. Figure 6b demonstrates that while the association is not strictly linear, in general there will be more science sources the more witnesses appear. A Spearman rank correlation analysis confirms this positive association.\textsuperscript{10}

We can think of these findings in a few ways: small studies that have a very high percentage of science sources are likely to represent inquiries that committees have decided are best addressed by science sources, with little additional context required. Larger studies probably represent more complex issues that require various types of input, and while we can expect absolute percentages of science sources to be somewhat lower the fact that science sources correlate well with the total number of sources means that we can still use science proportions as a general qualitative idea—being careful not to overstate these figures quantitatively. For this reason, the quartile approach is used as a general marker to help indicate relative consultation patterns, but these figures should be understood as broad guidelines rather than precise metrics.

As only 48 studies are being compared in total, it is not difficult to gain a sense of consultation patterns by visualizing the set of studies as a whole (Figure 7). A scatter plot reveals that committee type seems to be an important factor in determining the extent to which MPs rely on science sources. For example, the Environment and Sustainable Development and the Fisheries and Oceans committees, in both majority and minority sessions, are the only committees that engaged in studies where more than half of all witnesses sought per study were science sources and these committees also demonstrate much more diverse

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\textsuperscript{10} r_s = 0.880, P-value=0.000, significant at the 0.01 level (2-tailed)
consultation patterns (i.e., the range of science source proportions is wider). Even when accounting for the size of a study, these two committees in general seem to consult a greater proportion of science sources.

No discernible difference is evident in science source consultation between majority and minority government periods. Across committees, the proportion of science sources per study most commonly ranges somewhere between 10% and 40%. The Agriculture committee generally hovers on the low end of the spectrum relative to the other committees. The Clean Air Act special bill committee during the minority period shows a higher proportion of science sources than its C-38 counterpart in the majority period despite consulting more than twice as many sources (20/85 vs. 6/36 witnesses). With this helpful overview, we can begin to look at specific variables of interest. As different information behaviour patterns appear to depend on the committee, we will keep these distinctions in mind when evaluating our data.

**Figure 7. Percentage of sources consulted per study that are science sources, by committee**

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11 Both bills involved major revisions of environmental legislation: Bill C-30 proposed amendments to the Canadian Environmental Protection Act (1999), the Energy Efficiency Act, and the Motor Vehicle Fuel Consumption Standards Act; Bill C-38 amended the Environmental Assessment Act, the Environmental Protection Act, the Fisheries Act, the Species at Risk Act, and several other forms of environmental legislation—all under the umbrella of an omnibus budget bill.
Figure 8. Categorical variables of interest framed according to Taylor’s information use environment model

<table>
<thead>
<tr>
<th>Sets of People</th>
<th>Setting</th>
<th>Problem Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Majority or Minority</td>
<td>• Committee mandate</td>
<td>• Framing of issue (dominant value frame)</td>
</tr>
<tr>
<td>• Social networks:</td>
<td>• Time constraints</td>
<td>• Problem conception (policy problem typology)</td>
</tr>
<tr>
<td>Lobbyists? Government?</td>
<td></td>
<td>• Expected use (strategic, conceptual, instrumental)</td>
</tr>
</tbody>
</table>

5.2 Sets of People

The position within the steering committee was to have good representation from the NGOs, from academia, and from industry. We do have a representation from the NGOs, that being Mr. Ogilvie. To now add an additional NGO at the last minute is, I think, against the spirit of cooperation that was achieved in this.

—Mark Warawa, Conservative MP

In terms of this, we just put two auto industry people in front of the committee, so we are trying to establish balance at our panels, not to have too much weighting on one or the other. If we’ve just put an additional NGO, then the balance seems fine for tomorrow.

—Nathan Cullen, NDP MP

(Bill C-30 Clean Air Act Special Committee, February 5, 2007)

5.2.1 Majority or Minority?

As discussed in our general overview above, there appears to be little difference in the extent to which committees turned to science sources when the Conservatives were a majority government and during the earlier minority periods. A chi-square test for independence further supports this first impression:

H₀: The overall proportion of science to non-science sources consulted is independent of whether consultation occurred during minority or majority Conservative periods.

H₁: The overall proportion of science to non-science sources consulted is associated with minority or majority Conservative periods.

<table>
<thead>
<tr>
<th></th>
<th>MAJ</th>
<th>MIN</th>
<th>TOTAL</th>
<th></th>
<th>MAJ</th>
<th>MIN</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCI</td>
<td>212</td>
<td>207</td>
<td>419</td>
<td>SCI</td>
<td>201.11</td>
<td>217.89</td>
<td>419</td>
</tr>
<tr>
<td>NOT SCI</td>
<td>411</td>
<td>468</td>
<td>879</td>
<td>NOT SCI</td>
<td>421.89</td>
<td>457.11</td>
<td>879</td>
</tr>
<tr>
<td>TOTAL</td>
<td>623</td>
<td>675</td>
<td>1298</td>
<td>TOTAL</td>
<td>623</td>
<td>675</td>
<td>1298</td>
</tr>
</tbody>
</table>

Chi square statistic = 1.675; df=1; P-value = 0.19559 (not significant at p < 0.01).
With a P-value of 0.19559 we do not reject the null hypothesis. The extent to which scientific experts were consulted relative to other types of informational input does not notably differ, no matter which set of people (political parties) controlled the direction of committee studies. This finding alone may surprise critics of the Conservative government, who likely would expect the committees in question to have shown more interest in the insights of the scientific community during the two minority sessions when opposition parties had more control over the direction of committee studies. The Conservative government has been accused again and again of showing a disdain for scientific expertise, particularly with regard to environmental issues. Meanwhile, during the majority and minority periods examined here, the opposition parties put considerable effort into criticizing the government’s disregard of climate change science and trying to hold the government accountable for Canada’s international commitments to address greenhouse gas emissions and climate change. The subject matter of many of the studies undertaken during the minority period reflect this (see Table 3). However, the data presented here do not support the notion that this generally translated into greater consultation of science sources when opposition parties had the opportunity to control this factor, or vice versa.

Do we nonetheless see a difference “in kind” when we look for answers to the second research question: what factors appear to influence the types of scientific information sources consulted? In general, are different patterns evident during majority and minority sessions?

Again, the consultation choices during minority and majority periods exhibit similar patterns. Figure 9 indicates that in the minority period committees turned most frequently to academic and federal government science sources, and secondarily a balance of industry science on the one hand and environmental groups on the other. In the majority period, industry sources were more or less evenly matched against government and environmental group science sources. Compared to the minority periods, a notable difference in the majority session is that academic science sources are less dominant, whereas regional government scientists had more input. Keeping in mind the difference in information behaviours between the committees that we noted in our initial picture, it will be important to re-examine this breakdown of science sources at the committee level, which we will do in the Setting analysis below. In general, however, there is little evidence of significantly different source selections in the information-seeking practices of the Conservative party or when other parties controlled the direction of committee inquiries.
5.2.2 Lobbyist and Government Sources

For the past few days we’ve been travelling and hearing from various groups and stakeholders. We’ve heard from industry, from native groups, and from scientists. We are not scientists, but we are trying to pull together the big picture. The fact that there has been such a wide variance of conclusions drawn by the different groups in terms of something as simple as whether the water downstream is being affected by the oil sands is something that I think we all are somewhat struggling with.
—Justin Trudeau, Liberal MP, Oil Sands Impact Study, Environment and Sustainable Development Committee, May 13, 2009

The literature suggests that various types of network influence will impact the sources that policy makers choose to consult (Franks 1987; Howlett 2002). Intuitively it makes sense even from a point of view of convenience that committees might rely more heavily on people they know and to whom they have ready access. In practice, this would lead to a heavier reliance on government scientists, for example, and lobbyist sources as well—though it’s not self-evident that lobbyists would play a strong role as sources of scientific information per se. These are the distinctions that we would like to gain a better understanding of here.
First, it would be helpful to understand under which circumstances lobbyist sources dominated committee studies during the periods in question (or not). Then, we can try to compare this to their relative roles as sources of scientific information, after which we can also integrate information about consultation of government scientists in order to further develop our understanding of the role of these particular networks. Registered lobbyists can be found in all of our source type categories with the exception of federal government sources. Both environmental organizations and industry representatives predominate. As with the science sources, analysis of lobbyist data reveals they are not normally distributed; again, a Spearman rank correlation analysis demonstrates a positive correlation between lobbyist data and overall witness data.¹² A visual overview of lobbyist data is presented in Figure 10.

**Figure 10. Percentage of sources consulted per study that are lobbyist sources**

![Figure 10](image.png)

A few observations surface. First, in Figure 10 we see a general change in the positioning of the committees compared to our twin scatter plot picture of science sources above (Figure 7) with the Fisheries committee particularly low and many small Environment committee studies also exhibiting a lower percentage of lobbyist input. The committees with more economically driven mandates, by contrast, appear mostly above

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¹² $r_s = 0.857$, P-value=0.000, significant at the 0.01 level (2-tailed).
the overall median. Our initial tabular overview helps to fill in some of the blanks as well (Table 4). The anomalous Fisheries and Oceans study at the 100% lobbyist mark was a unique one-hour study in which a single witness was consulted—a World Wildlife Fund marine biologist who appeared during a minority government session to discuss the WWF’s position on seal harvesting and fish stocks on the east coast (Canada. Parliament. House of Commons 2006). In fact, while officially identified as an independent inquiry, this consultation was actually a follow-up to the large, politically charged seal hunting study, in which Canada reacted strongly to Europe’s intended embargoes of Canadian seal products. A content analysis reveals that committee members hoped the WWF—a highly reputed ENGO—would publicly endorse policy makers’ claims that the Atlantic region’s depleted cod stocks are related to the increase in the seal population, thereby justifying to the international community a need for Canada’s socio-economically desired annual seal hunt. Canada’s policy makers hoped to sell seal hunting as a scientifically defensible means to restore the ecosystem’s equilibrium. Much to the Fisheries committee’s disappointment, this particular marine biologist simply repeated the message previously delivered by other scientific advisors (including government scientists)—that there is currently no evidence of a direct link between seal population increases and cod stock declines—forcing the committee to cite their own opinions regarding a link rather than any qualified scientists in their final report on sustainable seal harvests (Canada. Parliament. House of Commons 2007a).

**Figure 11. Lobbyist source type distribution by committee**
The Environment and Sustainable Development study at the top of the scatter plot presents a nice contrast—a study that is clearly driven by the industry lobby. This is what we might expect of a study in which 100% of sources consulted are lobbyists—and is indeed the case of the Agriculture study at 100% as well—but this practice does not appear to be broadly typical of Environment committee studies, where lobbyist input is generally balanced between environmental groups and industry/trade groups (Figure 11). According to the Alberta-based Conservative MP who spearheaded this majority session inquiry, the objective of the study was “to discuss the positive environmental outcomes” of the newly formed industry group, the Canadian Oil Sands Innovation Alliance (Canada. Parliament. House of Commons 2012b). The industry group’s chair, Judy Fairburn, who balances her graduate degree in mechanical engineering with an MBA, describes her organization to the committee as “an unprecedented alliance of 12 major companies that will raise our collective game in oil sands environmental performance” by conducting its own scientific research on the impact of the oil sands (Canada. Parliament. House of Commons 2012b). All four witnesses who attended this meeting were Alliance representatives. The attempts by opposition MPs to question the purpose of the industry organization, its scientific endeavours, and the inquiry itself were deemed out of order and beyond scope as the study mandate was limited to discussing “positive” developments only.

As we can see, the objective of this latter “study” was purely to give the stakeholders in question exclusive access to deliver their particular message to Canadian parliament, with little need for scientific information to be provided given the study’s limited scope. In other words, of the three main objectives ascribed to parliamentary standing committees, this study seems to fall into the “opportunity for Members to hear from Canadians on topics of national concern and to have these representations placed on the public record” branch rather than the primary “allow[ing] for the detailed examination of complex matters which is more easily done in small groups” purpose. Why one particular group would exclusively benefit from this opportunity, rather than hearing from a wider array of Canadians on this topic of national concern, is perhaps a separate issue. What’s notable, however, is that the COSIA study seems to represent an exception in the general information behaviour of the Environment committee. The majority of “edification” studies conducted by both Environment and Fisheries committees appear on the lower end of the lobbyist consultation spectrum relative to the other committees, with several in each case seemingly lobbyist-free. Generally, the Natural Resources and Agriculture committees seem to turn more to lobbyist sources relative to the other committees when conducting studies that involve significant environmental considerations, and of these lobbyists the majority are industry sources (Figure 11).
But how do we account for the anomalous Fisheries study? Does dedicating an entire study to one marine biologist’s expert perspective—only to brush it under the rug when subsequently making policy recommendations—constitute a detailed examination of a complex topic, an effort to ensure that one stakeholder’s opinion is documented, or something else? In sum, whatever the officially stated aims of standing committees may be, these studies hint (unsurprisingly) at a messier reality in which party politics override formally stated deliberative aims where information is supposedly sought as a means to rationally or democratically evaluate policy priorities and options.

**Figure 12. Percentage of sources consulted per study that are federal government sources**

In the case of government witnesses, the Environment and Sustainable Development and Fisheries and Oceans committees were more likely to pursue studies that rely substantially on government sources, while the Agriculture and Agri-Food committee seemed quite disinterested in the perspective of federal sources in these cases (particularly when compared to its consultation of lobbyist sources). Another table can help us to summarize the role of government and lobbyist sources at the committee level (Table 5), keeping in mind the caveat from Chapter 4 about the potential underestimation of lobbyists. It seems that both of the special environmental bill review committees were quite reliant on network sources, with Bill C-38’s lobbyist figure standing out in particular. Compared to all other committees, the Fisheries committee seemed to consult registered lobbyists quite sparingly (as Figure 10 also indicated).
Table 5. Percentage of all witnesses/committee drawn from known networks

<table>
<thead>
<tr>
<th>Committee</th>
<th>Lobbyists (%)</th>
<th>Government (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGRI</td>
<td>46.2</td>
<td>13.7</td>
<td>59.9</td>
</tr>
<tr>
<td>RNNR</td>
<td>41.2</td>
<td>22.1</td>
<td>63.3</td>
</tr>
<tr>
<td>ENVI</td>
<td>39.3</td>
<td>25.4</td>
<td>64.7</td>
</tr>
<tr>
<td>FOPO</td>
<td>14.3</td>
<td>34.6</td>
<td>48.9</td>
</tr>
<tr>
<td>BILL C-38</td>
<td>52.8</td>
<td>22.2</td>
<td>75.0</td>
</tr>
<tr>
<td>BILL C-30</td>
<td>44.7</td>
<td>27.1</td>
<td>71.8</td>
</tr>
</tbody>
</table>

This is the picture we have of the role of government sources and lobbyist sources in general. For most committees, these known network sources constitute over half of all sources consulted—sometimes significantly more. This view, of course, gives us only a sense of the raw numbers; whether such voices at the table tend to resonate more powerfully with committees than non-networked sources is an open question, though as previously discussed both policy insiders and researchers claim this is the case (Finsten 1996; Franks 1987; Skogstad 1985). Now we can look more specifically at lobbyist and government science sources.

Table 6. Percentage of science sources/committee drawn from known networks

<table>
<thead>
<tr>
<th>Committee</th>
<th>Lobbyists (%)</th>
<th>Government (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGRI</td>
<td>32.1</td>
<td>7.1</td>
<td>39.3</td>
</tr>
<tr>
<td>RNNR</td>
<td>31.5</td>
<td>25.8</td>
<td>57.3</td>
</tr>
<tr>
<td>ENVI</td>
<td>36.7</td>
<td>20.5</td>
<td>57.1</td>
</tr>
<tr>
<td>FOPO</td>
<td>10.6</td>
<td>48.5</td>
<td>59.1</td>
</tr>
<tr>
<td>BILL C-38</td>
<td>66.7</td>
<td>16.7</td>
<td>83.3</td>
</tr>
<tr>
<td>BILL C-30</td>
<td>45.0</td>
<td>10.0</td>
<td>55.0</td>
</tr>
</tbody>
</table>

We can certainly say that the bill review for Bill C-38 during the Conservative majority session primarily drew on sciences sources from established networks, particularly lobbying interests. While the Agriculture committee appears much less reliant on the types of network science sources ties identified here, this has more to do with its low use of government sources—and in general, its lower interest in science sources.

Does the extent to which committees turn to science information sources for these studies differ when lobbyist interest is high? This question must be approached cautiously, as we’ve already established that both science sources and lobbyist sources generally increase in number the more witnesses are consulted overall. We can account for this hidden common denominator by looking for evidence of an association between the proportion of sources per study that are science sources and those that are lobbyist sources. A scatter plot provides a helpful representation (Figure 13). From this view, there is no evidence of an
association. That is, while lobbyists clearly constitute a strong presence in committee studies, there is no indication of a direct link between their participation and the extent to which scientific expertise plays a role in deliberations of environmental issues.

**Figure 13. No evidence of correlation between lobbyist and science source consultation per study**

![Graph showing no evidence of correlation between lobbyist and science source consultation per study.](image)

5.3 Setting

Normally, after passage of a bill at second reading, the committee which received the bill would organize its time, call for a variety of witnesses based on the lists provided by the recognized parties in proportion to their representation at the committee, hear the witnesses, formulate amendments, schedule a clause-by-clause meeting, call each clause, hear the amendments to the clause, vote on the amendments and the clauses and then, finally, vote on the bill. Mr. Speaker, you and I both know this process well. That is not what happened here.

—Nathan Cullen, NDP MP, regarding the Bill C-45 review process (House of Commons Debate Period, November 26, 2012)

5.3.1 Committee-level Analysis

The initial visualization of all studies demonstrated that two of the committees—the Environment and Sustainable Development committee and the Fisheries and Oceans committee—uniquely engaged in studies

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13 $r_s = -0.114$, P-value = .442 (two-tailed, not significant at p < .01).
in which more than half of all witnesses heard were science sources. Certainly there are reasons why we might expect each committee to have unique information behaviours. In particular, since a primary directive of committees is to act in an oversight capacity for specific government agencies and the issues in their jurisdiction, the regulatory scopes and mandates of those departments help to determine the scopes of each committee. During the time period examined here both Environment Canada and Fisheries and Oceans Canada formally defined themselves as science-based regulatory agencies focused on balancing ecosystem health with human health and economic security. Agriculture Canada and Natural Resources Canada both promoted a scientific approach to sustainable development with a heavy emphasis on innovation and economic security (see Appendix I, p. 103). The two special bill committees examined here both proposed amendments to major environmental legislation, including the Environmental Protection Act and the Environmental Assessment Act; however, the minority opposition’s approach to the Clean Air Act bill (C-30) was to emphasize public responsibility for climate change related issues such as CO2 emissions, while the special Finance Sub-Committee in charge of reviewing the Responsible Resource Development bill (C-38) during the majority session generally approached the issue as one of innovation and economic management.

We still would like to ascertain whether information behaviours at the committee level are truly unique relative to one another. A contingency table can help to verify whether or not this is generally the case.

**H₀:** The proportion of sources consulted is independent of the committee.

**H₁:** The proportion of sources consulted is associated with the committee.

<table>
<thead>
<tr>
<th></th>
<th>AGRI</th>
<th>ENVI</th>
<th>FOPO</th>
<th>RNNR</th>
<th>BILL C-30</th>
<th>BILL C-38</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCI</td>
<td>28 (24%)</td>
<td>210 (39%)</td>
<td>65 (36%)</td>
<td>89 (27%)</td>
<td>20 (23.5%)</td>
<td>6 (16.7%)</td>
<td>418</td>
</tr>
<tr>
<td>NOT SCI</td>
<td>89 (76%)</td>
<td>333 (61%)</td>
<td>117 (64%)</td>
<td>246 (73%)</td>
<td>65 (76.5%)</td>
<td>30 (83.3%)</td>
<td>880</td>
</tr>
<tr>
<td>TOTAL</td>
<td>117</td>
<td>543</td>
<td>182</td>
<td>335</td>
<td>85</td>
<td>36</td>
<td>1298</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>AGRI</th>
<th>ENVI</th>
<th>FOPO</th>
<th>RNNR</th>
<th>BILL C-30</th>
<th>BILL C-38</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCI</td>
<td>37.7</td>
<td>174.9</td>
<td>58.6</td>
<td>107.9</td>
<td>27.4</td>
<td>11.6</td>
<td>418</td>
</tr>
<tr>
<td>NOT SCI</td>
<td>79.3</td>
<td>368.1</td>
<td>123.4</td>
<td>227.1</td>
<td>57.6</td>
<td>24.4</td>
<td>880</td>
</tr>
<tr>
<td>TOTAL</td>
<td>117</td>
<td>543</td>
<td>182</td>
<td>335</td>
<td>85</td>
<td>36</td>
<td>1298</td>
</tr>
</tbody>
</table>

Chi square statistic = 26.891; df = 5; P-value = 0.0000599 (significant at p < 0.01)
In this case we can reject the null hypothesis and conclude that there is evidence of an association between the proportions of science sources consulted and the type of committee, the features of which we initially observed in our Figure 7 scatter plot. As per that graphical representation, the Fisheries and Environment committees are similar in terms of general reliance on science sources and are distinguished from the Natural Resources and Agriculture committees. We are examining the two special bill committees because they represent politically important cases and it would be interesting to know whether these committees followed or strayed from the behaviours exhibited by those committees that usually would be responsible for evaluating environmental legislation—in particular, the Environment and Sustainable Development committee. Notably, these two special bills depart quite a bit from the general patterns of the Environment committee, veering closer to the Agriculture committee pattern.

The burning question perhaps has more to do with the types of science sources consulted at the committee level. Are different patterns evident depending on which committee we look at?

**Figure 14. Distribution of science source types, by committee**
We start by comparing the major committees, after which we can explore how the special bill committees measure up. In general, Figure 14 gives further insight into the majority and minority distributions first encountered in Figure 9 above, but also helps us to understand some of the differences between the Environment and Fisheries committees relative to the other committees examined. Understandably, we see that the Environment committee consulted more with environmental groups, and they were important sources of science information for that committee, particularly during the majority session. However, we also see that during the minority government periods academic sources came into play more. The increase in consultation of regional government science sources during the majority period stems from a change in focus in the types of studies that occurred. When the Conservatives were in a position to control the nature of environmental policy studies undertaken by parliamentary standing committees, study topics turned away from big picture concerns about climate change, instead exploring more localized ecosystem management issues such as invasive species and conservation policies. In these cases, regional research expertise became more relevant—in keeping with McNie’s (2007) contention regarding the alignment between research scope and policy makers’ information needs.

What is particularly unique about the Fisheries and Oceans committee is the extent to which it turned to government science sources relative to the other committees. When one considers that the scientific community’s greatest concerns regarding political interference in the dissemination and integrity of government science findings come from the fisheries science realm, this finding stands out (Hutchings, Walters, and Haedrich 1997; Rosenau 2006). As addressed earlier in this paper, public servants—including scientists working for federal agencies—are bound by their duty of loyalty oaths to respect the perspective of government, and they can be prevented from disclosing information that goes against government wishes. The problem is severe enough that in recent months government scientists have been working through their unions to try to get new language introduced in their collective agreements. This language aims to protect their right to speak openly about their research; if the union’s efforts are successful, these scientists would have to make it clear that they are sharing their perspectives as individuals and do not represent the government’s official position (Semeniuk 2015). We might wonder, then, at the Fisheries committee’s reliance on the very sources of scientific information that have the least freedom to provide honest expertise. On the other hand, as noted in Chapter 2, the literature suggests that government scientists are most likely to conduct research relevant to policy needs. This factor may well contribute to the committee’s choices. A more extensive content analysis of individual studies would be needed to determine this.
In both the majority and minority periods, the Agriculture committee was most reliant on industry science sources when examining issues involving significant environmental questions. Figure 14 is not fine-grained enough to show the cause for the relatively high proportion of academic/think tank science sources during the majority government. During the 41-1 session, the Agriculture committee engaged in two very distinct policy studies: 1) an investigation of the losses of bee colonies experienced by Canadian farmers, and 2) an exploration of potential biotechnology innovations that might serve to revitalize the country’s struggling agricultural sector. It is this second study that is uniquely responsible for academic science source figure. Researchers engaged in novel biotechnology projects from both industry and university sectors were called upon evenly by the committee (8 university scientists and 8 industry scientists). In fact, this study was an outlier for the Agriculture committee, which generally relied very little on science sources when compared to the other committees. The Natural Resources committee was also not shy about consulting industry scientists; in general, its approach was to complement the industry perspective with other sources of scientific information—often, but not exclusively, government scientists.

**Figure 15. Comparison of major bill reviews**

How do the two special bill committees, each of which examined the same forms of environmental legislation typically reviewed by the Environment and Sustainable Development committee, compare? The most reasonable basis of comparison is to look at them next to the data we have for the Environment
committee’s bill studies (Figure 15). The basic take-away is that when it comes to science source consultation, these special committees exhibited very different information behaviours than what was typical of the Environment committee during this period. Specifically, rather than relying on science sources drawn from government, ENGOs and academia, the two special committees sought a more or less even sampling from the full spectrum of stakeholder categories.

In fact, the patterns that Figure 15 demonstrates for the two special committees nicely reflect the repeated refrain encountered when reading through committee transcripts and even parliamentary debates discussing these two controversial studies. Committee members from opposing parties called for a “balance” of stakeholder input. If we consider that here we’re looking not at all sources consulted per study but specifically at sources of scientific information, it is worth reflecting on the information-seeking approach of these committees. Is striving for a balance of “sides” a helpful means of trying to understand relevant scientific research evidence?

On the one hand, perhaps it’s simply invalid to assume that this balance-seeking has anything to do with committee attempts to understand the scientific issues involved given the multiple purposes of standing committees as deliberative environments; they may be more concerned with ensuring that all major political positions are on the public record. On the other, parliamentary discourse is quite specific in differentiating between “stakeholders” and “experts”. It is therefore interesting that in practice these two, significant bill committees seemed to take the approach that expert views can be balanced in the same way as stakeholder views. The main difference evident in the patterns of the two special bill committees appears to be that during the minority Bill C-30 review, academic science sources peak relative to other types of sources whereas during the majority Bill C-38 review, industry science sources peak. Without wishing to overstate these minor observable differences, they do seem to support the point raised often in the literature—that policy makers select the scientific sources most likely to support their established positions.

Past research has shown that policy makers in different policy areas or at different hierarchical levels of government demonstrate different information behaviours when it comes to their use of research evidence (Howlett 2009; Landry, Lamari, and Amara 2003). Thus far, our observations here suggest that committees similarly take different approaches in their use of expert sources, even when examining related topics. While initially this study expected that sets of people would constitute the main factor distinguishing information practices (i.e., minority vs. majority political composition), the findings show a much stronger difference between committees. This is a potentially interesting consideration—or challenge—raised by a system that
generally seeks to simplify parliamentarians’ examination of complex issues by siloing policy deliberation into distinct subject areas. This kind of siloing may help to make complex problems more manageable but may also result in committees addressing the “wrong problem,” as Hisschemöller and Hoppe (1995) have suggested. It seems plausible, at least, that factors considered significant in one information environment may be effectively eliminated from the intellectual exercise in another.

5.3.2 Duration of Study

The analysis thus far has hinted at a number of points that we have yet to consider directly. How, if at all, might the oft-noted time constraints of political decision-making impact committees’ information behaviours? Does the extent to which committees turn to science sources differ when inquiries are shorter or longer?

The committees examined here demonstrate somewhat different habits when it comes to study duration. In particular, unlike the other committees, the Natural Resources committee did not undertake studies of less than four meetings (the median duration for all studies). In contrast, almost a third of the Environment and Sustainable Development committee studies consulted all sources in a single meeting. Intuitively we might guess that these short Environment committee inquiries could be the studies that dominate the top 12 science source cases. As discussed above, (a) it seems reasonable to expect that longer studies represent more complex issues that require different kinds of input, and (b) we know that the Environment committee in particular tends to consult more science sources per study. Here, using total number of meetings per study as a measure of study duration, we can examine whether this might be the case.

Figure 16 demonstrates a number of things. First, while it’s true that the studies with the three highest proportions of science sources relative to other sources were short studies, the others are quite varied in duration. In general, the scatter plot demonstrates that study duration and reliance on science sources are not strongly associated at all. A more interesting discovery occurs when we consider study duration factors in light of our second research question, in which we explore whether types of science sources differ depending on study duration.

Supported by the literature, earlier we hypothesized that time constraints might lead committees to rely more on readily accessible sources of information. Within the limitations of the data available, this study focuses on two such sources: people who work for the federal government as well as lobbyists. If this notion has merit, then we would expect to see a greater reliance on these network ties when studies are shorter.
Does this translate to a greater role for science sources that belong to lobbyist or government networks when time is limited?

$H_0$: There is no relationship between the proportion of network-tie science sources consulted per study and study duration.

$H_a$: The proportion of network-tie science sources consulted per study is associated with study duration.

The scatter plot in Figure 17 helps us to visualize this relationship. We can reject the null hypothesis and conclude a negative correlation is evident ($r_s = -0.934$, $P$-value = 0.000, significant at $p < .01$). Simply put, the more time committees have to study an issue, the less they seem to rely on science sources drawn from identified networks. That there is no noteworthy relationship between study duration and the overall proportion of science sources consulted per study, nor the overall proportion of network ties generally and study duration, yet we nonetheless witness a striking drop in the role of network-tie science sources the more time committees spend examining a topic suggests that a closer look is warranted.

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14 Testing the null hypothesis of no association between network tie sources/study and duration of study, $r_s = -.094$, $P$-value = .526 (two-tailed, not significant at $p < .01$).
At first glance, the finding lends credence to the idea that these networks play a role not only because of factors such as lobbyist pressure, but also possibly the more mundane “principle of least effort” factor, which was the original motivation for looking at this relationship. However, if that were the case then why would this relationship be evident only for network science sources, but not all network-tie sources? We must be careful not to assume here that committees rely on network science sources because they are pressed for time. Previously we observed that certain committees seem more inclined to conduct brief studies than others, particularly the Environment and Fisheries committees. Is some other pattern evident in terms of the kinds of problems addressed in short periods compared to longer studies? These problem-level factors obviously deserve further consideration.

5.4 Problem Type

*Those actors who have the power to decide on the policy agenda, also have the power to choose the problems they like to solve.*

(Hisschemöller and Hoppe 1995, 45)
By framing this research within Taylor’s IUE model, we are in essence exploring the information behaviours of parliamentary standing committees from the most general bird’s eye view, moving toward the most specific—the individual problems that motivate each committee study. This research examines three problem-specific elements: end use, problem framing, and problem structure.

Categorizations of “end use” are taken directly from the committee system. Committees are responsible for reviewing bills proposed both by government and private members of the House of Commons. It is the House that determines to which committee such bills are sent, generally after the second reading. After consulting with the sources they deem relevant, the committee reviews the bill’s content clause by clause to discuss possible amendments. These are voted upon within the committee, and if the proposed amendments are accepted the committee issues a report to the House of Commons with its recommendations. If no amendments are passed at the committee level, the committee issues a report stating that the bill has been reviewed and accepted as is. Committees may also undertake informational studies with the intention of advising government on current or future policy. In these cases, the study culminates in a final written report. Finally, committees sometimes look into matters without the intention of producing any kind of deliverable but purely to acquire information. This dissertation describes these as “edification” studies.

**Figure 18. End use — proportion of science sources per study (%)**

Does the extent to which committees turn to science information sources differ depending on what they intend to do with that information? If we look at the proportion of science sources consulted per study
depending on end use, we can get a reasonable sense that end use does play a role—particularly in the case of bill reviews, which generally seem to be situated at the bottom end of the scale (Figure 18).

A chi-square test of independence indicates an association between end use and proportions of science to non-science sources.

H₀: The overall proportions of sources consulted are independent of the end use objective.

H₁: The overall proportions of sources consulted are associated with end use.

<table>
<thead>
<tr>
<th>observed</th>
<th>BILL</th>
<th>EDIFICATION</th>
<th>REPORT</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCI</td>
<td>56 (23%)</td>
<td>118 (35%)</td>
<td>245 (34%)</td>
<td>419</td>
</tr>
<tr>
<td>NOT SCI</td>
<td>188 (77%)</td>
<td>219 (65%)</td>
<td>472 (66%)</td>
<td>879</td>
</tr>
<tr>
<td>TOTAL</td>
<td>244</td>
<td>337</td>
<td>717</td>
<td>1298</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>expected</th>
<th>BILL</th>
<th>EDIFICATION</th>
<th>REPORT</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCI</td>
<td>78.8</td>
<td>108.8</td>
<td>231.5</td>
<td>419</td>
</tr>
<tr>
<td>NOT SCI</td>
<td>165.2</td>
<td>228.2</td>
<td>485.5</td>
<td>879</td>
</tr>
<tr>
<td>TOTAL</td>
<td>244</td>
<td>337</td>
<td>717</td>
<td>1298</td>
</tr>
</tbody>
</table>

*Chi square statistic = 12.04; df=2; P-value = 0.0024 (significant at p < 0.01)*

With a P-value of 0.0024 the null hypothesis is rejected. There’s evidence of an association between the proportions of sources consulted and end use objectives. The ratios of science source use for the three end use types provide a clear indicator that the bill review category is the end use that stands out (see observed values).

The findings here support those of Jones et al. (1996), in which the U.S. legislators surveyed indicated they had less interest in scientific expertise at the bill review stage. As pointed out previously, when conducting bill reviews (usually after the second reading), standing committees are expected to consult the full array of stakeholders deemed relevant as representatives of various public interests. In terms of expertise, it is more common at this stage to turn to policy experts and legal advisors. It is therefore not surprising that in general there is less reliance on scientific expertise per se, even when assessing environmental legislation. Ideally, if not in practice, the “right” scientific advice has already been taken into account in formulating the legislation in the first place.
5.4.1 Value Frames and Problem Conceptions

Last but not least, we would like to try to account for the role that value considerations play in the nature and extent to which the parliamentary committees in question consulted with science sources when considering environmental issues (Table 7). As described previously, this dissertation uses two different typological approaches: a problem structure typology (see p. 30), and a policy framing typology (see p. 27). The attempt to integrate these typologies into Taylor’s framework is an experiment in its own right. While the problem structure typology makes explicit claims about the expected role that scientific experts will play in each scenario, the framing typology does not.

The purpose of applying Nisbet’s frames (2010) is to try to focus our attention on the dominant values that seemed to define the direction taken in each study and see whether these are associated with any particular information use patterns. Note that we are concerned here with the values that those who have the power to direct the course of an inquiry convey as they articulate study scope. We would like to know: does the extent to which committees turn to science information sources differ depending on how an inquiry is framed?

Table 7. Value frames and problem structures

<table>
<thead>
<tr>
<th>+/-</th>
<th>Cmte</th>
<th>Study</th>
<th>Frame</th>
<th>Problem</th>
<th>End Use</th>
<th>Sci (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>ENV1</td>
<td>Plans for Ozone Monitoring Initiatives</td>
<td>Public accountability</td>
<td>Structured</td>
<td>Edification</td>
<td>100.0</td>
</tr>
<tr>
<td>-</td>
<td>FOPO</td>
<td>Marine Conservation Issues on the East Coast</td>
<td>Scientific uncertainty</td>
<td>Moderately structured (goals)</td>
<td>Edification</td>
<td>100.0</td>
</tr>
<tr>
<td>-</td>
<td>FOPO</td>
<td>Science Renewal Initiative</td>
<td>Public accountability</td>
<td>Structured</td>
<td>Edification</td>
<td>80.0</td>
</tr>
<tr>
<td>-</td>
<td>ENV1</td>
<td>Blue-Green Algae (Cyanobacteria) and their Toxins</td>
<td>Public accountability</td>
<td>Structured</td>
<td>Report</td>
<td>66.7</td>
</tr>
<tr>
<td>-</td>
<td>ENV1</td>
<td>Coal Bed Methane</td>
<td>Pandora’s Box</td>
<td>Unstructured</td>
<td>Edification</td>
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<tr>
<td>+</td>
<td>FOPO</td>
<td>Invasive Species that Pose a Threat to the Great Lakes System</td>
<td>Social progress</td>
<td>Structured</td>
<td>Report</td>
<td>58.1</td>
</tr>
<tr>
<td>-</td>
<td>ENV1</td>
<td>Carbon Sequestration</td>
<td>Middle way</td>
<td>Structured</td>
<td>Edification</td>
<td>55.6</td>
</tr>
<tr>
<td>-</td>
<td>FOPO</td>
<td>Condition of the Eelgrass Beds in James Bay</td>
<td>Public accountability</td>
<td>Structured</td>
<td>Report</td>
<td>55.6</td>
</tr>
<tr>
<td>+</td>
<td>ENV1</td>
<td>Habitat Conservation in Canada</td>
<td>Social progress</td>
<td>Moderately structured (goals)</td>
<td>Report</td>
<td>52.8</td>
</tr>
<tr>
<td>-</td>
<td>FOPO</td>
<td>Bennett Environmental Incinerator Inc., Belledune, New Brunswick</td>
<td>Public accountability</td>
<td>Structured</td>
<td>Edification</td>
<td>50.0</td>
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<tr>
<td>+</td>
<td>FOPO</td>
<td>Closed Containment Salmon Aquaculture</td>
<td>Economic development</td>
<td>Moderately structured (goals)</td>
<td>Report</td>
<td>50.0</td>
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</table>
Table 7. Continued from p. 74

<table>
<thead>
<tr>
<th>+/-</th>
<th>Cmte</th>
<th>Study</th>
<th>Frame</th>
<th>Problem</th>
<th>End Use</th>
<th>Sci (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>ENVI</td>
<td>Impact of Oil Sands Development</td>
<td>Pandora’s Box</td>
<td>Unstructured</td>
<td>Edification</td>
<td>49.2</td>
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<td>+</td>
<td>ENVI</td>
<td>Study to Provide Recommendations Regarding the Development of a</td>
<td>Social progress</td>
<td>Moderately structured (goals)</td>
<td>Report</td>
<td>46.5</td>
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<tr>
<td></td>
<td></td>
<td>National Conservation Plan</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>RNNR</td>
<td>Nuclear Safety Issues</td>
<td>Pandora’s Box</td>
<td>Unstructured</td>
<td>Edification</td>
<td>46.2</td>
</tr>
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<td>-</td>
<td>ENVI</td>
<td>Bill C-469, Environmental Protection Act (Phosphorus)</td>
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<td>Bill review</td>
<td>42.9</td>
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<td>+</td>
<td>ENVI</td>
<td>Invasive Terrestrial Species</td>
<td>Social progress</td>
<td>Structured</td>
<td>Edification</td>
<td>41.2</td>
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<tr>
<td>+</td>
<td>AGRI</td>
<td>Biotechnology Opportunities</td>
<td>Economic</td>
<td>Structured</td>
<td>Report</td>
<td>38.3</td>
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<tr>
<td></td>
<td></td>
<td>Development</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>RNNR</td>
<td>The Oil Sands: Toward Sustainable Development</td>
<td>Middle way</td>
<td>Unstructured</td>
<td>Report</td>
<td>35.0</td>
</tr>
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<td>-</td>
<td>ENVI</td>
<td>Bill C-377, Dangerous Climate Change</td>
<td>Scientific</td>
<td>Unstructured</td>
<td>Bill review</td>
<td>34.8</td>
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<td>-</td>
<td>ENVI</td>
<td>G8 Summit Debriefing on the Climate Change Developments</td>
<td>Scientific</td>
<td>Structured</td>
<td>Edification</td>
<td>33.3</td>
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<tr>
<td>+</td>
<td>ENVI</td>
<td>Federal Sustainable Development Strategy 2013-2016</td>
<td>Public</td>
<td>Structured</td>
<td>Edification</td>
<td>33.3</td>
</tr>
<tr>
<td>-</td>
<td>FOPO</td>
<td>Environmental Process Modernization Plan</td>
<td>Public</td>
<td>Structured</td>
<td>Edification</td>
<td>33.3</td>
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<td></td>
<td></td>
<td>Development</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>ENVI</td>
<td>Environmental Protection Act, 5-Year Review</td>
<td>Social progress</td>
<td>Moderately structured (means)</td>
<td>Report</td>
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<tr>
<td>-</td>
<td>ENVI</td>
<td>UN Framework Convention on Climate Change (UNFCCC)</td>
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<td>Structured</td>
<td>Edification</td>
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<td>-</td>
<td>ENVI</td>
<td>Bill C-288, Kyoto Protocol</td>
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<td>Moderately structured (means)</td>
<td>Bill review</td>
<td>30.4</td>
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<td>-</td>
<td>RNNR</td>
<td>Natural Resources Sectors in Canada</td>
<td>Social progress</td>
<td>Unstructured</td>
<td>Edification</td>
<td>30.0</td>
</tr>
<tr>
<td>+</td>
<td>ENVI</td>
<td>Urban Conservation Practices in Canada</td>
<td>Social progress</td>
<td>Moderately structured (goals)</td>
<td>Report</td>
<td>29.5</td>
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<tr>
<td>+</td>
<td>RNNR</td>
<td>Innovation in the Energy Sector</td>
<td>Economic</td>
<td>Moderately structured (goals)</td>
<td>Edification</td>
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<td>-</td>
<td>ENVI</td>
<td>Bill C-474, National Sustainable Development Strategy</td>
<td>Morality/ethics</td>
<td>Structured</td>
<td>Bill review</td>
<td>26.7</td>
</tr>
<tr>
<td>+</td>
<td>ENVI</td>
<td>Mandate of Canada's Oil Sands Innovation Alliance</td>
<td>Economic</td>
<td>N/A</td>
<td>Edification</td>
<td>25.0</td>
</tr>
<tr>
<td>+</td>
<td>RNNR</td>
<td>Resource Development in Northern Canada</td>
<td>Economic</td>
<td>Moderately structured (goals)</td>
<td>Report</td>
<td>24.7</td>
</tr>
<tr>
<td>-</td>
<td>RNNR</td>
<td>Greening of Electricity Consumption in Canada</td>
<td>Economic</td>
<td>Unstructured</td>
<td>Edification</td>
<td>23.7</td>
</tr>
<tr>
<td>-</td>
<td>BILL</td>
<td>Bill C-30, Canada's Clean Air Act</td>
<td>Scientific</td>
<td>Unstructured</td>
<td>Bill review</td>
<td>23.5</td>
</tr>
<tr>
<td>+</td>
<td>ENVI</td>
<td>Bill S-15</td>
<td>Public</td>
<td>Moderately structured (means)</td>
<td>Bill review</td>
<td>23.1</td>
</tr>
</tbody>
</table>
Table 7. Continued from p. 75

<table>
<thead>
<tr>
<th>+/-</th>
<th>Cmte</th>
<th>Study</th>
<th>Frame</th>
<th>Problem</th>
<th>End Use</th>
<th>Sci (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>ENVI</td>
<td>Environmental Assessment Act Statutory Review</td>
<td>Economic development</td>
<td>Moderately structured (means)</td>
<td>Report</td>
<td>23.1</td>
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<tr>
<td>-</td>
<td>RNNR</td>
<td>Canada's Forest Industry</td>
<td>Economic development</td>
<td>Unstructured</td>
<td>Report</td>
<td>22.5</td>
</tr>
<tr>
<td>+</td>
<td>FOPO</td>
<td>Arctic &amp; Northern Fisheries</td>
<td>Economic development</td>
<td>Structured</td>
<td>Edification</td>
<td>22.2</td>
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<td>-</td>
<td>FOPO</td>
<td>Matters Relating to the Cheam First Nation</td>
<td>Public accountability</td>
<td>Moderately structured (goals)</td>
<td>Edification</td>
<td>20.0</td>
</tr>
<tr>
<td>-</td>
<td>FOPO</td>
<td>Gravel Extraction and Enforcement in the Fraser River</td>
<td>Public accountability</td>
<td>Moderately structured (goals)</td>
<td>Edification</td>
<td>20.0</td>
</tr>
<tr>
<td>+</td>
<td>BILL</td>
<td>Bill C-38 (Responsible Resources Development)</td>
<td>Economic development</td>
<td>Moderately structured (goals)</td>
<td>Bill review</td>
<td>16.7</td>
</tr>
<tr>
<td>-</td>
<td>AGRI</td>
<td>Bill C-33, Canadian Environmental Protection Act (amdmt)</td>
<td>Social progress</td>
<td>Moderately structured (goals)</td>
<td>Bill review</td>
<td>14.3</td>
</tr>
<tr>
<td>+</td>
<td>ENVI</td>
<td>Bill C-45 (Environmental Assessment Act)</td>
<td>Economic development</td>
<td>Moderately structured (means)</td>
<td>Bill review</td>
<td>14.3</td>
</tr>
<tr>
<td>+</td>
<td>AGRI</td>
<td>Losses in Bee Colonies</td>
<td>Economic development</td>
<td>Unstructured</td>
<td>Edification</td>
<td>13.3</td>
</tr>
<tr>
<td>-</td>
<td>FOPO</td>
<td>Ensuring a Sustainable and Humane Seal Harvest</td>
<td>Economic development</td>
<td>Moderately structured (goals)</td>
<td>Report</td>
<td>11.5</td>
</tr>
<tr>
<td>-</td>
<td>AGRI</td>
<td>Biofuel Strategy</td>
<td>Economic development</td>
<td>Moderately structured (goals)</td>
<td>Edification</td>
<td>11.1</td>
</tr>
<tr>
<td>+</td>
<td>RNNR</td>
<td>Oil and Gas Pipelines and Refining Capacity in Canada</td>
<td>Economic development</td>
<td>Moderately structured (goals)</td>
<td>Report</td>
<td>10.5</td>
</tr>
<tr>
<td>+</td>
<td>FOPO</td>
<td>Bill C-45 (Fisheries Act)</td>
<td>Economic development</td>
<td>Moderately structured (means)</td>
<td>Bill review</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Our visualization in Figure 19 suggests that to some extent it does. Most notably, problems that committees framed primarily as economic development issues generally fall on the lower end of the science source spectrum. This is true regardless of majority or minority period, however a much greater percentage of majority studies applied this frame (60% vs. 18%). Studies with higher reliance on science sources seem to be framed primarily in terms of public accountability or social progress. Interestingly, studies framed in terms of scientific uncertainty cluster around the median. More minority session studies used the public accountability frame, possibly due to the opposition’s aims to hold the government to account (32% vs. 15%). By contrast, majority session studies with a higher reliance on science sources mainly exhibited a social progress frame (for example, the Environment committee’s various conservation plan studies). Framing of majority studies was limited to just three of the eight frames proposed in Nisbet’s typology.
whereas a much more varied range of value frames were identified in the minority period, during which four different political parties contributed to problem articulation and structure (Table 8). Our data do not allow us to determine whether this difference represents something specific about the Conservatives’ range of values or whether we would find a similarly limited set of values any time one party controls the direction of inquiry.

Figure 19. Proportion of science sources per study based on value frame

Table 8. Distribution of value frames per period (%)

<table>
<thead>
<tr>
<th>FRAME</th>
<th>MAJORITY</th>
<th>MINORITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social progress</td>
<td>25.0 %</td>
<td>10.7 %</td>
</tr>
<tr>
<td>Economic development</td>
<td>60.0 %</td>
<td>17.9 %</td>
</tr>
<tr>
<td>Public accountability</td>
<td>15.0 %</td>
<td>28.6 %</td>
</tr>
<tr>
<td>Morality/ethics</td>
<td>0.0 %</td>
<td>3.6 %</td>
</tr>
<tr>
<td>Scientific uncertainty ... a matter of expert understanding; what is</td>
<td>0.0 %</td>
<td>21.4 %</td>
</tr>
<tr>
<td>Pandora’s Box/Frankenstein’s monster/runaway science</td>
<td>0.0 %</td>
<td>10.7 %</td>
</tr>
<tr>
<td>Middle way/alternative path</td>
<td>0.0 %</td>
<td>7.1 %</td>
</tr>
<tr>
<td>Conflict/battle of personalities</td>
<td>0.0 %</td>
<td>0.0 %</td>
</tr>
</tbody>
</table>

Are there differences evident in the types of science sources consulted depending on value frame? Focusing specifically on the four most common frames for which we have more data, there is some evidence that this is the case (Figure 20). Studies framed in terms of economic development generally consulted more industry science sources. By contrast studies framed in terms of scientific uncertainty, social progress, or public
accountability consulted industry science sources minimally, and relied more on academic, environment group, or government science sources respectively.

Taylor (1991) suggests that how users structure their information problems will influence their information-seeking behaviours. Drawn from the literature on environmental science and policy decision-making, early versions of the policy problem typology employed here proposed that experts will outweigh other participants in situations in which policy makers wish to depoliticize and “objectify” a policy problem that threatens to be detrimentally controversial. The authors suggest that this solution is “often applied when ethical issues are at stake” (Hisschemöller and Hoppe 1995, 49). In the policy environment examined here several studies fit this description, particularly Fisheries and Environment committee studies such as the carbon sequestration study, the coal bed methane study, and the study of closed containment aquaculture. However, most of the studies that were identified as structured problems seem to be legitimately small departmental oversight inquiries, while many of the ethically controversial topics such as the Fisheries committee seal harvest study, the Environment committee’s look at the impact of oil sands development, or the Natural Resource committee’s nuclear safety examination did not appear to be structured according to the authors’ projections. That said, apart from the seal harvest study these other controversial topics did demonstrate a relatively high reliance on science sources, which could indicate a misapplication of the typology.

Figure 20. Distribution of science sources by value frame
Despite the above incongruity, we are still interested in whether the extent to which committees turned to science information sources generally differed depending on how these committees structured their problems—a factor Taylor deems relevant in his articulation of information use environments. If we assume that the problem structure typology was applied here as its creators intended, Figure 21 suggests that the authors’ predictions are valid in at least one case. In general, the studies that appear in the structured category do mostly fall above the median of science source proportions.

**Figure 21. Proportion of science sources per study based on problem structure**

Studies typed as “moderately structured (goals)” were those that primarily demonstrated disagreement “over the distribution of costs and benefits among rival social groups,” as per the problem structure description provided in the literature. The authors suggest that for such policy problems “science is unlikely to serve as an overarching policy framework” (Turnhout, Hisschemöller, and Eijsackers 2008, 230), but will be used strategically to back particular positions and ignored when inconvenient. Our data shows nothing particularly definitive. Problems categorized as “moderately structured (means),” though less prevalent here, seem to fall quite low on the science source spectrum. This is potentially contrary to the authors’ expectations that scientific expertise may “contribute a great deal” as a method of “translating value conflict into an issue of technical complexity” (230). In general, however, a discourse analysis examining these moderately structured cases would be the most appropriate way to determine that our findings are truly discordant. It’s possible that scientist witnesses who testified did serve in a manner akin to Turnhout et al.’s
expectations, and that this role is not aptly reflected in our somewhat unnuanced “proportion of all sources” model.

Overall it must be said that in the context of the policy problems examined here many cases were quite ambiguous and difficult to categorize. While the typology creators imply there are clear differences between cases where objectives are agreed upon but means are disputed and others where the objectives themselves are the source of disagreement, in the realm of Canadian environmental policy these distinctions are muddy. On paper the political parties are very far apart in their core values on environmental matters and one would expect this to mean that conflicts are as much with regard to ends as means, if not more so. Yet committee members as individuals are generally interested in ensuring their own constituents’ socio-economic well-being (Blidook 2012; Blidook and Samara 2013), therefore there may seem to be conflicts about goals that really are not, and other cases when conflicts about means in fact reflect abstract, perhaps unarticulated differences in general objectives. With environmental policy, conversations about obligations to future generations may suggest one set of values while the same politicians change their tunes often unreflectively when dealing with practical contemporary considerations. Ultimately, even if this typology is generally valid when applied as intended, in the case of the research questions this dissertation is interested in examining it is not clear that identifying problem structure in this way adds significant insights.

A more apt and potentially relevant point that authors Hisschemöller and Hoppe make is that policy problems are essentially manufactured. Parties in a position of power can define what problems should be looked at in the first place, and how such problems will be approached. An example provided earlier was the “Mandate of Canada’s Oil Sands Innovation Alliance” study undertaken by the Environment committee during the majority period. The Conservative majority limited the sources to a small set of industry representatives, and curtailed the discussion to only “positive” information claims. After several parliamentary periods in which the minority Conservative government was regularly being hounded by the opposition to address Canada’s environmental problems, the majority period studied here represents the first time that the government finally had control over the Environment committee’s agenda. While the authors propose that this type of control should result in a dominance of narrowly defined “structured” problems in which non-technical parties are excluded from the conversation, in the information environment examined here the solution instead seems to involve avoiding certain topics altogether.

The types of studies undertaken by the Environment and Sustainable Development Committee during the majority government represented a pretty radical departure from earlier periods. Concentrating on a series of
constituent-friendly studies that generally avoided discussion of thorny issues such as climate change and instead concentrated on promoting nature as a backdrop to human health and economic well-being, the committee could nimbly navigate various stakeholder perspectives and areas of uncontroversial scientific expertise while avoiding the environmental issues most contrary to the Conservative agenda. This perhaps explains why studies framed in terms of social progress could turn more to science sources than, for example, the Natural Resources or Agriculture committees whose missions were very clearly economic. Notably, the three Environment committee majority studies with an economic development frame exhibit high reliance on industry science sources relative to other types of sources—in direct contrast to the majority studies framed in terms of social progress and public accountability.

In the minority period, the opposition parties tended to have control over what constituted policy problems worth studying. It is difficult to ascertain whether the problem structure typology aptly describes the information behaviours in the minority committee environments. Given the established importance of committees as a unit for examining information practices in this environment, let us see if we can establish anything about how values and problem structuring played out at this level.

The Fisheries committee demonstrates an interesting split between public accountability and economic development frames—a finding that seems in keeping with our initial look at science proportions, in which we saw Fisheries studies widely dispersed above and below the median (Figure 22). The majority, though not all, Fisheries studies with an economic frame occurred during the majority period, and all public accountability studies were during the minority period. It seems that during both minority and majority
periods the Agriculture committee limited its framing primarily to economic development, and secondarily social progress despite the obvious environmental risks and considerations relevant to its studies. The Natural Resources committee also tended to frame issues with significant environmental considerations as primarily economic in nature. As Figure 19 indicated, the economic frame tends to be associated with lower use of science sources. It does not seem surprising that when committees value economic development and innovation above considerations regarding scientific uncertainty, public accountability, or moral responsibility they will turn more to industry science sources, as we found earlier.

Table 8 summarized the differences in value frames between the majority and minority periods. Now in Figure 22 we can see that the more diverse range of frames evident in the minority sessions are primarily found in studies undertaken by the Environment and Sustainable Development Committee. We might conclude that this stems from the fact that our data includes more studies from the Environment committee than any other (understandably, given our focus on environmental policy issues), which probably creates more opportunity for different frames to surface. However, we do have a balanced number of Environment committee studies drawn from the minority periods and our majority period, and this variation of value frames surfaces only during the minority period. The kinds of frames that surface uniquely in the Environment committee and uniquely during the minority period are, specifically: the morality/ethics frame; the scientific uncertainty frame in which parties invoke or undermine expert consensus; and the Pandora’s Box frame, calling for precaution in the face of potentially significant impacts. That these frames, which seem so genuinely connected to reigning environmental debates globally, only surface in this one permutation of committee examining environmental issues is an interesting and possibly surprising observation. While it would be ill-advised to interpret the why’s and how’s of this finding here, it is nonetheless a finding that could be very helpful as a starting consideration for future research.

Earlier we noted an association between network science sources and study duration. Given the very particular shape of the curve evident in Figure 17, it seems as though studies less than five meetings in duration generally show a higher proportion of network science sources, after which the curve more or less flattens out. Note that network science sources include both lobbyist science sources and government science sources, and neither of these individually demonstrate this associative pattern. This raises the question of whether study duration might be associated with certain types of problems. First, if we look at the same scatter plot but use colour coding to identify the distribution of value frames, we see at least two notable distinctions: (1) public accountability studies are short in duration and dominate the higher network
science source proportions, and (2) social progress studies demonstrate the opposite characteristics (Figure 24). By contrast, value frames such as economic development and scientific uncertainty follow the curve and are not concentrated among longer studies or shorter studies. The same visualization technique applied to problem types or end use does not reveal any distinctive patterns that stray from the overall trend line.

**Figure 24. Network-tie science sources—studies categorized by value frame**

These three methods are obviously not the only way one could qualify this set of studies, and it’s not a given that these categorizations can provide an answer to this particular question. A closer content analysis would be the best method of determining whether there is any definitive explanation for the observed trend apart from our initial hypothesis regarding time constraints. For example, eight of the ten public accountability studies were either: (a) inquiries requested by a constituent, or (b) debriefs on specific government agency policy agendas. In the first scenario, constituents were asking for government science expertise to address local environmental concerns or accusing either government or industry of engaging in practices that harm their environment. Both constituent and agency study triggers present a reasonable explanation for the types of science sources consulted and to some extent the brevity of the studies.
5.5 Conclusion

Previous researchers have expressed the need for more scholarship examining the information practices of legislative contexts outside of the United States, with several authors pointing to the lack of empirical data on Canadian policy makers specifically. Significant science bodies have also called for more research examining policy makers’ processes of becoming informed, while others have pointed to the need for a closer examination of the sources of information that influence policy. This chapter has provided a descriptive analysis of primarily qualitative categorical variables collected from observational data that is openly available online. The intention has been to identify patterns evident in the collective information-seeking practices of this previously unstudied federal environment, and begin to ascertain their relationship to political behaviours.
CHAPTER 6. CONCLUSION AND FUTURE RESEARCH

As members recognize, it’s a matter of us collecting information on all sides of the issue and trying to understand it better . . .

Through their formal mandates and daily practice, Canadian federal agencies responsible for environmental oversight demonstrate strong expectations regarding the role of scientific information in environmental policy and decision making. At the same time, major environmental legislation such as the Environmental Protection Act note “the integral role of science,” even stating that it is a “duty” of the Government of Canada to apply scientific knowledge as well as traditional aboriginal knowledge to environmental problems (Canadian Environmental Protection Act, 1999).

Typically, uses of scientific expertise are framed in one of three ways: scientists can describe the basic dimensions of environmental problems, clarifying both what is known and what is uncertain about natural systems and our interactions with them; they can propose methods for resolving these problems, though feasibility generally depends on various value-based considerations; and finally, it is often expected that probabilistic approaches can be used to estimate not just environmental consequences of current activities but also the potential economic and social consequences of environmental policies (Steel et al. 2004, 3).

This study considers the role of scientific expertise in the context of House of Commons standing committees.

Policy work within Canada’s parliamentary committees is framed as a democratic, rather than primarily technocratic, process. As deliberative information environments, Canada’s House of Commons standing committees are expected to serve multiple purposes. They are mandated to examine policy issues in-depth, based on the notion that these small settings provide a better venue for thoughtful examinations of evidence, as well as more civilized discussion and analysis than what is possible during full House debates. At the same time, they are expected to act as the main democratic platform for constituent views on federal policy issues. Finally, the committee system permits the country’s elected representatives to directly inquire into the practices of federal public agencies in order to hold the government to account on behalf of the public. All of these functions constitute legitimate democratic aims that should reasonably be part of a contemporary governance model. In practice, however, the system’s stated purpose of comprehensively
assessing information as a mechanism for improving policy sometimes may conflict with its other
democratic or politically strategic objectives.

Because it has failed to explicitly examine or articulate the means by which various kinds of stakeholder and
expert sources can contribute to the inquiry process, the system tends to conflate, confuse, or even overlook
their epistemic and social value. For example, according to the data examined here, public accountability
studies in which committee members query ministers and departmental bureaucrats about policy and
regulatory practices tend to be short studies that rely entirely or primarily on government sources. This
contradicts the stated purpose and carries inherent limitations. Public servants are currently bound by their
contractual duty of loyalty to convey only the official government line. Excluding external scientific
expertise from these meetings may inhibit committee members’ capacity to obtain genuine information
about pros and cons or to learn about other approaches that may have been assessed and proven in other
environments.

One potential solution may well be the current efforts of the public service unions mentioned in Chapter 5.
Government scientists are trying to renegotiate their collective agreements, hoping to insert a new scientific
integrity clause that will permit them to share their expertise as a perspective that is independent of official
government policy positions. This may be particularly helpful in the committee context analyzed here.
Alternatively, members of Canada’s scientific community have also called for more input from independent
scientific bodies (Grisé 2013; Hutchings, Walters, and Haedrich 1997; Keith 2015). Although Royal Society
expert panels are sometimes called upon to act as special advisors to legislators, past attempts to create
enduring, publicly responsible scientific advisory bodies such as a National Science Advisor (a position that
has proven useful in other Westminster systems) were phased out when the Conservative party came to
power in 2006.15 It certainly would be prudent, as long as duty of loyalty pledges remain in place, for House
of Commons committees to make a more conscientious effort to seek out independent, non-government
science perspectives when probing existing government policies. This should not be confused, however,
with seeking special interest input on scientific issues in order to give democratic voice to constituents—an
equally valid but distinct informational practice (Dietz 2013).

15 The National Science Advisor role was eliminated without consultation, and replaced in 2008 by an innovation-
oriented body that provides confidential, non-public advice to government—the Science, Technology and Innovation
Council (http://www.stic-csti.ca).
The Westminster parliamentary system was born and developed at a time when orally consulting expert witnesses constituted the most comprehensive and useful way for legislators to inform themselves. In certain cases, this may no longer be true. Legislators regularly extoll the virtues of Library of Parliament analysts, who have the capacity to comprehensively review, understand, and summarize relevant bodies of literature, and generally help to provide useful context on complex issues. In today’s world, it may make sense to dedicate committee consultation to a public deliberation process that avoids the currently ambiguous distinctions between “experts” and “stakeholders” and focuses on giving voice to constituents. Library of Parliament analysts could play a more central science communication function, serving as bridges between expert knowledge communities and members of parliament. However, to ensure the transparency and accountability expected, the contributions of Library of Parliament analysts must become part of the public record, unlike today. Indeed, I argue strongly that this information should already be part of the public record and that the current policy of non-disclosure is quite problematic. In a representative democracy, citizens deserve to know what information parliamentarians are relying on when making policy recommendations or decisions. Particularly when citizens’ privacy or security are not at stake, limiting the public record to oral testimony while excluding the written evidence received—including both stakeholder briefs and Library of Parliament analysis—represents a major gap in parliamentary accountability.

In the case of controversial inquiry topics such as the two special bill studies, rather than relying solely on government science as described above, committees demonstrated quite the opposite approach. Policy makers often referred to the need to “balance sides” and they tried to choose witnesses based on the idea that an equal sample is needed from different stakeholder camps (though to what extent this occurs depends on the power dynamics of the committees). This information-seeking tactic was also evident in the small, constituent-driven inquiries. Here constituents present their issue; the committee listens first to their experiences and then asks the “other side”—whether that be government bureaucrats or particular industry representatives—to justify their positions. Or, as in the example of the non-controversial biotechnology study undertaken by the Agriculture committee, industry experts are numerically balanced against university researchers, perhaps as a means of ensuring that the committee is not unduly swayed by industry’s enthusiasm or perhaps simply to look objective on paper.

One interpretation of this balancing behaviour is that it represents an appropriate means of democratizing knowledge; certainly in some ways it meshes well with the definition of democracy discussed in Chapter 2 wherein the interests of all recognized members of a state are to be valued equally by those who have the
authority to make decisions on their behalves (King 2003). Committees demonstrate that stakeholder experiences and expectations, official government positions, and expert research findings are being assessed as information sources of equal validity and value. What the committee system does not seem to acknowledge is that in such situations the weight (i.e., power) of the information conveyed is perhaps most likely to come from something other than the information itself.

The notion that well-reasoned consideration of all sides of an issue is a necessity for responsible self-government is central to the writings of John Stuart Mill (1871) and many other seminal political philosophers. It is also at the heart of arguments about the value of a free press and free speech. Yet decades of research now demonstrate the general ineffectiveness of this all-sides approach as a means of improving understanding of complex and controversial issues in deliberative contexts. The evidence indicates that pre-existing values largely determine how people evaluate new information. Particularly in polarized environments, group exposure to the same information but representing different sides of an argument—no matter how valid or invalid that information is—will generally lead those involved to become more convinced by the information that confirms their pre-existing expectations and more suspicious of the information that does not, to the point where their views often become even more extreme than they were before (Lord, Ross, and Lepper 1979; Glaeser and Sunstein 2009; Glaeser and Sunstein 2013). Recognizing and addressing how differences in the power of the messenger impact information’s salience is no minor point. Conducting inquiries in this way may support a democratic imperative of giving voice to all sides, but it is unlikely to be an effective means to build consensus among political parties or constituents themselves, nor does it appear to be a generally productive method of elucidating complex issues.

Certain boundaries and disparities have long been noted in the epistemic models used to develop scientific knowledge and those generally applied in judicial and legislative environments (Jasanoff 1987; Stern 2005). For this reason, it would be a valuable exercise for those responsible for committee infrastructure and practice to examine whether current deliberative strategies serve their stated aims, or even whether these aims should be re-considered. For example, rather than blending stakeholder consultation with expert consultation, in certain circumstances it may make sense to articulate stages of inquiry in which different types of witnesses are consulted with different informational and political expectations (U.S. National Research Council 2008). However, a key question is whether it even makes sense for us to foreground objective epistemic goals when examining deliberative environments like Canada’s standing committees. Are these the primary, or most significant, objectives of these committees’ information practices?
The two typologies used in this dissertation were incorporated on the premise that committee work is by and large “information work” meant to increase policy makers’ collective knowledge. Some of the limitations of the typologies surface when we recognize that—except perhaps in certain educational settings—information work is rarely the principal activity, but instead embedded within environments where parties have multiple intentions, often without recognizing potential incongruities between these objectives. In part because committee work isn’t strictly for edification purposes, some committee studies demonstrated ambiguous aims, which made it difficult to classify their problem structures and sometimes to understand the point of the exercise at all.

Typologies themselves can be difficult for their creators to fully articulate; they are unlikely to be universal, and therefore can be challenging to apply to new situations even when seemingly appropriate to do so. Nonetheless, this dissertation’s findings indicate that further refinement and exploration of how we might better account for users’ values appears worthwhile. The observational data collected here created perhaps the clearest picture through the application of Nisbet’s (2010) value frames. The need for researchers to examine how and when policy makers’ value considerations impact political uptake of research findings and other forms of information has previously been established (U.S. National Research Council 2012). This study demonstrates that value frames, depending on power dynamics within the system, are associated with consultation of particular types of sources as well as a greater or lesser interest in scientific input.

The dominance of value frames such as economic development, social progress, and public accountability in evaluations of environmental policy easily lent themselves to lobbyist (both industry and environmental organizations) and government perspectives. Thus it is not terribly surprising to see lobbyist and government sources playing such a prominent role overall, with other types of sources such as academic researchers, other civic groups, and First Nations representatives—who undoubtedly have relevant perspectives to offer on environmental policy issues in Canada—less notable in our data. Whether value orientations beget systemic information choices or the system leads to convenient value frames is an open question. In general, while expressed motivations vary, the primary outcome for these deliberations appears to be to document major stakeholder perspectives and government positions rather than to fully assess the value or relevance of the information presented as a mechanism for helping to solve policy problems. This result to some extent supports King’s (2003) suggestion that deliberative democratic activities are best suited as platforms of justification rather than epistemic enlightenment or consensus-building. If this is the
case, perhaps the mandates of standing committees should be adapted to reflect this primary function, and committee practice should evolve accordingly.

6.1 Future Research

Resources and time constraints required limiting this particular study to the exploration of a subset of the rich observational material actually available on standing committee activities. This dissertation concentrated on trying to build a general, foundational picture of committees as information use environments. It focused on discovering which factors appear to be more and less relevant within this previously unexamined setting. The prologue of this dissertation includes a set of telling and typical quotations from Canada’s members of parliament, drawn from the committee studies sampled for this research. Further content and discourse analysis of these same committee meeting transcripts, examining in particular the questions and perspectives of members of parliament as information seekers could be an excellent complement to the initial findings described here.

Committees emerged as an obvious unit, each essentially representing its own unique information use environment. In the Canadian context, particularly with the move toward further democratization of knowledge in the policy setting, it would be interesting to evaluate a relevant body of Aboriginal Affairs standing committee studies to compare to the cases looked at here. As well, data now exists for a second majority Conservative session (41-2), which could be helpful in ascertaining to what extent the patterns identified here apply more broadly. Again, however, now that this foundational understanding of committee patterns has been established, concentrating more on committee discourse itself, on the role of network sources, and on outcomes such as committee report content including citation analysis are all research directions likely to provide interesting contributions to our understanding of Canadian legislature as an information setting.

6.2 Conclusion

This research was motivated by several long-standing areas of interest. The first stems from my professional background as a news editor for a now defunct, major Canadian weekly. I have witnessed first-hand the deterioration of the press’s capacity to serve as a reliable fourth estate over the past two decades. Canadians today have limited access and insight into federal legislative behaviours and actions. In discovering this rich mine of publicly available structured data on federal government activities I was curious to know: in what ways might this information serve public interests, and might there be a way for me as an academic to put
this new source of information to use in a way that Canada’s media or general public cannot, particularly under current market conditions?

The second stems from my intellectual interest in how we learn, how we reason, how we evaluate information in order to make decisions for ourselves and those we love—in particular, how we do this in highly social environments for collective aims. The third stems from my curiosity about how the library and information science disciplines might uniquely contribute to the growing discourse regarding the use of scientific evidence in democratic settings, especially in an era with extremely polarized views and new philosophies regarding the democratization of knowledge. The concept of deliberative democracy as an instrument for genuine civic participation continues to grow in popularity. Those who study the effectiveness or limitations of democratic deliberation tend to do so by concentrating on experimental conditions. These deliberative constructs are primarily viewed as a political philosophy rather than a standard part of democratic governance. Still, many hope that such activities will lead to more active civic involvement in decision-making, greater public understanding of shared issues, and perhaps also more consensus. The reality, I think, is that versions of this kind of deliberation have long been part of many governance models, even if not always influentially so. Rather than relying solely on controlled experimental designs, we might also benefit from observing what has been taking place in these entrenched real-world environments. New developments in the world of open data may help us to do so.
REFERENCES


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APPENDIX A. COMMITTEE MANDATES

Note: All committee mandates quoted directly and in full from 41-1 parliamentary session documentation. Retrieved online: 04/04/2015.

Standing Committee on Agriculture and Agri-Food (AGRI)

The Standing Orders of the House of Commons give all standing committees the mandate to exercise certain general powers. Standing Order 108(2) gives committees the power “to study and report on all matters relating to the mandate, management and operation of the department or departments of government which are assigned to them.” For a more detailed overview of parliamentary committees, please consult the Compendium of House of Commons Procedure.

Generally speaking, the Standing Committee on Agriculture and Agri-Food may examine any issue related to Canada’s agriculture and agri-food industry. It is a public forum where specific events or initiatives affecting the sector can be addressed.

More specifically, the Committee focuses on bills, expenditures and activities of the organizations that are part of the Agriculture and Agri-Food portfolio:

- Agriculture and Agri-Food Canada (AAFC);
- The Canadian Food Inspection Agency (CFIA);
- The Canadian Grain Commission (CGC);
- The Farm Products Council of Canada (FPCC);
- Two Crown corporations:
  - The Canadian Dairy Commission (CDC);
  - Farm Credit Canada (FCC).

The Standing Committee on Agriculture and Agri-Food also examines the activities of other organizations that are not part of the Agriculture and Agri-Food portfolio, such as the Canadian Wheat Board (CWB) and the Pest Management Regulatory Agency (PMRA).

An important part of the Committee’s mandate is to study and vote on the items for the various agencies in the Agriculture and Agri-Food portfolio.
Figure 25. Department of Agriculture and Agri-Food's purview (2011 snapshot)
Standing Committee on Environment and Sustainable Development (ENVI)

Under Standing Order 108(1), the Committee examines, enquires into and reports on matters referred to it by the House of Commons, including legislation, departmental activities and spending, reports of the Commissioner of the Environment and Sustainable Development, and other matters related to the general subject matter of the environment and sustainable development.

As well, under Standing Order 108(2), the Committee studies and reports on topics ENVI itself chooses to examine relating to the mandate, management and operation (including policies, programs and legislation) of Environment Canada, Parks Canada and the Canadian Environmental Assessment Agency.

ENVI web page. About this Committee – Mandate. 41st Parliament, 1st Session (June 2, 2011 - September 13, 2013). [Link]

Figure 26. Environment Canada's purview (2011 snapshot)
Standing Committee on Fisheries and Oceans (FOPO)

The House of Commons Standing Committee on Fisheries and Oceans (“the Committee”) studies and reports on matters referred to it by the House of Commons, or on topics the Committee itself chooses to examine. It is a permanent committee established by the Standing Orders of the House of Commons (S.O. 104(2)(h)). Legislation, departmental activities and spending, and other matters related to the general subject matter of the Committee may be referred to it from time to time.

Powers

Under Standing Order 108(1), standing committees can examine any matters referred to them by the House of Commons or as required by legislation. They can report to the House, send for persons or records, and delegate their powers to subcommittees. They can sit whether the House is sitting or adjourned, and may sit jointly with other standing committees. In general, committees can study and report on:

- legislation relating to the department(s) under their purview;
- program and policy objectives of the department (by reviewing the department’s annual Report on Plans and Priorities);
- immediate, medium and long-term expenditure plans of the department, and the effectiveness of their implementation (by reviewing the Main Estimates and Supplementary Estimates throughout the budgetary cycle);
- the relative success of the department, as measured by the results obtained as compared with its stated objectives (by reviewing the annual Departmental Performance Reports); and
- other matters relating to the mandate, management, organization or operation of the department, as the committee deems fit.

Under Standing Order 108(2), the Standing Committee on Fisheries and Oceans can study the policies, programs and legislation and any matter of interest, as they see fit, related to the department assigned to it, namely, Fisheries and Oceans Canada (DFO). Various independent agencies and Crown corporations are also assigned to the Committee:

- Freshwater Fish Marketing Corporation;
- Atlantic Fisheries Licence Appeal Board; and
- Pacific Region Licence Appeal Board.
When reviewing bills referred to it by the House of Commons, a committee may study each clause of the bill and report the bill back to the House, with or without amendment. When bills are referred to a committee after second reading, any amendments proposed must not run counter to the fundamental principle and scope of the bill. However, Standing Order 73 also allows for a bill to be referred to a committee before second reading, thus providing the committee with the opportunity to amend the draft legislation more substantially. Furthermore, committees may be asked by the House of Commons to review draft legislation before it is introduced in the House.

FOPO web page. About this Committee – Mandate. 41st Parliament, 1st Session (June 2, 2011 – September 13, 2013). [link]

Figure 27. Fisheries and Oceans Canada purview (2011 snapshot)
Standing Committee on Natural Resources (RNNR)

Established by the Standing Orders of the House of Commons, the mandate of the Standing Committee on Natural Resources is to study and report on matters referred to it by the House of Commons, or on topics the Committee itself chooses to examine. It can study all matters relating to the mandate, management, operation, budget and legislation of the Department of Natural Resources and of organizations pertaining to its portfolio.

Created on June 25, 1993 through a merger of the Department of Energy, Mines and Resources and the Department of Forestry, the Department of Natural Resources (NRCan) comprises four major industrial sectors: the energy sector, the forest sector, the minerals and metals sector and the earth sciences sector. The Minister of Natural Resources is also responsible before Parliament for the Canadian Nuclear Safety Commission, Atomic Energy of Canada Limited, the National Energy Board, and the Northern Pipeline Agency.

After having been associated with other committees – Aboriginal Affairs (2001-2004) and Industry, Science and Technology (2004-2005) – the Natural Resources component was back, at the beginning of the 39th Parliament in 2006, under the purview of a single committee, the Standing Committee on Natural Resources.

Figure 28. Natural Resources Canada purview (2011 snapshot)
Standing Committee on Environment and Sustainable Development

ENVI • NUMBER 056 • 1st SESSION • 39th PARLIAMENT

EVIDENCE

Tuesday, May 8, 2007

Chair

Mr. Bob Mills
Standing Committee on Environment and Sustainable Development

Tuesday, May 8, 2007

The Chair (Mr. Bob Mills (Red Deer, CPC)): I'd like to call this meeting to order. Welcome to our guests who are on the video and our two guests who are here.

Just for the committee's information, I will be tabling Bill C-307 tomorrow. Mr. Kevin Parks cancelled last evening; however, he has a brief that will be handed around. The clerks are putting that together right now.

We will try to deal with the motions close to the end of the meeting. If need be, we will go slightly longer to take care of them.

Can our guests on the video screen hear us? Okay. I think we'll start with your presentation. If you can keep it to 10 minutes, that will give the members an opportunity to ask questions. From there we'll go to Mr. Schwartz and finally to Ms. Ernst.

I have a magic timer here to keep track of your time. Please begin.

Mr. David Pryce (Vice-President, Western Canada Operations, Canadian Association of Petroleum Producers): Thank you, Mr. Chairman and members of the committee.

My name is David Pryce. I'm vice-president of western Canada operations with the Canadian Association of Petroleum Producers. I appreciate the opportunity to talk with you today, and my apologies that I was not able to get down to Ottawa.

With me today I have Cam Cline, who's an engineer with 23 years of experience, and Marc Dubord, who's a hydrogeologist with 15 years of experience. They're representing the Canadian Society for Unconventional Gas and are here to provide assistance in answering any of the technical questions you may have.

I understand you have our slide deck with you. If you turn to the first slide, it will show the outline.

What I want to do is cover very briefly what natural gas from coal is and where it is in Alberta, then talk about typical operations we have in developing this resource. I also want to spend a little time talking about a stakeholder consultation process that has gone on in Alberta and about some of the issues and concerns and what's being done to address them, and then, finally, put this in the context of Canadian gas production.

It's a lengthy deck, so I will move quickly through it to meet the time constraints. If you have questions that I don't cover, you can catch us at the end of this.

On the next page, "Natural Gas from Coal in Alberta" is the title. Really, natural gas from coal is found across Canada. I want to focus on Alberta because that's where the industry activity is occurring at this time. The map shows the various horizons or zones where natural gas from coal—or coal-bed methane, as it is also known—can be found.

I want to focus on the three zones that are attracting industry interest at the moment. The first is the Horseshoe Canyon. It has about 66 trillion cubic feet of resource and is probably the largest play in the world right now. But it is in its infancy, as all of them are. Current production is around 600,000 cubic feet per day. That's where our focus is at the moment.

The second, the Mannville zone, is a huge resource, and it is at the point of trying to determine technically whether it can be produced on a commercial basis. It is associated with salty water typically.

The third zone is the Ardley zone, another large resource, which can be associated with either salt water or fresh water and in some cases is dry. This particular zone is sitting in abeyance for development, as we wait for rules to be developed on how we will deal with the fresh water that might be produced with it. So there's not a lot of activity in that particular horizon.

I think the bottom line is that there's a huge resource potential. It is in its infancy, and we are looking at ways to make this a commercial play.

The next slide—the next few slides, really—talk about the typical footprint we might have out on the landscape. This particular one is a drilling operation that is in effect. It is an operation that really is for coal-bed methane, or natural gas from coal. It has a much smaller footprint as we do these kinds of activities: smaller and fewer pieces of equipment and minimal surface disturbance is the typical way we do things. We don't necessarily strip off the vegetation and topsoil; we try to get in and out with minimal disturbance.

The next slide shows the next phase in activity. This is a well stimulation operation. This is where we inject, typically, nitrogen gas down the hole to try to enhance and flush the reservoir to better encourage production. As with the drilling operation, a minimal footprint objective is what we're trying to achieve.
In the next slide, titled “Well Construction”, what we're trying to convey is the engineering and regulatory measures that are in place to ensure that we separate our production zone from the upper water aquifers. What we are required to do by regulation is apply a surface casing and cement it in place and then a production casing and cement it in place. The intent of that, as I said, is to separate the producing zones from the upper aquifer zones.

If you move to the next slide, titled “Well Depths”, what we're trying to show is the vertical depiction of the different wells we deal with. On the left side is a typical residential or farm domestic well. That's usually completed in the 10- to 100-metre range. The next well is the dry “natural gas from coal” well typical of a Horseshoe Canyon well, subject to those well completion requirements I mentioned before. It is usually completed in the zone somewhere around 200 to 800 metres in depth to access those coal seams. Again, it's typically a dry well, with no fluids associated with it.

The next one is the Mannville well. It is deeper and typically associated with salt water.

The final well is a typical disposal well. The point of this last piece is to indicate that any salt water we produce are required by regulation to inject downhole. When you look at the slide as a whole, we're trying to show that there is a significant vertical separation between the upper water aquifers, where domestic wells typically occur, and the producing zones we have.

The next two slides show the pipelining procedures. We install pipelines to get the gas to market. With coal-bed methane the pipelines are relatively small—six inches down to less than four inches. When it's around six inches we do a little bit of topsoil stripping to preserve and protect the topsoil. Then we plow the line in.

The next slide shows the plowed-in pipeline four inches or smaller. We're able to plow that right in without any topsoil disturbance. The goal overall is to minimize the footprint, minimize the disturbance, and protect the topsoil.

Next is the sound attenuating compressor. Noise is one of the issues that has been raised from time to time, and we have the technical capability to minimize that through sound attenuation control. We are subject to the rules of the Alberta Energy and Utilities Board and the National Energy Board, which set the standards or criteria around noise. Where it's needed and appropriate, we have the ability to apply sound attenuating equipment on compressors.

The next slide is on stakeholder consultation. This is not a new issue for the industry, nor is it a new opportunity in terms of a resource. It was developed several years in advance in the United States. We've been learning from that experience, but we also have our own experience in developing conventional oil and gas. With that experience comes the regulatory environment. Notwithstanding that, because it's a resource that's moving forward in Alberta, questions arise around how to develop it responsibly.

The Government of Alberta installed a MAC, or multi-stakeholder advisory committee, in 2003. It was led by the departments of energy and environment. As a stakeholder group they tried to identify the issues that might be of concern to folks to determine if the regulatory environment addressed them or if new measures were required.

Do we have confidence that the regulatory environment is adequate? Does it protect the water? Does it deal with the surface impacts that might be associated with natural gas from coal development, such as well density, the number of wells and their proximity together, the number of roads, the level of activity and noise, and the cumulative effects of those things? There are also questions around air quality, the overall pace of activity, and the effectiveness of the interrelationship or communication among industry, government, and the land owners.

Our view is that we have a pretty strong regulatory environment in place. It has been in place for decades, as a result of the evolution of the conventional aspect of the oil and gas industry. Coal-bed methane development is quite similar in its process to conventional development methods. So the regulatory environment deals with issues around well density or well spacing, flaring, noise, and how we protect downhole for the upper aquifers with the casing and cement methodologies. It deals with handling saline water or produced water and mechanisms whereby we're required to have consultations with the landowners.

In Alberta we have surface rights and subsurface rights, and we need to reconcile those rights. We have a Water Act in Alberta that's been in place for more than a decade. It provides controls for our industry, through permitting and licensing processes, as we look at ground water and surface water.

Having said that, the MAC process raised some questions and challenged whether there were things that could be done better. I'll talk to that in the next few slides.

The Chair: Mr. Pryce, I just want to let you know your 10 minutes are up, so please conclude.

Mr. David Pryce: I will summarize.

There are mechanisms in place around water protection. There are mechanisms in place, both technical and regulatory, for managing our footprint, as you can see in the subsequent photos, by pulling well heads together and drilling from a common pad. There are mechanisms for dealing with the air issues that are being raised.

We support the recommendations of the MAC process. We've done things to improve the regulatory requirements around stimulation of wells and well testing. CAPP has put its own best management practices in place to guide our membership. Other associations are looking at ways of doing business better with land owners.

The second-last slide shows the role that CBM is going to play in the future—it's about 8% to 10% of Canada's gas production profile.

So my time is up. There is a summary slide at the back that I will leave to you. My only other comment is it's a huge resource with vast potential. There are technical challenges we're working through, and there are strong regulatory rules in place to manage it.

Thank you very much.
The Chair: Thank you very much, Mr. Pryce. Sorry for the short time, but it does go very quickly.

I will move to Mr. Schwartz. As members recognize, it's a matter of us collecting information on all sides of the issue and trying to understand it better, as it does apply right across Canada.

Mr. Schwartz.

Mr. Robert Schwartz (Director, Pine Lake Surface Rights Action Group): Thank you, Mr. Chairman.

First, I'd like to thank the members of this committee for actually agreeing to hear this issue. Thank you very much.

My name is Robert Schwartz. I live near Red Deer, a city located in the southern third of Alberta, approximately 100 kilometres east of the eastern slopes of the Rockies.

Is coal-bed methane a federal environmental issue? To answer this question, we must understand what coal-bed methane gas is and how CBM production differs from conventional oil and gas production. We must also understand the magnitude of the proposed development and how it will affect the hydrology of the interprovincial watershed.

I would like to quote two passages from Alberta's Earth Sciences Report 2003-2004. The first quote is:

These tests suggest producing water from these aquifers initiates flow from the aquifers, flow across aquifer-saturated boundaries and potentially flow from surface water bodies. These connections became evident under relatively low flow conditions when compared to production rates that would be associated with coalbed methane development.

The second quote from the same report states:

Under this scenario, one of the potential receptors of this produced water is surface water, such as rivers and lakes.

I would also like to quote Mr. Neil McCrank, past chairman of the Alberta Energy and Utilities Board, the regulatory body that we deal with there. In 2006, as a speaker at a Canadian Society for Unconventional Gas conference, Mr. McCrank stated that there will be 25 to 50 times as many wells drilled for coal-bed methane than have been drilled for conventional oil and gas.

To date there have been 327,000 conventional oil and gas wells drilled in Alberta. If the past chairman of AEUB is correct, there will be 8 million to 16 million CBM wells drilled in this province. Most of these 8 million to 16 million wells will produce coal-bed methane gas from many shallow or thin coal layers that also contain fresh water. These coal seams have a hydrological connection to the interprovincial watershed. These seams can be seen at many places along both the Red Deer River and North Saskatchewan River.

The southern third of the province of Alberta is the headwaters of this major interprovincial drainage system. This headwater drainage area flows via the Oldman River, the Bow River, the Battle River, the Red Deer River, and the North Saskatchewan River. The Red Deer River and the North Saskatchewan, in particular, are used as a spawning ground for Lake Winnipeg whitefish and touladi. All of the rivers mentioned are used, to some degree, as spawning habitat for many fish species originating in Manitoba. These river systems all discharge into Hudson Bay via the Nelson River. These river systems, as well as being a vital component of a viable fish population in Manitoba, are a vital source of potable water in Saskatchewan.

The geological layering of subsurface Alberta is interesting. We know that the surface, precipitation and river flow is from west to east. Precipitation that becomes ground water through soil absorption follows the underlying geology and flows as groundwater from east to west in the Red Deer area. Much of this groundwater does not travel far west before it is discharged through springs and seeps into the deep gorges of these interprovincial river systems.

If one thinks of the eastern slopes and foothills of the Rockies as a 100,000-square-mile sponge that moderates river flows, this would be a correct analogy. This hypothetical sponge would lie above the Lee Park formation. The Lee Park formation is the shallowest impermeable formation above which all other formations are considered to be unconsolidated. The hydrology above the Lee Park formation is known to have small impermeable lenses capable of trapping gas. As a whole, all geology above the Lee Park formation is considered permeable and homogeneous. What Alberta allows to happen in this sponge will certainly have downstream consequences.

The AEUB special report number 81, published in September 2006, admits in the executive summary that a hydraulic connection exists between the different portions of coal-bearing formations on a regional scale. Most coal-bed methane development will take place above the Lee Park formation, whereas most conventional oil and gas production takes place below the Lee Park.

I hope my explanation of the general geology of Alberta has kindled a federal interest in what type of activity takes place above the Lee Park. All water above the Lee Park, whether it's precipitation, groundwater, or surface water, eventually ends up as interprovincial river flow.

Conventional oil and gas production takes place predominantly below the Lee Park. These host rock formations are capped by impermeable lenses of material that prevent the upward natural migration of oil and gas. The oil and gas trapped in these host rock formations is thermogenic—that is to say, conventional oil and gas has been produced by heat and pressure. This process of converting prehistoric plant and animal matter into oil and gas has long since expired. There is no more conventional oil and gas being created. Because of the geological age of conventional oil and gas, it is nearly always associated with highly saline water, which is the remnant of a vast inland salt water ocean.

Provincial regulation mandates that conventional oil and gas wells isolate potable groundwater from saline water by means of cemented surface casings, inside which are cemented production casings that are run right to the bottom of the well. The hypothetical freshwater sponge zone mentioned earlier is by and large protected, although a significant percentage of all surface casings develop leaks. These leaks are required to be repaired under current provincial conventional oil and gas regulations.

Coal-bed methane is a completely different situation. CBM is produced from shallow geologic zones that have historically been excluded from production by previous regulations.
The origin of CBM is entirely different from conventional oil and gas. CBM is the result of present-time microbiological organisms that produce methane as a waste. This microbiological process is dependent on the presence of non-saline water. The coal seam only acics as a host rock in which the methane collects. The presence of coal is not critical, or even necessary, for the microbiological production of methane gas; coal seams are merely the most porous geological formations and thus the most efficient medium from which to extract methane. I'd like to add that some coal seams have a porosity high enough that they will allow a water flow rate of 800 metres a day. These are aquifers, and moving aquifers.

The regulations that have historically protected these hypothetical sponges have been relaxed. The new regulations have, by and large, been put forward by industry and summarily adopted by the Alberta government regulators. These new regulations allow for and authorize many practices that will have a profound negative effect on groundwater and consequently river water.

The new CBM regulations allow for the dewatering of coal seams and the injection of this water into deeper saline zones. This dewatering of coal seams, necessary to induce gas flow into the well bore, will have the delayed effect of reducing river flows, as the creation of dry depressurized zones in the near-surface geology will surely acquire river water to replace that which was removed.

The new regulations allow for the commingling of production of a well from all zones capable of being produced. In other words, this allows shallow CBM gas to be produced from the same well bore as, and at the same time as, deep conventional gas.

As a point of reference, in water well construction, the practice of producing potable water from more than one aquifer has been banned for years.

It is reasonable to expect that water will drain from an upper freshwater formation into the lower saltwater formations—

The Chair: Excuse me, Mr. Schwartz, your time is up. Perhaps you could summarize the main point you'd like the members to hear, and I'm sure you can get the rest in as the questions go around. So if you could summarize as quickly as possible, that would be great. Thanks.

Mr. Robert Schwartz: Thank you.

It is reasonable to expect that water will drain from an upper freshwater formation into the lower saltwater formations due to depressurization from previous conventional gas and oil production. To my knowledge, there has never been a study done to determine the probable effect of having 8- to 16-million vertical conduits installed that are capable of transferring potable groundwater to deep saline zones. That water is gone forever.

The new regulations do not require the industry to repair surface casings or leaks on conventional wells. All that is required is to connect the surface casing vent to the gas sales pipeline. There is no requirement to identify how much water is flowing down the old well bore and into deep saline conventional zones. This water will be lost forever, and it will certainly never reach Hudson Bay.

The new regulations allow for unrestricted injection of formation stimulants such as benzene, toluene, xylene, synthetic oils, and methanol into freshwater zones below 600 metres. This is achieved by a process called “fracing”. Tons of these chemicals are currently being used. This contaminated groundwater will eventually surface as river flow. Based on a 30-year-old incomplete database, the base of groundwater protection is actually set at less than 600 metres in many areas. In other words, these toxins are now being injected into freshwater formations as shallow as 200 metres.

The industry-inspired new regulations do not protect groundwater at all below 600 metres from chemical injection, even though we have known areas of pristine groundwater in the foothills that are a kilometre and a half deep—

The Chair: Mr. Schwartz, I really apologize. You're at 13 minutes now. Obviously, then, I would have to do it for everyone. So to give members the maximum chance, I would like to go on to Ms. Ernst, and then you can finish it up as you answer the questions. Thank you.

Ms. Ernst.

Ms. Jessica Ernst (Environmental Specialist, Ernst Environmental Services): Good morning, Bonjour.

I grew up in Montreal. I now live in Alberta. I'm very sorry, but I have forgotten all my French. I live near Rosebud, Alberta. It's a small, little-theatre cultural town with a lot of beautiful historic resource.

I have worked in the oil patch for 25 years. I have also been banished by the regulator that Mr. David Pryce was so proudly discussing earlier in his presentation. I believe I was banished—this was in writing—by the energy regulator because they were trying to intimidate me.

I have evidence of EnCana Corporation not complying with the noise regulations, and the EUB actually covering up for the non-compliance in writing. I believe that the EUB, the regulator, did this to try to silence me. They copied the RCMP. So I'm very surprised that you, honourable members, here have allowed me to speak, because I do believe this was the first time this had happened in Alberta. I have been informed that the banishment was a violation of the Canadian Charter of Rights.

I grew up proud to be a Canadian. I grew up proud of our water, our leadership on peace and mediation, and environmental issues globally. I have worked in other parts of the world. I have to admit, I'm ashamed to be Canadian now, and I plead to you all as this committee to listen carefully and review the documents, and carefully consider whether the federal government needs to get involved.

I have never seen such atrocities in my 25-year career of working in the oil patch as I have now seen in the boom: human rights violations, environmental degradation, and disrespect of the legislation and the regulations.
In regard to noise, the other day when I was leaving from the airport, the night before I left, the compressor noise—we're surrounded by 13 EnCana compressors—drove me to distraction. Occasionally the noise is mitigated, but not always. There's a straw-bale wall surrounding these compressors.

I have direct experience with the water. This is my water, on fire, from my tap, poured into a pop bottle, a water bottle. There is no sugar in there. A few minutes later I set it on fire. I've lived in my place since 1998, 50 acres. CBM came and my water dramatically changed—a chemical burst on my skin and eyes. My dogs not only refused to drink the water, but they would back up. White smoke was coming off the water.

There were whistling taps. I didn't know what it was. I was really busy. I thought it was my plumbing. I thought, "Oh my goodness, I have to replace the taps." Little did I know that I was living in an explosive time bomb. It was methane and other hydrocarbons coming out of my taps. Sometimes I couldn't even close my taps there was so much gas. I couldn't get luuds out of my soap or shampoo anymore; the water changed.

Also, living ruraly, you know you get stains on your plumbing and toilets—sorry to speak so intimately. All of a sudden my toilets went pristine, brand new. Something got rid of the stains, I think probably what was burning my skin.

Mr. Pryce mentioned the good regulations. This happened in 2004. These are the two aquifers in my community. This is an EnCana well. It fractured into—into—our aquifers. So the protection and the separation that was discussed is not possible. Perforations, which explode through the casing, and then the fracs, and who knows what solvents went into our aquifers?

In the States, EnCana was found to contaminate groundwater and did not protect health and safety.

This again is another picture of my water, a different picture. I don't do this in the house anymore because the flame exploded so high it shot up to the ceiling. I'm a blur in the picture—this is me here—because I had to jump; it scared me.

We have one out of 20 resource wells leaking. The landowner in an investigation is usually blamed, instead of comprehensive testing of the resource wells. There are ways to find out which gas wells are leaking. They can be fixed. In this case, EnCana has stated publicly that they do not need to cooperate with this investigation because they don't believe in the science that can lead to finding which wells are leaking.

The regulators misinform the public. We have thousands of resource wells leaking.

The new testing that came up only began when a number of concerned citizens went to the legislature and went to the public. The MAC committee was still in deliberation. I believe the testing requirements wouldn't have happened.

We have now had, finally, a number of years of CBM, but our knowledge on groundwater is behind. The precautionary principle: where is it?

In 2005, industry advised the Alberta Energy and Utilities Board that some of their shallow fracs were damaging oil and gas wells. So they brought in some new rules. These rules should have been brought in before they began the experiments, especially for our drinking water.

This is a water well that exploded last spring. The farmer had dealt for three years with the regulator—the so-called best regulator. What's wrong with this picture? Three men were seriously injured on sampling day. After contamination, some companies refused to cough up the data that was needed to investigate and remediate.

This is a diagram that the AEUB, the energy board, and Alberta Environment go to the public with. "They say it never happens. Oh, no, there is no leaking."

By the way, methane is a much worse greenhouse gas than CO₂, and we have thousands of these leaking methane directly into the atmosphere. There is surface casing vent flow, and gas migration through soils. The interesting thing is that the AEUB, in 2007, is even warning that the gas leakage and the gas migration potential is worse in the shallow zones. This is where we're going to be doing our CBM and where our water is.

In Rosebud water we have 30 milligrams to 66 milligrams of dissolved methane, as well as free gas. CAPP, which is here today on the video, has a report that one milligram puts you at risk of explosion if the water passes through an unventilated place. A light switch, static in my hair, could have blown up my house.

The regulator is still in denial. They have done tests on our water. You have a table. We have benzene, toluene, ethylbenzene, and xylenes in our water. We have ethane, propane, methane, butane, and octanes, and we have kerosene in the community drinking water. In most cases, the landowner is blamed for the contamination by way of bacteria. On the table, you can look at the process we have to go through.

I read your report that came out recently on the chemicals and your Canadian Environmental Protection Act, and I plead with you to please implement this act in Alberta.

We are told that only nitrogen is used, so our water is safe because nitrogen comes from the air. I would like to show you a list. This came from "Oilweek." These are a variety of products, hundreds of them, used in different stages of drilling, cracking, and servicing. Some of them contain diesel and mineral oil. In Alberta, the regulator does not require industry to disclose any of the chemicals used, not even if they're toxic, not even if it's benzene, a known carcinogen, or toluene, which damages the brain, notably in children. Toluene was found in our water.
We need to know what the chemicals are, especially so shallow, and I believe that the federal act is perfect. I noticed in your report this is seldom used and seldom implemented. I would like to ask that you use this and implement it in Alberta and ask the regulators to control the chemicals being used.

I have seen many pallets of chemicals that aren't even on this list, bags of chemicals that say, “Danger, Unregulated”. Nobody knows what's inside, driving through playground zones. We don't know now how to analyze our water. These chemicals could have gone into our water, but we don't know what to test for.

I also brought with me a pledge to protect our groundwater. You had this translated. I would like to ask every member of Parliament, not just the committee members, to sign this pledge and fax it to Honourable Minister Baird and our Honourable Premier Stelmach.

There are a few things we would like done to protect our groundwater.

CBM can be a fantastic new resource. We can all share in the prosperity. Canada is a fantastic country. I would like to see the Canada I knew as a child come back from regulated rule. I would like to see the people in charge. I would like to see public health and safety protected. There are still people in my community bathing in and drinking water with benzene and toluene. We do not need to harm people to have prosperity.

Coal-bed methane will spread far. The shales are coming. They will spread far. These impacts, violations of the Canadian Charter of Rights and Freedoms, will spread through the country if we continue to allow industry to rule.

The precautionary principle: why are we allowing perforations and fractures into these shallow zones above the base of groundwater protection? Industry still doesn't know what these shallow perfs and fracs do. They have stated this in writing to the EUB. Why don't we learn first? We can do an economical mitigation here, slow down, think first, collect some data first. Let's find out what we're doing to our groundwater. This is Canada's water. We all have water on the table here. This water will affect all of us.

The story has been much in the news. I bring one gift for my French friends here today. Quebec journalists are writing three stories on the water situation. In September, I believe, the Rosebud water situation will be published, but they are also writing about climate change. I find it interesting that Quebec is so concerned about what is happening to our water in Alberta that they're sending journalists out. There is an Alberta Views article. I have copies here for you. They've been handed in. Even Canadian Business magazine has published the story about the water. There I am with my water. I can't live with this water anymore. It's too dangerous. I have trucked-in water that the Alberta government is supplying and paying for. I've lost my independence. I live rural. I have to rely on trucked-in deliveries. I want my water back. I want to protect water for others.

In conclusion, in my experience, the regulations are not working. The regulators are not working. Instead of dealing with the industry's non-compliance, they banished an ordinary citizen, considered me a threat to safety and the public. I had just found out when I got this letter from my regulator in Canada, a country that I thought was a democracy, that I was living in danger of explosion from my water. Yes, methane can be natural, but it is normally at very low levels. Nothing like the levels we have after this company, EnCana, fractured directly into our potable water supplies. They have cemented this well off, but we do not know what damage has been done to our aquifers. This is very serious.

Thank you.

The Chair: Thank you, Ms. Ernst, for your comments.

We'll now go to our first round. I will remind our guests that there are headphones there for translation. Some of the questions will be asked in French, so you will need those.

I also would like to welcome the students who have just joined us. For the members' information, these are students from the franco-Ontarian school, Gisèle-Lalonde, from here in Ottawa.

I would like to welcome all of you to the hearing of the environment committee. We are looking at coal-bed methane and its recovery and its possible effects on the water aquifers. Welcome to all of you, and thank you for being here.

We'll now go to ten-minute rounds. I believe you're sharing your time, Mr. Rota, with Mr. Regan.

[Translation]

Hon. Geoff Regan (Halifax West, Lib.): Thank you, Mr. Chairman.

I would like to join you in welcoming the students who are here today.

Allow me to now switch to English.

[English]

Mr. Chairman, I'd like to ask a question, through you, to Mr. Pryce, if I may.

Mr. Pryce, the last time that I think I can recall seeing a toilet on fire, or exploding with fire, would be when my kids were watching the movie Home Alone. So it's a surprising and startling thing when you see the photograph that Ms. Ernst just presented to us, showing fire shooting out of her commode, so to speak. It comes across as irrefutable evidence of the problem. What can you tell us about this?

Mr. David Pryce: Thanks for the question. One of the slides I didn't get to really spoke to the issue. There are a couple hundred thousand water wells drilled in Alberta. The data from Alberta Environment's records show that at least 26,000 of those wells have been drilled through. The coal seams have encountered them. The data further indicates that there are probably 900 gassy—as they call them—water wells shown in their records that are indicative of the challenge of the geology that Mr. Schwartz spoke about. The gases there are naturally occurring. The fact that they are occurring and that you're seeing the fires, or the explosions as they're reported, in some of these wells is a result of the naturally occurring gas migrating into those water wells.
Hon. Geoff Regan: From what you're saying, I guess that gives one cause for concern about past regulation of those wells. Why should we be more sanguine or more reassured about the situation today with the drilling of wells for coal-bed methane?

Mr. David Pryce: The point I was trying to make, in terms of the technical requirements around the completion of the wells, is illustrated in the slide that shows the cement and the steel casing that is put in place. It is intended to separate the producing zones from those upper shallow water aquifer zones. So there is engineering applied to this. There is a regulatory environment that requires us to adhere to those practices to ensure that we do provide that measure of protection.

In addition to that, as we talked about the MAC process, one of the recommendations the department of the environment has mandated now is that we do water well testing. We test the wells in proximity to the coal-bed methane wells we drill, to confirm the condition of that water prior to drilling those wells, to understand whether or not methane is present. If it is present, the presumption is that it's naturally occurring, and then following up with that, if there's any change in that water well after the fact, we know we've got something to look at.

Hon. Geoff Regan: I hope we'll follow up with that with the other witnesses as we go on. I think there are opportunities for that. I am anxious to hear other reactions.

But let me ask you another question, Mr. Pryce. You've undoubtedly seen the government's climate change plan, which claims it will cut greenhouse gas emissions by 20% by 2020. That's the claim. It has been disputed, but that's the claim they're making. CAPP has said it doesn't know what the impact will be because it hasn't been provided with the information.

Can you help us understand what role your sector will play in the government's climate change plan?

Mr. David Pryce: I was prepared to talk about coal-bed methane. I will do my best to answer the question.

As we look at the requirements that are coming out, we're looking at ways to enhance the efficiency of our operations, to minimize the intensity of those emissions coming from our activity. Beyond that, I'm not in a position to really respond. It's not something I was prepared for, for this discussion.

The Chair: Mr. Rota.

Mr. Anthony Rota (Nipissing—Timiskaming, Lib.): Thank you, Mr. Chair.

[Translation]

I would like to welcome the students and wish them a fruitful day. I hope the information that they collect this morning will be of interest.

[English]

My question is for Mr. Pryce, followed by Ms. Ernst.

The numbers I hear are 8 million to 16 million wells using groundwater or taking gas out. I'd like a little bit of comment on that, because it seems that you've got a lot of wells out there. What is there to regulate or monitor the cumulative effects of mining this gas, the coal-bed methane, out of the earth? What I'm seeing is a lot of separate holes being drilled, with no large, overseeing body. Is there an oversight body out there, and what kinds of reports are we getting from the body? First Mr. Pryce and then Ms. Ernst.

Mr. David Pryce: Sure. The Alberta Energy and Utilities Board is our primary regulator for the activity that is undertaken by our industry, and there are well-licensing requirements that we have to go through.

One of the policy goals is to maximize the recovery of the resource. There are other policy goals that require protection of the environment, and that's typically administered by Alberta Environment in this case. So where we're looking at the water side of the issue, Alberta Environment is the primary regulator. Where we're looking at the drilling practices, the regulatory requirements around production and that sort of thing, the Alberta Energy and Utilities Board is the primary regulator.

Mr. Anthony Rota: Ms. Ernst.

Mr. David Pryce: If I could ask Mr. Cline to add to that—

Mr. Cam Cline (Engineer, Canadian Society for Unconventional Gas): I think I might just want to add that the well count is far too high. It is not the number that we'll ever achieve drilling coal-bed methane in Alberta.

Mr. Anthony Rota: Do you have a number now and what is anticipated?

Mr. Cam Cline: The current estimate for Horseshoe Canyon is that right now there are about 10,000 CBM wells, and we drill about 2,000 wells per year. There are some upside estimates for the Horseshoe Canyon in the 50,000-well range, but that would certainly be in the high end. That would be if every Drilling resource was developed in the province. That's just the one coal, but that's the one out of the three. Not only that, in a lot of cases, particularly with CBM, well bores will be shared, so, for example, of the 10,000 CBM wells that are currently used in the province, approximately 35% of those are actually using existing well bores. So the number of wells would simply not get that high.

Mr. Anthony Rota: Very good.

Ms. Ernst.

Ms. Jessica Ernst: Most of the work I do in the oil patch is on cumulative effects, and alarmingly, as our developments are dramatically increasing in Alberta, the mitigation of and assessment of cumulative effects seem to be going down. We seem to be deregulating in Alberta instead of increasing our assessment of these effects.
From the global warming perspective, the leakage of these wells, as well as potential effects on groundwater, the cumulative effects of these shallow zone developments, the unconventional developments, I think could be dire if we don’t take better protection... As Mr. Cline mentioned, a lot of the older wells are being used to commingle and perforate and frac. When they come to do the CBM, they will often come back again and again to perf and frac again and again. The cement in the surface casing as well as the production casing leaks from many different ways. When the cement is setting, if there are air bubbles or gas moving through from the deeper zones, that can create channels. The cement degrades over time. With each one of these perforations happening, cumulatively, what is the integrity of the cement going to be?

Interestingly, too, on the EUB, the data collection is so behind, and we’re increasing the cumulative effects, but we have less knowledge and data collection than we really should have for the groundwater mapping and the baseline testing. For example, in my area the experiments on the CBM happened before the baseline testing, even though this multi-stakeholder committee was saying, “We have to test first. We have to protect the groundwater; it’s vital for life.”

It only took pressure through the press before the baseline testing happened. I believe we still would not have baseline testing if a number of concerned Albertans had not gone to the legislature and gone public.

The EUB did a study that just finished in 2006. This is the regulator. They actually said that seven out of seven of the produced water from the coal-bed methane wells had the contaminants that we found in our Rosebud drinking water—the benzene, toluene, ethylbenzene, etc., the heavier hydrocarbons—but 11 out of the 12 water wells in the study did not, had no detectable levels. And 10 out of those 12 water wells had no detectable levels of methane, and they were all getting their water from coal. So even though CAPP has stated that 26,000 of our water wells getting coal supposedly have this natural methane, the regulator’s own study found that this was actually not true.

So hopefully, now, with the baseline testing, if we can improve on the testing... In the baseline testing, for example, Mr. Rota, the industry is not even required to test for heavy metals or the BTAX, these contaminants that could get into drinking water. So right now we’re not even able to assess the cumulative effects because the baseline testing standard isn’t testing for the right things.

*1200*

Mr. Anthony Rota: Thank you.

They tell me my time is up. I have a lot more questions, but thank you.

The Chair: If you could just keep your answers short, members can get all their questions in.

Mr. Lussier.

[Translation]

Mr. Marcel Lussier (Brossard—La Prairie, BQ): Thank you, Mr. Chairman.

I too would like to acknowledge the presence in this room of a group of Franco-Ontarian students. I believe it is shepherded by my colleague from Gatineau. Welcome to all of you.

My first question is for Mr. Pryce.

I would like to know who decides the make-up of the advisory committee, the MAC.

[English]

Mr. David Pryce: Thank you.

The multi-stakeholder advisory committee, or MAC, was a group that was put together by the Government of Alberta that consisted of members of the public, members of industry, and members of the government itself. That was the composition of MAC.

[Translation]

Mr. Marcel Lussier: How many members does it have?

[English]

Mr. David Pryce: There were probably about—and I’m guessing—20 to 25. There were also a number of people who came into and out of the process as issues came up, who have an interest in or an expertise in that kind of an issue.

[Translation]

Mr. Marcel Lussier: Is your group responsible for appointing some members to the MAC and, if so, how many?

[English]

Mr. David Pryce: We had been asked to be represented on the committee, and CAPP had, I believe, two or three.

[Translation]

Mr. Marcel Lussier: Did you ever consider suggesting the names of Ms. Ernst or Mr. Schwartz for this committee?

[English]

Mr. David Pryce: If I may come to that in a moment, I’ve been corrected on something. CAPP had one member and CSUOG, the Canadian Society for Unconventional Gas, had one member.

We left the representation up to the Government of Alberta to make those determinations.

[Translation]

Mr. Marcel Lussier: Thank you, Mr. Pryce.

Ms. Ernst, did you receive any financial or technical support from farmers or private land owners for testing your wells or did you have to bear the whole cost?

[English]

Ms. Jessica Ernst: Do I have a translation?

[Translation]

Mr. Marcel Lussier: Would you like me to repeat my question?

Ms. Jessica Ernst: I do not understand.

Mr. Marcel Lussier: Did you have to bear the full cost for testing your water or did you receive any assistance from the industry?

[English]

Ms. Jessica Ernst: I wish I could speak in French.
Note: The above extract was taken from the 39th Parliament, Session 1, Environment and Sustainable Development Standing Committee “Coal Bed Methane Study” (Canada. Parliament. House of Commons 2007b). The complete transcript is accessible online at: