The Underbelly of Economy versus Environment Conflicts:
Detangling Sources of Tension in Contentious Natural Resource Decisions

by

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A Dissertation Submitted to the Faculty of Social and Applied Sciences in Partial Fulfillment of
the Requirements for the Degree of

DOCTOR OF SOCIAL SCIENCES

Royal Roads University
Victoria, British Columbia, Canada

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January 19, 2018

Holly J.K. Clermont, 2018
Committee Approval

The members of Holly J.K. Clermont’s Dissertation Committee certify that they have read the dissertation entitled *The Underbelly of Economy versus Environment Conflicts: Detangling Sources of Tension in Contentious Natural Resource Decisions*, and recommend that it be accepted as fulfilling the dissertation requirements for the Degree of Doctor of Social Sciences.

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Final approval and acceptance of this dissertation is contingent upon the candidate’s submission of the final copy of the dissertation to Royal Roads University. The dissertation supervisor confirms to have read this dissertation and recommends that it be accepted as fulfilling the dissertation requirements.

Professor Ann Dale [signature on file]
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Reflections and Thanks

Dr. Ann Dale is my supervisor, my mentor, and my friend. More than once, I have discovered my ‘ahah’ moments in her early writings. If I achieve half of what she has done during her extraordinary career, I will be very pleased. Over the course of this degree, my husband and I were laid off from work, and both of our sons were struck by serious health problems and traumatic accidents. Ann pulled me through all of it. Words cannot express how grateful I am for her enduring kindness and patience, and for her resolute confidence in my ability to complete.

My entire committee was comprised of exceptional intellects. Thank you, Drs. Maureen Reed and Leslie King for sharing your wisdom and time with me, and for demonstrating that being a scholar means much more than having a degree.

There was no shortage of inspiration at Royal Roads University. Thank you to Drs. Robin Cox; stats gurus Bernard Schissel, Fernando Mata and Jacqueline Quinless; Brian Belcher, Elliot Tepper, and Marilyn Taylor. High five to my cohort (Jacquie Gilson, Meagan Hamilton, Susan Drouin, Sharon McIntyre, Milton Almeida, Amy Tucker, and Brian Parai), a limitless source of motivation and creativity. A resounding thanks to my RRU employer Dr. Jaigris Hodson, who introduced a whole new dimension to my research. Thanks also to IT master Dave Adams and Victoria illustrator Karen Gillmore, for helping me transform loose ideas into meaningful video.

I am grateful to Carole Sandhu, Gwen Campden, Michelle Underdown, the late Dr. Karen Berg, Dr. Jane Clelland, David Ayres, Barbara Vensel, Dr. Rob Newell, RRU’s amazing library staff, Dr. Bernard Schissel, Dr. Siomonn Pulla, Dr. Matthew Heinz, and the many others who offered and provided support when I needed it most. Thank you to the individuals
responsible for my scholarships and bursaries: RRU Faculty of Social and Applied Sciences’ Sustainable Research Scholarship, CFUW Parksville Qualicum Return to School Bursary, Cassandra and Carla Sims Award, Daniel James Frazer Entrance Bursary, TD Environmental Sustainability Scholarship, and SSHRC. Leslie King and Maggie Henigman, please accept my gratitude for your numerous, fine letters of support. Fist bump to my former employer and friend, Shyanne Smith, who provided the flexibility to work and pursue a doctorate at the same time. Clearly, it takes a village to raise a Doctor of Social Science.

I would also like to acknowledge 68 anonymous participants, who dedicated their time to this cause. Special thanks (and apologies) to those who came first and taught me a thing or two about surveys and interviews.

To participants who described social science as subjective, ambiguous, or ‘not science’, I can now unequivocally reply, “social science is science.” This journey began with a visit to the ‘father of resilience theory, ecologist Crawford (Buzz) Holling. Focused on the study of social-ecological systems, he was entirely comfortable with the idea that a biologist, trained in the natural sciences, might pursue a social science degree. Systems theorists understand that intractable complex environmental problems inevitably have a complex human dimension. In his memoir, A Journey of Discovery, he argued for integrating different forms of understanding and suggested “searching for the relatively simple features of complex systems” (Holling, 2006, p. 27). This is precisely what I have endeavoured to do in this work.
Dedication

I dedicate this dissertation to my parents, Violet Osberg Komisar and Alex Komisar (1932-2002), my husband Tim Clermont, and my sons, Dawson and Jory.

While I was writing my first paragraphs, my mom, nearly 80 years-young, was putting the finishing touches on a 150’ train mural, organizing a ‘100 years of rail’ community celebration, tending the family farmyard, and canning and freezing vegetables from her massive, ridiculously productive garden. An author herself, she is my confidante, my inspiration, the source of my own steady determination. My dad had also spent a lifetime learning and doing, a ‘jack of all trades’. Jumping three grades before age 15, he had a brilliant mind and was engaged with numerous organizations. He lights my fiery spirit, my drive to make a difference. My husband of thirty years, Tim is my glass half-full, a lifeline in the storm, the belly laugh at the end of a long, hard day. He is bedrock, 100% authentic, and a pretty fine editor too. And my kids. From them, I know pure joy. They give me purpose and inspire me to lead others to a brighter future in my own, bumbling way.
Abstract

It is well-established that biodiversity confers resilience to social-ecological systems, and also that humans are collectively and routinely degrading and destroying ecosystems and driving species to extinction through development and other avenues. In the decade preceding this research, biodiversity loss at local and globally-aggregated scales persistently and substantially exceeded the safe operating space for biosphere integrity, contributing to assertions that the stability of Earth’s systems could no longer be relied upon. The propensity to protect biodiversity, or contribute to its demise, arises from a variety of tangled motivations. I investigated five of these influences, including values, sense of place, networks of relationships, media frames, and perceptions of science, for two contentious proposed energy projects in western Canada. I first conducted a frame analysis of online media regarding an oil pipeline expansion from Alberta to British Columbia (BC), and a run-of-river hydroelectric project on the BC coast. I then surveyed and interviewed participants, mapped their place connections, analyzed social networks and social media networks, and examined text and oral submissions to regulatory agencies. These findings were systematically integrated to explore how the five influences contributed to each conflict and decisions affecting biodiversity.

Support and opposition for the pipeline were found to be proxies for the prioritization of self-enhancement and self-transcendence (nature) values, respectively, while self-transcendence (nature) values were found on both sides of the run-of-river conflict. For the pipeline conflict, disparities in senses of place underscored a clash of regions. In both cases, well-intentioned but polarizing leaders contributed to online media frames that emphasized conflict and buttressed extreme positions, while helping shape or reinforce siloed networks and the diffusion, uptake,
and understanding of scientific and other information. Environmental review processes were mostly unresponsive to these influences. Leverage points to better reduce environmental conflict and protect biodiversity were identified for environmental assessment and similar processes.
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Abstract

Key Words

Introduction


Algorithms, Birds of a Feather, and Cultural Cognition

Case Studies

Trans Mountain pipeline expansion.

Bute Inlet hydroelectric project.

Methods

Results and Discussion

Credibility.

Credible science.

Credible sources.

News, Networks, and Sinking Bitumen.

Salience.

Planning to fail early.

Policy wars.

Legitimacy.

Weighing conflicting science.

Weighing Indigenous knowledge.
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<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>BC</td>
<td>British Columbia, Canada</td>
</tr>
<tr>
<td>BCEAO</td>
<td>British Columbia Environmental Assessment Office</td>
</tr>
<tr>
<td>BIHP</td>
<td>Bute Inlet Hydroelectric/Run-of-river Project</td>
</tr>
<tr>
<td>CEAA</td>
<td>Canada Environmental Assessment Agency</td>
</tr>
<tr>
<td>KM</td>
<td>Kinder Morgan</td>
</tr>
<tr>
<td>NEB</td>
<td>National Energy Board</td>
</tr>
<tr>
<td>SE</td>
<td>Self-Enhancement</td>
</tr>
<tr>
<td>SNA</td>
<td>Social Network Analysis</td>
</tr>
<tr>
<td>ST-nature</td>
<td>Self-Transcendence-nature</td>
</tr>
<tr>
<td>ST-social</td>
<td>Self-Transcendence-social</td>
</tr>
<tr>
<td>TM</td>
<td>Trans Mountain ULC (subsidiary of Kinder Morgan)</td>
</tr>
<tr>
<td>TMPE</td>
<td>Trans Mountain Expansion Project</td>
</tr>
<tr>
<td>USA</td>
<td>United States of America</td>
</tr>
<tr>
<td>VEC</td>
<td>Valued Ecosystem Component</td>
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Chapter 1. Introduction

As a teenager, I made near-daily excursions to sit with my Saint Bernard on the edge of a bridge bordering the family farm. Beavers had built a dam there, and would routinely patch the structure or play in plain sight. The mature wetland they created was a showcase of flora and fauna. Abundant herbs and browse drew moose and deer. Waterfowl nested in overhanging snags and nibbled on duckweed. With every visit, the wetland revealed more creatures to me, coming closer, trusting. Their sanctuary was mine also, a place to ground myself and brush off the stressors of adolescence.

One day, heavy equipment removed the bridge and replaced it with a culvert. The dam was blown, the edges of the stream stripped of soil and rip-rapped. It would be more than a decade before the site began to attract some of the wildlife it once supported. Later, as a biologist, I would refer to such events as unnecessary destruction and degradation of sensitive ecosystems. Yet knowing better ways of doing things - what natural resource professionals denote as ‘best practices’, was rarely sufficient to prevent them from happening.

With population expansions, changes in land use, and amplification in per capita use of natural resources, humankind has altered the extent and composition of ecosystems (Millennium Ecosystem Assessment, 2005; Shepherd et al., 2016; World Wide Fund for Nature (WWF), 2016). Generally, they are smaller, fragmented remnants of what had once existed (Lea, 2006; Secretariat of the Convention on Biological Diversity, 2014). They have become less complex and more alike; there is less biodiversity (Millennium Ecosystem Assessment, 2005). By moving organisms and materials from place to place and modifying or replacing natural landscapes with novel, semi-natural, or built environments, we have collectively constructed a human-dominated
epoch known as the anthropoic era or the anthropocene (Crutzen 2002; Rockström et al., 2009). Notwithstanding, biodiversity is as foundational to human life as it ever was, and we are urged to be prudent with its care (WWF, 2016).

The term ‘biological diversity’ was used in 1980 in some of the first publications describing manifestations of troubling, worldwide loss at multiple scales (Hamilton, 2005; Norse, 1995). In its most simple form, it is species richness, the number of species in a given area. However, biodiversity has a depth of meaning that ranges from genetic variation in organisms to the diversity that influences all aspects of a functioning ecosystem, including its dynamics, productivity, stability, and resilience (Tilman, 2001). Response diversity is nature’s redundancy, a safeguard for the preservation of ecological goods and services when other types of biodiversity losses are occurring (Elmqvist, Folke, Nystrom, Peterson, Bengtsson, Walker, & Norberg, 2003).

In the first significant effort to document and address global biodiversity loss, the Global Biodiversity Strategy (World Resources Institute (WRI), International Union for Conservation of Nature (IUCN), and United Nations Environment Programme (UNEP), 1992) reported more than 700 extinctions of vertebrates, invertebrates, and vascular plants since 1600. Also in 1992, the Convention of Biological Diversity (CBD) was introduced at the Rio de Janeiro ‘Earth Summit’, a treaty legally binding 196 parties to protocols conserving biodiversity.

Yet within a decade, Chapin et al. (2000) reported that humans had triggered the first anthropogenic mass extinction event in the history of the planet. A host of initiatives to record and address biodiversity loss brought increasingly grim news and dire warnings. “Human actions [were] fundamentally, and to a significant extent irreversibly, changing the diversity of life on
Earth” (Millennium Ecosystem Assessment, 2005. p. 2). Biodiversity loss was occurring at an unprecedented rate and scale (UNEP, 2007). The rate of biodiversity loss had transgressed planetary boundaries (Rockström et al., 2009). “It is unlikely that ecosystems can be kept within safe ecological limits,” cautioned the Secretariat of the CBD (2014, p. 12). Building on Rockström et al.’s (2009) planetary boundaries work, Steffen et al. (2015) found a loss of biosphere integrity, a measure aggregating genetic diversity with the functional diversity of ecosystems, could destabilize the Earth’s capacity to support human life.

Although persistent, piecemeal destruction and degradation are leading ecosystems and species to extirpation and extinction (BC Conservation Data Centre 2017; Secretariat of the CBD, 2014; WWF, 2016), climate change has made matters worse (Steffen et al., 2015), shifting species ranges and disaggregating ecosystems (Parmesan & Yohe, 2003; Parmesan, 2005; Secretariat to the CBD, 2010). Maclean and Wilson’s (2011) meta-analysis of 1,120 papers published since 2005 revealed predictions of extinction rates resulting from climate change had been empirically confirmed. Wiens (2016) discovered climate-related extirpation had already occurred in more than 47% of 976 species surveyed worldwide.

Species extinctions and extirpations are today altering the processes that enable ecosystems to provide the services they once did, such as the pollination of forests, crops, and gardens (Hooper et al., 2012; Walker & Salt, 2006; Walther et al., 2010). Bracken and Low (2012) discovered that losses of keystone and already rare cornerstone species can reshape ecosystems in only a few weeks. In the latest Living Planet Report, which measures vertebrate species diversity in the context of their habitats and known threats to those habitats, Rockström stated, the stability of the planet “can no longer be relied upon” (WWF, 2016, p. 5).
In the mere 37 years since we learned that widespread biodiversity loss was occurring, there have been countless efforts at multiple scales to change course, far too many to list here. The Intergovernmental Science Policy Platform on Biodiversity and Ecosystem Services (IPBES) was established in 2012 to coordinate global assessments of biodiversity and ecosystem services, and to strengthen capacity for the effective use of biodiversity science in decision-making. Ninety-four percent of the parties to the Convention on Biological Diversity have developed National Biodiversity Strategies and Actions Plans (CBD, 2015).

Regionally and locally in British Columbia (BC), Canada’s most biodiverse province (Austin, Buffett, Nicolson, Scudder, & Stevens, 2008), technical and strategic initiatives have improved the ability to locate sensitive and rare ecosystems and species, and developed tools to prioritize their protection (e.g., Austin et al., 2008; BC Ministry of Environment, 2009). Innovative planning processes have integrated ecological, social, and cultural interests with economic ones (e.g., BC Government, 2016). These have failed to change the trajectory for biodiversity for a host of reasons, such as the lack of political will to enforce federal legislation, provincial legislation that has not been enacted by regulation, senior government policies that favour resource extraction and development, and scattered and voluntary approaches to protection predicated on concepts of shared stewardship (Kirschhoff & Tsuji, 2014; Parker & Whittleton, 2014; Wood & Flahr, 2004). As a result of these collective failures, environmental campaigns and social movements have arisen to defend and protect biodiversity and natural places threatened by development (cf., Penn, 2015).

This dissertation focuses on the ‘environment versus economy’ conflicts generated by such campaigns and movements. Dale (2001) and others have described economy versus
environment conflicts as a false dichotomy, since human societies are ultimately reliant on, and cannot transcend the constraints of the biophysical world. Today, renewable energy projects and other climate-friendly initiatives are also competitive with biodiversity protection. At first glance, these appear to be a ‘clash of greens’ or ‘environment versus environment’ conflicts. Climate change is, of course, the exemplar for pathological dualism (Dale, 2001), showcasing our collective failure to recognize our interdependence with nature. Still, arguments over land use and other natural resources remain grounded in an ‘environment versus economy’ paradigm.

Examining multiple streams of scholarly literature, I discovered this duality, and more specifically the prioritization of economic interests over biodiversity protection and other environmental interests (or vice versa) could be attributed to five entangled motivations, or influences, held by individual decision-makers. Here, ‘decision-makers’ encompass all who contribute to decisions for natural resources, from citizens and activists to corporate leaders and government ministers. ‘Decisions’ include recommendations by governments and environmental review panels, as well as commitments to intervene, comment, protest, undertake studies, and so on. Such decisions made by individual actors contribute to resource conflicts and affect if and how they may be resolved. In this research, ‘natural resources’ is a general term that encompasses biodiversity in all forms, as well as renewable and non-renewable resources occurring in nature that might be used for economic gain. The influences include: 1) values, 2) sense of place, 3) perceptions of science, 4) networks of relationships, and 5) media frames. Their definitions and theoretical underpinnings were in separate bodies of literature; these are described in the chapters below.
Context of the Inquiry

With climate change becoming increasingly newsworthy, energy development has become one of the most contentious issues of our time. Energy development increasingly entangles climate-relevant disputes with conflicts affecting ecosystems and species. My two case studies exemplify this, focused on BC and to a lesser extent the adjacent province of Alberta. The proposed Trans Mountain pipeline expansion would move bitumen from Alberta’s oil sands through sensitive ecosystems and the most populous area of BC’s coast to lucrative export markets. The proposed Bute Inlet run-of-river hydroelectric project would develop seventeen watersheds flowing into a majestic inlet on BC’s remote Central Coast, the largest renewable energy project of its kind and the nucleus for a ‘green corridor’ of renewable energy along the coast. Using these cases, I explore in depth several key findings from the literature.

The values literature in the tradition of Schwartz (1992; 1994; 2011) suggests decision-makers prioritizing development over environmental protection likely hold personal values that emphasize self-enhancement over concerns for nature (Schwartz, 1992). They may hold cultural values that support changing or controlling nature, and see activism as violating social order (Schwartz, 1994; 2011). The sense of place literature suggests these individuals may have a superficial or ‘commodifying’ (i.e., fleeting, based on a list of place characteristics) connection to natural places (Cross, 2015; Hay, 1998).

Conversely, those who prioritize biodiversity protection over economic development likely emphasize self-transcendence values with a concern for nature (Schwartz, 1992). They are more likely to hold cultural values that emphasize living in harmony with the natural environment, and aspire to egalitarianism, which predicts political activism (Schwartz, 1994;
They may have deeper or more complex connections to natural places than their pro-development counterparts (Cross, 2015; Hay, 1998; Schwartz, 1992).

The literature also suggests that people will be influenced by their networks. They will rally to one side of a resource conflict or another based on prior or perceived important relationships, and diminish scientific and other information that do not conform to their group’s values and thinking - unduly elevating those aspects common to the group (Janis, 1972; Kahan, 2010, 2012; Lord, Ross, & Lepper, 1979). This might lead a development supporter to privilege economic data generated by their sector over environmental science, for example.

Notably, from the outset, media frames were not included as a key influence. However, the frame analysis I conducted to enhance my knowledge of these case studies and to identify actors for surveys and interviews revealed media frames to be highly salient in conflict situations. As a result, I examined the frame literature and an emerging literature on the polarizing effects of digital media. Frame theory and analysis demonstrate how media frames link to the other four influences to affect the tenor of the conflict and decisions-making (e.g., Darnton & Kirk, 2011; Snow, 2004).

Research Objectives

This dissertation explored the propensity of individuals to protect biodiversity or diminish its importance in economy versus environment conflicts. I aimed to inform decision-making processes and practices, such as environmental assessment, to facilitate greater biodiversity protection and climate action. I strived to do so without diminishing the role and importance of the sustainable development of natural resources, respecting another important objective. That is, I wished to raise awareness of the sources of tensions that lead to polarizing
conflict and a paucity of genuine cooperative and collaborative natural resource decision-making, with a goal to reducing such tensions.

Research Question

This research began with the question, “What are the influences on decision-makers that lead them to either protect or further endanger sensitive or at-risk ecosystems and species?” After the literature review, I narrowed the scope of my research to five salient influences, with a focus on economy versus environment conflicts. To understand the motivations that underlie the protection of biodiversity, or inhibit such protection for two energy projects in BC, I asked, “How do values, sense of place, perceptions of science, networks of relationships, and media frames influence decision-making for contentious energy projects affecting sensitive ecosystems?”

Significance of the Inquiry to Practice and to Academic Knowledge

Influences on decision-making for natural resources in conflict situations are typically examined independently of one another, often by researchers working in different theoretical genres. For example, values are investigated without considering sense of place and vice-versa (e.g., Hay, 1998; Schwartz, 1992). This represents a substantial gap, both in the scholarly literature and in practice (e.g., for environmental assessment). My work rests at an interdisciplinary frontier, bridging several, mostly disparate social theories to unravel and reveal the roles of the five influences in natural resource decision-making in two conflict situations. To manage this complexity, I integrate and triangulate multiple streams of evidence and demonstrate how my results align with existing theoretical and empirical knowledge.
A key assumption throughout this research is that salient motivational influences are integrated and cannot be wholly separated, only disentangled (Dale, 2001). This assumption stems from practical considerations as well as academic ones. For example, values and sense of place are frequently interwoven in oral and written public submissions to regulatory agencies regarding environmental assessments, and cultural values inherently involve networks of relationships (Kahan, 2010). This assumption was also validated in keynote speeches by scholars at the Resilience 2017 conference in Stockholm Sweden, who understood values, sense of place, different knowledges (including different forms of scientific understanding), and our bonds with one another that affect the environment, to be entwined constructs critical to sustainability and the resilience of complex, social-ecological systems (K. Browne, C. Folke, personal communications, August 21, 2017). Further, these areas were identified at the conference as frontiers for future research.

Indeed, this research contributes to several areas of academic inquiry. Most importantly, it provides a ‘big picture’ understanding of several overlapping and interconnected influences in environment versus economy conflicts. Scholars can build upon this work, and also draw upon it to reexamine the variability associated with findings understood in isolation.

My research also contributes to specific bodies of knowledge. Among the large body of empirical knowledge associated with Schwartz (1992, 2011, 2012) values theory, it is one of the relatively few attempts to extract opposing personal and cultural values from their broader context and apply them to a real-world conflict. This values research also provides a nudge to a stalled body of knowledge examining opposing values in environmental conflicts (cf., Boyle et al., 2012; Kahan, 2010). At the same time, it provides empirical evidence for Kahan’s (2012)
cultural cognition thesis, demonstrating how constructs such as culturally biased assimilation unfold in environmental assessment. My research also adds to emerging literature on regional sense of place, and contributes to knowledge of the roles of sense of place in environmental protection and resource development. Finally, it advances a method of frame analysis developed by Benford and Snow (2000) and refined by Lindekilde (2014), by demonstrating its usefulness in assessing natural resource conflicts.

In addition to its scholarly relevance, my research has significant practical applications. In the hands of decision-makers, my findings can be used to diminish tensions in economy versus environment conflicts, including, but not limited to those associated with fossil fuel-based and renewable energy projects. This has the potential to reduce or circumvent damaging polarization, thereby saving time and money for governments, industry, and non-profit organizations. More specifically, my findings can be used to inform a broad range of typically strained decision-making processes, both now (e.g., review of Canada’s environmental assessment process) and in the future (e.g., First Nations consultation, proportional representation). They can also be used to disarm divisive rhetoric and design unifying messages for factions that tend to ‘lean outward’, toward extreme positions in environment versus economy conflicts (e.g., pipelines are 100% good or bad). Perhaps most importantly, my findings offer compelling rationale for a paradigm shift that places environment on par with, or above economy when these are in conflict. Here, paradigm is defined in its lay-context, as “a deep set of beliefs about how the world works” (Meadows, 1999, p. 17). These practical applications will be revisited in Chapter 8, Synthesis and Conclusion.
Methods Overview

Several complementary data collection and analytical methods allowed for an in-depth, iterative analysis of rich and informative data. Publicly available online media for each case were analyzed using frame analysis. Interview data were qualitatively coded (Figure 1.1). Survey data (i.e., values, views, reports, decisions) were most amenable to descriptive statistics. Data from a network questionnaire contributed to social network analysis (SNA) and network maps (also called net graphs). Survey and interview data were used to create maps of home and favourite places. Finally, all sources of data were integrated to respond to the research questions. A social network analysis of TMPE Twitter data was used to triangulate results. These were well suited to answering the research questions.

Figure 1.1. Methods map
Structure of the Dissertation

This dissertation is presented in a ‘bookended papers’ format. It deviates from a traditional structure by distributing the literature review, theoretical orientation, results and discussion to four papers (Chapters 4 through 7). Methods are summarized in each paper and provided in more detail in Chapter 2. The literature review and theoretical orientation for the five influences are roughly parsed into these four papers as follows: media frames in Chapter 4, sense of place in Chapter 5, perceptions of science and networks of relationships in Chapter 6, and a brief overview of values and networks of relationships in Chapter 7. Chapter 3 includes a more comprehensive review of the values literature, mainly because it was not possible to include a thorough review in Chapter 7 due to the formatting requirements of the target journal, but also because values theory is woven throughout the dissertation. The synergistic effects of the five influences are captured in the synthesis and conclusion.

More specifically, Chapter 2, Research Methodology, outlines my epistemological position and case studies, and describes the application and limitations of each method. Chapter 3, An Introduction to Values Theory, provides an overview of the values theory that is not addressed in individual papers and integral to Chapter 7, a short paper requiring a focus on solutions, rather than problem description or theory. My story begins to take shape in Chapter 4, with the first of 4 papers. Energy Frames: Positioning Fossil Fuel and Renewable Energy Projects in Online Media delineates values frames and identity frames, and examines frame distribution in various online media. This paper has been prepared for submission to a Canadian communications journal. Chapter 5, Sense of Place in Natural Resource Conflicts, examines the personal connections of my research participants to the places affected by the energy projects, as
well as their connections to favorite natural places. This paper was accepted by an applied research journal for peer review on April 11, 2017. Chapter 6, *Science-based: The role of scientific evidence in contentious environmental assessments*, looks at the influence of values and cultural cognition on the salience, credibility, and legitimacy of scientific evidence throughout the assessment process. It is formatted in preparation for submission to an international, interdisciplinary, peer-reviewed journal focused on environmental politics. Chapter 7, *Appreciating Values Diversity in ‘Environment v. Economy’ Conflicts*, explores how values and views intersect with networks and positions in energy conflicts. It is formatted in preparation for submission to a hybrid peer-reviewed journal and popular magazine dedicated to showcasing innovative ideas for solving integrated ecological, social, and economic problems to an educated lay public. *Synthesis and Conclusion*, Chapter 8, ties the findings of the research together, to address the research questions and provide recommendations for natural resource practitioners and future research.

Since the papers will be co-authored with my committee, ‘we’, rather than ‘I’, is used in the four papers, and I refer to myself as lead author. Although each paper is formatted to American Psychological Association sixth edition standards for the purpose of this dissertation, they are structured to satisfy each journal’s specifications.
Chapter 2. Research Methodology

Epistemological Position

As a biologist, my professional credo is to uphold the public interest through science-based stewardship of ecological resources (see College of Applied Biology Act, 2002). Biologists must provide “objective, science-based, unfettered, forthright and intellectually-honest opinion, advice and reports” (Schedule 2 of Code of Ethics, p. 1). As a novice social scientist, I recognize the limitations of being objective, and feel obliged to share my epistemological position, which is neither positivist nor interpretivist (Proulx, 2008).

Austrian-born, American physicist Fritjof Capra (1997) stated in The Web of Life that the social exists in two domains: the physical and the social symbolic. He asserted the social is governed both by the fixed laws of nature and the transitory rules of society. Capra subscribed to theories of autopoeisis and structuring coupling put forth by Chilean scientists Humberto Maturana and Francisco Varela. Autopoiesis is the ability of living organisms to self-organize in a never-ending series of cyclical iterations. The central characteristic of an autopoietic system is its ability to ‘structurally couple’ with its environment; that is, it undergoes constant structural changes, including the creation of new structures and connections in the autopoietic network, by responding to triggers or perturbations in the environment. These in turn alter behaviour. Since an organism specifies whether or not it responds to the trigger, structural coupling is an ‘act of cognition’. Maturana and Varela’s Santiago theory of cognition holds that the mind is not a thing, but a process, and when organisms respond to environmental perturbations, they “bring forth” both an inner and outer world (Capra, 1997, pp. 254-267).
This epistemology means I cannot separate myself from my northern European heritage, from my childhood on a northern Alberta farm, from my home town - the ‘Gateway to the Peace Oil Sands’, from my strong attachments to the BC coast where I have lived for nearly 30 years, or from the places and people I have come to know during this research and throughout my life. All are part of who I am today. At this moment, I believe myself to be open-minded fence-sitter with an aim to help reduce conflict in natural resource decision-making processes. As a relatively privileged Caucasian female researcher residing in a western democratic nation, I have controlled for my biases through the use of mixed and triangulated research methods.

Case Study

This research, with mixed data collection and analytical methods, was oriented by case study. Case study uniquely offers a holistic, in-depth understanding of a contemporary problem, issue or phenomenon within its social or natural context (Hesse-Biber & Leavy, 2011; Johansson, 2003; Scholz, Lang, Wiek, Wlater, & Stauffacher, 2006; Yin, 2009), and excels at facilitating understanding of complex issues and social-ecological problems (Dooley, 2002; Goldstein, 2011; Walker & Salt, 2006). There is a richness in case study data enabled by contextual and comprehensive study (Yin, 1989; 1997).

Case study also embraces mixed methods and epistemological pluralism (Johansson, 2003). The methods chosen for each case study depend upon appropriateness and pragmatism. Case study allows for integration of multiple sources of evidence in a converging fashion to illuminate a case from different angles (Johansson, 2003; Yin, 1997). The conclusion for the case study is developed largely from the consistency of data from these multiple sources. As case study is vulnerable to verification bias, the preconceived notions of the researcher, sources are
often triangulated to enhance validity (Denzin, 1970; Flyvbjerg, 2006; Johansson, 2003). Rival explanations can be investigated within a single case study (Yin, 1997).

Generalizability in academic terms arises from developing, testing, and replicating theoretical propositions (Denzin, 1970; Dooley, 2002; Johansson, 2003). In practice, however, policy and management often rely on studies and recommendations from a single or few research projects (Moon, Brewer, Januchowski-Hartley, Adams, & Blackman, 2016).

**Case selection.**

Here, two cases of proposed energy projects were explored and compared: the Trans Mountain oil pipeline expansion project from Alberta’s oil sands to Burrard Inlet on BC’s Lower Mainland (TMPE), and a run-of-river hydroelectric generation project at Bute Inlet on BC’s Central Coast (BIHP) (Figure 2.1). Both cases invoked deeply held values. The conflict over the TMPE was intense and ongoing, seen as threatening sensitive terrestrial, freshwater, estuarine, marine, and other habitats, as well as climate change mitigation. To explore whether the influences were isolated to fossil fuel energy projects, I elected to compare this case with a large renewable energy project that had been so contentious that it likely played a role in the results of a provincial election. The cases are more thoroughly described in each paper.

**Document Sampling**

This section, and the next section describing my frame analysis, provide the detailed methods for the paper entitled *Energy Frames* (Chapter 4). Documents for frame analysis were purposefully sampled from a medley of traditional news stories, quasi-journalistic articles, and industry and advocacy group propaganda. I aimed to capture a cross-section of online media, available to anyone with a computer who was interested in the cases or some aspect of the
Narratives around them. Social media were not sampled, to avoid the influence of bots and trolls that might unduly bias the sample.

The TMPE case was ongoing during my research. Daily, I monitored four national news outlets for relevant stories, representing a range of political leanings. Canada’s public broadcaster, CBC News, provided regular coverage. I also monitored a BC-based independent news magazine offering in-depth articles and opinions. Relevant articles referenced by two publicly-available list serves were also collected, leading to articles from smaller outlets. Additionally, I subscribed to newsletters produced by individual actors and groups that had been mentioned in earlier collected news articles. Finally, I used Google, DuckDuckGo, and Royal Roads University’s Summon to find additional pro-pipeline articles, with search terms energy + Trans Mountain (and Kinder Morgan). I also tried ‘oil and gas’, ‘fossil fuels’ + ‘Trans Mountain’. Seventy articles were collected in all. Published between April 12, 2014 and June 26, 2015, they included the first protest and many stepwise decisions associated with the conflict thereafter.

Articles for the Bute Inlet case were more difficult to access, as some issue-based organizations had folded and links were often broken. As a result, I broadened the scope to include pertinent articles that discussed independent power projects more generally. Using systematic online searches beginning with ‘Bute Inlet’, ‘run-of’river’, ‘independent power’, I collected articles dating from the project’s inception in 2008 to August 2, 2016. A total of 148 articles were collected, from 64 different sources, materials similar to those collected for the TMPE case.
Figure 2.1 Case study areas
Limitations.

The emphasis on British Columbia (versus Alberta) media sources lessened the numbers of pro-development sources and frames. Pro-development media articles were more frequently behind paywalls or paid subscriptions, decreasing access for this research but also decreasing them for the public; this research focused on free, publicly available online media.

Furthermore, TMPE articles used in the analysis encompassed a much shorter period of time (slightly more than 14 months), compared to eight years in the BIHP case (i.e., 2008 - 2016), with the majority of articles for the BIHP in 2008 and 2009. That the BIHP case was dated was a shortcoming in some ways - as an unknown number of articles was now unavailable, but advantageous in knowing the outcome of proposed project and the long-term trajectory of the conflict. By contrast, the TMPE was ongoing during the course of this research, later expanding in the national public sphere as pipelines became a federal election issue and a delicate topic for the new government.

Frame Analysis

American journalism professor Stephen Reese said in 2010, “the definitive framing study will never be found” (p. 17). Indeed, the methods used to find and analyze frames are nearly as varied as the techniques used to construct them. I explored several approaches, including open source, text network visualization software. As the software highlighted similar keywords and linkages among articles with clearly different frames, quantitative methods were set aside in favour of a systematic, qualitative approach. Several deductive and inductive approaches were tested with the data (e.g., Isendahl et al., 2009; Matthes & Kohring, 2008; Touri & Koteyko, 2015; Van Gorp & Vercruysse, 2012), before settling on a theoretically-derived, deductive
framing approach designed by American sociologists Robert Benford and David Snow (2000). They differentiated diagnostic, prognostic, and motivational ‘core framing elements’ for social movement/collective action frame analysis, and included identity frames, which they viewed as inherent in frame analysis. Danish political scientist Lasse Lindekilde (2014) provided a clear illustration of Benford and Snow’s core framing elements in his analysis of prophet Muhammad cartoons in Denmark.

Diagnostic framing elements identify a problem and attribute blame or causality to someone or something. Because individuals often disagree on the nature of the problem, groups may seek to delineate the boundaries between supporters and opponents (or good versus evil) (Benford & Snow, 2000). In Lindekilde’s (2014, p. 207) analysis of Prophet Muhammad cartoons in Denmark, a diagnostic frame was that “al-Qaeda blamed Western-oriented elites or crusaders as the root of all evil in Muslim societies”. Diagnostic frames typically constrain the range of strategies and solutions available for prognostic frames (Benford & Snow, 2014).

Prognostic framing elements articulate goals, strategies, tactics, or solutions to address the problem, and often are ‘counter-frames’ in response to their opponents’ assertions (Benford & Snow, 2000). One of Lindekilde’s (2014, p. 207) prognostic frames was al Qaeda's “jihad by the sword” against the “crusader alliance” (since the crusaders are the root of all evil).

Motivational framing elements are rationale for action, or a “call to arms” (Benford & Snow, 2000, p. 617). They often refer to severity, urgency, efficacy, and/or propriety or duty (Benford & Snow, 2000). For Lindekilde (2014, p. 207), a motivational frame was al-Qaeda's attempt to make violent jihad against the crusaders a religious duty for individual Muslims.
Self-enhancement and self-transcendence values frames were also measured. These values frames are introduced in the introduction to values theory (Chapter 3), and explained in greater detail in the paper, *Energy Frames* (Chapter 4).

**Coding.**

Articles were first imported into MAXQDA data analysis software (1989-2016, VERBI Software – Consult – Sozialforschung GmbH, Berlin, Germany, version 11). The unit of analysis in three phases of coding was a point, argument, or an “instance of claim-making” (Hutter, 2014, p. 345; cf., Matthes & Kohring, 2008). (In MAXQDA, these are called segments.) “Claim-making consist of public speech acts that articulate political demands, calls to action, proposals, or criticism, which, actually or potentially, affect the interests or integrity of the claimants or other collective actors” (Koopmans & Stanham, 2010, p. 55).

In a first phase, TMPE documents were inductively coded to find identity frames and deductively coded to find diagnostic, prognostic, and motivational core framing elements. Prominent frames were identified and named by observing how core framing elements were used over multiple articles, then combining or re-combining them under common themes. In a second phase, the articles were recoded with the prominent frames. Any point that could not be linked to an existing frame was assigned to a new, inductive code. In a third phase, the coded texts were examined for self-enhancement, self-transcendence (social), and self-transcendence (nature) values frames (Schwartz, 1992) (explained in Chapter 3, An Introduction to Values Theory, and Chapter 4, the paper *Energy Frames*). For the TMPE case, ten frames were delineated from 897 segments assigned to 23 codes. Conceptual saturation was reached after examining 34 articles from 15 different media types (i.e., 26% mainstream news, 18% local news, 35% independent
news, 15% non-profit, and 6% other). Remaining articles were quickly reviewed for the presence of additional frames. In Microsoft Excel for Mac, Version 15.16 (2015), 108 segments from the same 34 articles were assigned to a frame and to a person. Additional variables, such as occupation (e.g., journalist) and media type were added to explore trends.

Learning from the TMPE coding process, all 148 articles collected for the BIHP case were deductively coded in MAXQDA using the final coding system for the TMPE case. Once inductively-derived codes were added for the BIHP, there were 2,627 points in 55 codes. These were used to characterize 17 frames. Thirty-four articles were selected for further analysis in Excel, equating to the number used for the TMPE case. They were weighted to reflect the media types in the total document sample (i.e., mainstream news (14%), local news (12%), independent news (27%), non-profit sources (20%), and other sources (27%)). Articles with the greatest number of coded segments per article were first chosen, while later selections ensured a representative diversity of voices overall. Remaining articles were scanned for additional frames. A total of 297 points were assigned to frames and individuals. Delimiting frames was markedly eased by using the coding system for the first analysis. Excel was used to examine how frames were distributed among media types. In a final step, frames were examined to see how they aligned with various framing techniques (cf., De Bruijn et al., 2015).

**Participant Sampling**

Drawing first from publicly available online media retrieved for frame analysis, key actors were identified for the TMPE project case. Contact information was found online (email addresses, phone numbers, or online forms). Potential participants were sent an email, briefly introducing the research and my rationale for undertaking it. Attached was an attractive
invitation with a link to a 4 minute YouTube video that described the research. The video was created with Apple Keynote, Garageband, and iMovie, and illustrations drawn by a professional artist.

Despite these steps, people were very reluctant to participate - particularly those working for the proponent or otherwise active in the fossil fuel industry. Many cited the sensitivity of the ongoing TMPE review process. I then turned to the thousands of NEB intervenor and commenter applications and letters for contact information, and invited everyone with an available email address. Since most intervenors and commenters were opposed to the project, snowball sampling only exacerbated the imbalance between participants supporting and opposing energy development. After this approach met with limited success, reminders were sent, and LinkedIn was used to contact people whose email addresses were no longer viable. Finally, a generic invitation was posted to LinkedIn and Twitter to encourage connections and followers to participate or pass the invitation to interested others; I received several kind replies but no new participants.

Once a person replied, it might take several email communications or a phone or Skype call to convince them to participate. Then, once people agreed to participate, completion of the surveys and commitment to an interview would often require several reminders. Participants were asked to provide the names of others who might participate, and encouraged to send my invitation to interested others. Nearly every participant thanked me for conducting this research and felt it was valuable, yet only a few people contacted me to volunteer to participate, after hearing about my research from others.
In an attempt to secure more survey data, and to accommodate people who wished to contribute but did not have the time for five surveys and an interview, I created a new type of participation, which one of my participants branded ‘participation light’. Some ‘light’ participants later agreed to participate in an interview. Late in the data collection process, a few key informants were interviewed without completing surveys.

For the BIHP, I did not limit my initial searches to those in publicly available online media. Records for people who had submitted comments regarding the project to the BC Environmental Assessment Office and Canadian Environmental Assessment Agency were examined immediately. Unfortunately, many of the files were inaccessible. Here again, I had difficulty convincing people to participate, but the reasons were different from those I heard in the TMPE case. Because the conflict had peaked in 2008-2010, some were uninterested or felt they were not fundamental to the project. A few said they could not recall enough information to participate. In short, securing participation was time-consuming and difficult, requiring commitment and persistence. To compensate for the low numbers of project supporters, I requested more time of them in interviews; nearly all were graciously obliging. Only when I had triangulated multiple sources of data (i.e., frames, surveys, interviews, network analysis, Twitter analysis), did I feel assured that I had secured sufficient numbers of participants from a range of backgrounds to validate my findings (see Table 2.1).

In summary, there were three ‘successful’ recruitment strategies, that is, names found in online media, lists from agencies, and to a lesser degree, snowball sampling. Of hundreds that I contacted or attempted to contact, 68 people participated in some manner. Forty were male, and 28 female. Forty-three percent were designated leaders, or had assumed leadership of their
organizations or groups. At least seven were First Nation or Métis. They ranged in age from 30 to 82, with a mean of 56.3 years. Most were highly educated. Forty-five had a post-secondary degree, diploma, or certificate, and 12 had professional credentials. Tables 2.1 and 2.2 show participants by actor type and organization type; these categorizations were mutually exclusive, based on the identity and organization with which the participant most strongly self-identified. Notably, seven were Indigenous but only one strongly identified with an Indigenous organization; this was not indicative of their commitment to their Indigenous heritage, only that their strongest institutional allegiance was elsewhere. Most who were not associated with organizations were retired; their former occupations are reflected in Actor Type. Anecdotally, the distribution of actor and organization types were roughly representative of those I found in publicly available online media, and intervenor and commenter lists.

Table 2.1. Actor types

<table>
<thead>
<tr>
<th>Actor Type</th>
<th># Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic</td>
<td>6</td>
</tr>
<tr>
<td>Activist</td>
<td>12</td>
</tr>
<tr>
<td>Accredited Professional</td>
<td>5</td>
</tr>
<tr>
<td>Business Owner</td>
<td>1</td>
</tr>
<tr>
<td>Citizen</td>
<td>9</td>
</tr>
<tr>
<td>Communications</td>
<td>7</td>
</tr>
<tr>
<td>Government Employee</td>
<td>2</td>
</tr>
<tr>
<td>Organization Aide</td>
<td>1</td>
</tr>
<tr>
<td>Organization Leader</td>
<td>16</td>
</tr>
<tr>
<td>Review Panel</td>
<td>2</td>
</tr>
<tr>
<td>Political Leader</td>
<td>7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>68</strong></td>
</tr>
</tbody>
</table>
Table 2.2. Organization types

<table>
<thead>
<tr>
<th>Organization Type</th>
<th># Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic</td>
<td>7</td>
</tr>
<tr>
<td>Corporate Oil &amp; Gas</td>
<td>6</td>
</tr>
<tr>
<td>Corporate Renewable</td>
<td>3</td>
</tr>
<tr>
<td>Environmental</td>
<td>12</td>
</tr>
<tr>
<td>Gov/Political/Regulatory</td>
<td>9</td>
</tr>
<tr>
<td>Indigenous</td>
<td>1</td>
</tr>
<tr>
<td>Issue-based</td>
<td>6</td>
</tr>
<tr>
<td>Media</td>
<td>2</td>
</tr>
<tr>
<td>None</td>
<td>16</td>
</tr>
<tr>
<td>Theological</td>
<td>1</td>
</tr>
<tr>
<td>Resource/Dev/Business</td>
<td>2</td>
</tr>
<tr>
<td>Small Business</td>
<td>2</td>
</tr>
<tr>
<td>Union</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>68</strong></td>
</tr>
</tbody>
</table>

**Surveys**

Survey data informed all papers. Surveys were administered electronically, using the free version of Fluid Surveys (fluidsurveys.com). Full participants completed an informed consent form and five surveys (i.e., values, views, reports, decisions, and network surveys) (Appendix A), and joined me in a follow-up interview. ‘Participation light’ was comprised of two surveys, *Values and Place*, and *Views and News* - which paired the Values and Views surveys with interview questions that had been deemed especially valuable. Collectively, respondents completed 270 surveys, from January 11 through November 15, 2016.
The values and views surveys were based on theory, empirical data, and my knowledge and experience as a natural resource practitioner. They were presented in a ‘best-least’ format, described below. Views differ from values in being context-dependent (Schwartz, 2006). By including both a values and views survey, I could examine the relationships between values and views (e.g., whether respondents who prioritize self-enhancement values appreciate nature for the resources it provides, rather than for its beauty or life-sustaining qualities).

Items for the reports survey were selected through online searches, to ensure they were publicly available. Respondents were not required to read the reports in the reports survey, only to rate their accuracy based on what they already knew. Survey participants were asked to name, or nominate, additional reports. Nominated reports were added to the survey as they became known.

Options in the decision and networks surveys were derived mainly from online media collected for the frame analysis. Therefore, network data were collected for non-participating organizations by virtue of participants’ connections with them.

**Best-least surveys.**

My values survey was grounded in the tradition established by Schwartz and Rokeach, borrowing measurements used to develop the values theory. More specifically, it drew from the Rokeach Value Survey (RVS), the 56-item Schwartz Value Survey (SVS), and the less abstract 40-item Schwartz’ Portrait Values Questionnaire (PVQ) (Hitlin & Piliavin, 2004; Mayton, Ball-Rokeach, & Loges, 1994; Parks-Leduc, Feldman, & Bardi, 2015; Schwartz, 1992, 2012). Most, but not all empirical studies employing the RVS or SVS measure the full suite of values. Here, the full suite was deemed too onerous for participants, and unnecessary given my focus on a
single dimension of Schwartz values (i.e., self-enhancement/transcendence). I used only 18 statements in my design.

While the RVS used a ranking approach, the Schwartz surveys used a rating one (Hitlin & Piliavin, 2004). Schwartz converted the ratings into relative importance scores by subtracting each person’s mean response to all the value items, from his or her response to each item (Schwartz, 2012). Respondents were asked to choose the two most important and two least important values to anchor the ratings (Rohan, 2000). Anticipating there would be some impatience in completing multiple surveys, I sought a novel format that would make the values and views surveys more interesting. Like the RVS, ‘best-worst scaled surveys’ (Finn & Louviere, 1992) force respondents to rank various options, thereby avoiding the need to derive relative importance scores. By requiring respondents to discriminate among competing options to choose one that is the ‘best’ and another that is the ‘worst’ or ‘least’ appealing, best-worst surveys (or what I prefer to call best-least surveys) have been shown to accurately measure cognitive processes that people might use to make choices and trade off decisions (Daly, Lee, Soutar, & Rasmi, 2010; Lee, Soutar, Louviere, & Daly, 2007; Marley & Louviere, 2005). Since values are juxtaposed in the real world, it is important to capture how people prioritize them when they are presented together.

Lee, Soutar, and Louviere (2008) found their best-worst survey produced results similar to the Schwartz values survey (Schwartz, 1992) with a much shorter response time and with greater precision. People found best-worst surveys easier than rating surveys (Marley & Louviere, 2005), because they were shorter and better approximated real-life situations (Lee, Soutar, Louviere, & Daly, 2007). In their typical form, best-worst scaled surveys are known to
provide rich insights, involve less response bias than rating scales, and allow for a greater variety of statistical analyses than rating scales and forced choice comparisons (Daly, Lee, Soutar, & Rasmi, 2010; Flynn, Louviere, Peters, & Coast, 2007; Lee, Soutar, & Louviere, 2008; Lee, Soutar, Louviere, & Daly, 2007; Marley, 2009).

Some of these benefits may have been lost with my design modification. Best-worst surveys typically have a balanced block design with repeated statements in combinations that control for context and order effects (Lee, Soutar, Louviere, & Daly, 2007; Daly, Lee, Soutar, & Rasmi, 2010). Again, I felt a conventional balanced block design would have been too onerous for my research participants. I opted for 18 statements in 6 values sets. Seven were self-enhancement statements, 8 were self-transcendence statements capturing social and nature-related components identified by Schwartz, and 3 were ambiguous and included to assess important contributing values. With three choices in each set, it was possible to determine both the absolute and relative importance of each value statement (Table 2.3). To enhance rigour and introduce opportunities for contextual responses, a comments section was added to enable respondents to discuss statements they perceived as ambiguous or unclear. Respondents were also invited to create their own “best” values statements, provided an opportunity to discuss their choices in a follow-up interview, and probed if necessary to discern whether a response truly reflected self-enhancement, self-transcendence, or some other value.

In an early field test, this combined survey-interview approach appeared to have certain advantages over data collection methods including only one or the other. The respondent preferred survey questions over open-ended interview questions, as they represented a form of
standardization and suggested widespread participation. Still, her elaborations on the survey responses were often descriptively thick and rich with explanation.

The departure from a fully balanced block design is further justified by the notion that values exist as a continuum, rather than as discrete units, with motivations that blend into one another (Schwartz, 2011). Therefore, a measure of one value on the circumplex could also measure its neighbour; power could partially measure achievement, for example. Also, if survey respondents perceive a value as having little relevance to the situation at hand, they will moderate their responses accordingly (Kristiansen & Zanna, 1994). Notably, Schwartz’ surveys were not balanced. He tailored the number of items to measure each value to its conceptual breadth, using more items to capture universalism than to measure power or achievement, for example (Schwartz, 2012). Appendix B, Measuring Values Priorities, shows how each value measurement was derived.

Table 2.3. Best-least values survey question, derived from Schwartz values surveys. The value that each statement measures is shown in brackets here, but was not shown in the survey itself.

<table>
<thead>
<tr>
<th>Best</th>
<th>Values Set 2</th>
<th>Least</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1. Looking after the environment is important to me. I strongly believe that people should care for nature.</td>
<td>(self-transcendence - nature - protecting the environment)</td>
<td></td>
</tr>
<tr>
<td>V2. Advancement is important to me. I strive to do better than others.</td>
<td>(self-enhancement - achievement)</td>
<td></td>
</tr>
<tr>
<td>V3. It is important to me to listen to people who are different from me, even when I disagree with them.</td>
<td>(self-transcendence - social - broadmindedness)</td>
<td></td>
</tr>
</tbody>
</table>

Please read the 3 statements, then choose 1 statement that BEST describes how you feel, and 1 statement that LEAST describes how you feel. At the end of this section is a text box where you can record any comments. For example, if none of the choices for a given question accurately reflect your values, you may write a statement that best describes how you feel.
Interviews

Interview data informed all papers. Semi-structured, open-ended interviews were conducted by phone or Skype audio from February 9 to November 16, 2016. Forty-one people were interviewed (30 for the TMPE case, 11 for the BIHP case). Interviews were recorded and transcribed into MAXQDA. A total of 2,642 segments were deductively and inductively coded, the former related to probes into the survey questions. Participants also communicated by email to share additional information. Several participants had engaged with both projects, or wished to speak to energy projects as a whole; the interview, however, focused mainly on the single case for which they had been contacted. A sample of interview questions is provided in Appendix A.

Place analysis

This section introduces the methods used in the paper entitled Sense of Place (Chapter 5). Geographic Information System (GIS) software is increasingly used in case study to better understand the spatial components of social phenomena (Alessa, Klisky, & Brown, 2008; Brown, 2004; Zhu, Pfueller, Whitelaw, & Winter, 2010). Interview coded segments, SPSS statistical software, version 23 (IBM Corp, 2015), and ArcGIS (Esri, 2016, version 10.4.1) were used to map centroids for home postal codes and latitudes and longitudes for favourite places indicated by each participant. In some cases, postal code areas were too large for meaningful analysis; in these cases, the centroids were adjusted to reflect home communities. Using the XY to Line tool, participants’ home places were linked by lines to their favourite places and measured.

Limitations.

The geographical scope of sense of place data collected during surveys and interviews was constrained by participant selection, which in turn was constrained by articles used in the
frame analysis, intervenor and commenter lists, and snowball samples.

An overlay of sense of place mapping with sensitive ecosystems and polygons of at-risk species occurrences was created to visually explore their linkages (i.e., whether favorite places were also sensitive ecosystems with rare species) (Figure 2.2). It was found to be incomplete due to a paucity of external data. Nonetheless, the map effectively showed the TMPE would pass through an area with extensive at-risk biodiversity.

**Statistical Analysis**

Survey data and certain interview data (e.g., types of place connections) were entered into SPSS. Zotero citation software (Roy Rosenzweig Center for History and New Media, 2016, version 4.0.29.15) was used as a tool to further explore reports read by participants. Most participants did not nominate additional reports, and if they did, they typically named only one or two. Because this did not necessarily reflect the participants’ knowledge, additional reports referenced in their commenter or intervenor documents, or noted during email exchanges or in interviews, were added to Zotero and summed in SPSS. I used correlation, cross-tabs/contingency tables and non-parametric tests (e.g., Chi-square, Fischer’s Exact) to examine SPSS data. A factor analysis was performed to evaluate and confirm the validity of values scores.

**Limitations.**

I conducted a path analysis, to examine dependencies among values and views. While the results were interesting, I determined there were insufficient survey responses to run a rigorous path analysis. I opted for analyzing the data for associations and strength of associations, to which it was better suited.
Figure 2.2. Favourite places and sensitive biodiversity. Orca critical habitat extends into Canadian waters northwest through the Salish Sea/Strait of Georgia. TMPL/TMPE=Trans Mountain pipeline expansion (TMPE)
I had also hoped to measure cultural values by aggregating the personal values of a cultural community’s members (e.g., Schwartz, 1999; Wan et al., 2007). Although I used measures of cultural values, I did not have sufficient data to aggregate them and produce valid statistical results. However, the combined survey and interview data, together with insights from the frame analysis, were functional substitutes.

Network Analysis

Social Network Analysis (SNA) is a visual way to examine relationships, with a long history involving multiple disciplines (Marsden, 1990, 2005; Prell, 2011; Wellman and Berkowitz, 1988). Here, it was used as an analytical tool, more than a methodology. With individuals and organizations as nodes, and network survey data as edges, node and edge files were created in SPSS and Excel. Network analysis was also used to analyze report survey data, with individuals and reports as nodes. Bipartite net graphs with directional ties were created using Gephi network software, version 0.9.1 (see Bastian, Heymann, & Jacomy, 2009) and Kumu network software (2017). Both generated network analytics, including, for example, eigenvector centrality and reach. These net graphs and metrics showed how information, advice, and financial support were disseminated; which organizations cooperated and collaborated with one another; how positive or negative individuals felt about the various organizations; and how the networks for the two cases overlapped. When combined with the interview data and triangulated with the social media analysis, they provided insights into the interactive role of individuals and organizations engaged in the conflict, such as how leaders and other members of organizations used their organizational platforms to rally others to the cause or to make decisions, and what aspects of belonging to one or more organizations participants appreciated,
disliked, or simply adhered to without much consideration.

**Social Media Analysis**

I collected Twitter data over several periods, using a variety of software (e.g., NodeXL (in Excel), Netlytic, and Twitter Archiver) and hashtags (e.g., #KinderMorgan, #KMVigils, #NotKinderMorgan, #KMFace). I also collected Facebook group data, for *Send Kinder Morgan Your Food Fish*. The final collection of tweets with NodeXL used the hashtag #BreakFreeCAN on May 14th, 2016, a day of protest at the Kinder Morgan facility in Burnaby. The protest was scheduled to coincide with a global BreakFree protest of fossil fuel projects (Pawson, 2016). Net graphs were produced in Gephi (2016), using a Yifan Hu layout. This analysis showed how certain organizations and leaders acted as hubs for protest and other forms of collective action, and to whom they targeted with their messages. This triangulated my network and frame data, predominantly by showing how organizations and individuals included in the network but not directly represented by participants were involved in the conflict. For example, my participants did not include a representative from Greenpeace, yet it was an organization to which several of my participants were connected, and an important hub for the BreakFree protest.

**Explanation-building**

The project design, together with good timing on the TMPE case, facilitated systematic explanation-building. While frame analysis was meant to provide background and suggest names for participants, its greatest value was temporal, since it was a window into how the conflicts developed. I collected survey and interview data when the TMPE conflict was actively ongoing, and (coincidentally) synthesized my overall results shortly after decisions were made and the results of consultation on environmental assessment were published.
The body of data collected for the BIHP case was considerably smaller than that for the TMPE case, limited by the number of participants, the ability of participants to recall distant memories, and the termination of the environmental assessment in 2016. Therefore, the BIHP case was used primarily for falsification and for exploring some of the similarities and differences between renewable and fossil fuel-based energy conflicts. Taken together, the cases provided important insights into key points of contention, such as the need for renewable energy and the speed with which we should transition from renewable energy to fossil fuels.
Chapter 3. An Introduction to Values Theory

Chapter 3 augments the values literature presented in the papers, as it is woven through most of the papers and is critical to the understanding of this thesis. This literature was necessarily abbreviated in the papers due to the formatting requirements of the journals to which they were submitted. The remainder of the literature review for the dissertation can be found in individual papers, Chapters 4 through 6.

The literature relevant to values is vast and crosses many disciplines. This chapter narrows the scope to focus on contributions to natural resource conflicts and decision-making. First however, it is important to identify some of the challenges inherent in the study of values and the role of values in natural resource decision-making. Values are abstract, with no standard language, in academia or in daily life (Rohan, 2000). What one perceives as family values is unlikely to be endorsed by all families, for example. Some values are considered moral, while others are not (e.g., helping others, seeking power over others). And remarkably, values may be viewed by some as fundamental to a decision, and by others as detrimental to it. In disputes involving natural resources, values have been described as barriers to effective decision-making, contributing to dysfunctional and irrational outcomes (Hitlin & Piliavin, 2004; Fischer & Schwartz, 2011; Wade-Benzoni et al., 2002).

There is little agreement as to precisely how values intervene in decision-making processes. They may influence all decisions (Dowie, 2004; cf. Hitlin & Piliavin, 2004), play a greater role when decision situations are difficult or labile (Dietz, Fitzgerald, & Shwom, 2005; Hosack, 2007), be integral early in the decision-making process (Hall, 2008), or be salient when people are forced to make decisions with limited information or time (Hall & Davis, 2007). How
individuals approach decision-making may be rooted in values - whether they react intuitively without the benefit of scientific data, are uncomfortable making decisions until all information is gathered, or will only consider evidence of a quantitative nature, for example (Hall, 2008).

Schwartz (2012, p. 297) defined values as “affect laden beliefs that refer to a person’s desirable goals and guide the selection or evaluation of actions, policies, people and events”. Rokeach (1968, p. 16) stated, “Once a value is internalized it becomes, consciously or unconsciously, a standard or criterion for guiding action, for developing and maintaining attitudes toward relevant objects and situations, for justifying one’s own and others’ actions and attitudes, and for morally judging oneself with others”. Rohan (2000, p. 270) described a personal value as “an implicit analogical principle constructed from judgments about the capacity of things, people, action and activities to enable best possible living”.

There are several notable features in these definitions. First, values are guiding principles for all we believe and do. While not entirely context-free, they transcend specific situations (Rokeach, 1968; Schwartz, 1992). Second, they may be subconscious - we may not always recognize that we have a particular value, or notice their impact in everyday decisions (Schwartz, 2012). Third, values are analogical principles or standards for comparison that we use to judge various aspects of ourselves and others. Values play a significant role in delineating in-groups versus out-groups, and in rationalizing rhetoric (Kristiansen & Zanna, 1994). Fourth, there is an element of morality to values. Feather (1995, p. 1135) noted that values have a “normative, or oughtness, quality about them.” We are uncomfortable when something conflicts with our values. Values are used to defend, justify, and promote existing views (Kristiansen, & Zanna, 1994).
Fifth, values are to enable *best possible living*. Best possible living may refer to biological needs, interactional requisites for interpersonal coordination, or social institutional demands for group welfare and survival (Schwartz & Bilsy, 1987). However, Rohan (2000) asserted that enabling best possible living reaches beyond survival needs, as people are motivated to live as pleasantly and productively as possible. *Eudaimonia*, roughly translated into ‘human flourishing’ or ‘actualizing potential’, was recognized as the ultimate human goal by Aristotle and other early philosophers (Rohan, 2000; Eudaimonia, n.d.). It may follow that aspirations for best possible living are highly individual and fluid, a potpourri of needs and wants that corresponds to a medley of values. Yet theorists have discovered a surprising degree of homogeneity and stability in values across individuals and cultures.

**Schwartz’ Theory of Basic Human Values**

My research is grounded in the work of social psychologists Milton Rokeach and Shalom Schwartz, who are renowned among values theorists for having developed a broad understanding of the structure of values and instruments to effectively measure them. Rokeach and Schwartz recognized that people hold similar values, and these are limited in number. Rokeach suggested there were “five or six dozen” ‘modes of conduct’, or instrumental values (e.g., courage, honesty), and “perhaps a dozen and a half” ‘state of existence’, or terminal values (e.g., a world at peace) (Rokeach, 1969, p. 552). He believed that values were inherently social, translating an individual’s needs and desires into a socially acceptable form (Grube, Mayton, & Ball-Rokeach, 1994). He posited that they were universal, trans-situational, and hierarchical - ascending or descending in importance without decay (Mayton, Ball-Rokeach, & Loges, 1994).
Schwartz built on this work - developing a theory of basic human values founded on motivational goals (Schwartz, 1992, 1994, 2006; Schwartz & Boehnke, 2004). The centerpiece of this theory is a “circumplex” of ten basic values, a universal values structure empirically confirmed to be consistent across many people of different cultures around the world (Schwartz, 1992, 1994; Schwartz & Boehnke, 2004, p. 231). Individual values differ only in the relative importance they place on the universal value types (Rohan, 2000). The circumplex, a diagram resembling a pie graph, portrays a motivational continuum and two bipolar dimensions (Figure 3.1).

![Figure 3.1. Schwartz’ universal structure of basic value types. The self-transcendence and self-enhancement dimension captures the conflict between values that emphasize the welfare and interests of others and for nature, and values that emphasize the pursuit of one’s own interests (Schwartz, 2012).](image)

The ten values are shown to be distinct but are more appropriately regarded as a continuous, overlapping sequence (Schwartz, 2012). The closer together two values are in the circle, the more similar their underlying motivations (Schwartz, 1992). Actions in pursuit of any
value have consequences that conflict with some values and are congruent with others, and these are predictable via the circumplex structure (Schwartz, 2012). *Self-enhancement* values such as achievement and power are likely to be compatible; a quest to seek personal success is likely to strengthen and be strengthened by a mission to enhance social position and authority over others. Achievement and power values conflict with values on the other side of the circle, i.e., the *self-transcendence* values of universalism and benevolence, which involve concern for others and for nature (Schwartz, 1992). Applying the values theory of Schwartz (1992; 2012), I surmised that people who prioritize self-enhancement values will support economic development over environmental protection, while those who align with self-transcendence values are more likely to be against development projects.

Other authors have examined similar values with congruent findings. Kahan (2010) distinguished between people with hierarchical, individualistic values and those with primarily egalitarian, communitarian values. Those with individualistic values were found to be skeptical of environmental risks and believed widespread acceptance of these risks would limit commerce and industry, while people with egalitarian values tended to be suspicious of commerce and industry. Boyle, Crompton, Kirk, and Shrubsole (2011) differentiated between intrinsic and extrinsic values. Intrinsic values included values that embody care for community or each other, social justice, and protection of the environment. Their extrinsic value construct included material wealth, personal achievement, power, and utilitarian views of the environment.

**Value Priorities**

Throughout the values literature, authors discuss values when they are really referring to *value priorities* (Rohan, 2000). Value priorities are the ordering, or relative weight or importance
attached to values (Rokeach, 1968; Schwartz, 1992; Schwartz & Bilsky, 1987). Rokeach believed values were not simply ordered, but had centrality (Grube, Mayton, & Ball-Rokeach, 1994). He saw terminal values as being more central; when changed, these have a greater impact on beliefs and behaviours, compared to less central values (Grube, Mayton, & Ball-Rokeach, 1994). Tadmor and Tetlock (2007, p. 1007) referred to “core values” that underlie belief systems, again suggesting that certain values are more central than others; however, the term is frequently used to simply describe values that individuals feel are most important to them.

The distinction between values and value priorities is at times very important. People prioritize their values to meet survival needs, and to enable best possible living (Rohan, 2000; Schwartz & Bilsky, 1987). Values essential to survival are generally perceived as having greater importance than ethical values, a category under which care for nature typically falls (Duelli et al., 2007; Inglehart, 2000; Maslow, 1948; Rokeach, 1969). Yet, in the anthropocene epoch (Crutzen 2002; Rockström et al., 2009), one might easily view ecosystems as essential for survival. Those who see biodiversity as the source of life, or who view biodiversity loss as a security issue, are more likely to advocate for the protection and recovery of sensitive ecosystems. Similarly, in a climate of global political and financial instability, some are likely to view power as essential to best possible living.

**Conflicting Value Priorities**

Schwartz (2012) believed people pursue competing values, but only through different acts, at different times. Rokeach (1969) believed it is nearly impossible to behave in a way that is simultaneously congruent with all of one’s values, and that cultural, social and institutional factors act as a filter that helps us prioritize our values. When prioritizing values, strongly held
values will outcompete weaker ones. In fact, values-based decisions are expected to be in harmony with one’s strongest values (e.g., Hosack, 2007; Tetlock, 1986), and these are mostly subconscious. Schwartz (2012) asserted that values only enter awareness when one is considering actions or judgments that have conflicting implications for one or more important values.

In situations where conflicting values are of approximately equal stature, only one of these can come out on top. Trading-off conflicting value priorities is difficult and emotional cognitive work (Tetlock, 1986, 2000). Kristiansen and Zanna (2007) noted that when there is value tension, people are motivated to be attentive and open to information. Canadian-American scientist Philip E. Tetlock’s Value Pluralism Model showed that people reconcile important competing values by invoking more complex reasoning (Tadmor & Tetlock, 2007; Tetlock 1986). For example, Tetlock (2000) found that liberal thinkers were most likely to invoke complex reasoning when economic efficiency conflicted with social equality, whereas conservatives did so when national defense and fiscal prudence were in conflict. In such cases, two modes of integratively complex reasoning come into play: differentiation (i.e., weighing the merits of each value) and integration (i.e., developing rules for trading off values) (Tadmor & Tetlock, 2007). The intensity of the value conflict and the accountability pressures faced by the individual influence the complexity of reasoning required (Tadmor & Tetlock, 2007).

Henik (2008) found the type and intensity of emotions triggered by value conflict affected the degree of integrative complex thinking that occurs and predict how arguments are assessed. Strong values and emotions were tied to low complexity in thinking and less interest in rational argument.
Tetlock found the politically centrist were more likely to have values in conflict that were nearly equal in importance, and more likely to think about a policy issue in complex ways and be less confident in the correctness of their positions (Tetlock, 1986). Notably, when politicians acknowledged conflicting values or offer complex values-centric reasoning, they were less likely to be trusted and respected - even by their own supporters. Tetlock (2000, p. 262) referred to this as the “traitor effect”; it was more acceptable that a leader categorically reject the other side’s perspective. Those on the extreme left or right of the spectrum were most upset when someone recognized the legitimacy of their view but did not agree with it (Tetlock, 2000).

Priming Values

A value can be primed or activated to influence views and behaviour by framing or reframing an issue in ways that indicate the value is threatened (Darnton & Kirk, 2011; Fairhurst, 2005; Kasser, 2011; Nelson & Willey, 2001; Schultz et al., 2005). If self-transcendence values are primed, self-enhancement values will be suppressed, and vice versa. When values are activated, they are infused with feeling (Schwartz, 2012). Maio, Cheung, Pakizeh, and Rees (2009) suggested that priming can alter behaviour even when there is no real or existing tension.

Values and Networks

An individual’s value priorities, or one’s personal values, are influenced by her or his social values, i.e., one’s perceptions of the value priorities of other people, groups, or institutions (Hall, 2008; Kahan, 2010; Pidgeon & Fischhoff, 2011; Rohan, 2000; Schwartz, 1999). An individual has a single personal value system (i.e., a set of values and learned rules to guide their ranking in making choices and resolving conflicts (Rokeach, 1969)), but may have several social value systems that partition people and organizations into groups with similar value priorities.
She or he may draw upon any of these systems to make and justify decisions, and must reconcile them if they are in conflict (Rohan, 2000).

Social values, which exist within the mind of an individual, may differ from cultural values, which are shared by, or are representative of a cultural community (e.g., professional network, activist organization). Cultural values are normative and underlie and justify the functioning of social institutions and organizations (Schwartz, 2011). Cultures, like individuals, demonstrate a predominance of values in one dimension over another (Schwartz, 1992, 1999). Both social and cultural values may be at play when individuals represent their institution or organization (Hitlin & Piliavin, 2004; Knafo, Roccas, & Sagiv, 2011).

Notably, social and cultural values may be differentiated from ideological values, which are values that groups actively endorse or promote (Rohan, 2000). Decisions associated with ideological values may derive from personal or social value systems, but they are more purposive than either personal or social values (Rohan, 2000).

Schwartz’ Cultural Value Orientations

Schwartz structured seven cultural value orientations in a circumplex structure, not unlike the one he developed for basic human values (Schwartz 1992, 1994) (Figure 3.2). Four are relevant to this research. Hierarchy values are characterized by a cultural legitimacy of unequal distributions of power, roles, and resources. Hierarchy values oppose Egalitarianism values, which transcend selfish interests and promote equality. Mastery values emphasize getting ahead by controlling and changing the social and natural environment. They oppose Harmony values, which emphasize harmonious integration with the environment. Roughly, these are the cultural equivalents of the self-enhancement and self-transcendence personal values dimensions.
The Mastery versus Harmony dimension encompasses approaches for how people should manage their relationship to the natural and social world, while the Hierarchy versus Egalitarianism dimension offers antithetical ways for people to behave in a responsible manner that preserves the social fabric (Schwartz, 2006). Empirical studies have shown that these dimensions are universally present across some 82 countries, countries with highly diverse attributes (Schwartz, 2012).

More specifically, a Hierarchy culture legitimizes the unequal distribution of power, roles, and resources (Schwartz, 2006). People are socialized to take for granted and comply with a
hierarchical distribution of roles (Schwartz, 2006). Important values include social power, authority, humility, and wealth; humility is included because in hierarchical societies, members must accept that they are inferior to some and superior to others (Schwartz, 1999, 2006). Hierarchy assumes that a person’s obligations to the upper echelons are more important than his or her individual ideas and aspirations (Schwartz, 2006). People that hold hierarchical values are less likely to engage in activism, as such action violates the authoritative social order (Schwartz, 2006).

By contrast, people in Egalitarian cultures recognize one another as moral equals, and are socialized to cooperate and feel concern for everyone’s welfare (Schwartz, 2006). Important values include equality, social justice, responsibility, help, and honesty (Schwartz, 2006). Egalitarianism predicts greater political activism, particularly for causes that reach beyond self-interest (Schwartz, 2006).

Harmony cultures emphasize fitting into the world as it is, trying to appreciate rather than change, direct, or exploit (Schwartz, 2006). Mastery cultures emphasize ambition, success, daring, and competence (Schwartz, 2006). Mastery values also oppose Egalitarianism values (Vauclair, Hanke, Fischer, & Fontaine, 2011). They align, however, with Hierarchy values, because efforts to achieve success are often at the expense of others and result in unequal allocations of resources (Schwartz, 1999).

**Cultural Communities and Cultural Cognition**

Schwartz examined cultural communities among countries. The United States (USA), our closest neighbour, had a culture that emphasizes Mastery and Hierarchy values more than Harmony and Egalitarianism ones (Schwartz, 2008). English-speaking nations had an
entrepreneurial and somewhat exploitative orientation to the social and natural environment. Francophone Canadian values were more similar to those in Western European nations, which have shown a preference for educated, rational-based, harmonious relationships with the environment (Schwartz, 2006). Using different value measures, Dheer, Lenartowicz, Peterson, and Petrescu (2014) found British Columbians were more culturally similar to those in Washington, Oregon, and California, than in other regions in North America.

In fact, cultural communities are found in many forms and at multiple scales. They may be family groups, professional networks, community organizations, religious groups, ethnic groups, and even a demographic or social class. In general, they include those with whom we are close, those with whom we frequently interact, and/or those with whom we identify (Schwartz, 2007).

Cultural communities are important considerations in conflict, since people are more apt to consider, trust, and support information and views from those with who belong to their cultural communities (Kahan, 2010, Kahan et al. 2012). Kahan and his colleagues assigned a name to this tendency, calling it the ‘cultural cognition thesis.’ Using perceptions of climate change as an example, they suggested cultural cognition may cause a person to avoid expressing their anxiety to her co-workers at an oil refinery, or a professor may not reveal his skepticism to his academic colleagues (Kahan et al., 2012).

Cultural cognition integrated a number of psychological mechanisms described in social theories. For example, in the social comparison literature, people are known to clarify their thinking by discussing matters with others who are deemed similar (Erickson, 1988). In confirmation bias and biased assimilation literature, people will readily accept evidence that confirms their views and reinforces their values while critically evaluating disconfirming
Evidence (Lord, Ross, & Lepper, 1979; Schulz-Hardt, Frey, & Lüthgens, 2000). Social identity theory, first developed by Tajfel and Turner in the 1980s, suggests that group members will self-stereotype to minimize differences between themselves and their group, and exaggerate differences with other groups to achieve a distinct, positive identity (Kristiansen & Zanna, 1994). The homogeneity of the in-group increases when out-groups are present, and during competition, values are underscored and differences and lines between groups drawn more sharply (Ashforth & Mael, 1989).

Such tendencies are relevant to natural resource conflicts in several ways. People may self-censor, deferring to the knowledge and values of their cultural community (Kahan et al., 2012). They may engage in groupthink, a phenomenon whereby cohesive groups strictly adhere to one position without dissent and at the expense of other alternatives (Janis, 1972). In the absence of varied perspectives, and in some cases, the complex thinking that accompanies values in conflict, a group may develop increasingly narrow and hardened views (Kristiansen & Zanna, 1994). Identifying in- and out-groups as ‘us’ and ‘them’ sets the stage for polarization, where members assume that group interests directly oppose each other. In this setting, the opposing group’s interests are easily dismissed as misguided or biased (e.g., a project supporter might associate opposition with ‘leftist’ views (Hoffman & Jennings, 2012)). At this juncture, decisions are dichotomies; one can only support or deny, agree or disagree.
Chapter 4.


Abstract

Global warming or climate change? Environmentalists or foreign-funded radicals? Oil sands or tar sands? Media frames in Canadian energy development often capture, reflect, and promote opposing values. With frame analysis, we explored the roles of identity and values frames in online articles relevant to two contentious proposed energy projects in British Columbia. Frames contributed to conflicts by defining actors as adversaries, signaling tipping points for fresh or renewed volatility, filtering and amplifying media effects, and influencing stepwise and final outcomes. Avenues for mitigating conflict through frame management are considered.

Keywords

frame analysis, media, conflict, polarization, values

Natural resource conflicts in Canada are fought on several fronts, and a key battleground is in publicly-available online media. Media documents are replete with frames. Framing is a persuasive form of communication, whereby people manage meaning by selecting certain words, images, or symbols over others, with an intent to influence thinking or behaviour (Goffman, 1974; Fairhurst & Sarr, 1996). In this paper, we introduce theoretical concepts relevant to framing renewable and fossil fuel-based energy conflicts, identify and discuss the origins and consequences of frames key to two conflicts, and explore ways to soften the effects of polarizing frames that inhibit peaceful and collaborative resolutions. This work also advances a method of
frame analysis developed by Benford and Snow (2000) and refined by Lindekilde (2014), by demonstrating its usefulness in assessing these natural resource conflicts.

**Framing Conflict, in Theory**

Frames may determine whether we notice a problem, and how we understand, remember, evaluate, and choose to act upon it (Entman, 1993). They can be used to define situations and set the terms of debates (Reese, 2001; Tankard & Kosicki, 2001). The perceived space for policy alternatives available to decision-makers may be constrained by dominant frames (e.g., raising taxes is bad, cutting taxes is good) (Bohman & Raitio, 2014). There are three frame characteristics that influence the degree to which a frame ignites or stirs conflict: frame infrastructure, frame dynamics, and the agency of frame advocates and recipients.

Gamson (1999, p. 24) describe frames (shortened from framework) as “an underlying infrastructure that provides coherence and a story line to a range of facts, says which are important and relevant and which are not.” Framing infrastructure may be cognitive or cultural, attached to, or in pursuit of broader meanings entrenched in pre-existing individual and group biases (Reese, 2001). When we hear a frame, we understand it by referencing already held feelings, ideas, and values. Repeated encounters with the frame tend to reinforce the cognitive pathways to those feelings, ideas, and values (Darnton & Kirk, 2011). For example, how people know, or come to know oil will shape their views in a fossil fuel-related conflict. A physical substance, oil may be framed as integral to growth and capitalism, or to various forms of mobility and freedom (Szeman, 2014). Alternatively, it may be framed as responsible for exponential world population growth, pollution, and climate change (Szeman, 2014). While a frame depicting Alberta bitumen as a source of national wealth will resonate with someone who
understands oil as progress, it will distress others who believe the substance a threat to planetary stability.

There are a number of clever techniques used to strengthen frame infrastructure and impacts. For example, frames may be constructed of *cold* information, *warm* lived experiences and *hot* values (De Bruijn et al., 2015; Gamson, 2009). In a framing contest, frames that are human, warm, and emotional will typically trounce ones that are technical, cold, and analytical (De Bruijn et al., 2015). Frames may also be structured as masculine or feminine. Masculine frames make a clear distinction between good and evil, and leadership is about decisiveness, power and strength (De Bruijn et al., 2015). In feminine frames, the distinction between good and evil is less clear, and leadership is about bridging differences, establishing relationships, and questioning one’s own position. In the villain, victim, hero frame, the hero adopts a clear moral position and promises to protect the victim from the villain (De Bruijn et al., 2015). The 3P frame incorporates policy, principles, and personal perspectives (De Bruijn et al., 2015). A policy perspective conveys information, a principled perspective is focused on values, and a personal perspective personalizes the issue (De Bruijn et al., 2015).

Frames are also dynamic, providing “an ongoing interpretation that can incorporate new happenings and factual claims” (Gamson, 1999, p. 24). To persist, they must adjust to new information, events, and rebuttals (including counter frames). This temporal aspect is sometimes described as a *framing cycle*. Frames gain public visibility and legitimacy in news media within a cycle of emergence, conflict, resonance, and resolution (Koopmans & Statham, 2010; Miller & Riechert, 2001; Seamon, 2005). In the emergent phase, frames often arise in quotes within news reports or in submitted materials (Miller & Riechert, 2001). During the conflict phase,
stakeholders use frames to highlight certain aspects of the issue and downplay others, and to compete for media attention (Miller & Riechert, 2001). Media actors, attracted to conflict frames, begin to shape existing frames and may create their own frames. In the resonance phase, individual frames align with the values and experiences of the public (Miller & Riechert, 2001; Lindekilde, 2014). In the resolution phase of the cycle, decision-makers set policy to conform to the dominant frame (Miller & Riechert, 2001). Opponents are forced to concede to, or include this frame, because it has come to define the issue (Seamon, 2005). In many cases, however, opposition has only quieted, and may emerge with new information or events; U.S. gun control is an example of a cycling frame, emerging each time a mass murder occurs in America (Miller & Riechert, 2001).

When frames have broad appeal, they are viewed as common sense (Lakoff, 2005). However, the journey of a fledgling frame to common sense can be less than virtuous. People skilled in the art of shaping frames may strategically mobilize supporters, hobble opponents, and ultimately, determine outcomes (Benford & Snow, 2000; Entman, 1993; Lindekilde, 2014). Framing has been described as manipulative, immoral, and dangerous; necessary and responsible; genius and masterful (cf., De Bruin et al., 2015). The acts of framing and reframing are often referred to as a game (De Bruijn et al., 2015).

Yet, while frames can be deliberate deceptions designed to discredit others, “one person’s calculated frame is another person’s principled standpoint” (De Bruijn et al., 2015, Week 4, Episode 10). By simplifying complex issues, bringing attention to different views and interpretations, and helping people make sense of arguments, frames may effectively facilitate
public deliberation (Miller & Riechert, 2001; Pan & Kosicki, 2001). In the best of circumstances, they can help bind diverse interests and actors (Pan & Kosicki, 2001).

Those who successfully elevate and effectively disseminate their version of meaning are empowered, or become so (Benford & Snow, 2000; Fairhurst & Sarr, 1996). Dale & Sparkes (2011, p. 478) described agency as “an a priori condition in individuals that enables and strengthens social capital and contributes to collective social agency. It is the agency of individuals and the synergy of the group that creates the self-perpetuating efficacy needed to inspire and organize networks to take action.” In this way, the meanings embedded in frames are impetus for collective action.

However, agency and framing resources are unevenly distributed. Pab and Kosicki (2001, p. 45) referred to a “web of subsidies”, referring to both institutionally structured and strategically cultivated networks through which influential resources flow. Strategically cultivated networks are often guided by “issue entrepreneurs” (p. 46), people skilled in political lobbying or manipulative messaging. “Much of the power of framing comes from its ability to define the terms of a debate without the audience realizing it is taking place” (Tankard & Kosicki, 2001, p. 97). Entities that control extensive financial and communications resources have an edge (Noakes & Johnston, 2005).

Government agencies are advantaged in framing disputes, as they have significant resources and experience in shaping media texts (Noakes & Johnston, 2005; Seamon, 2005). Media producers are generally friendly to government agencies as they rely on them for official, legitimate, and time-sensitive sources of information (Noakes & Johnston, 2005).
By contrast, social movements tend to have a difficult time securing consistent media attention. Most media producers are drawn to conflict, but focus on specific events and their actors. Less often, they are keen to analyze the historical or social conditions that gave rise to the contentious issue (Noakes & Johnston, 2005).

**Media Effects**

When news outlets reinforce frames put forth by political actors, advocacy groups and others, they can provoke powerful, judgmental cognitive processes (Fredin, 2001; Shah, Domke, & Wackman, 2001). Mainstream media have been described as gatekeepers, filters, screens, and lapdogs of the elite, at the same time reputed for professionalism, objectivity, balance, and fairness (de Graaf et al., 2015; Koopmans & Statham, 2010). They have been assigned the roles of democratic watchdogs - purveyors of political and moral accountability and guardians of a vulnerable public, the proverbial fourth estate (Eldridge & Steel, 2016). Indeed, ‘fourth estate’ was coined by Irish statesman Edmund Burke in the 19th century to describe a political power that could either be feared or harnessed (de Graaf et al., 2015).

The distribution and selection of media are significant in framing conflicts, because they are difficult to disentangle from the impacts of the frames themselves. There is growing awareness that news production is a business sector with its own interests and political leanings (Deacon, Baxter, & Buzzelli, 2015; Patterson, 2016). People understand that news stories are often framed, scripted, spun, disguised, timed, and otherwise managed to convince or mislead (American Press Institute and Associated Press, 2016; O’Neill et al., 2015; Statistics Canada, 2016). However, there is far less known of the extent to which messaging is steered to some
advantage. For example, frames may be pre-tested on social media or in comment sections known to attract and amplify extreme voices (Toepfl & Piwoni, 2015).

Indeed, the nature and use of media are changing in a digital world, further blurring the lens through which frames must be understood. As traditional news competes with quasi-journalism and propaganda, information-gathering is becoming progressively individual. People now have a repertoire of media to which they routinely turn, which may include traditional news but also aggregators, listserves, e-newsletters, and social media. With far too much information to consume, they select media that are of interest to them and are consistent with their values, defined here as principles “constructed from judgments about the capacity of things, people, action and activities to enable best possible living” (Rohan, 2000 p. 270).

Yet, choice also begets personalization in the digital world. Media outlets and aggregators are indeed gatekeepers, as is Google. Yet, that traditional role has been altered by the routine collection of user data to develop algorithms that filter and otherwise curate information (Kleis Nielsen, 2016). Additionally, news organizations may be persuaded to produce content best suited to the algorithm, rather than the audience (VanNest, 2016; Viner, 2016). People are then in a filter bubble, where pre-existing beliefs are reinforced and opposing views may not even reach them (Pariser, 2011; Viner, 2016). Since frames link to pre-existing beliefs, they amplify the filter bubble effect.

When they share information, whether in person or online, people are likely to find themselves in echo chambers with like-minded others (Bakshy, Messing, & Adamic, 2015; Gruzd & Roy, 2014; Mitchell et al., 2016). The more partisan they are, the more likely it is they will receive one-sided information (Mitchell et al., 2016). Repeatedly drawn to media and frames
with which they agree, individuals and groups may drift to extreme points of view (Sunstein, 2008). People who have a diverse media repertoire may be unaware of the hold that echo chambers have on conflict situations, while those who reside in filter bubbles or echo chambers may not recognize the considerable traction mainstream media has with politicians. Notably, whether articles are read or redistributed depend on a host of interrelated and complex factors, such as education, age, gender, and civic or political interest (Culbert et al., 2015; Mitchell et al., 2016; Moeller & de Vreese, 2015; O’Neill, 2009).

Identity Frames

We examined two types of frames in online media: identity frames and values frames. Identity frames link to agency and delimit we and them - adversaries differentiated by their interests and values (Gamson, 1992, 2009; Noakes & Johnston, 2005). An injustice element squarely places blame on them, expresses moral indignation, and legitimatizes action to end the perceived injustice (Gamson, 1992; 2009; Noakes & Johnston, 2005). In this way, frames can create or harden boundaries between factions and impede productive outcomes (Pan & Kosicki, 2001).

Identity frames may describe specific individuals and groups acting in solidarity, or “imagined communities” often encompassing individuals with surprisingly disparate interests (e.g., Christians, farmers, Conservatives, the ‘left’) (Gamson, 2009, p. 284). Sometimes, identity frames employ stereotypes, igniting a host of value-laden feelings about the groups involved, and ultimately re-conceptualizing the situation to be more about the groups and less about the issue (cf., Nelson & Willey, 2001). In the absence of a definite adversary, identity frames will target an abstraction, however, the effect tends to be muted (cf., Gamson, 1992); the 1% or big business
are examples of abstract adversaries. Identity may or may not be self-determined; supporters, opponents, and the media may construct different identities for the same group.

**Values Frames**

In a policy struggle, the winner may be determined by one side’s ability to activate or ‘prime’ values to sway public opinion, rather than the quality of the arguments (Fairhurst, 2005; Nelson & Willey, 2001; Schultz et al., 2005; cf., Seamon, 2005). To illustrate how frames link to values, we offer a quote by Canadian activist Naomi Klein, in *The Guardian* article, *Climate change is corroding our values, Naomi Klein says*: “Climate change is spawning injustice, racism, intolerance and wars” (Vidal, 2016, para. 1). By framing climate change as a catalyst for conflict, Klein reveals that she values a *world at peace*, a basic personal value identified by Rokeach (1969). For Klein, a *world at peace* likely contributes to her interpretation of best possible living, and this is threatened by climate impacts (Rohan, 2000; Schwartz, 2006). Frames that dismiss the threat are likely to prime the *world at peace* value.

Importantly, people share similar values, but prioritize them differently (Rokeach, 1968; Schwartz, 1992). Schwartz’ (1992) universal values structure holds that when people emphasize self-enhancement values such as power and achievement, they are unlikely to also prioritize self-transcendence values involving concern for others and for nature (and vice versa). If self-transcendence values are primed and reinforced by a particular frame, self-interest values will be suppressed (and vice versa) (Darnton & Kirk, 2011). Similarly, security values oppose self-direction values, such as freedom (Schwartz, 1992). Security values are more closely aligned with self-enhancement, while self-direction is more closely associated with self-transcendence values (Figure 4.1).
Figure 4.1 Schwartz’ universal structure of basic value types (Schwartz, 2012). Universalism values encompass both concern for others (ST-social), or for nature (ST-nature), however one is often prioritized over the other.

Other scholars have identified similar values dichotomies. Intrinsic values, that embody care for community or each other, social justice, and protection of the environment were found to be in opposition to extrinsic values emphasizing material wealth, personal achievement, power, and utilitarian views of the environment (Boyle, Crompton, Kirk, & Shrubsole, 201). People with individualistic values were skeptical of environmental risks that might limit commerce and industry, while those with egalitarian values were more suspicious of commerce and industry (Kahan, 2010). Values theory suggests that people who prioritize self-enhancement values (or their equivalents) will defend energy projects, while those who align with self-transcendence values are more likely to be against them.

It is in the context of frames and framed values, that we examined online media coverage of two contentious proposed energy projects in British Columbia. We investigated the role of frames as a source of tension in these ‘economy versus environment’ conflicts, and more
specifically how frames and framing techniques contributed to polarization and inhibited productive dialogue for sustainable development and environmental protection.

Case Studies

Trans Mountain pipeline expansion.

The Trans Mountain Pipeline Expansion (TMPE) project proposed to move bitumen 1,147 km from Alberta’s landlocked bitumen sands to tidewater in BC at Vancouver, Canada’s third largest city (Figure 4.2). It would traverse sensitive ecosystems, protected areas, Indigenous territories, and several populous municipalities en route to markets to Asia and the United States. The Trans Mountain application and associated promotional materials described the proposal as ‘twinning’ an existing pipeline, since more than 85% would parallel an “existing pipeline disturbance”, i.e., a pipe that had transported oil products from Alberta to Burnaby (in Greater Vancouver) since 1953 (National Energy Board (NEB, 2016, p. xxi; Trans Mountain Pipeline ULC (TM), 2013). Framing the project as ‘twinning’ an existing pipeline was one of many issues that would stir opponents to action. The proposal included new facilities and 987 km of new pipeline to increase capacity from 300,000 barrels/day (b/d) to 890,000 b/d and bring an estimated 34 Aframax class tankers into Vancouver each month (TM, 2013). The project, approved by the NEB and the Trudeau Government in 2016, has slowed amid court challenges and protests.

Bute Inlet hydroelectric project.

Initiated in 2008 by Plutonic Power/Bute Hydro Inc. and General Electric (which would become Alterra Power), the Bute Inlet Hydroelectric Project (BIHP) was the largest of its kind in Canada. Comprised of 17 non-storage run-of-river sites on three river systems draining into the
Bute Inlet on BC’s picturesque Central Coast, it had an approximate generation capacity of 1,027 megawatts, enough to power ~300,000 homes (Plutonic Power Corporation (Plutonic), 2009). The proponents envisioned a Green Power Corridor along the BC coast, meeting the needs of 586,000 homes, creating ~5,900 person years of employment, and offsetting an estimated 4 million tons of CO2 emissions every year (Plutonic, 2009). Conflict over the project dissipated when the environmental assessment process was terminated in June 2012, however, the project was not formally withdrawn from the process until April 26, 2016 (Bennett, 2016). The company had spent $20 million to develop the project (Alterra Power Corp, 2016).

**Methods**

To explore the role of frames in these energy conflicts, we purposefully sampled online traditional news stories, quasi-journalistic articles, and industry and advocacy group propaganda to gather a cross-section of media available to anyone with a computer. To observe the discourse to which people may be passively exposed as well as information they might actively pursue, the lead author subscribed to relevant list serves and newsletters from organizations engaged with the projects, actively monitored left- and right-leaning news outlets and independent news magazines, and used search engines to find additional articles, including articles that discussed run-of-river hydro projects more generally. Seventy TMPE articles were collected, published between April 12, 2014 and June 26, 2015. A total of 148 run-of-river articles were collected from 2008 through 2016, with the majority in 2008 and 2009. At this stage, the outcome of the BIHP and the long-term trajectory of the conflict were known, whereas the TMPE conflict was ongoing. The latter would later expand in the national public sphere, as pipelines became a federal election issue and a juggernaut for the new federal government elected in late 2015.
Figure 4.2 Case study areas
Points or arguments in each article were deductively assigned to diagnostic, prognostic, and motivational core framing elements (Benford & Snow, 2000; Lindekkilde, 2014), in MAXQDA (2016, version 11). Diagnostic framing elements identify a problem and attribute blame or causality to someone or something. Prognostic elements articulate goals, strategies, tactics, or solutions to address the problem, and often are ‘counter-frames’ in response to their opponents’ assertions. Motivational elements are rationale for action, or a “call to arms” (Benford & Snow, 2000, p. 617); they often refer to severity, urgency, efficacy, and/or propriety or duty (Benford & Snow, 2000). (Diagnostic and motivation core elements overlap with an ‘injustice’ element found in other framing approaches.) These elements, when viewed across multiple articles, were used to identify prominent frames. Points or arguments, called segments in MAXQDA, were deductively re-coded to explore the relationship between frames and self-enhancement, self-transcendence-social (ST-social), and self-transcendence-nature (ST-nature) values. Identity frames were derived by coding to topic (e.g., security) and position on the project.

For the TMPE case, ten frames were identified in 897 segments. Although all 70 articles were reviewed, conceptual saturation was reached after examining only 34 articles from 15 different media types (e.g., mainstream news). Learning from the TMPE coding process, all 148 articles collected for the BIHP were deductively coded using the final coding system from the previous case. Seventeen frames were derived from 2,627 segments.

Thirty-four articles were purposively selected from each case for frame distribution analysis, weighting the sample to reflect the distribution of media types in the total document
sample. Articles were first prioritized to reflect the greatest number of coded segments per article, and then to ensure a diversity of voices.

Results and Discussion

Energy frames.

Of ten TMPE frames, there were two prominent identity frames, three self-transcendence (ST) values frames, and two self-enhancement (SE) values frames (Figure 4.3). Consistent with values theory, the SE frames were pro-pipeline frames, while the ST frames were anti-pipeline frames. The remaining three were anti-pipeline frames with both SE and ST qualities. There were 17 frames identified for the BIHP and run-of-river projects more broadly, including 6 identity frames, 6 ST values frames, 2 SE values frames, and 3 frames with both ST and SE qualities (Figure 4.4). Both project supporters and opponents advanced ST frames. The surfeit of frames appeared to diminish their impact. Below, we describe the frames that were most influential in the cases, as well as ones that best illustrate important framing techniques.

Anti-petroleum extremists.

The Anti-petroleum Extremists identity frame assigned to pipeline opponents comprised only 5% of all frames, yet remained salient well beyond the removal of the Conservative federal Government in late 2015 (see Table 4.1 for core framing elements). Its longevity can be attributed to its predominance in mainstream media (60% of frame, 14% of mainstream news), the powerful agency of its advocates, and the genuine threat to opponents posed by kindred legislation. (Here, frame advocates included anyone who advanced the frame, whether they had authored the piece or were quoted within it.) The frame had its origins in a 2012 media firestorm over a separate pipeline project, the Enbridge Northern Gateway pipeline proposed for northern
Figure 4.3. TMPE frames. Ten frames were found in a sample of 108 segments from 34 articles. Percentages include arguments using the frame, and those directly countering the frame. Frames are described below or in Supplemental Information, Table SI.4.1.
Unfortunately, there are environmental and other radical groups that would seek to block this opportunity to diversify our trade. Their goal is to stop any major project no matter what the cost to Canadian families in lost jobs and economic growth. No forestry. No mining. No oil. No gas. No more hydro-electric dams. These groups threaten to hijack
our regulatory system to achieve their radical ideological agenda. They seek to exploit any loophole they can find, stacking public hearings with bodies to ensure that delays kill good projects. They use funding from foreign special interest groups to undermine Canada’s national economic interest. They attract jet-setting celebrities with some of the largest personal carbon footprints in the world to lecture Canadians not to develop our natural resources. Finally, if all other avenues have failed, they will take a quintessential American approach: sue everyone and anyone to delay the project even further (Oliver, 2012).

Table 4.1. Anti-petroleum Extremists identity frame, core framing elements

<table>
<thead>
<tr>
<th>Frame</th>
<th>Diagnostic</th>
<th>Prognostic</th>
<th>Motivational</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anti-petroleum Extremists</td>
<td>Anti-pipeline protesters are organized, radical extremists conspiring to eliminate the use of fossil fuels by any means necessary. They do not understand or respond to rational economic and risk arguments and are funded by wealthy, foreign environmental organizations.</td>
<td>Anti-pipeline protesters must be treated as we would any other potentially violent terrorists.</td>
<td>Anti-pipeline protesters are threats to national security. At risk are public safety, vital petroleum infrastructure, and the economic stability and growth that the petroleum industry provides.</td>
</tr>
</tbody>
</table>

The frame gained traction in September 2014, when surveyors for TM, a subsidiary of Kinder Morgan Energy Partners, cut trees in Burnaby Mountain Conservation Area – adjacent to one of the region’s largest universities and near the terminus of the pipeline. This sparked protests, the arrests of more than 100 people (Holberg, 2016), litigation, and at the time of this writing, more than three years of conflict across many venues. In BC’s Supreme Court, Kinder Morgan’s lawyer argued that the Burnaby Mountain protesters had conspired to harm the
company. He alleged that employees had been assaulted and intimidated, offering as evidence photos of angry protesters.

Kaplan told the court that erecting protest signs on the mountain constituted free expression, but then presented photographs of the protesters with facial expressions he said were malicious. “One of the things I will argue is that is not only intimidation, but that is actually an assault," he said. "Some of the faces demonstrate the anger, and frankly, the violence demonstrated by some of the people." As Kaplan presented his evidence, supporters of the demonstrators in the packed gallery frequently burst into laughter and called out snide remarks (Burgmann, 2014).

This sparked a Twitter meme, #KMface, where people posted pictures of themselves with angry or silly facial expressions. The identity frame developed a more ominous tone in early 2015, when a leaked Royal Canadian Mounted Police (RCMP) document showed that the RCMP and Canadian Security Intelligence Service (CSIS) had been investigating pipeline protesters. “There is a growing, highly organized and well-financed, anti-Canadian petroleum movement, that consists of peaceful activists, militants and violent extremists, who are opposed to society’s reliance on fossil fuels,” it said (RCMP, 2014).

Federal Bill C-51, the precursor to the Anti-terrorism Act, 2015, had just been tabled. “Activity that undermines the security of Canada”, it read, includes “interference with the capability of the Government of Canada in relation to... the economic or financial stability of Canada” and “interference with critical infrastructure.” Given the Government perceived pipelines as critical infrastructure necessary to the economic security of Canada, environmental and Indigenous protesters were conceivably potential terrorists and threats to national security.
Frame advocates pointed to industry statistics to support their claims that protesters were irrational, such as the low frequency of marine spills and the relative safety of pipeline transportation relative to rail and trucking. They noted ways that risks are mitigated, such as technological advancements in pipeline infrastructure, double-hull requirements for tankers, and tug support for navigation. However, the power of the Anti-petroleum Extremist frame lay not in cold information, or even warm ‘lived experiences’, but in hot values (De Bruijn et al., 2015). The Anti-petroleum Extremists frame set security values against self-direction values, demonstrating the proximity of self-enhancement values to security values (Schwartz, 1992). It also combined several other framing techniques.

Anti-petroleum Extremists exemplified the ‘villain, victim, hero’ framing model (De Bruijn et al., 2015). Here, Prime Minister Stephen Harper and his Conservative federal government were framed as heroes, protecting the Canadian public and important investors from villainous extremists. As a masculine frame, it delineated principled politicians and investors from unprincipled protesters.

When the federal government described environmentalists as ‘foreign-funded radicals’, they had ‘hijacked’ a common anti-tar sands frame, namely that foreign wealth had tremendous influence over Canadian energy and environmental policies. Climate activists often pointed to the ultra-wealthy Koch Brothers as foreign influencers, since they were the largest foreign lease holders of the Canadian oil sands, and known financiers of climate change denial campaigns (Peries, 2014; Ward, 2014).

The ‘foreign-funded radicals’ rant by Joe Oliver also used a framing technique known as ‘breaking the monopoly on emotion’ (De Bruijn et al., 2015). While it was expected that
protesters would be passionate in their explanations, few anticipated the harsh rhetoric arising from the federal government.

**Devoted Guardians.**

Devoted Guardians was a counter-frame to Anti-petroleum Extremists, frequently found in independent news sources (70% of frame, 17% of independent news) (Table 4.2). It portrayed project opponents as reasonable people with legitimate concerns.

The tinder that ignited national interest in Burnaby Mountain was the arrest of a soft-spoken Simon Fraser University professor, Lynne Quarmby... Professor Quarmby, a resident of West Vancouver, was the antithesis of the dangerous “foreign-funded radical”, and her bold action galvanized other soft-spoken, thoughtful people to come forward and disobey the authorities: grandmothers, First Nations chiefs, a mother and child (Boothroyd, 2015).

When *Alberta Oil* (2015) surveyed Canadians to explore their views on the TMPE and other energy projects, they discovered opponents were widespread across the country, and better educated and younger than pipeline advocates. The resolution phase of the framing cycle had been nudged; the oil industry was being urged to pay attention to the Devoted Guardians frame (Seamon, 2005).

Like the Anti-petroleum Extremists frame, Devoted Guardians was a ‘villain, victim, hero’ frame. Here the villains were the Harper-led Conservative Government, National Energy Board, and Kinder Morgan. The victims were BC residents being forced to endure the risks of a bitumen spill. They were also the children and future generations faced with the consequences of
biodiversity loss and runaway climate change. In this scenario, the heroes were those willing to take a stand against the pipeline project.

Table 4.2. Devoted Guardians identity frame, core framing elements.

<table>
<thead>
<tr>
<th>Frame</th>
<th>Diagnostic</th>
<th>Prognostic</th>
<th>Motivational</th>
</tr>
</thead>
<tbody>
<tr>
<td>Devoted Guardians</td>
<td>Pipeline supporters are using their power and wealth to mislead the public with partisan and profit-driven rhetoric.</td>
<td>Informed, committed people must protect the vulnerable and the unaware from unsustainable projects, policies, and practices.</td>
<td>Anti-pipeline protesters have legitimate concerns and are 'on the right side of history'. If successful in stopping the pipeline, they will be hailed as environmental and climate heroes. If unsuccessful, ensuing spills and/or calamitous climate change will demonstrate their moral integrity.</td>
</tr>
</tbody>
</table>

**BIHP identity frames.**

Whereas TMPE identity frames were few and reflected clear divisions between supporters and opponents, BIHP identity frames were many and the boundaries were less distinct, largely due to the mix of SE and ST motivations (see Supplemental Information, Table SI.4.1). A moderate version of the TMPE frame Anti-petroleum Extremists, Usual Activists advanced two narratives. First, environmentalists were described as against everything. Secondly, they were framed as professional activists paid by groups with deep pockets, in lieu of a *real* job. BIHP Devoted Guardians were similar to those in the TMPE case by viewing themselves as underdogs facing powerful and wealthy adversaries, but differed by dedicating themselves to safeguarding the environment, BC Hydro, or both. BC Hydro is a Crown corporation some regarded as sacrosanct and vulnerable.
Empowered Activists self-identified as victors responsible for the suspensions and terminations of various run-of-river projects. They led calls for a moratorium on run-of-river development until a comprehensive review of impacts could be undertaken. This served to split the environmental movement into two opposing camps: wilderness protection versus climate action. The provincial New Democratic Party (NDP)'s decision to impose the moratorium should it be elected (as well as to *axe the* [carbon] *tax*), is believed to have deepened the divide and helped re-elect the BC Liberals in May 2009 (Holberg, 2009; Kimmett, 2013).

The division between two environmental groups that might have been allies -- groups that David Suzuki referred to as "tree-huggers" focused on protecting wilderness, and "smokestack pluggers" focused on the rapid deployment of renewable energy - came to define the 2009 election (Kimmett, 2013).

The tone was more extreme in the frame Thieves (of control over water) and Assassins (of wilderness and BC Hydro), used to describe the Province and conspiring corporations. Despite being a hot, masculine frame, it was absent from mainstream news and non-profit sources and gained little traction overall.

Merriam-Webster defines 'to assassinate' as "to murder ... by sudden or secret attack, often for political reasons... Killing our rivers cannot be tolerated by any society for any reason. This is more than an economic matter. It is spiritual. We define ourselves and are defined to the world by our wilderness and the bounties it contains. We cannot, on our watch, allow others to destroy that precious gift which we hold in trust... This isn't creating a bit of competition for BC Hydro, this is the assassination of our public power company that has served us so well for nearly 50 years (Mair, 2009)."
In stark contrast, Clean and Green, the most prominent BIHP identity frame, cast the provincial government and run-of-river hydroelectric companies as heroes rescuing humanity from climate change (Supplemental Information, Table SE.4.1). Whereas TMPE identity frames were readily embraced by their respective sides, we and them overlapped here, largely due to a mix of SE and ST motivations.

**Pro-project, self-enhancement values frames.**

Project supporters in both cases promoted a Defending Progress and Prosperity frame that characterized the project as an enormous opportunity and their industry as fundamental to economic prosperity (Table 4.3).

<table>
<thead>
<tr>
<th>Frame</th>
<th>Diagnostic</th>
<th>Prognostic</th>
<th>Motivational</th>
</tr>
</thead>
<tbody>
<tr>
<td>Defending Progress and Prosperity (TMPE)</td>
<td>The oil sands are Canada’s economic engine, without which the country’s economy will flounder.</td>
<td>Access to tidewater and Asian markets is fundamental to sustain and expand Alberta’s oil sands, (as the U.S. develops its own energy resources).</td>
<td>Opposition is a public relations problem. The TMPE has become increasingly important as opposition to other pipelines has grown.</td>
</tr>
<tr>
<td>Defending Progress and Prosperity (BIHP)</td>
<td>Renewable energy is Canada’s new economic engine. People who don’t recognize this are slowing its development and expansion.</td>
<td>Run-of-river projects will drive economic growth and facilitate energy security.</td>
<td>Demand for renewable energy is only going to increase, and run-of-river projects have a long life span. BIHP will be profitable for decades.</td>
</tr>
</tbody>
</table>

While the overall message of the TMPE frame was clear - pipelines are necessary for economic prosperity, the 3P arguments supporting it were disjointed across national, regional, and local scales. The policy perspective focused on jobs, tax revenue, and other benefits to the national economy, all of which anti-pipeline advocates had undermined by exposing and inflating the potential risks of the project. Meanwhile, a regional and personal perspective
suggested protesters *freeze in the dark*, harkening back to longstanding tensions between east and western Canada. From a *local* principled perspective, most of the attendees of a public open house had preferred the pipeline be re-routed through the Burnaby Mountain Conservation Area, as opposed to running through their neighborhoods. Notably, the frame in this sample was mainly found in independent news sources. After the 2015 federal election however, it frequently occurred in mainstream news, as industry representatives and proponents sought to sway the Trudeau Government to approve the TMPE.

The TMPE frame Political Game centered on the doctrine of *federal paramountcy*, which holds that federal laws always trump incompatible provincial legislation, and by extension, municipal bylaws (King, Welsh, & Hall-McGuire, 2015) (see Supplemental Information, Table SE.4.1). It condemned strategic posturing by BC Premier Christy Clark, who announced five conditions must be met before BC would support heavy oil pipelines, as well as the mayors who campaigned and won on their resistance to the TMPE. One of Clark’s five conditions was a fair share of economic benefits; her government approved the TMPE in early 2017, on securing a $1B revenue sharing agreement with Kinder Morgan over a 20-year period (Hunter, 2017).

**Anti-project, self-transcendence values frames.**

Restoring Democracy was the most common TMPE frame, representing more than a quarter of all arguments. It was the most prominent frame in mainstream and local news, and it was this frame to which newly elected Prime Minister Justin Trudeau first responded, appointing an Environmental Review Panel in May 2016. In Restoring Democracy, moral justice trumped legal justice, since legislators and regulators were aligned with industry and could not be trusted. Advocates cited a laundry list of injustices by the Harper Government and NEB, including
decisions to broaden NEB powers, eliminate oral cross-examination, dismissing municipal bylaws to grant access to a conservation area, and so on. Restoring Democracy countered the Political Game frame by asserting municipalities should have greater control over resource decisions within their boundaries, and projects should not proceed without ‘social license to operate’, defined here as “obtaining broad public support for proposed undertakings” (Expert Panel for the Review of Environmental Assessment Processes, 2017, p. 4).

Defending the Environment, which included references to some aspect of the natural environment or ecosystem services, was the most frequent frame in non-profit media (overrepresented by environmental groups in this sample). Found in 41% of frame and non-profit sources, it was comparatively rare in mainstream news (6% of frame, 5% of mainstream news). In the early days of the conflict, Defending the Environment advocates focused on the threat to Burnaby Mountain Conservation Area. Later, the emphasis was on potential damage from bitumen spills into watercourses along the pipeline route and the path taken by tankers. Ten percent of Defending the Environment proponents focused solely on climate, stressing the upstream and downstream risks of producing and burning additional fossil fuels. When Defending the Environment was raised by Indigenous actors, it was often linked to the loss of cultural heritage (e.g., as ecosystems are degraded, traditional food sources become unavailable).

More generally, frame advocates felt it was unjust to risk BC’s environment and planetary stability for Alberta’s economy.

No Choice was an injustice frame that blended ST-nature and ST-social values, whereas Restoring Democracy had focused on ST-social values. It grew from events that pre-dated the legal decisions that failed to provide relief for the City of Burnaby in its protection of Burnaby
Mountain Conservation Area (Burnaby (City) v. Trans Mountain Pipeline ULC, 2015 BCCA 78, 2014 BCSC 1820), such as the branding of protesters as foreign-funded radicals, successful lobbying by industry associations to weaken environmental laws, and the federal omnibus ‘budget’ Bill C-38 (Jobs, Growth, and Long-Term Prosperity Act, S.C. 2012, c.19). The bill overhauled the Canadian Environmental Assessment Act and amended many other Acts to ease oil and gas exploration, extraction, and transportation. These included the Canadian Environmental Protection Act, Coasting Trade Act, Fisheries Act, Income Tax Act, Kyoto Protocol Implementation Act, National Energy Board Act, Oil and Gas Operations Act, and Species at Risk Act (Heelan Powell, 2012). At this juncture, attempts to stop the Northern Gateway pipeline had had little effect (e.g., Morton, 2014), and the TMPE process appeared to be heading in the same direction. Consultations with First Nations had failed, climate change was overlooked in the terms of reference, certain interest groups were denied intervener status, and public participation was restricted.

The No Choice frame was accentuated by Bill C-51 as well as widespread audits of environmental charities by the Revenue Canada Agency to enforce limits on political and partisan activity, a move which effectively precipitated a chill on dissenting voices (Voices-Voix, 2015). No Choice frame proponents felt they had been marginalized from decision-making processes, and criminalized as anti-petroleum extremists.

Defending the Environment in the BIHP context emphasized biodiversity loss (e.g., Pacific salmon, Grizzly Bears, Marbled Murrelets) over climate-related risks, with frame advocates expressing their frustration in having to choose between climate action and wilderness
protection. Here, senior governments were accused of abandoning the precautionary principle and setting the stage for widespread and cumulative environmental effects.

Privatizing Our Rivers was the most prominent BIHP frame, but nearly absent in mainstream news (2% of frame, 2% of mainstream news). This 3P injustice frame was a clear call to arms for public water resources and BC’s Crown jewel, BC Hydro, as deregulation, privatization, and integration with U.S. markets would lead to enormous rate hikes. Amid a variety of socio-economic arguments (e.g., deferral accounting practices), frame advocates accused senior governments of deception and skirting democratic processes, not unlike the Restoring Democracy frame in the TMPE case. Bill 30 (Miscellaneous Statutes Amendment Act (2006)), an amendment of the the BC Utilities Commission Act (1996), was widely perceived as silencing the voice of communities and citizens in decision-making for run-of-river projects. In the 2009 omnibus budget Bill C-45, the Harper Government revised the Navigable Waters Protection Act, exempting certain projects from assessment. In 2012, Bill C-38 removed the majority of Canadian streams from federal oversight, altered the Fisheries Act (e.g., by removing the ‘HADD’ prohibitions on causing harmful alteration, disruption or destruction of fish habitat), and changed other pertinent legislation and policies.

The Unnecessary Power frame focused on energy conservation as a substitute for run-of-river projects, pointing to BC Hydro service plans and the Province’s own Green Energy Task Force (2010) recommendations and Clean Energy Act (2010) - which all underscored the importance of conservation. The frame was extended when the BC Utilities Commission found BC Hydro’s Long Term Acquisition Plan was not in the public interest (BC Hydro, 2008; Pullman, Milbourne, & Harle, 2009). Notably, Unnecessary Power advocates consistently
dismissed projected demands from a transportation sector transitioning from fossil fuels to electric vehicles (International Energy Agency, 2016). The following comment best demonstrated the disconnect.

If we all curbed our demand, then there would be no need for such projects. If we want to get away from gas and start driving electric cars than [sic] we better start thinking of where that energy is going to come from...now!! (Andrews, 2009).

**Framing Conflict, in Practice.**

Frames did not stand alone; they linked together in a series of missteps and corrections. For example, pipeline protesters did not see themselves as Anti-petroleum Extremists, and were offended and legitimately fearful that this narrative was being promoted by their government and law enforcement agencies. Yet, the Extremists frame had arisen from actual, violent events affecting and threatening real people in Canada’s oil and gas industry (RCMP, 2014). The kernel of truth - which could have been used to raise awareness and understanding, was buried in a hot frame designed to portray pipeline opponents as villains devoid of integrity (De Bruijn et al., 2015).

Restoring Democracy and No Choice frames became prominent when frame advocates felt they themselves were under assault (as opposed to nature), with environmental organizations under audit and project opponents painted as security threats. These frames attacked a series of deceptive and authoritarian legislative maneuvers by the federal government to deregulate environmental protection and otherwise facilitate project approvals, rallying more support. While the defeat of the Harper Government deflated these frames, many of the underpinnings remain to rise again (cf., Miller & Riechert, 2001).
The Restoring Democracy frame, which patently rejected the NEB review process, was the most prevalent frame in mainstream news and overall, while the Defending Progress frame, aligned with the increasingly unpopular Harper Government, was all but dismissed in mainstream BC and national news. The new Trudeau Government responded to the Restoring Democracy frame with further public consultation. However, this move, together with Trudeau’s campaign rhetoric that a clean environment and a strong economy must go hand-in-hand, relaxed project opponents but roused supporters. Intense lobbying, and an increasing prevalence of the Defending Progress and Prosperity frame in mainstream media, captured the attention of decision-makers interested in scoring political points on the economy. When the Government approved the project, Trudeau’s announcement reiterated the frame’s prognostic element, demonstrating the agency of its powerful corporate advocates (cf., Noakes & Johnston, 2005).

Since frames resonate by tapping into, or priming existing views and values (Darnton & Kirk, 2011), it was not unexpected to find these conflict frames were largely values-based and ideological (Rohan, 2000). Project support generally aligned with SE values frames, while opposition was advanced with ST frames. Identity frames similarly had SE or ST qualities, as did many media sources. For example, left-leaning news media and blogs authored by environmental non-profit organizations almost always promoted ST frames. Reflecting wider trends (Compton & Benedetti, 2010; Viner, 2016), some of the stories written by journalists were opinion pieces, columnists routinely slanted the news, and press releases and other forms of advocacy appeared to masquerade as news.

Pan and Kosticki (2001) suggested frames could be used to bind diverse interests and actors. In the BIHP case, a frame that included both SE and ST qualities did indeed exhibit some
potential to unify opposing factions. The SE/ST frame Do It Right, which suggested run-of-river projects would be acceptable if certain safeguards were in place, was formally advanced by West Coast Environmental Law, Watershed Watch Salmon Society, Pembina Institute, and David Suzuki Foundation (2009), as a set of recommendations for responsible clean energy development. The BC Sustainable Energy Association (Dauncey, 2008) also introduced a position statement grounded in the Do It Right frame. Even organizations which called for a moratorium and fought the BIHP did not dismiss run-of-river hydro completely, asking that power development be regionally planned, environmentally appropriate, acceptable to First Nations, and publicly owned (Kimmett, 2009). Rather than approving a project with conditions, Do It Right suggested creating the conditions for appropriate projects. This frame did not get much traction, however, amid the din of more assertive frames.

Conclusion

Frames contributed to these energy conflicts in four important ways. First, identity frames established the actors as adversaries, the we and them in the conflicts (Gamson, 2009). With the exception of Clean and Green, an identity frame with both SE and ST qualities, identity frames exhibited linkages to either SE or ST values (Schwartz, 1992). These identity frames helped reinforce agency and injustice elements, by positioning we organizations and actors as strong and capable, and them as dangerous or morally bankrupt (Gamson, 1992, 2009; Noakes & Johnston, 2005). Bringing attention to SE and ST frames, or their qualities (e.g., their infrastructure, dynamics, and agency) may help people make sense of arguments and unite diverse interests (Pan & Kosticki, 2001).
Secondly, volatile frames sent signals that people engaged in the TMPE conflict were reaching a breaking point. Minding the dynamics of frames, and watching for and respecting Restoring Democracy and No Choice frames, may help deescalate conflicts before they reach a threshold (cf., Miller & Riechert, 2001).

Third, frames were filtered and amplified both by media effects such as journalistic practices and the ideological leanings of the outlets and organizations producing the material. Apparent from the quality of our sample and the distributions of the frames, these media effects modified frame exposure, potentially serving to deepen divisions already wrought by values-based conflict. Networks surveys and interview data associated with these cases suggest that digital media and network effects that contribute to filter bubbles and echo chambers also played a role (Clermont, 2017 [this dissertation]; Pariser, 2011). News media frames may be particularly impactful because we perceive them as news, rather than suasion.

Finally, frames influenced stepwise and final outcomes. The Harper Government’s affiliation with the Anti-petroleum Extremists frame almost certainly contributed to their election loss, and Prime Minister Trudeau very clearly responded to the Restoring Democracy frame with panels and committees to lead further consultation, for example. Also significant was the tendency of news media to advance the frames of leaders of organizations engaged in the conflict, and for leaders to publish their own frames to steer the conflict to their advantage. This agency, when coupled with the divisive nature of the frames, appeared only to intensify the conflicts. With people routinely drawn to frames with which they agree, they could only become more polarized (Sunstein, 2008). Leaders must be made aware that when they align with inflammatory frames for political advantage, they leave little room for dialogue or negotiation
and may ultimately serve to undermine self-interests. As Patterson, Grenny, McMillan, & Switzler (2005, p. 66) wrote in *Crucial Conversations*, “you can’t solve a problem with a villain.”

To reduce the impacts of damaging conflict frames, it is crucial to manage them, and to strategically reframe issues. When people are not aware of frames, they are susceptible to disinformation, distortions, and manipulation. Bringing an awareness and understanding of media frames to those most vulnerable to them makes them less influential and evens the playing field. Frame management, to protect vulnerable populations from negative frame effects and to mitigate conflict, is an important area of future research.

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Supplemental Information

Table SI.4.1. Frames, core framing elements. Frames are separated by type and listed alphabetically. See main text for others.

<table>
<thead>
<tr>
<th>Frame</th>
<th>Diagnostic</th>
<th>Prognostic</th>
<th>Motivational</th>
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<tbody>
<tr>
<td><strong>BIHP Identity Frames</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Astroturf (they, supporters)</td>
<td>They are not average citizens; they are organizations with a self-serving agenda pretending to be something they are not.</td>
<td>People should represent themselves honestly.</td>
<td>The organization is a grassroots front for unions, political actors, organized environmental groups, and others who are opposed to the project for ideological reasons.</td>
</tr>
<tr>
<td>Clean and Green (we, supporters)</td>
<td>Burning fossil fuels to produce electricity is contributing to climate change, greenhouse gases in the atmosphere are reaching a tipping point, and renewable sources of energy are urgently needed to replace fossil fuels.</td>
<td>Run-of-river projects will displace dirty power with minimal harm to the environment, contributing to sustainability and a clean energy future.</td>
<td>In the absence of a dramatic shift to renewable energy, the planet will suffer catastrophic effects from climate change. Independent power producers will be ‘doing well by doing good’.</td>
</tr>
<tr>
<td>Devoted Guardians (we, opponents)</td>
<td>The Government’s energy plan is misleading and its management of run-of-river projects is irresponsible.</td>
<td>Informed, committed people must protect the vulnerable and the unaware from unsustainable projects, policies, and practices.</td>
<td>Run-of-river projects will ruin BC’s riverine and riparian environments and bankrupt BC hydro.</td>
</tr>
<tr>
<td>Empowered Activists (we, opponents)</td>
<td>Governments and corporations are deceitful and use their money and power to see their misguided plans to fruition.</td>
<td>With education and demonstrations of opposition, citizens will stymie run-of-river projects, safeguarding publicly-owned utilities and the environment.</td>
<td>People must continue to be vigilant and aggressively rally against run-of-river projects, otherwise they will be built.</td>
</tr>
<tr>
<td>Thieves and Assassins (them, supporters)</td>
<td>The free-enterprise government is upending our public utility and giving away publicly-owned resources to environmentally irresponsible private companies, for political and ideological reasons.</td>
<td>Electricity and water are being privatized in BC, at the expense of pristine wilderness and everyday British Columbians.</td>
<td>BC Hydro was forced by law to buy high and sell low excess power, destined for export but without international agreements. Spectacular wilderness is being gifted to corporations that are thoughtlessly damaging and destroying it.</td>
</tr>
<tr>
<td>Usual Activists (they, supporters)</td>
<td>Environmental activists oppose every development, regardless of its benefits.</td>
<td>People who are ideologically opposed to development are irrational and should be ignored.</td>
<td>Every protest, regardless of the project, is led by the same actors.</td>
</tr>
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### TMPE SE Frames

<table>
<thead>
<tr>
<th>Frame</th>
<th>Diagnostic</th>
<th>Prognostic</th>
<th>Motivational</th>
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<tbody>
<tr>
<td>Political Game (TMPE)</td>
<td>Although the Province and municipalities do not have jurisdiction over the pipeline review process, they have political leverage.</td>
<td>The legal authority to move fossil fuels to the west coast rests with the federal government as it has paramountcy and jurisdiction over interprovincial infrastructure, and with legitimate companies that invest in Canadian resources and provide royalties and employment.</td>
<td>The Province and some municipalities are engaged in disingenuous political posturing that could result in financial penalties or the loss of the project.</td>
</tr>
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### TMPE ST Frames

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<thead>
<tr>
<th>Frame</th>
<th>Diagnostic</th>
<th>Prognostic</th>
<th>Motivational</th>
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</thead>
<tbody>
<tr>
<td>Defending the Environment (TMPE, ST-nature values)</td>
<td>The TMPE already degraded the Burnaby Mountain Conservation Area and will dramatically increase the risk of oil spills, particularly in the marine environment. It will also contribute to greenhouse gas emissions and dangerous climate change by encouraging greater investment and development of the Alberta tar sands and facilitating greater use of fossil fuels globally.</td>
<td>Sensitive ecosystems must be protected from harm, and dangerous climate change averted, to safeguard life-sustaining conditions for current and future generations.</td>
<td>Nature cannot defend itself and is therefore vulnerable to careless, greedy individuals who would degrade and destroy it for financial gain.</td>
</tr>
<tr>
<td>No Choice (TMPE, ST values)</td>
<td>Kinder Morgan, NEB, the Harper government, and the courts have collectively failed to recognize climate change as a serious threat, and eschewed any responsibility to protect valuable ecosystems from harm.</td>
<td>Burnaby Mountain Conservation Area is a stage to register systematically-silenced voices and the court of last resort. Protesters must step in to protect their city, while municipal leaders defend their bylaws and authority in the courts.</td>
<td>The TMPE is the proverbial straw on the camel’s back for citizens and activists frustrated, angered, and overwhelmed with a long series of assaults on the environment and affronts to democracy.</td>
</tr>
</tbody>
</table>
### Frame | Diagnostic | Prognostic | Motivational
---|---|---|---
**Restoring Democracy (TMPE, ST-social values)** | Pipeline review processes are nothing more than industry love-ins, with the Harper Government in the pocket of corporations - a front for Big Oil, and an unrelenting cheerleader for the tar sands in pursuit of a pipe dream of Canada as an energy superpower. | 2015, as a federal government election year, is an opportunity to reclaim Constitutional rights (e.g., freedoms of expression, peaceful assembly, and association) and self-determination for communities, and to reestablish democracy as the will of the people. | The Harper Government, with its reach into formerly independent bodies such as the RCMP, NEB, and CSIS, cannot be trusted to protect the interests of average Canadians. Kinder Morgan is a foreign-owned company offering little to Canadians and should be judged on its poor track record.

### TMPE SE/ST Frames

| Environmental Security | Biodiversity loss and climate change are environmental security risks and ‘threat multipliers’ that endanger human health and safety and diminish resource potential. | Environmental security is a prerequisite for sustainable prosperity and essential for regional and national security. | Climate change and biodiversity loss are immediate regional and national security priorities and threats to global security. |

| Market Fundamentalism | The Harper Government and Kinder Morgan have designed faulty economic arguments that mislead the Canadian public. | A thriving economy and healthy environment can be realized through clean energy. No pipelines are needed or wanted in a ‘green city’. | The TMPE review process is the antithesis of free enterprise. Exploiting non-renewable resources for the profitability of foreign-owned corporations is not in Canada’s best interests. |

| Suppressing Science | The Harper Government has muzzled scientists, and dismissed or discredited peer-reviewed scientific evidence in favour of distorted corporate-led information. | Science capacity in government and an evidence-based approach to policy development and decision-making must be restored. | Without science, decisions are based purely on leader ideologies, undermining democratic processes and sound decision-making. |

### BIHP SE Frames

| Clean Energy Powerhouse (BIHP) | “Renewable energy can help reduce GHG emissions and build a greener economy that generates well-paying jobs” (MEMPR, 2010). | “Electrical self-sufficiency and clean, renewable power generation is integral to BC’s effort to reduce its carbon footprint and fight climate change” (MEMPR, 2010). | Run-of-river projects provide energy security and revenues through export, which will be increasingly relevant as climate policy demands more stringent mitigation. |

### BIHP ST Frames
**Corporate Conservation (pro-BIHP, ST)**

- **Diagnostic**: Forest companies abandoned their culverts that barred fish passage, and left industrial sites without cleaning them up.
- **Prognostic**: Run-of-river power producers have demonstrated good corporate citizenship by correcting problems left by others and will be careful to minimize harm to the environment in their own activities.
- **Motivational**: Best practices build goodwill with locals and their communities.

---

**Defending the Environment (BIHP, ST-nature values)**

- **Diagnostic**: Run-of-river projects destroy riparian ecosystems and degrade riverine habitat for valuable and at-risk species.
- **Prognostic**: Sensitive ecosystems must be protected from harm to safeguard life-sustaining conditions for current and future generations.
- **Motivational**: Nature cannot defend itself and is therefore vulnerable to careless, greedy individuals who would degrade and destroy it for financial gain.

---

**Greenwashing (BIHP, ST-nature values)**

- **Diagnostic**: Run-of-river power producers are disingenuous in saying they’re in it for the environment; they’re in it for the money.
- **Prognostic**: Large hydro projects will cause untold harm to species and ecosystems.
- **Motivational**: The scale of projects such as BIHP preclude them from being green.

---

**Gold Rush (BIHP, ST values)**

- **Diagnostic**: The Province has failed to plan for run-of-river projects, especially at a regional scale. Companies are staking every stream in the province for run-of-river hydro, without constraints.
- **Prognostic**: Runaway run-of-river power development will have untold cumulative impacts. Once a moratorium is in place, deliberative planning can commence.
- **Motivational**: Without provincial, regional and local planning for cumulative effects, scores of streams will be degraded, and habitat will be fragmented by roads and transmission lines.

---

**Pristine Wilderness (BIHP, ST-nature)**

- **Diagnostic**: Run-of-river projects will destroy pristine wilderness.
- **Prognostic**: If pristine wilderness is developed, it is no longer pristine; all of its special qualities will be lost forever.
- **Motivational**: People are connected to wilderness in social, cultural, spiritual, and economic ways.

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**Unnecessary Power (BIHP, ST-social)**

- **Diagnostic**: BC is a net exporter of power, demand is not growing, and run-of-river projects produce power when reservoirs are full. Run-of-river projects are not wanted or needed.
- **Prognostic**: Energy conservation should be a priority ahead of initiatives to develop any new sources of power.
- **Motivational**: Run-of-river projects will raise rates and encourage more electricity consumption. There is no guarantee that exported power will reduce emissions. Conservation is the least expensive option and mitigates GHG emissions.
### Frame

<table>
<thead>
<tr>
<th>Do It Right</th>
<th>Diagnostic</th>
<th>Prognostic</th>
<th>Motivational</th>
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<tbody>
<tr>
<td></td>
<td>Governments have promoted run-of-river projects without rigorous planning and critical safeguards.</td>
<td>Renewable energy projects should adhere to a set of principles and standards that avoid or mitigate environmental, social, and economic impacts.</td>
<td>Climate action is urgently needed and renewable energy projects must play a role.</td>
</tr>
</tbody>
</table>

| Indigenous Prosperity | Many indigenous communities are remote and impoverished, in need of sustainable economic opportunities. | Run-of-river projects can lift indigenous communities out of poverty. | Run-of-river projects are consistent with cultural principles that respect nature, are a local source of electricity for remote communities, and provide jobs and revenue for nation-building. |

| Privatizing Our Rivers (BIHP, ST-social) | Senior governments changed the laws to privatize BC’s electricity system. | Public resources will be sold off to private companies at the expense of current and future generations. | As a result of run-of-river projects, ratepayers will see skyrocketing electricity bills and BC Hydro will be bankrupt. |
**Chapter 5. Sense of Place in Natural Resource Conflicts**

*Keywords: sense of place, place-protection, environmental advocacy, biodiversity conservation, natural resource conflict*

*Short title: Sense of Place*

**Abstract**

By raising awareness and practicing civil disobedience, environmental advocates frequently act in the first and last lines of defense when biodiversity or natural places are under threat. Using surveys, interviews, and mapping of favourite places, we examined two controversial energy projects on the coast of British Columbia (BC), Canada, to consider how sense of place influences advocacy in natural resource conflicts. With place topologies developed by Cross (2015) and Hay (1998), and appreciation, concern, and responsibility for nature as organizing themes, we explored how place connections intersect with values and views. Ties to natural places, at a regional scale, were found to underpin environmental advocacy and resistance to development, by tapping into deep ‘sense of place’ connections as well as ones conveyed through networks based on values and ideologies. We suggest that place-based conflicts over nature and biodiversity can be mitigated by considering disparities in senses of place and addressing underlying values and associated views.

**Introduction**

With increasing sophistication, conservation scientists and practitioners have identified and prioritized ecosystems and species designated as rare, sensitive, and/or at-risk of extinction and integrated them into strategic planning processes (Biodiversity Conservation Strategy Partnership, 2008; Jones, Coops, & Sharma, 2010). Still, biodiversity is routinely compromised
by land and resource development, to an extent that it is now a serious global problem (Raincoast Conservation Foundation, 2016; Steffen et al., 2015). Environmental advocacy, in the form of letter writing, petitions, rallies, and protests, occasionally tips the scale when technical and strategic solutions have failed, by raising sensitivities to threats and defending natural places (Carter, 2007; Parai & Esakin, 2003).

Canada’s west coast, the setting for this research, is renowned for its beauty and rich biodiversity, but also for vigorous opposition to natural resource development. Its reputation stems largely from mass protests during the summer of 1993, in the largest single event of civil disobedience in Canadian history (Penn, 2015). An estimated 10,000 people blockaded logging roads and some 900 people were arrested during a ‘war in the woods’ over clear-cut harvesting in Clayoquot Sound (Reed, 2004; Walter, 2007). Their efforts were rewarded with a multi-party resource planning and management board, more stringent forest regulations, and a new Clayoquot Sound Biosphere Reserve (Parai & Esakin, 2003). Since then, renewable and non-renewable resource extraction and energy projects have drawn intense responses from environmental advocates.

Recent resistance has focused on pipelines from Alberta that would carry diluted bitumen to tidewater and increase tanker traffic in BC waters (see Figure 5.1). When Kinder Morgan’s Trans Mountain Pipeline Expansion (TMPE) was approved in 2016, an Alberta reporter described it as a triumph over NIMBYism (Not In My BackYard) (Yedlin, 2016). Those who use the pejorative label see individuals who oppose local development as uninformed, selfish, protectionist, and alarmist - simply opposing projects because of their proximity, and exaggerating risks irrespective of scientific evidence and a broader public interest (Kikuchi &
Gerardo, 2009; Mihaylov & Perkins, 2015; van der Horst, 2007). Yet, scholars have shown lack of knowledge and self-interest to be inappropriate characterizations for many advocates (Devine-Wright, 2009; Mihaylov & Perkins, 2015).

Figure 5.1 Case study areas
Instead, motivations underlying environmental advocacy may include feelings of appreciation, concern, and responsibility for nature (Dietz, Fitzgerald, & Shwom 2005; Ruepert et al., 2016); values that prioritize nature (Dunlap & Van Liere, 2008; Schwartz, 1992); and a nature-centric sense of place (Hung, 2014; Lin & Lockwood, 2014), among other things. Some scholars have shown that when one’s identity is interwoven with a place, harm to that place is perceived as a harm to themselves (Collins & Kearns, 2013; Hung, 2014). The magnitude of the defense of a place has been equated with the collective strength of commitment to that place, and a depth of experiences there (Brown & Raymond, 2007; Hay, 2006). Devine-Wright (2009) proposed that NIMBYism be re-conceptualized as place-protection arising from disruptions to place attachments and threats to place identities.

We contrasted two contentious proposed energy projects, one fossil fuel-based, the other renewable, to explore how sense of place influenced environmental advocacy and resource conflicts. More specifically, we examined how sense of place might influence the protection of places supporting sensitive ecosystems and other forms of biodiversity. While the TMPE was characterized as a clash of regions (Angus Reid Institute, 2016), the Bute Inlet Hydroelectric Project (BIHP) split BC’s coastal environmentalists into two camps - one prioritizing climate action over biodiversity protection, and vice versa. This research contributes to knowledge of the roles of sense of place in environmental protection and resource development, and adds to an emerging literature on regional sense of place.

**Sense of Place**

Places can be sites we visit, polygons on a map, locales with multiple borders and scales (e.g., temperate ecosystems or butterfly habitat), or abstractions such as ‘countryside’ or ‘corn
belt’. Our ‘sense’ of a place envelops our physical sensory experiences; the emotional, symbolic, and moral significances we associate with that place; and our knowledge of it (Breslow, 2014).

‘Sense of place’ broadly includes three conceptual components that describe the different bonds that we have with places, and the meanings we ascribe to them, namely place attachment, place identity, and place dependence (Brown & Raymond, 2007; Hay, 1998; Jorgensen & Stedman, 2001). These components are often mutually reinforcing and difficult to disentangle (Dakin, 2003), yet each have developed somewhat distinct bodies of literature. Place attachment and sense of place are used interchangeably at times, yet attachment generally emphasizes person-to-place ties, whereas one’s sense of place frequently embraces both personal and social linkages (Kyle & Chick, 2007). Place identity focuses on the emotional, symbolic meanings ascribed to places, while place dependence refers to the functional utility of a setting – for work or recreation, for instance (Brown & Raymond, 2007; Kyle & Chick, 2007).

Tuan (1974), an early scholar of place, coined the term ‘topophilia’ to describe how powerful place attachments contribute to a strong sense of identity. He also referenced geopiety, sometimes described as a reverence for sacred places, or special connections to locales or natural features in the environment that have highly personal and specific meaning (Knowles, 1992). Geopiety has been characterized as a deep-rooted sense of belonging to a place, such that one felt they had sprung from its soil and was nurtured by it (Stephenson, 2012; Tuan, 1977). This nurturing is reciprocated in ongoing care and defense of the place if threatened (cf., Collins & Kearns, 2013). Brown and Raymond (2007) found place identity and place dependence were also informative predictors of resource conflicts.
Where Tuan viewed place as a concrete entity, many other scholars have seen it as socially constructed, with interpretations and representations becoming tangible as they coalesce around specific spaces (Riechert Powell, 2007). In her research of issues affecting salmon habitat in Washington’s Skagit Valley, Breslow (2011, p. 237) found people make sense of a place “through various concatenations of place-based knowledge, science, and ideas of nature and culture.” Kyle and Chick (2007, p. 212) believed that place was “conditioned by cultural affiliation,” where “meanings emerge and evolve through ongoing interaction with others and the environment.”

People have a portfolio of place identities, including neighborhood, community, region, and so on, with loyalties for each that vary with lived experiences (Ali, 2017). Richert Powell (2007, p. 67) pointed to regions as “meta-places”, aggregated social constructions that shape how the region, and local places within it, are understood. Place identity in this context arises from multiple origins, only one of which is geography. Indeed, as our interactions become digital and virtual, we increasingly engage with communities that are largely divorced from geography (Ali, 2016).

**Sense of place topologies.**

In pursuit of a coherent understanding of place, some scholars have created descriptive categories to which connections can be allocated. Cross (2015) introduced a framework describing ways in which people experience place in at least seven different ways. *Sensory* processes encompass the aesthetic, but also personal, social, and cultural entities that can be seen, heard, smelled, tasted, or touched. In nature, these are often physically or mentally restorative, fostering sensory associations with place and stronger place attachments. *Narrative*
processes are interpersonal experiences of storytelling, often furthering place attachments and the cultural meanings associated with place. **Historical** processes are biographical and ancestral, where key life events, family and cultural history accumulate over time in place. Historical processes do not necessarily translate to a deep sense of belonging. **Spiritual** processes are deeply personal and stable over time, characterized by an enduring sense of belonging or ‘oneness’ with place. For Cross, spiritual senses of place have no relationship to religion or religious-like spirituality. **Ideological** processes are individual, group, or cultural commitments to a place, requiring adherence to a code or a call to action. **Commodifying** processes are cognitive and fleeting, whereby place is assessed on the basis of a list of desirable characteristics. **Material dependence** processes are akin to place dependence, where sense of place is grounded in a reliance on the physical or social features or resources of a place.

By contrast, Hay (1998) categorized place connections with an emphasis on features of residency, equating greater lengths of residence with stronger intensities of sense of place. A **superficial** sense of place, in tourists and transients, lacks ‘rootedness’ and is often aesthetic. A **partial** sense of place, found in holiday home owners and resident children, may be developing, but weak. A **personal** sense of place develops outside of kinship or another social network but still lacks the stability and characteristics of longer residency. In-migrants who have accumulated local knowledge, social ties, and community standing have a personal sense of place. People have an **ancestral** sense of the place where they were raised or spent most of their lives. A **cultural** sense of place is deep, emotional, profoundly spatial, and socially grounded - characteristic of Indigenous relationships with their traditional territories. Hay believed that if one’s sense of place was fully developed, it would precipitate feelings of security, belonging and
stability. He felt people could develop a generic sense of place by transferring connections from one similar place to another, but these would occur only at the expense of more mature place bonds.

While it may take decades or generations to cultivate a deep (e.g., spiritual or cultural) sense of place, Dale, Ling, and Newman (2008) advanced the notion that a landscape rich in biodiversity and aesthetically beautiful may foster a stronger place identity in a much shorter period of time. In a study of three communities in BC, they found people living in proximity to such landscapes were more apt to interact and linger there - developing a sense of place that intrinsically linked to the natural environment.

This literature suggests that people with deep connections to natural places will rally to protect them, however it does not indicate how disparities in place connections influence natural resource conflicts or how such disparities might be resolved. Using the topologies described by Hay (1998) and Cross (2015), we sought to address this gap in the theoretical literature and in practice, by exploring the role of sense of place in two contentious energy projects.

**Case Studies**

**Trans Mountain pipeline expansion.**

The TMPE conflict first escalated in September, 2014, when surveyors for Trans Mountain ULC cut trees in Burnaby Mountain Conservation Area adjacent to one of the largest universities in BC. The regulatory agency for the project, the National Energy Board (NEB) ruled that the City of Burnaby’s bylaws were inoperative or inapplicable, citing the doctrines of federal paramountcy and interjurisdictional immunity. While the city defended its bylaws in the court system, area residents protested onsite. In November, more than 100 protesters were
arrested, including Indigenous leaders and university staff, most for defying a court injunction allowing the surveyors to complete their work.

Events on Burnaby Mountain sparked more than two years of rallies and other forms of protests opposing the project. An estimated 400 intervenors and 1,250 commenters participated in the review process (NEB, 2016). Municipalities, First Nations, and environmental groups initiated court challenges targeting the NEB, Trans Mountain ULC, and the federal Attorney General of Canada. The TMPE and other proposed pipelines were local and national issues in the October, 2015 federal election that selected a new Liberal Government.

The NEB concluded its assessment in May 2016, recommending approval of the project for its economic advantages. At the same time, it acknowledged that the operation of project-related marine vessels would result in significant adverse effects to the endangered and iconic southern resident Killer Whale (*Orcinus Orca*) population. The NEB also acknowledged greenhouse gas emissions from project-related vessels would be significant.

The new Liberal Government appointed an environmental review panel to collect additional information (Hall, 2016). There were nearly 2,500 participants at 44 meetings in 11 cities, and 20,154 email submissions (Ministerial Panel for the TMPE (Ministerial Panel), 2016). An online questionnaire drew 35,259 responses, the highest-ever response to a federal government questionnaire (Ministerial Panel, 2016). Panel members believed these contributions were heavily weighted to project opposition (Ministerial Panel, 2016). Within a wide range of concerns, potential spills and climate impacts were paramount (Ministerial Panel, 2016). Protests continued at the hearings, and in October, ninety-nine TMPE protesters received citations for
crossing police barricades on Ottawa’s Parliament Hill in what organizers called the largest act of youth-led climate civil disobedience in Canada (The Canadian Press, 2016).

In late November, the Prime Minister announced the application had been approved, claiming the Alberta Government’s price on carbon and production cap on that province’s oil (or bitumen) sands had addressed concerns about climate change impacts. A world class, $1.5B ocean protection plan was promised to mitigate risks to marine and estuarine biodiversity along the route (CBC News, 2016; Tasker, 2016). Leaders from political, Indigenous, and environmental organizations vowed to press on, with protests, court challenges, and civil disobedience (e.g., Hume & Bula, 2016).

**Bute Inlet hydroelectric project.**

The BIHP was perhaps the largest and most controversial proposal submitted in response to Clean Power Calls by BC Hydro (Costello, 2016). Comprised of 17 non-storage run-of-river sites on three river systems draining into the Bute Inlet on BC’s picturesque Central Coast, the BIHP would power ~300,000 homes (Plutonic Power Corporation, 2009). It would be the springboard for a Green Power Corridor along the Pacific coast, meeting the needs of 586,000 homes, creating 5,900 person-years of employment, and offsetting four million tons of annual carbon dioxide emissions (Plutonic Power Corporation, 2009).

In early 2009, the public was invited to participate in developing a Terms of Reference for the environmental assessment. The first open houses were crowded, disruptive and confrontational (BC Citizens for Green Energy, 2009; Mair, 2009). Run-of-river projects were accused of causing massive damage to watersheds, by impacting streams and disturbing and fragmenting sensitive terrestrial habitats with previously little access or lasting development.
People voiced concerns for at-risk species such as Marbled Murrelet (*Brachyramphus marmoratus*), iconic animals like Pacific salmon (*Oncorhynchus spp.*) and Grizzly Bears (*Ursus arctos horribilis*), and important cultural species such as eulachon (*Thaleichthys pacificus*). In April, Rally for Rivers was held in conjunction with a meeting of the Association of Vancouver Island and Coastal Communities (AVICC), one of five area associations of local governments in BC. AVICC passed motions calling for a moratorium on run-of-river projects (MacLennan, 2009). In the lead up to the 2009 BC provincial election, Save Our Rivers Society toured the province to save 'rivers at risk' (Joyce, 2008). Prominent environmentalists and environmental groups chose sides between climate action and watershed protection (M’Gonigle, 2009; Kilian, 2009). Although the government remained in power, the project was eventually withdrawn from the environmental assessment process in 2016 (Canadian Environmental Assessment Agency, 2016).

**Methods**

We identified respondents for online surveys and follow-up interviews, through publicly available online media, environmental assessment documents, and personal referrals. In total, 68 participants representing 11 actor types and 13 organization types were recruited. These ranged from unaffiliated citizens and environmental and social activists, to political leaders and members of review panels. Participants were aged 30 to 82, with a mean of 56.3 years. Forty were male, and 28 were female. At least seven were First Nation or Métis members. Forty-five (66%) had a post-secondary degree, diploma, or certificate, and twelve (18%) had professional credentials. Congruous with the range of contributors to the environmental assessment processes, a majority of participants (79%) were opposed to the projects.
We assessed participants’ value priorities and views pertaining to appreciation, concern, and responsibility for nature with modified best-least surveys administered by Fluid Surveys (Finn & Louviere, 1992; Schwartz 1992). Forty-one participated in semi-structured, follow-up interviews. Survey data and place categories were analyzed for trends, with SPSS version 24 (IBM, 1989, 2016) and ArcGIS version 10.4.1 (ESRI, 2015). Interviews were deductively coded to theoretically-derived survey categories, using MAXQDA version 11 (VERBI, 1989, 2016).

We asked participants to describe their relationship with their favorite places and with areas they anticipated would be affected by the energy projects (either TMEP or BIHP). Responses were assigned to the most appropriate category of the Hay (1998) and Cross (2015) topologies. The ‘partial’ Hay category was excluded to reflect this study’s participants, ‘personal’ was renamed to ‘emergent’ to reflect its somewhat rudimentary character, and a ‘rarely or never visited’ was added to indicate a less-than-superficial connection to a place. Hay and Cross categories were ranked for analysis. We used SPSS and ArcGIS to map and link centroids for participants’ home postal codes with Google Map coordinates for their favorite places. For the data-rich TMPE area, these were layered with sensitive and at-risk ecosystems and species.

**Results**

**Proximity of favourite places.**

In considering whether proximity reflected NIMBYism or nature-centric place connections, we found 93% of those who described their favorite places in spiritual or narrative terms ($\chi^2(5)=12.927, p=0.024$; Cramer’s $V(CV)=0.485, p=0.024, n=55$), or in cultural ones ($\chi^2(4)=12.592, p=0.013$; $CV=0.478, p=0.013$) supported environmental protection over energy projects. For BC residents, their favorite places were more likely to be within the region (89%),
with the majority of favourite places along the coast or on the islands (82%) (Figure SI.5.1). Here, *regional* refers to a scale that is greater than local, but less than province-wide.

By contrast, participants who were likely to be neutral or support energy projects, when such projects conflicted with environmental protection, identified favorite places that were either very proximal or very distant from home. Half of participants identifying distant favorite places linked them to recurrent experiences beginning in childhood. The others described vacation spots, in superficial, emergent, commodifying, or sensory terms. Of those who selected the most proximal favorite places and self-identified as likely to be neutral or support energy projects, all but one revealed superficial, commodifying, ideological, or sensory connections. All but one Alberta resident cited favorite places in other Canadian provinces - BC, Ontario, and Newfoundland, and in the U.S. state of Hawaii.

**Appreciation for favourite places.**

Recreation was seldom the deciding motive for favorite place selection. Participants chose settings for their tranquility, to relax or be contemplative (44%). “I feel at peace when I’m there” (Participant (P)14, male, age 31). Three participants mentioned specific health benefits of spending time in nature, such as lowered blood pressure and an improved immune system. “Getting outside and looking at trees as opposed to just linear shapes like buildings is really helpful for the brain” (P10, male, age 56). Favorite places were often settings for fond memories of childhood, or of times with their own children (42% of participants). These, rather than social memories in general (44% of participants), were correlated with the Cross topology ($\chi^2(5)=15.377, p=0.009; CV=0.529, n=55$, see Table SI.5.1 for correlations). Whereas 65% of participants who reported a spiritual connection, and 70% who had an historical connection with
their favorite place also referenced their childhood or children, relatively few with lesser sense of place connections did so. More than half (54%) of those who shared child memories had spiritual connections with their favorite places.

Favorite place stories also referenced aesthetics and ecology. Participants appreciated their favorite places for their beauty (33%) and for their ‘wildness’ or ‘pristineness’ (18%). Several emphasized geological features as attractions. Forty percent mentioned some form of biodiversity (i.e., specific ecosystems, species, or species groups (e.g., birds, whales) in their favorite places. People tending to support environmental protection were twice as likely to mention biodiversity as those who would support energy projects or be neutral (46:23%), and 86% of people who mentioned biodiversity were more likely to support environmental protection. The views statement, ‘I would rather spend time with people, or in urban settings than in nature’, prioritized by 13% of participants, was negatively correlated with biodiversity mentions ($\chi^2(1)=6.183$, $p=0.013$; CV=0.342, n=53).

Two Indigenous participants, both political leaders, were deeply connected to their favorite places. Referring to the area around his life-long home, P38 (age 40) said, “It’s genetic. It’s in my DNA.” P52 (female) identified a spiritual, sacred mountaintop for ceremonies. “It has special meaning to us, and lots of ancestral stories of our creation…. …give our ancestors were important for healing, for decolonization, and to protect the territory and its people from harm.

By comparison, three project supporters struggled to think of any favorite natural places. “There are very few places that I have been where other people would call it completely natural” (P25, male, age 64). “I consider myself an urban individual, so I don’t often strive or feel the
desire to get up and experience nature” (P43, male, age 62). Conversely, project opponents who struggled with favorite place selection had difficulty choosing a single favorite.

**Appreciation and concern for affected places.**

**Knowing remote areas, by proxy.**

When place topographies were combined for the two cases, deeper place connections were associated with general support for environmental protection over energy projects, regardless of whether participants were describing their favorite places or those affected by the projects (Table SI.5.1). When the cases were split, however, there were strong associations for TMPE-affected areas ($\chi^2(5)=25.918$, $p=0.000$; CV=0.751, $n=46$ (Hay, 1998); $\chi^2(5)=19.074$, $p=0.002$; CV=0.658, $n=44$) (Cross, 2015)), and no significant differences for Bute Inlet. Many people engaged with the BIHP or run-of-river projects more generally had never been to the remote site (38.5%), and only 17% of BIHP participants chose as their favorite place a location near Bute Inlet. The head of a construction company had a stronger connection to the area than many project opponents. “I really could have seen myself spending the next 20 years living in the woods building these run-of-river IPPs” (P66, male, age 40). Whereas TMPE participants were less likely to have an ideological connection to the project area if they supported environment protection, BIHP participants were more likely to do so (Table SI.5.2). Some BIHP participants ‘transferred’ place connections from one site to another (Hay, 1998), particularly when they were nearby. For example, P56, a Cortes Island resident, described Bute Inlet as “part of the Cortes experience,” though she had never been there.

**Scale effects: The blind men and the elephant.**

In stark contrast, only 8.3% of TMPE participants had rarely or never visited areas that
could be affected by the project, and more than half had spent much of their lives in an affected area or professed a deep emotional connection to it. Importantly, the scale at which participants perceived the pipeline was akin to the parable of the blind men and the elephant, where people are shown to see a partial experience as whole. Although the project had broad reach, spanning parts of two provinces and extending into the marine environment, most thought of affected places at regional, or less frequently - global scales. “I think that most people... know that the chances of a spill are relatively [low], but obviously if you ask the people who are affected by the Exxon Valdez spill how they feel about the 1 in 100,000 or whatever the risks were, they wouldn’t be so cavalier about those numbers” (P18, male, age 45). “The mountains, they used to have snow on them, they don’t anymore” (P50, male, age 55).

Those who looked at the entire length of the project noted that support was lowest on the coast, growing with proximity to Alberta. P25 attributed the gulf in views to differences in land use and ownership, believing the pipeline’s footprint was largely inconsequential to large ranchers in the BC Interior. On the coast, housing was comparatively very expensive, people willing to pay such costs did so for the natural amenities, and threats to these elicited a much stronger response.

*Appreciation and concern for urban nature.*

Few pipeline supporters viewed the TMPE as affecting ‘nature’, particularly in the populous Lower Mainland. “All of those areas are incredibly beautiful, and I do understand the concerns... but I also see a lot of development in that area, with the port being the busiest of all in Canada, so commerce is taking place” (P16, male, age 62).
Pipeline opponents with favorite places in the Lower Mainland were quick to point out the area is not wilderness. “...but it’s beautiful in its own way” (P20, male, age 70). Several expressed their appreciation for living in an urban environment where nature was readily accessible. Burnaby Mountain Conservation Area, the site of the protests, was especially important to some Lower Mainland residents.

The mountain...[was] part of a vision for [Simon Fraser] university... it enables us to take a break from the city, go somewhere to reflect and to learn, and know that we have crossed a barrier (P4, male, age 68).

Indigenous participants outside of the Lower Mainland relayed their support for Burnaby Mountain and the First Nations there.

I know the people of T’sleil Waututh have the very same kind of connection to that place that I have to this place, but I don’t pretend to have any connection to that place. I feel completely disconnected when I’m there... I can put myself there in the context of, ‘What if that place was here? What if that was the place I was deeply connected with?’ ...I can understand how distraught people were - when you get to the place where they’re actually drilling the holes... I can feel that, I can taste that, that intrusion into my place (P38).

**Defining insiders, outsiders and outliers for affected places.**

The TMPE protests accentuated place connections with Burnaby Mountain and ties within the local community.

The people who were sort of camped there, they tended to be young, and the weather was pretty bad, and in a lot of ways they were pretty miserable... but there was a tremendous sense of purpose and camaraderie there, a lot of people were coming and bringing them
food and supporting them, and then there was a group of students who would go to classes and do their student work but also showed up regularly, and then there were other people coming and going, and every so often there would be a staged rally where lots of people showed up... There was a sense of community purpose (P8, male, age 72).

It’s funny, on the last day or near the end of the days, all of these environmental organizations that had never been involved at all came and took pictures of themselves at the site, and then tried to take credit for the whole thing... It really kind of started to take away from the spirit of what that was, essentially entirely local residents getting arrested by their own police... When the local police would leave, there would be police from Abbotsford and from other places that saw these folks as people that needed to be roughed up (P46, male, age 53).

Some project opponents portrayed Albertans, as well as foreign investors such as General Electric and Kinder Morgan, as outsiders that do not or cannot relate to coastal concerns.

I wouldn’t expect an Albertan to understand if they haven’t actually been on the coast, or have their livelihood depend on a coastal industry. I wouldn’t expect them to understand what the potential devastating impact a massive bitumen spill would be (P18).

At the same time, TMPE supporters portrayed the south coast as an outlier, and pipeline opponents as indifferent to the national public interest.

The Lower Mainland and the islands, basically they are very much the hub of environmental ethics in Canada. There is certainly no other part of the country that I have ever worked in, and I have worked from Newfoundland to BC, where I have seen the
same level of concern around the environment and the same belief that anything that might affect the environment should be completely not okayed (P25).

It used to be NIMBYism... I don’t mind you building it, just don’t build it near me... now [it’s] BANANAism... Build Absolutely Nothing Anywhere, Near Anyone. In other words... don’t build it at all (P36, male, age 70).

Importantly, key decision-makers, such as environmental assessment panel members or government ministers were not from the region where most of the impacts of the projects were occurring, and did not aggrandize nature.

**Responsibility for natural places.**

For the Indigenous leaders we interviewed, their eternal connectedness was infused with responsibility - not just for their places or traditional territories, but for nature more generally. For them, the term ‘stewardship’ was an uncomfortable fit.

We are part of a food web rather than the top of a food chain... The orca hunted primarily the Chinook, humans hunted basically the sockeye - we worked alongside one another. The relationship between the whale and the human was one of brothers and sisters, just as the relationship between the whale and Chinook were brother and sister. The sockeye salmon were former humans in the story that we tell, so... we see ourselves as part of, not as administrators of the system. I use the word steward, I don’t have a hatred for it, but stewarding is sort of a paternalistic view of the relationship, and what I learned about my culture... we were not stewards, we had a place within (P38).
For other participants, the alignment of connectedness and responsibility for nature we found in the Indigenous leaders was less clear. One politician admitted, “My attachment is to the people I represent” (P47, male, age 50). In describing their favorite places, nearly a quarter of all participants mentioned some form of stewardship (e.g., protecting wetlands), including more than 29% of those who said they were more likely to support environmental protection, and 8% of those who would support energy projects. Several participants mentioned joining or creating organizations based on their appreciation or concern for favorite or affected places. Stewardship mentions were weakly correlated with ‘care for nature’, mentions of biodiversity in favorite places (p=0.023, FET), and the statement, ‘Regular time outdoors in natural settings is important for my physical, mental, and spiritual health’ (χ²(1)=4.846, p=0.028; CV=0.297, n=55). For the BIHP, mentions of stewardship were strongly correlated with mentions of tranquility in favorite places. Some participants juxtaposed stewardship with environmentalism.

My dad worked at logging and later manufacturing and my stepdad worked in fishing. I learned anything that I ever wanted to know about being an environmentalist through them, because they both had a very strong sense, that we live as a part of this land and if we screw it up, we’re screwed. So you have to manage and care for the land as a steward, and not be some sort of rapacious parasite that comes in and exhausts a resource and leaves it, the goose that laid the golden egg and all those kinds of metaphors (P54, organization spokesperson).

There were significant links between place connections and values demonstrating a sense of responsibility for nature and respect for environmental limits. The Hay (1998) and Cox (2015) topologies for affected places were moderately correlated with the values statement, ‘care for
nature’ (see Table 21.5.1). ‘Care for nature’ and ‘duty to care for nature’ values statements were also moderately correlated with the statement, ‘We should adapt to nature and fit harmoniously into the natural world’ (0.491, $p<0.01$ and 0.434, $p<0.01$, respectively). People who prioritized ‘adapt to nature’ were nearly twice as likely to have spiritual or narrative connections with their favorite places than weaker connections.

**Discussion**

**Sense of place in nature.**

Senses of place, as they apply to connections with nature, were found to exist on a continuum, from stark urbanism and perhaps a sense of alienation from nature, to a spiritual oneness with nature and place reminiscent of topophilia or geopiety (Knowles 1992; Tuan 1974, 1977). Individuals with deeper connections to both favorite places and affected places were more likely to oppose the energy projects and to support environmental protection more generally, although this finding was not statistically significant for the BIHP data on its own. Given the ‘clashing shades of green’ (Kimmett 2009), this was not unexpected. People with deeper connections were also more likely to say looking after the environment was important to them, that people should care for nature.

In favorite place selection, experiences *in* nature were often more salient than experiences *of* nature. Solo and social activities included stirring, highly sensory recreational experiences, joyful stories of children or childhood, and soothing spiritual rituals. Tranquility, biodiversity, beauty, and wildness or pristineness were, in descending frequency, some of the attractions mentioned by participants in describing their favorite places. Although these attractions were uncorrelated, the majority of favorite places were associated with parks and conservation areas.
that exhibited many such characteristics. For the Otways region of Australia, Brown and Raymond (2007) similarly suggested an abundance of aesthetic and wilderness or other natural landscape features, together with recreation and therapeutic experiences in the landscape, created conditions leading to greater place attachment. This multi-dimensionality of sense of place, encompassing sensory experiences, social activities and experiences, and spiritual and cultural experiences and practices were reiterated in a study of shellfish harvesting in nearby Puget Sound (Poe, Donatuto, and Satterfield 2016).

**Sense of place by proxy.**

A deep sense of place may be a predictor of stronger environmental advocacy but was not necessarily a prerequisite. The range of place connections held by environmental advocates demonstrated that one need not have strong attachments, nor boots on the ground, to defend a place from harm (Table SI.5.2). People may ‘transfer’ senses of place to protect similar values to which they are attached (Lin & Lockwood, 2015). Networks were also places, virtual communities where connections with real natural places could be transferred and fostered (Anderson 2004; Dale, Ling, & Newman 2008). Project opponents and supporters in both cases were embedded in stable and cohesive networks - some extending back to the Clayoquot Sound protests, that influenced place connections with project areas.

**Regional senses of place.**

Deep place connections are more likely when a place has natural amenities, for example, when it is topographically interesting and has a good climate (Dale, Ling, & Newman 2008; Hay, 2006). The mountainous coastline of BC is aesthetically pleasing, and on this, project supporters and opponents agreed, regardless of their place of residence. For opponents however, their
experiences fostered deep connections with regional favorite places, many of which were in or near sensitive ecosystems and occurrences for species at risk. Their higher level of perceived threat likely grew from incremental assaults that made these areas simultaneously vulnerable and uniquely special. New Zealand’s Ngunguru sandspit is a case in point, a place known as rare, sensitive, beautiful, compromised by earlier development, and incessantly under threat. The spit was an element of regional identity and a focus of sustained place-protective actions (Collins and Kearns, 2013).

Beyond the coast, participants appeared to have a sense of place unique to their own regions. For the Albertans who mentioned the Rocky Mountain parks, the massifs represented an enduring part of the landscape, not a vulnerable one. In general, Albertans’ sense of place was aligned with the province’s oil and gas resources and its status as the engine of the Canadian economy (Greaves, 2013). The pipeline could be conceived as an extension of their sense of place. Similarly, Dakin (2013) found people who viewed ‘landscape as heritage’ in BC’s Cariboo region felt connected to historic landmarks associated with mining and forestry, and those who viewed ‘landscape as way of life’ appreciated the region as a place to live, work, and play (e.g., the pastoral attractiveness of a working farm). ‘Landscape as nature’ was only expressed as an outcome of geological processes or in reference to ecological health and functions.

We expect there are as many different regional senses of place as there are regions. Further research on Canada’s west coast might explore the proportion of residents to which a nature-centric regional sense of place applies. In a study of Ecuador’s Galapagos Islands and two
coastal American sites, Ardoin (2014) found up to a quarter of residents indicated their place connections occurred at a regional scale.

**Senses of place in conflict.**

If one considers the TMPE as a clash of regions (Angus Reid Institute, 2016), where nature-centric and ‘bitumen-centric’ senses of place collide, the bitterness of the conflict becomes easier to understand. If Albertans see the environmental sacrifices they have made in developing their boreal forests and aspen parklands for the national public good as unselfish and patriotic, then the notion that others were unwilling to help landlocked resources get to market is predictably inconceivable. For coastal British Columbians sharing a deep, nature-centric sense of place, the threat of a spill provokes an identity crisis of sorts, since nature and its attractions (e.g., beauty, tranquility, biodiversity) are integral to a treasured way of life.

For the cohort that is deeply concerned about the climate and believes we should adapt to nature, building fossil fuel projects anywhere is a direct threat, and not building renewable projects may also be. Adapting to nature adheres to a long-held sustainability concept that supposes economy and society are constrained by environmental limits, and for this group, the survival of humankind depends on staying within those limits (Steffen et al., 2015).

The essence of the BIHP conflict is reflected in Breslow’s (2014) study in nearby Washington State, where habitat restorationists, Native Americans, and farmers were at odds over salmon restoration. Each had different senses of place for the same region, and different bonds to the resources in those places.
Conclusion

Sense of place influenced environmental advocacy and resource conflicts primarily by focusing the risks and benefits posed by the projects onto a known or perceived geography. The felt intensities of place-based stressors were grounded in an array of experiences and emotions that had come to define their collective place identities, attachments, and dependencies. The quality and intensity of stressors were also delineated by levels of concern and responsibility for affected and similar places, which derived from sources ranging from geopiety and spirituality to experiences with world travel and salient organizations in social networks.

Sense of place also played a role in delineating in-groups and outsiders. It filtered or coloured information arising from adversaries (cf., Fisman, 2007; Breslow, 2014), and accentuated both real and perceived differences among in-groups and adversaries (e.g., stereotypes).

Sense of place is also likely to have direct effects on decision-making in resource conflicts. Key decision-makers, such as panel members on energy boards, did not have a nature-centric sense of place. Therefore, appreciation and concerns for nature and natural places - routinely on record in environmental assessments, may lack ample consideration.

Notably, those with a sense of place tied to nature may not readily protect biodiversity. Most favorite places on the south coast were in or near sensitive ecosystems and occurrences for species at risk, yet few made reference to them. People may recognize them only as pretty or special places, their ecological health masked by their beauty (Poe, Donatuto, and Satterfield 2016). Biodiversity loss may also be disguised by omission; you rarely miss what you don’t see.
We also identified a strong *regional* sense of place on Canada’s southwest coast. Among southwest coast participants, threats to natural places in this region appeared to manifest as sweeping social stress. Generalizing from our data, we outline for consideration key characteristics of a regional sense of place. At its core, a regional sense of place is cultivated through a series of personal and social experiences that, for some, perhaps key individuals, tie to historical events and narratives. Here, a historical west coast environmental movement, pre-dating mass protests in Clayoquot Sound, defended remnant rare and sensitive ecosystems and other spectacular settings from development and other threats (cf., Penn, 2015). 2) This *a priori* movement was latent between campaigns, and became quickly reactivated when a new challenge emerged.

In this way, sense of place grows to be a stable entity, manifesting as a way of life. Outsiders may see environmental advocates here as NIMBYs, yet our data revealed a collective regional place identity that respects nature, with deep attachments to the beauty, tranquility, and biodiversity found in coastal nature, and a sense of responsibility for it. This sense of place was widespread and normalized to an extent where traditional supporters of development (i.e., municipalities and business organizations) viewed the pipeline expansion project as an externally-imposed threat to a coastal way of life.

A strong regional sense of place may also develop from connections with others. In lieu of deep place connections, advocates may adopt transient place connections by relating to people, values, and ideologies in stable, cohesive and widely accessible emergent and *a priori* networks (Dale & Sparkes, 2008; Newman & Dale, 2007). These connections motivate them to care about and protect regional places when they are threatened (cf., Ardoin, 2014).
Therefore, it is advantageous for all parties to bridge sense of place disparities that contribute to a zero sum game for biodiversity conservation and resource development, encouraging people to articulate how they understand their places and the characteristics they feel it is important to sustain. Devine-Wright (2009) suggested we expect and respect emotional place-protection; we should also respect and expect resource-protection from regions with a sense of place tied to its resource development. Untangling the social considerations that flow from sense of place, such as stereotypes and perceptions of injustice, is also necessary (Breslow 2014). We recommend assessments be restructured to recognize and reconcile incongruent senses of place when development projects are proposed.

To foster a nature-centric sense of place, we suggest facilitating memorable childhood experiences in nature. With these, people may be more likely to cultivate a nature-centric sense of place. To encourage biodiversity conservation, we recommend promoting biodiversity as an attraction among those who already have regional ties to nature based on other attractions. If messaging frequently couples nature’s diversity with its more conspicuous attributes such as beauty or tranquility, advocates will begin to embrace it as a significant contributor to their deep sense of place.

Although sense of place research is sometimes conducted at a regional scale, considering regional sense of place as a meaningful construct in its own right recognizes it as an important area for future research. Here, we have examined some of the conditions through which it might arise, and its various qualities and implications. However, the diversity and extent of senses of place in defined jurisdictions (e.g., the nature of sense of place subpopulations), compatibilities
and sources of tension predicted by senses of place, and the role of regional sense of place in climate adaptation are just a few of many areas to explore.

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Supplemental Information

Figure SI.5.1. Home postal codes to favourite places
Table SI.5.1. Association of place attributes with participant values and views.

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<td></td>
</tr>
<tr>
<td>Memories of childhood or own children</td>
<td>both</td>
<td>0.409**</td>
<td>I. Memories of social activities</td>
<td>(p=0.003, \text{FET, n=55})</td>
<td>A</td>
</tr>
<tr>
<td><strong>Place Typologies x Values and Views</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Favorite Place (Hay)</td>
<td>both</td>
<td>0.414**</td>
<td>S. When environmental protection conflicts with energy projects, I am more inclined to sympathize with or support advocates of environmental protection.</td>
<td>(\chi^2(4)=12.592, p=0.013, \text{CV}=0.478, n=55)</td>
<td>A/C</td>
</tr>
<tr>
<td>Favorite Place (Cross)</td>
<td>both</td>
<td>0.357*</td>
<td></td>
<td>(\chi^2(4)=9.569, p=0.048, \text{CV}=0.472, n=43)</td>
<td></td>
</tr>
<tr>
<td>Affected Places (Hay)</td>
<td>both</td>
<td>0.394**</td>
<td></td>
<td>(\chi^2(5)=12.927, p=0.024, \text{CV}=0.485, n=55)</td>
<td></td>
</tr>
<tr>
<td>Affected Places (Cross)</td>
<td>both</td>
<td>0.326*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affected Places (Hay)</td>
<td>both</td>
<td>0.537**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affected Places (Cross)</td>
<td>both</td>
<td>0.584*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affected Places (Hay)</td>
<td>both</td>
<td>0.453**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affected Places (Cross)</td>
<td>both</td>
<td>0.508**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affected Places (Hay)</td>
<td>both</td>
<td>0.472**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affected Places (Cross)</td>
<td>both</td>
<td>0.537**</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S. Looking after the environment is important to me. I strongly believe that people should *care for nature.*

\(\chi^2(5)=19.940, p=0.001, \text{CV}=0.581, n=56\)
\(\chi^2(4)=14.767, p=0.011, \text{CV}=0.561, n=47\)
\(\chi^2(6)=12.877, p=0.045, \text{CV}=0.480, n=59\)
\(\chi^2(5)=11.277, p=0.046, \text{CV}=0.501, n=45\)
<table>
<thead>
<tr>
<th>Place Attributes</th>
<th>Case</th>
<th>Spearman's rho</th>
<th>Interview (I) and Survey (S) Responses</th>
<th>Significant Crosstabs</th>
<th>Theme*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Favorite Place (Hay)</strong></td>
<td>BIHP</td>
<td>-0.613*</td>
<td>S. Scientific evidence has shown that climate change and biodiversity loss are interconnected and pressing problems that must be considered in land and resource decisions.</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>Affected Place (Hay)</td>
<td></td>
<td>0.612*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affected Place (Cross)</td>
<td></td>
<td>0.612*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| **Favorite Place (Hay)**      |      | 0.613*         | S. Climate change is more urgent/pressing than biodiversity loss, and must be considered in all land and resource decisions. |                       |        |
| Affected Place (Hay)          |      | -0.612*        |                                         |                       |        |
| Affected Place (Cross)        |      | -0.612*        |                                         |                       |        |

| Affected Places (Cross)       | both | 0.315*         | S. Species and ecosystems at risk of extinction signal a much larger environmental problem. | C                     |
|                              | TMPE | 0.316*         |                                         |                       |        |

**Favorite Place Descriptions x Values and Views**

<table>
<thead>
<tr>
<th>Value</th>
<th>x Values and Views</th>
<th>Significant Crosstabs</th>
<th>Theme*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Beauty</strong></td>
<td>TMPE 0.408**</td>
<td>S. I appreciate nature for its beauty.</td>
<td>A</td>
</tr>
<tr>
<td><strong>Biodiversity Recreation</strong></td>
<td>both 0.280*</td>
<td>S. Humans have a duty to care for nature. It is important to me that people be accountable for their impacts on the environment.</td>
<td>A x R</td>
</tr>
<tr>
<td></td>
<td>BIHP -0.577*</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Biodiversity</strong></td>
<td>both -0.342*</td>
<td>S. I would rather spend time with people, or in urban settings, than in nature.</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>TMPE -0.401**</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Biodiversity Stewardship</strong></td>
<td>BIHP 0.577*</td>
<td>S. Regular time outdoors in natural settings is important for my physical, mental, and spiritual health.</td>
<td>A</td>
</tr>
<tr>
<td><strong>Tranquility</strong></td>
<td>both 0.297*</td>
<td></td>
<td>A x A</td>
</tr>
<tr>
<td></td>
<td>BIHP 0.577*</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Stewardship</strong></td>
<td>both -0.276*</td>
<td>S. Protection of sensitive ecosystems is the responsibility of our governments.</td>
<td>R</td>
</tr>
<tr>
<td><strong>Favorite Place memories</strong></td>
<td>both 0.412**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>of childhood or own children</td>
<td>TMPE 0.318*</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Memories of social activities</strong></td>
<td>both -0.385*</td>
<td>S. Regardless of what others are doing, I have a responsibility to protect sensitive ecosystems.</td>
<td>R</td>
</tr>
<tr>
<td></td>
<td>TMPE</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Beauty</strong></td>
<td>BIHP -0.598*</td>
<td>S. Looking after the environment is important to me. I strongly believe that people should care for nature.</td>
<td>A x C/R</td>
</tr>
<tr>
<td><strong>Stewardship</strong></td>
<td>both 0.332*</td>
<td></td>
<td>R</td>
</tr>
<tr>
<td><strong>Tranquility</strong></td>
<td>both 0.284*</td>
<td></td>
<td>A x R</td>
</tr>
<tr>
<td></td>
<td>BIHP 0.683*</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Biodiversity</strong></td>
<td>TMPE 0.343*</td>
<td>S. I am a global citizen. I care about many places, most of which I have never visited.</td>
<td>A x C/R</td>
</tr>
</tbody>
</table>

*Indicates a significant theme.
Table SI.5.2. Place connections and the likelihood of prioritizing environmental protection (% of case).

<table>
<thead>
<tr>
<th>Place Category</th>
<th>Favorite Places (Cross)</th>
<th>Affected Places (Cross)</th>
<th>Favorite Places (Hay)</th>
<th>Affected Places (Hay)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TMPE</td>
<td>BIHP</td>
<td>TMPE</td>
<td>BIHP</td>
</tr>
<tr>
<td>Environmental Protection</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>never/rarely, superficial</td>
<td>3</td>
<td>20</td>
<td>11</td>
<td>33</td>
</tr>
<tr>
<td>emergent</td>
<td>9</td>
<td>10</td>
<td>0</td>
<td>33</td>
</tr>
<tr>
<td>commodifying</td>
<td>3</td>
<td>10</td>
<td>11</td>
<td>33</td>
</tr>
<tr>
<td>ideological</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>material dependence</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>sensory</td>
<td>18</td>
<td>30</td>
<td>11</td>
<td>67</td>
</tr>
<tr>
<td>ancestral, historical</td>
<td>15</td>
<td>50</td>
<td>11</td>
<td>0</td>
</tr>
<tr>
<td>narrative</td>
<td>18</td>
<td>0</td>
<td>11</td>
<td>0</td>
</tr>
<tr>
<td>spiritual, cultural</td>
<td>42</td>
<td>10</td>
<td>56</td>
<td>0</td>
</tr>
<tr>
<td>other</td>
<td>12</td>
<td>10</td>
<td>10</td>
<td>0</td>
</tr>
</tbody>
</table>
Chapter 6. Science-Based:

The Role of Scientific Evidence in Contentious Natural Resource Decisions

Abstract

With values and cultural cognition as a theoretical foundation, and salience, credibility, and legitimacy as organizing themes, we investigated how perceptions of science influence its use in natural resource conflicts. Administering values, views, reports, decisions, and network surveys with follow-up interviews, we examined perceptions and flows of science and other forms of information for two contentious proposed energy projects in British Columbia, Canada. Values, cultural cognition, and media effects permeated all aspects of using scientific evidence within and leading up to environmental assessment processes, from commissioning scientific research to selecting, assessing, and weighing it with other forms of information. As a result, science was developed and used to support decisions rather than to inform them. We discuss ways to improve the use of science in environmental assessment and other planning and development processes.

Key Words

science-based, evidence-based, cultural cognition, salience, credibility, legitimacy

Introduction

Politicians and others routinely describe scientific evidence as fundamental to decisions affecting the environment (Lidskog, 2014). Yet sensitivities to the everyday production and dissemination of science have become more prevalent (e.g., Rainie, 2017), and the use of science in decision-making more unclear (cf., Russell-Smithe et al., 2015). July 2012 marked an historical moment in Canadian politics when some 2,000 scientists and science advocates
gathered on Parliament Hill to protest the Conservative Government’s suppression of publicly funded science and the ‘death of evidence’ in federal decision-making. In a mock funeral procession, they chanted, ‘No science, no evidence, no truth, no democracy’ (Link, 2015). The government had rolled back environmental legislation, defunded and closed century-old scientific institutions and libraries, and dismissed and muzzled scientists, after winning a majority of seats in the 2011 election (Link, 2015; Solar, 2014). A host of changes in legislation and policy, designed to ease and expedite the development and export of Canadian bitumen and other natural resources, targeted the environmental assessment (EA) process (Mitchell, 2015).

EAs are conducted to minimize or avoid adverse environmental effects from proposed developments before they materialize (Canadian Environmental Assessment Agency (CEAA), 2012). Central to EAs are risk and risk abatement - the purview of scientists, among others (Cash et al., 2002). Yet, the process is very broad, encompassing, for instance, economic justification and wide-ranging Indigenous interests. All evidence is required to be exposed to both expert and public scrutiny in some form (Sinclair & Doelle, 2015).

How scientific evidence is understood and used in EA is contingent upon its salience, legitimacy, and credibility (Cash et al., 2002; Cravens & Ardoin, 2016). Evidence is salient if it is relevant to the person considering it and the issue at hand (Cash et al., 2002). For example, Canada’s Conservative Prime Minister at the time, Stephen Harper, claimed the decision on the proposed Northern Gateway pipeline from Alberta’s bitumin sands to BC’s west coast would be based on science, not politics - by scientists examining the economic costs and risks associated with the project (Fekete, 2012). For Prime Minister Harper, an economist, economic tests were
more salient than environmental ones, reflecting his conservative values and his view that pipelines were in the vital interest of the country.

Legitimacy is whether the scientific evidence arises from, or is embedded in a process that is seen to be unbiased and fair (Cash et al., 2002). From the onset of the review of the Northern Gateway project, the legitimacy of pipeline EA processes was questioned. Foremost among concerns was that climate-related evidence was disallowed from the EA, particularly Greenhouse Gas (GHG) emissions that could result from upstream expansion in the sands or downstream burning of bitumen products (Gibbs, 2014; Mitchell, 2015).

Credibility refers to whether evidence is believed and trusted (Cash et al., 2002). In June 2014, three hundred scientists and scholars sent a letter to the Harper Government, saying the Joint Review Panel’s report for Northern Gateway had so many systemic errors and omissions that it was essentially useless (CBC News, 2014). The Government wholly accepted the Panel’s recommendations later that month. By stating, “The Panel’s rigorous science-based review included feedback from over 1,450 participants in 21 different communities, reviewing over 175,000 pages of evidence and receiving 9,000 letters of comment” (Government of Canada, 2014, June), it argued the decision was indeed founded on credible and legitimate evidence.

In our study of two contentious proposed energy projects, one fossil-fuel based, the other renewable, actors often called for more science, or disputed scientific claims offered by others. We encountered a common expression, “If they would just look at the science....” - implying that people would support the projects if they understood the science and technology in energy development and transportation, or oppose them once they were aware of biodiversity or climate science. We investigated how science was used in decision-making for these projects, and
whether it could play a decisive and unifying role in energy development and environmental protection. Here, ‘decisions’ included recommendations by governments and environmental review panels, as well as commitments to intervene, comment, protest, undertake studies, and so on. We explored how decision-makers - from unaffiliated citizens to past and present review panel members, perceived science and scientists, discovered and selected scientific information, assessed conflicting science, and weighed science with other forms of evidence and information in EA decisions.

This work transcends the perpetual disconnect between objective science and subjective values, providing empirical evidence of the mechanisms of cultural cognition and media effects in environmental assessment, and confronting the disconnect between science-based decision-making and values-based decision-making in Canadian environmental assessment (Link, 2015; Popper, 1969).

**Expert Panel for the Review of Environmental Assessment Processes.**

For decades, Canadian EAs have been criticized for the poor quality of the science, and the undervaluation of science in EA processes (Greig & Duinker, 2011). In 2016, Canada’s Minister of Environment and Climate Change convened the Expert Panel for the Review of Environmental Assessment Processes, hereinafter ‘Expert Panel’, to restore public trust in EA and get resources to market. The Expert Panel (2017) engaged more than 1,000 people in 21 cities over 4 months, receiving nearly 400 presentations as well as some 500 written submissions and 2,600 completed surveys. Presentations to the Expert Panel (2017) were categorized as Indigenous (32%), non-governmental organizations (26%), individual/academic (21%), government (12%), and industry/industry associations (9%). In its final report, it redefined EA as
Impact Assessment (IA), based on five pillars of sustainability (i.e., environmental, economic, social, cultural, and health). In this paper, we juxtaposed our findings with the policy recommendations of the Expert Panel, to explore their implications and identify further avenues of research.

**Algorithms, Birds of a Feather, and Cultural Cognition**

Science is a familiar term that we all understand, but may interpret differently, like ‘love’ or ‘nature’. The Science Council (2017) defined science as “the pursuit and application of knowledge and understanding of the natural and social world following a systematic methodology based on evidence.” When making decisions, people employ a series of both subconscious and mindful lenses to examine whether evidence is salient and credible.

Importantly, EA projects are scrutinized beyond the legislated EA process, in various forms of public discourse. Public communications now occur in a ‘post-truth’ era, where credible news and information on EA projects may be difficult to find, and opinion may be shaped more by appeals to emotions and personal beliefs than objective facts (Lubchenco, 2017). In this environment, news is not only framed and spun, but also fabricated to generate ad revenue (Viner, 2016). Journalists chase mouse clicks at the expense of veracity, and social media and digital bots create misinformation cascades (Forelle et al., 2015; Lubchenco, 2017; Viner, 2016). Repetitive news stories and social media posts can trigger the ‘availability effect’, where we are more likely to assign significance to a resource for its frequency, rather than its quality (Kahan, 2012).

In distilling some 2.5 quintillion bytes of daily data into manageable bits (IBM, 2016), we may ourselves choose predominantly politically right or left-leaning news aggregators, or
environmental or economic-focused listserves that provide a biased sample of news and information. Algorithms also choose for us, automatically filtering digital searches and news feeds to curate and personalize our content so we receive more of what have already received (Pariser, 2011). This ‘filter bubble’ tends to limit access to information that conflicts with our views (Pariser, 2011). Through ‘homophily’, a phenomenon known by the idiom, ‘birds of a feather flock together’ (McPherson, Smith-Lovin, & Cook, 2001), networked communications tend to circulate information in echo chambers where opposing evidence and explanations are scant (Colleioni, Rozza, & Arvidsson, 2014; Pariser, 2011). Value homophily occurs when we interact more frequently and develop deeper connections with people who share our values, ideologies, beliefs, and social norms (Dale & Sparkes, 2008; McPherson, Smith-Lovin, & Cook, 2001). The distortions of digital media and a tendency to homophily act to reinforce group values and beliefs, contributing to polarization and conflict (Bakshy et al., 2015; Dale and Sparkes 2008).

Selection and evaluation of evidence and experts may also be shaped by ‘cultural cognition’ or in-group bias. The cultural cognition thesis suggests we conform to the values and views of groups with whom we identify or share significant relationships, to avoid dissonance and to protect social standing that might come from deviating from the tendency of the group (Kahan, Jenkins-Smith, & Braman, 2011). We seek information from experts who share our values, are more open-minded to evidence that confirms both our personal and cultural perceptions, and dismiss or depreciate information representing a threat to our cultural values and identity (Kahan, Jenkins-Smith, & Braman, 2011). As a result of cultural cognition, a right-leaning scientist may feel more comfortable in the business sector than in ‘liberal academia’, or a
worker in the fossil fuel industry may not reveal his anxiety about climate change (Kahan, 2012; Maranto & Woessner, 2012).

At the same time, people have unequal direct access to scientific evidence (Enserink, 2016; Porter, 2012), and unequal opportunities and abilities to fully understand and evaluate EA information. To manage complex conflicting or uncertain EA information, they lower the effort needed to form or modify beliefs by relying on ‘cognitive shortcuts’, trusting in a political party or media outlet, deferring to the expertise and views of others, or simply arguing their positions in terms of values (Kahan, Jenkins-Smith, & Braman, 2011; Kelly, 2011; Miscolta-Cameron, 2016).

Schwartz’ (1992) values theory suggests people hold similar values, but prioritize them differently. When people emphasize self-enhancement values such as power and achievement, they are unlikely to also prioritize self-transcendence values involving concern for others and for nature (and vice versa) (Schwartz 1992). Strongly held values outcompete weaker ones.

Those who have strong values, such as keen partisans, are most susceptible to ‘biased assimilation’ - a form of information processing where confirming evidence is readily accepted, while disconfirming evidence is subjected to hypercritical evaluation (Lord, Ross, & Lepper, 1979). Laypeople and scientists alike may cling to attitudes reflecting only vague impressions and unproven assumptions, despite the availability of confounding evidence (Lord, Ross, & Lepper, 1979). In a renowned study of attitudes toward capital punishment, Lord, Ross, and Lepper (1979) found the gap between people with opposing views increased when exposed to identical evidence.
Kahan (2012) advanced the notion of ‘culturally biased assimilation’, whereby we are motivated to absorb and embrace risk information they associate with our cultural group. In studying the perceived risks of nanotechnology - a relatively new scientific field at the time, Kahan et al. (2009) found cultural values were more predictive of risk perceptions than the level of exposure to the topic. Kahan (2012) deduced that people could assimilate bias without any prior beliefs, simply by presupposing what their cultural group might think.

The level of scientific support for positions we are culturally predisposed to accept is overestimated, by more readily recalling instances that support such positions, in what Kahan, Jenkins-Smith, & Braman (2011) referred to as the ‘cultural availability effect’. And, in identifying credible experts, there is a tendency to impute knowledge, honesty and shared interests to people we perceive to share our values; Kahan (2012) called this the ‘cultural credibility heuristic’. As a result, individuals and factions on either side of a contentious project may have different perspectives as to what they see as salient, credible and legitimate.

By investigating how these social forces influenced perceptions and use of science in two contentious proposed energy projects, we aspired to improve both the quality of the science in environmental decision-making and the appreciation for it (Greig & Duinker, 2011).

Case Studies

**Trans Mountain pipeline expansion.**

Kinder Morgan Canada’s Trans Mountain pipeline expansion (TMPE) would carry diluted bitumen from Alberta’s bitumen sands to tidewater for export (Figure 6.1). From 2,118 applicants, 400 intervenors and 798 commenters were allowed to participate in the EA led by Canada’s National Energy Board (NEB) (Expert Panel, 2017). Protests and other forms of
resistance confronted a range of issues, including risks of tanker spills and GHG emissions from anticipated increases in bitumen production and use. Amid the conflict, a new Liberal government was elected, promising to restore trust in EA and make decisions based on ‘science, facts, and evidence’ (Liberal Party of Canada, 2017). Afterwards, the NEB assessment continued unabated, with the Board recommending approval of the project in May, 2016. In response to ongoing dissension, the Government appointed a Ministerial Review Panel to collect additional information. The Ministerial Panel for the TMPE (2016) received nearly 2,500 participants at 44 meetings in 11 cities, as well as 20,154 email submissions and 35,259 responses to an online questionnaire - the highest response rate ever recorded for a federal government questionnaire. When the project was approved in November 2016, opponents vowed to press on with protests, court challenges, and civil disobedience (e.g., Hume & Bula, 2016).

**Bute Inlet hydroelectric project.**

Plutonic Power’s Bute Inlet Hydroelectric Project (BIHP), comprised of 17 non-storage run-of-river sites on three river systems, was the largest of its kind proposed for British Columbia’s picturesque Central Coast (Costello, 2016). It was part of a Green Power Corridor, a grand plan to meet the power needs of 586,000 homes, create 5,900 person-years of employment, and offset 4 million tons of annual carbon dioxide emissions (Plutonic Power Corporation, 2009).

The first open houses in early 2009, to develop a Terms of Reference for EA, were crowded and confrontational (BC Citizens for Green Energy, 2009). Although a CEAA-appointed review panel began to lay the groundwork to assess the BIHP, the proponent suspended the EA to collect additional data. The project was formally withdrawn in 2016, when
the entire independent power sector stalled due to the development of Site C, a large hydroelectric dam under construction in northeast BC (Bennett, 2016).
Methods

Online media, EA documents, and referrals from other participants were used to recruit 68 participants representing 11 actor types and 13 organization types. Recruits ranged from unaffiliated citizens to political leaders and members of EA panels. Forty male and 28 female participants were age 30 to 82 (average 56.3 years). At least seven were First Nation or Métis. A highly-educated group, forty-five (66%) had a post-secondary degree, diploma, or certificate, while an additional twelve (18%) had professional credentials requiring a degree. Nearly 87% of TMPE participants and 79% of BIHP participants had post-secondary or professional credentials.

Recruits were asked to respond to a series of surveys and to participate in semi-structured, follow-up interviews. Modified best-least surveys (Finn & Louviere, 1992) assessed respondents for their value priorities (Schwartz, 1992) and views (i.e., trust in information, comparing science with other forms of knowledge and public opinion, biodiversity and climate science). To assess self-enhancement (SE) and self-transcendence (ST) values, values scores were computed from best-least choices in the values survey, with the formula: SE score = \( \sum (SE\ best) - \sum (SE\ least)/\sum (all\ possible\ SE\ best) \). Self-transcendence (social) (STS) and (nature) (STN) values scores were similarly derived. Survey data were analyzed for associations among values and views with SPSS version 24 (IBM 1989, 2016).

Network surveys traced the flow of information and financial resources, as well as the level of cooperation and collaboration among individuals and groups. Items for the reports survey were selected through online searches, using the projects as search criteria. To help determine what scientific information participants were accessing about the project, and how they perceived it, survey respondents were asked to rate the accuracy of reports in the reports
survey. They were not required to read the reports in the reports survey, only to base their ratings on what they already knew. Network and report survey respondents were asked to nominate additional organizations and reports, respectively, and these were added to the surveys as they became known. The reports covered a range of types (e.g., peer-reviewed, grey literature), authorship, and topics related to the projects. Additional reports, news articles, and other information mentioned in participant intervenor and commenter documents were analyzed for salient topics. Report survey data were examined with SPSS in combination with Zotero citation software version 4.0.29.15 (Roy Rosenzweig Center for History and New Media, 2016). Interviews were coded with MAXQDA version 11 (VERBI, 1989, 2016).

Results and Discussion

Credibility.

Credible science.

Nearly 20% of participants were conflicted or otherwise troubled by the term ‘science’. Participants characterized it as a way of knowing (e.g., an incremental method reaching for facts or truth), or less frequently as a body of knowledge (e.g., a collection of probabilities and scenarios). Notably, participants who self-identified as religious or spiritual often had unique views on all aspects of science. For example, one described science as an “unnecessarily dispassionate and detached spiritual practice.”

Paradoxically, participants described science as ‘objective’ or ‘fact’, yet too malleable to be blindly trusted. Most frequently, ‘soundness’ was premised on issues of legitimacy, such as funding sources. Science produced by or for industry, government, non-profit organizations, and environmental campaigns were all dismissed by certain participants as suspect. Significantly,
participants accepted that corporations and their consultants produced biased science, while governments and non-profits were expected to be more even-handed.

Participants widely acknowledged that EA science was selectively created or used to win, rather than aspire to some truth. However, there were subtle but critical differences in how some participants perceived the role of science in EA, most notably whether it was to ‘find proof’, falsify existing information (i.e., the exception tests the rule), or inform the process (i.e., neither proving or disproving). If one viewed science as proof, uncertain evidence should be excluded. Those who believed science was more suited to falsification referenced the Precautionary Principle, an ecological Hippocratic Oath to err on the side of caution when science cannot fully address uncertainty or complexity (United Nations Educational, Scientific and Cultural Organization (UNESCO), 2005). When science was simply perceived as information, uncertainty merited further inquiry.

Perceptions of certain branches of scientific study, together with positions on the projects, were reflected in participants’ values scores. People who prioritized self-enhancement values were significantly more likely to support the proposed energy projects as well as hypothetical ones, while those who aligned with self-transcendence values were more likely to be against them (Table SI.6.1). Among those with higher SE scores and lower STN scores, economic science generally ranked higher than climate science and biodiversity science; for participants with lower SE scores and higher STN scores, this was reversed (Table SI.6.2). Some TMPE opponents, including professors, were irked that economics held such prominence in decision-making. They diminished it as ‘not a natural science’, or dismissed the notion that it was a
science at all. ‘Economics’ were blamed for climate change and other market failures, and for elevating the significance of jobs over ‘growing food, drinking water, and breathing air’.

_Credible sources._

Several participants classified Indigenous (or ‘traditional’) knowledge as science, consistent with the findings of the Expert Panel (2017). One (a lawyer) noted, “ten thousand years of observing patterns is science.” A Chief explained that spirituality is intrinsically embedded in Indigenous knowledge, by seeing knowledge as ‘teachings’ and adopting a holistic, systems-based approach guided by nature’s own regulations “built in by the Creator.”

Local residents and Indigenous people - regarded by some as inherently local, were viewed as having ‘first-hand’, ‘common sense’ knowledge. Local people had spotted errors in the TMPE application, and understood watershed dynamics that could damage run-of-river infrastructure, for example. Local knowledge, noted one BIHP participant, crucially bridges the disconnect between our global use of goods and on-the-ground impacts. “I don’t see what’s happening... but the people who live in the area see what’s happening.” For others, the relative importance of Indigenous and local knowledge had little to do with Indigenous knowledge as science; rather, it was an issue of social justice, the right to be heard and have a say in what should happen in their own territories and backyards.

The lower the SE score, the more likely participants were to say ‘Indigenous and local knowledge should be considered equal to academic or government science in decision-making for lands and resources’, with 87% of project opponents prioritizing this statement compared to only 15% of supporters (Table SI.6.2). One supporter suggested local knowledge be limited to purely local decisions, and case-by-case in issues of national importance.
In EA, investigative reporters, lawyers, academic and applied scientists, government staff, industry and non-profit groups, panel support staff, and intervenors were all identified as experts to which people deferred. People differentiated experts from non-experts in several ways: individuals with considerable, specific, on-the-ground technical expertise (e.g., an expert in river crossings), individuals with an ability to critically interrogate information (as opposed to manage or regulate projects), producers of peer-reviewed science who were willing to be cross-examined, and professionals constrained by legislation or codes of ethics. Participants from industrial or business sectors most frequently referenced themselves as experts.

By contrast, all but one participant felt public opinion was less important than science and local or Indigenous knowledge. TMPE participants, apparently unswayed by the unprecedented level of awareness and engagement with the project, rationalized this view by describing the public as a lay-public. The contradiction appeared to be rooted in what ‘being informed’ entailed. For example, the communication specialist who said, “It’s your duty as a citizen to get informed about something that you’re going to speak passionately about,” admitted to knowing much about the pipeline industry and little about the project.

Public submissions to NEB nearly always infused scientific evidence or local knowledge with values, views, and sense of place. The beauty of the coast, meaningful experiences with family, and concerns for how an oil spill might impact these, often intermingled with references to species-at-risk, for example. Some participants believed values and views were valid and persuasive forms of evidence. Further, NEB and other quasi-judicial courts are obligated to include as evidence facts that are not scientific, such as “I don’t feel safe”, or “this feels to me
like we’re going backwards rather than forwards.” Others felt ‘emotive’ statements weakened the case people were trying to make.

**News, Networks, and Sinking Bitumen.**

Most participants believed scientific evidence was more reliable than information arising from news media or from their own organizations or sectors (92% of TMPE and 92.3% of BIHP participants). However, people often accessed science through news media and sector materials that interpreted the information. Project supporters primarily chose proponent materials (34%), news media (25%), and sector materials (17%) as conduits for information. Opponents were more likely to turn to their networks (35%), or to access a variety of materials with no one information source predominating (35%) (Figure SI.6.1). There were similar relationships among information conduits and participant values; for example, participants with low STN scores accessed information primarily through news and proponent materials. Less than a quarter of participants accessed news from a variety of sources equally weighted to politically neutral, left and right-leaning sites, with project supporters much more likely to prefer right-leaning sites (Figure SI.6.2). At the same time, more than 80% of participants ranked information from others in their organization or sector (e.g., environmental non-profit sector, oil and gas sector) as more reliable than news media. Since news selection and political ideologies are linked (Anderson & Coletto, 2017; Mitchell et al., 2014), and organizations and sectors have their own cultural values, these tendencies expose people to filter bubbles, echo chambers, and availability effects (Kahan, 2012; Pariser, 2011).

For example, risks associated with marine spills were highly salient for project opponents (Tables SI.6.3 and SI.6.4), with bitumen science playing a central role in risk debates. When the
TMPE review was hardly underway, Government of Canada (2013) lab research found that fine sediments and high-energy wave action caused diluted bitumen (or dilbit) to sink or be dispersed as floating tarballs, whereas it floated on sediment-free saltwater after evaporation and mixing. The authors concluded the behavior of bitumen in seawater depends on exposure to natural processes. On the release of the report, *Globe and Mail* explained the findings verbatim (Luk, 2014). At the same time, right-wing journalist Tom Fletcher (2014) penned *Bitumen floats at sea, study finds*; in this context, dilbit floats *unless* mixed with some types of sediment. Desmog Canada headlined, *It’s Official: Federal Report Confirms Diluted Bitumen Sinks* (Linnitt, 2014).

With fully half of TMPE supporters gravitating to mostly right-leaning news media (Figure SI.6.2), and more than a third of opponents looking to their networks for information, some are vulnerable to biased interpretations.

We found networks on both sides constrained broader information-seeking and critical thinking. Characteristic of culturally biased assimilation (Kahan, 2012), participants rarely questioned information emanating from their trusted networks. Notably, this extended to positions as well as evidence. One participant admitted his professional organization supported the TMPE for purported economic benefits to its members without evaluating those benefits or considering other factors.

A notable conduit of science for participants was themselves. At least 39% of TMPE and 56% of BIHP participants had been involved with developing or commissioning scientific reports for the EA, or in crafting applicable standards or guidelines to which the projects should adhere. However, they were unlikely to review a scientific report associated with the project unless it was required reading. Most participants had read fewer than a quarter of all the reports.
in the survey (Figure SI.6.3), with 37% of TMPE participants and 8% of BIHP participants completely unfamiliar with them.

The foundational materials of the project, such as the TMPE application or the BIHP project description and Terms of Reference, were considered required reading. Eighty percent of participants claimed to have read at least some of them. Plutonic Power’s (2008) revised project description totaled 30 pages, and the 50 page Terms of Reference was developed jointly by federal and provincial EA authorities from a draft that underwent public review. By contrast, the TMPE application was described as an onerous, massive, repetitive, technical document, designed to intimidate and discourage people from engaging with it. Nearly every TMPE participant remarked on the time and effort involved in assessing the application, as well as their own ability to do so - justifying their reliance on teams of staff, caucus researchers, and experts to review and interpret the content of its estimated 15,000 to 23,000 pages. Even individuals identified or who self-identified as experts admitted to using second-hand information from others, rather than reviewing the application themselves. With other cognitive shortcuts at play, it is likely the cultural credibility heuristic was, too (cf., Kahan, 2012).

Whether and how participants examined other reports depended largely on their roles and objectives. Intervenors were more likely to scrutinize proponent reports and offer peer-reviewed contradictory evidence, while most commenters referencing reports looked for publicly accessible material to support their arguments. Campaigners looked to reports for the “juiciest fact” to persuade the public or decision-makers. Project supporters were less familiar with reports on topics that were outside of the scope of the project set by NEB, such as climate. By contrast, climate was highly salient in materials used by TMPE opponents, reflecting
participants’ convictions that this topic should have been included within the scope of the EA (Tables SI.6.3 and SI.6.4).

Of those who had read the survey reports and were willing to attest to their accuracy, all rated academic, peer-reviewed articles as mostly or completely accurate. Whereas TMPE supporters and opponents often perceived the accuracy of reports differently, BIHP respondents were more likely to agree, regardless of stance. In interviews and in their correspondence to the NEB, TMPE participants identified 191 references additional to those in the reports survey, most of which were academic, peer-reviewed articles and government reports on spills and biodiversity (Table SI.6.3). They also referenced 126 news articles and blogs, mostly pertaining to spills - again demonstrating the influence of news media in EA (Table SI.6.4).

**Salience.**

*Planning to fail early.*

The TMPE application was filed with the regulator as an expansion of an existing project in December 2013. Consultations began in 2011 and fields studies were in progress by April 2012 (Trans Mountain Pipeline ULC, 2013). Hydrological data collection for the BIHP began in 2003, with engineering, environmental, and other studies well underway before the bid into BC Hydro’s Clean Power Call and submission into the BC EA process in 2008 (Plutonic Power Corporation, 2006; 2008). In other words, the proponents and their hires spent years working within defined parameters to develop their projects in preparation for EA.

This pre-EA planning process, guided by legislation and preparation or filing documents developed by EA authorities, largely predict the types of information deemed salient by proponents, regulators, and project supporters in EA. For power projects generally, companies
collect data on numerous prospective sites and transmission lines before bidding into the highly competitive Clean Power Call. Front-end data collection and planning allow projects to ‘fail early’, before substantial financial resources are invested. A primary goal at this stage is to avoid valued components such as species-at-risk occurrences and Indigenous sacred sites, as well as landslide or other hazard areas. Any of these could slow or kill a project, or create costly management challenges once the project is built.

TMPE proponents consulted landowners and others, to identify issues, address potential incompatibilities, and lay the foundation for ongoing relationships. Deals were struck to facilitate access or land use, and to mitigate or compensate for degraded or destroyed habitat by protecting, enhancing, or creating habitat elsewhere. These findings contrast with Expert Panel (2017), which suggested proponent-driven pre-EA planning is siloed and devoid of diverse knowledge and expertise. The EA process had legitimacy among supporters largely because salient issues had been identified and managed before formal consultative processes were even underway.

**Policy wars.**

Opposition was driven largely by real or perceived strategy and policy vacuums - on energy, climate, spill response, land use, and cumulative effects. The Expert Panel (2017) similarly noted that a lack of clarity and consistency (i.e., uncertainty) in climate policy led to more adversarial EAs. With no venue to have the types of policy discussions that might take place in higher level planning processes, and a legalistic EA setting where there is little, if any room for alternatives or innovation, the TMPE and BIHP ignited and amplified a gamut of tensions. Unable to address these broader issues in any meaningful way, companies responded
with public relations that did not, and arguably could not address such problems. Efforts to quell broad policy arguments in EAs by delimiting narrow parameters only inflamed tensions and raised concerns about the democratic process. Too late, NEB (2016, December 2) offered this on its website: “We do not create or debate federal energy policy. The Parliament of Canada and its elected officials have that mandate.”

When projects are proposed in the absence of credible and legitimate scale-appropriate contextual rules and guidelines, people resort to what one participant called all-or-nothing, ‘100% positions’. In EA, this manifests as development versus protection, or economy versus environment. With the science of higher level policy uncertain and contested, the scientific evidence considered within individual projects appears abstract, arbitrary, incomplete, or irrelevant.

If a project is proposed, its first test is whether it fits within existing plans and established policies. On BC’s Lower Mainland, participatory and science-based regional and municipal plans and bylaws defined no-go zones, determined compatible uses, and dictated the extent and pace of development, among other things. For the TMPE, the first test was tree cutting for surveys in Burnaby Mountain Conservation Area in 2014, which incited protests and arrests. NEB ruled the City of Burnaby’s bylaws were inoperative or inapplicable, citing the doctrines of federal paramountcy and interjurisdictional immunity.

Similarly, BIHP opponents viewed the project as the largest of many in a ‘gold rush’ of stream staking and power development. Coarse, landscape-level planning had led the Province to locate run-of-river projects on BC’s Central Coast. The Western Renewable Energy Zones initiative had produced a ranked inventory of 8,242 potential run-of-river sites in eleven U.S.
states, parts of Mexico, Alberta, and BC (Pletka & Finn, 2009). This initiative, however, was neither well known nor conducted at a regional planning scale befitting the project EA. Characteristic of many, one participant remarked, “It was left to... this strange, free market type of situation, where energy companies would say, ‘well, I think I could do a profitable one here’... not, here’s where it’s going to make the least impact on conflicting uses and on the environment.”

Legitimacy.

According to knowledgeable participants, there are nine permanent NEB members and an unlimited number of temporary members, whereas CEAA remains a permanent roster of potential panel members, who before any appointment must undergo an interview to determine whether they have the required skill set and there is no conflict of interest. Prior to hearings, panel members meet to discuss issues and logistics, visit project areas, consult with experts from government agencies, and interact with support staff.

A project support team is provided from NEB and CEAA staff, based on the nature of the project and anticipated issues. There are some 450 expert NEB staff (NEB, 2016, November), described by participants as highly qualified engineers, economists, biologists, and other professionals having a good understanding of the issues and extensive experience from many different projects. In complex cases, additional experts may be drawn in to assist. A typical NEB hearing team includes 12-20 individuals. In a joint federal/provincial process, there are staff from both CEAA and the provincial regulator; there might be 5-6 CEAA and 10-12 provincial staff.

Support staff assist throughout the EA process, first by providing information, analyzing what the proponent has proposed, and identifying issues before and as they arise (e.g.,
environmental issues, community issues, engineering design, safety, financing, land access, markets). Later, they help respond to questions associated with the proposal and hearings, critically analyze evidence, deconstruct conflicting evidence, and help write the decision report. They are required to work within their own expertise, and at no time are they allowed to introduce new evidence. According to one panel member, they are expected to “put the heat on companies to do the right thing.” Discussions between staff and panel members are confidential.

Project supporters respected the history and structure of EA authorities, and the professionalism and integrity of panel members and staff, often citing personal experiences with them. Some described it as “the perfect body” and viewed attempts to denigrate it as scurrilous. Like other organizations, EA authorities had a distinctive culture; in the case of NEB, it was to support free enterprise without harming the environment. “The mantra at the NEB during my time there was ‘protect and enable’,” one said. Another described it as ‘approve with conditions’. They trusted panel members to learn the evidence well enough to weigh it, in the absence of a transparent, standardized process. Notably, two of three panel participants were likely to be neutral when energy projects conflicted with environmental protection. The third reported he would be likely to lean towards energy projects, but was equally suspicious of companies and environmentalists.

TMPE opponents saw panel members as the political appointees of a pro-pipeline government working behind closed doors towards a predetermined outcome. (The Expert Panel, (2017) agreed with our findings, noting the opacity of the review fostered distrust.) This division - where supporters trusted the regulatory agency and opponents did not, underpinned other
disparities in process legitimacy. By comparison, BIHP opponents were comfortable with the pending CEAA process.

Notably, politicians were seen as generally unqualified to decide on EAs, because they were inherently ideological, tied to ‘big money’, and easily swayed by potential votes. One participant felt politicians were unsuitable because they typically lack a scientific background.

**Weighing conflicting science.**

Consistent among participants was a belief that all EA science should be scrutinized, by validating assumptions, methods, and interpretations. Oral cross-examination was seen as an important way of scrutinizing evidence within the EA process. Although there were more than 90 days of cross-examination in the Northern Gateway EA, the TMPE review favored written questions to the proponent over oral questioning of live witnesses defending their own evidence. In lieu of oral cross-examination, there were two rounds of written information requests, a single opportunity to file written evidence, and another to orally present a final argument devoid of new evidence.

“The absence of oral cross-examination does not mean that the evidence of the proponent is not tested or challenged – it is thoroughly tested and challenged by NEB’s expert staff, and through the written questioning process and the filing of information that comes to different conclusions, and through the submission of final argument” (NEB, 2016, December 1).

Whereas project supporters saw ample opportunity for rebuttal in the written process, opponents felt it impeded opportunities for clarification and in-depth analysis. Additionally, it was unclear who had written the responses. NEB was viewed as complicit in errors of omission
by neglecting their duty to compel better responses and by ruling in favor of Trans Mountain in most cases. In ruling 14, NEB justified its decision to forego cross-examination by stating that, “the legislation [i.e., the revised NEB Act and CEAA 2012] makes it clear that the Board is master of its own procedure” (NEB, 2014, p.5). Notably, Trans Mountain had opposed the motion to allow oral cross-examination because, “the Board is the master of its own procedure” (p. 2). The Expert Panel (2017) recommended a transparent and collaborative expert review exhibiting how decisions reflect the evidence, and criteria for decision-making to demonstrate how trade-offs are made.

BIHP participants - given the luxury of time and space with the project in abeyance, began to cultivate a fact base outside of the EA process. The Energy Forum, initiated in 2011, is an information-sharing collaboration among power producers, industry associations, and non-profits. A research team at Simon Fraser University led development of the BC Run of River Decision Support Tool in partnership with other academic institutions, governments, industry, natural resource managers, and environmental groups.

Weighing Indigenous knowledge.

Similar to the Expert Panel (2017), participants recognized the challenges of weighing Indigenous knowledge with western science in EA. In TMPE oral final arguments, this problem and its relationship to process legitimacy was articulated by the Chief of the Alexander First Nation.

Time and time again when we participate in these regulatory processes, we see our oral evidence being considered as though we are merely sharing stories of ancient history and specific cultural practices as they are memories. And each time the recipient, whether it is
the Applicant or the regulator, appears focused on specific locations or aspects that they want to pluck out and convert to a scientific measurement, almost to the point where the information is unrecognizable, without regard for the consequences that come along with taking that information out of its cultural context... This not only distorts the significance and value of what we are sharing but is terribly offensive and undermines the confidence that we try to have in the fairness of this process (Chief Kurt Burnstick, Alexander First Nation, 2016).

Six participants spoke at length about the legitimacy of Indigenous knowledge relative to other forms of knowledge. For two Indigenous participants, the disregard for their oral histories left them feeling misunderstood, the prospect of large profits exiting their territories without due process continuing the injustices wrought by colonization. One non-Indigenous participant felt the legitimacy of Indigenous knowledge was frequently undermined by the politics of the treaty process. Three others, all non-Indigenous, believed Indigenous knowledge should be given as much or greater weight in decision-making than other forms of evidence, but also felt it should be subject to similar scrutiny (i.e., recognizing its limits, encouraging it to be challenged).

*Weighing public opinion.*

In 2012, the Conservative Government narrowed the definition of standing in EA from ‘any interested person’, to those ‘directly affected’ or ‘with relevant information or expertise’. Still, thousands of people registered as interested parties for the TMPE and BIHP EAs. That so many people might routinely seek standing in a review process was troublesome to panel members in particular. Aside from the costs and logistics of managing large numbers of people and effectively weighing the resulting volumes of data, such inclusiveness had the potential to
turn an evidence-based process into an endless process of engagement decided on a show of hands. While panel members fondly recalled highly structured EAs, with fewer than 20 skilled intervenors and experts identifying technical issues that could be addressed through project modifications, opponents felt arbitrarily and unduly silenced by the new restrictions.

The Expert Panel (2017) recommended early and ongoing legislated participation opportunities open to all, with results having the potential to impact decisions. It believed the assessment process could only contribute positively to a project’s social license if it embraced the concerns of affected parties through meaningful public engagement.

Conclusion

Perceptions of science, taken collectively, are ripe with seeming contradictions. Participants viewed science as objective fact, but also biased. The public is both uninformed and engaged. These and other grey areas beget contradictory beliefs, and contentious EA projects are beset with complexity, uncertainty, and ambiguity. This inevitably led to cognitive shortcuts, such as deferring to interpretations by others.

The act of choosing these ‘others’, whether mindful or subconscious, was subject to the mechanisms of cultural cognition - all of which can filter and amplify certain information over others. For example, the cultural availability effect was invoked when people chose information from partisan media or turned to sector and advocacy groups to access project information. In turning to news media and search engines, people were vulnerable to additional mechanisms, such as filter bubbles and echo chambers influenced by algorithms. Some shortcuts were enshrined in the culture of organizations, such as the ‘protect and enable’ mores of NEB. The perceived level of integrity of the EA authority influenced whether the process it led was viewed
as legitimate. The relative salience and credibility of scientific information, and indeed all EA information, was seen through the various mechanisms, or lenses, of cultural cognition (Figure 6.2).

Cultural cognition was apparent throughout the EA process. In pre-EA planning, confidence in proponent-led practices largely forecast the types of information that project supporters perceived as important, namely technical merits such as the safety record of pipelines or proximity of transmission lines. It was also evident in the mobilization of opponents, who became increasingly aware of unresolved policy matters through networked groups. Thus central issues, and by extension salient science, widely differed from the outset.

If information is embedded in a process believed to be unfair, then it will not be regarded as legitimate (Cash et al., 2002). Process legitimacy played a significant role in the TMPE case. The proponent, federal government, and NEB were all mistrusted. As a result, many project opponents felt they held the burden of salvaging the legitimacy of the process.

Given the breadth of biases in EA, the notions of best available science, and evidence- or science-based decision-making must be more critically assessed, to make explicit the values that may be woven through them. As scholars in a post-truth era (Lubchenco, 2017), we must be clear that we view science and science-based decision-making as fundamentally important to systematic knowledge-building and to democratic processes sustained by a knowledgeable public. Throughout history, philosophers and others have deliberated the role of values and the truth of facts in science; currently, objectivity in science is best understood as an ideal that scientists and others must aspire to, to reduce epistemological, personal, institutional, and
Figure 6.2 Influence of cultural cognition on individual perceptions of science in EA
other forms of bias (Reiss & Sprenger, 2017). Similarly, facts are not unarguable truth (cf., David, 2016), but must be examined in context, since people prioritize certain verifiable facts over others. There is a voluminous body of philosophical literature dedicated to these concepts, that we have purposefully neglected in this applied, interdisciplinary work.

Here, the focus is to manage the effects of values-based bias and cultural cognition to make EA science more widely salient and credible, and the process more just. Our participants suggested developing a salient and credible ‘fact base’. This was both an ongoing repository for evidence collected over time (e.g., a clearinghouse with both project-based and longitudinal studies), and an approach to address conflicting evidence (e.g. a tie-breaking science officer who had the ability to commission and aggregate studies). The Expert Panel (2017) recommended that weighting be removed from the process altogether, by weaving together scientific, Indigenous, and local knowledge throughout the process. This would entail, for example, indigenous and community ‘knowledge-holders’ collecting standardized, publicly available baseline data alongside scientists.

There are a number of challenges here, the most significant of which is a fundamental lack of understanding as to precisely how different knowledges can be judiciously and fairly integrated. Indigenous knowledge, for example, is constructed over time and managed with great responsibility by knowledge keepers, language speakers, and traditional users. Local knowledge lacks structure, since it is rarely compiled in a standardized way. Accounting for public opinion in EA and striving for social license is another challenge, since inclusiveness must be weighed against the sheer volume of input, with legitimacy suffering if there is too much of one or the other. Raymond et al. (2010) warned that integrating different forms of knowledge must include
new processes to examine the validity and reliability of knowledge claims, that factor in, and make explicit divergent epistemological beliefs. The innovative integration of knowledge classes and public opinion is an important area for future research.

Yet, if EA decision-making was truly science-based, grounded in the latest peer-reviewed science, scientific and local expertise, and longitudinal Indigenous knowledge, would there have been the same level of conflict? Likely yes. Science-based conflicts are often values-based conflicts, therefore more data is largely ineffectual (Miscolta-Cameron, 2016). Arguments over the science of bitumen behavior in marine waters was less about cleanup techniques than whether bitumen should be allowed to travel in the Salish Sea at all, given potential impacts on treasured places and species such as the iconic Killer Whale (Clermont, Dale, Reed, & King, 2017, Sense of Place). Including the science of upstream and downstream GHG effects in EA was really about the felt urgency of transitioning to renewable energy (Clermont, Dale, King, & Reed, 2017, Appreciating Values).

Since science in EA is commissioned, selected, and analyzed through the lenses of cultural cognition, there is little opportunity for decision-making to be science-based to the exclusion of values. Making values explicit in evidence may do little to change this, as any evidence intertwined with values lacks salience and credibility for those who do not share those values. Decision-makers faced with complexity and uncertainty are even more likely to make values-based rather than evidence-based decisions (Kahan, Jenkins-Smith, & Braman, 2011; Kelly, 2011; Miscolta-Cameron, 2016). In essence, the EA produces a predominantly value-based and political decision masked as a science- or evidence-based one.
Due to the influence of culturally biased assimilation and other mechanisms of cultural cognition, unbiased EA decisions cannot be made by politically appointed panel members and those who appointed them. Nor can they be made by a vociferous public in pursuit of social license. The Expert Panel (2017) recommended the creation of an Impact Assessment Commission with the capacity for planning and assessment, western science, Indigenous knowledge and relations, community knowledge, public participation, proponent liaison, information management, and monitoring and enforcement. In the absence of a diversity of values among decision-makers, the process is susceptible to deteriorating legitimacy. Additional research is needed in this area to enhance the quality of EA science and increase the appreciation for it.

Perhaps the most important recommendation of the Expert Panel (2017) was the notion that new knowledge be pursued when perceived to be lacking. If it is important to know whether bitumen will sink when encountering river sediments or organic matter in a marine environment, then field and lab scientists should be dispatched to learn more. This is science as enlightenment, to inform rather than prove or falsify. Once EA science is driven by curiosity rather than support for a position, then it will truly be science-based.

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Supplemental Information

Table SI.6.1. Values scores and support for energy projects

<table>
<thead>
<tr>
<th>Value Score</th>
<th>View Statement</th>
<th>Spearman’s rho correlation</th>
<th>Chi-Square and Cramer’s V</th>
</tr>
</thead>
<tbody>
<tr>
<td>SE</td>
<td>Support energy projects</td>
<td>0.371**</td>
<td>χ(7)=33.515, p=0.000, Cramer’s V=0.741, n=61</td>
</tr>
<tr>
<td></td>
<td>Support environmental protection</td>
<td>-0.371**</td>
<td>χ(7)=24.507, p=0.001, Cramer’s V=0.624, n=63</td>
</tr>
<tr>
<td></td>
<td>Oppose TMPE or BIHP</td>
<td>-0.606**</td>
<td>χ(14)=49.852, p=0.000, Cramer’s V=0.619, n=65</td>
</tr>
</tbody>
</table>

Table SI.6.2. Values scores and views on science

<table>
<thead>
<tr>
<th>Case</th>
<th>Values Score</th>
<th>Views Statement</th>
<th>Spearman’s rho correlation</th>
<th>Significant Crosstabs</th>
</tr>
</thead>
<tbody>
<tr>
<td>TMPE</td>
<td>SE</td>
<td>Biodiversity science is one of the most important considerations in decisions for lands and resources because the risks are too great if ignored or minimized.</td>
<td>-0.310*</td>
<td>-</td>
</tr>
<tr>
<td>TMPE</td>
<td>STN</td>
<td>Biodiversity science is less important than most other considerations in land and resource decisions.</td>
<td>0.302*</td>
<td>-</td>
</tr>
<tr>
<td>TMPE</td>
<td>SE</td>
<td>Compared to biodiversity and climate science, other types of science - such as economics, are equally or more important in decisions for lands and resources.</td>
<td>0.356*</td>
<td>χ(6)=31.972, p=0.000; Cramer’s V=0.808, n=49.</td>
</tr>
<tr>
<td>TMPE</td>
<td>SE</td>
<td>Compared to academic or government science, local and/or Indigenous knowledge and experience should be considered equally or more important in decision-making for lands and resources.</td>
<td>0.829**</td>
<td>χ(4)=9.870, p=0.043; Cramer’s V=0.871, n=13.</td>
</tr>
<tr>
<td>BIHP</td>
<td>SE</td>
<td></td>
<td>0.421**</td>
<td>χ(6)=17.643, p=0.007; Cramer’s V=0.619, n=46.</td>
</tr>
<tr>
<td>TMPE</td>
<td>STN</td>
<td></td>
<td>0.491**</td>
<td>χ(4)=11.886, p=0.018; Cramer’s V=0.508, n=46.</td>
</tr>
<tr>
<td>TMPE</td>
<td>SE</td>
<td></td>
<td>-0.445**</td>
<td>χ(6)=19.076, p=0.004; Cramer’s V=0.630, n=48.</td>
</tr>
</tbody>
</table>
### Significant Crosstabs

<table>
<thead>
<tr>
<th>Case</th>
<th>Values Score</th>
<th>Views Statement</th>
<th>Spearman's rho</th>
<th>Significant Crosstabs</th>
</tr>
</thead>
</table>
| BIHP | SE           |                | -0.829**      | \( \chi(4) = 9.870, p = 0.043; \)  
|      |              |                |               |  \( \text{Cramer's } V = 0.871, n = 13. \)  |
| TMPE | STN          |                | 0.397**       | -                     |

*There were no significant correlations with STS score, nor any significant correlations between any values score and the views statements:

**Biodiversity science is one of the most considerations in decisions for lands and resources because it is factual and objective.**

**Climate change and biodiversity loss are distant threats, and there is much to be determined before they can be weighed against other factors in decision-making for lands and resources.**

**Scientific evidence has shown that climate change and biodiversity loss are interconnected and pressing problems that must be considered in all land and resource decisions.**

**Climate change is more urgent/pressing than biodiversity loss, and must be considered in all land and resource decisions.**

**Compared to science, public opinion should be considered equally or more important in decisions for lands and resources.**

---

Figure SI.6.1. Primary sources of information regarding the project. Balanced mix=confirmed mix as well as those who claimed a mix. Other=government sources, search engines. \( \chi(5) = 9.589, p = 0.088; \)  \( \text{Cramer's } V = 0.429, n = 52. \)
Figure SI.6.2. Routinely accessed news sources. $\chi^2(4)=13.674$, $p=0.008$; Cramer’s $V=0.528$, $n=49$. If political lean could not be confirmed by content or references (e.g., Gutstein 2011), the source was deemed neutral.

Table SI.6.3. Reports referenced by TMPE participants in interviews and EA documents, $n=191$.

<table>
<thead>
<tr>
<th>Source</th>
<th>Spills</th>
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<th>Climate</th>
<th>Economy</th>
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<td>Academic not peer-rev</td>
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<td>4</td>
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<tr>
<td>For or by non-profit</td>
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<td>EA documents</td>
<td>9</td>
<td>4</td>
<td>1</td>
<td>6</td>
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</table>
### Table SI.6.4. News articles and blogs referenced by TMPE participants in interviews and EA documents, n=126.

<table>
<thead>
<tr>
<th>Most prominent tag</th>
<th>Neutral* (re TMPE) references for anti-TMPE</th>
<th>Anti-TMPE references</th>
<th>Pro-oil and gas references used in anti-TMPE argument</th>
<th>References for pro-TMPE argument</th>
<th>Total</th>
</tr>
</thead>
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<td>Security</td>
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</tr>
</tbody>
</table>

*32/37 government biodiversity reports were submitted by a single participant. Other additional references = partnerships, individual’s websites, international conventions, Wikipedia. Other tags = democracy, health, safety, toxicity/contamination/pollution, geology, renewable energy, regulatory, ‘Green History of the World’, Indigenous.
### Table

<table>
<thead>
<tr>
<th>Most prominent tag</th>
<th>Neutral* (re TMPE) references for anti-TMPE</th>
<th>Anti-TMPE references</th>
<th>Pro-oil and gas references used in anti-TMPE argument</th>
<th>References for pro-TMPE argument</th>
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<td><strong>14</strong></td>
<td><strong>3</strong></td>
<td><strong>126</strong></td>
</tr>
</tbody>
</table>

* Note: Articles were considered neutral if they did not mention the TMPE, however they may have been biased in another context (e.g., articles about the Exxon Valdez spill in Alaska).

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**Figure SI.6.3.** Familiarity with reports in the survey, $n=47$. 

![Bar chart showing familiarity with reports](chart.png)
Chapter 7. Appreciating Values Diversity in Environment v. Economy Conflicts

This final paper is presented in a format suitable for a hybrid peer-reviewed journal and popular magazine that focuses on real, integrative solutions. Its condensed structure necessarily limits a comprehensive theoretical orientation and excludes other traditional elements. See Chapter 3, An Introduction to Values, for a more thorough theoretical orientation. This journal requires accessible language suitable for an educated lay public, which will allow me to cultivate a broader reach with my research, and to develop proficiency in communicating my findings to mainstream audiences.

Survey, interview, and network data were employed to address the question, “How do values and networks of relationships influence ‘environment versus economy’ conflicts?” This paper includes perhaps the most significant findings of my research. It guides readers to consider integrating values, rather than attempting to change them, the latter at the centre of a still-dominant paradigm that suggests people must embrace environmental values before environmental protection or sustainable development can occur (Meadows, 1999; WWF, 2016).

In Brief

The divide between environment and economy is a familiar one. In sustainability models, economy is constrained by environmental limits in what is described as a false dichotomy. Nonetheless, environment versus economy plays out in every day natural resource conflicts and is reflected in values theory tested across more than 80 countries. Cultural values theory suggests that emphasize living in harmony with the natural environment are not jointly prioritized with those focused on changing or controlling nature. Similarly, personal values that prioritize care
for nature cannot be expressed with values in pursuit of self-interest. To explore whether environmental conflict is indeed embedded in seemingly irreconcilable values, we turned to coastal British Columbia, Canada, a region with a long history of environmentalism and resistance movements. There, conflicting values were decidedly central to both renewable and fossil-fuel-based energy projects. However, they were not necessarily barriers to environmental protection, but lost opportunities. In this paper, we discuss how understanding the role that values play can be used to confront biodiversity loss and other intractable problems.

**Key Concepts**

- *Economy versus environment* conflicts were rooted in values. Supporters of energy development projects generally prioritized values in pursuit of self-interest, while opponents emphasized values that care for nature and other people.

- Goal-oriented terms such as *public interest* and *balance* meant different things to different people, splitting along values boundaries.

- People with disparate values often had similar views, yet were unaware that they agreed on many issues. Areas of disagreement tended to rest on assumptions supported by verifiable facts on both sides.

- Individual views were generally moderate, less extreme and polarized than media frames or organizational posturing had indicated. Weary of conflict, most people desired productive exchanges of ideas leading to agreement.

- Conflicts may be diminished by recognizing the contributions of diverse values. Just as biodiversity is the crucial raw material for evolution in times of change, a range of values
are required to integrate fossil-fuel and renewable energy economies en route to a sustainable future.

Introduction

Many have endeavoured to guide us towards a gentler relationship with the environment, to live within our ecological means, and treasure the breadth of life on Earth. Biodiversity has been described as a “precious genetic library” (Ehrlich & Wilson, 1991, p. 760), the “common heritage of mankind” (Lerch, 1998, p. 288), and living or natural capital (Lovins, Lovins, & Hawken, 1999). American systems scientist Donella Meadows once said that allowing a species to go extinct is a crime akin to randomly eliminating libraries, labs, and universities (Meadows, 1999). It shrinks the potential for ecosystems to evolve, and cuts back resilience - the ability to rebound from perturbations and shocks (Chapin et al., 2000).

Today, we need that evolutionary potential and the resilience it confers more than ever. While climate change multiplies threats to biodiversity (Ceballos et al., 2015), biodiversity acts as a buffer to climate change and its impacts. In addition to slowing the rate of change by storing carbon, biodiverse habitats allow us more time to adapt, by providing redundancy to food webs affected by warming or battered by storm damage, for example (Secretariat of the Convention on Biological Diversity, 2014; Walker & Salt, 2006). Meadows (2008) noted that we tend to strip away buffering safeguards and realize their importance too late. More and more, scientists are finding examples of climate-driven ‘regime shifts’ that have transformed rich ecosystems into ones far less friendly to human prosperity and survival (e.g., Wernberg et al., 2016).

Biodiversity loss and climate trends are often attributed to a paradigm that privileges the economy ahead of the environment (Meadows, 1999). This paradigm may be explained in part
by values theory that suggests economy versus environment arises from our personal and cultural values.

Values Create Boundaries

Values have an odd role in decision-making. On one hand, they are considered abstract, emotional, or impractical entities that must be subdued in favor of more objective lines of reasoning. On the other, they are promoted as the moral and strategic underpinnings of democracy, reflected in every vote and political maneuver. Conflicts nudge or jolt values into awareness, and in the heat of battle, they become evermore explicit (Schwartz, 2012). Social psychologist and values theorist Milton Rokeach (1969, p. 550) once noted, “If you claim to have a value and you do not want to influence anyone else under the sun to have it too, the chances are it is not a value.”

Values are defined as persistent guiding principles and standards for comparison, constructed from judgments about the capacity of things, people, and actions to enable best possible living (Rohan, 2000; Rokeach, 1968). Aristotle used the term eudaimonia to describe best possible living, roughly translated into human flourishing or actualizing potential (Rohan 2000). People believe themselves to flourish in different ways - by accumulating wealth or by serving the vulnerable, for example, and this simple truth quietly lays the foundation for conflict.

Personal values.

Values theorist Shalom Schwartz (1992) determined that we all share ten basic motivational values, but prioritize them differently. Some are compatible and can be held simultaneously, while others are in direct conflict with one another; we cannot prioritize opposing values at the same time. In opposition are self-enhancement (SE) values that emphasize
the pursuit of one’s own interests, such as power and achievement, and self-transcendence (ST) values that highlight the welfare of others (ST-social) or for nature (ST-nature) (Schwartz, 2012). These opposing values can translate directly to positions on resource development. In a California example, survey respondents opposed to mining in public parks highly rated the ST-nature measure world of beauty (Tetlock, 1986). Those who supported more mining placed a low value on world of beauty and a higher value on personal prosperity, a SE measure (Tetlock, 1986).

**Cultural values.**

Schwartz (1999, 2012) also structured seven cultural value orientations, empirically showing these are universally present across 82 countries. A hierarchy culture legitimizes the unequal distributions of power, roles, and resources (Schwartz, 2006). Here, people are less likely to engage in activism, since this violates the social order (Schwartz, 2006). In opposition is egalitarianism. People in such cultures recognize one another as moral equals, and are socialized to cooperate and feel concern for everyone’s welfare (Schwartz, 2006). Egalitarianism predicts greater political activism, particularly for causes that reach beyond self-interest (Schwartz, 2006). Cultures with harmony values cherish a world of beauty, seek unity with nature, and endeavour to protect the environment (Schwartz, 1999). Cultures that emphasize egalitarianism and harmony are more likely to call for cooperative regulation of resources (Schwartz, 2006). Mastery values oppose both egalitarian and harmony values (Schwartz 2006; Vauclair, Hanke, Fischer, & Fontaine, 2011). Groups that hold mastery values get ahead by controlling and changing the social or natural environment. Mastery values align, however, with hierarchy values, because efforts to achieve success often result in unequal allocations of
resources (Schwartz, 1999). Roughly, these are the cultural equivalents of the SE versus ST personal values dimension (Schwartz, 1992, 1999, 2006).

Schwartz (2008, p. 22) found that English-speaking nations and regions generally had “a cultural orientation that encourages an assertive, pragmatic, entrepreneurial, and even exploitative orientation to the social and natural environment.” American culture, for example, emphasized mastery and hierarchy values more than harmony and egalitarian ones (Schwartz, 2008). Canada’s west coast may be an exception, renowned for its environmentalism and resource conflicts. Clermont, Dale, Reed and King (2017, in review) found the south coast of BC had a distinct culture largely characterized by deep connections to natural places.

Cultural values associated with place geographies are entangled with other types of cultural values, characterizing sectors, socioeconomic classes, organizations, and many other types of in-groups. In general, cultural groups tend to encompass those with whom we feel close, those with whom we frequently interact, and/or those with whom we identify (Kahan, 2010). These cultural groups are defined by boundaries that separate us from those who do not share our values, leading to conflict when important values collide or are threatened.

Our research applied this knowledge of values theory to two cases of contentious energy projects, to examine the role of values in the conflicts and assess whether they might be harnessed to achieve better outcomes for biodiversity.

**Two Contentious Proposed Energy Projects**

The proposed Trans Mountain pipeline expansion would carry diluted bitumen to British Columbia (BC) tidewater from Alberta’s oil sands, the third-largest oil reserve in the world (Figure 7.1). The proposal generated protests, arrests, and court challenges. Most at issue were
Figure 7.1 Case study areas
upstream and downstream climate impacts, and the sanctity of the marine environment, including an endangered population of Killer Whales. When the project was approved in late 2016, opponents vowed to continue the fight.

In the second case, climate activists aligned with clean energy supporters against other green groups and individuals concerned for the picturesque watersheds of British Columbia’s Central Coast. The Bute Inlet hydroelectric project would have been the largest run-of-river project in Canada, comprised of 17 sites on three river systems. It was delayed by the proponent to conduct additional field work and analysis, then formally withdrawn in 2016.
Garden along the Empress Hotel, Victoria, BC. The Orca or Killer Whale is an icon on Canada’s west coast, decorating totems, gardens, buildings, clothing, and much more. With the pipeline expansion, an estimated 29 additional Aframax tankers carrying diluted bitumen would travel each month through the Salish Sea, where the whale watching industry contributes up to $24.5 million to the local economy (Raincoast Conservation Foundation, 2016). Photo by H. Clermont.

**Grouped: Values Cluster and Divide Us**

From both a personal and cultural standpoint, the values theories held true. Respondents who prioritized SE values were significantly more likely to support the energy projects, regardless of whether the project was fossil fuel-based or renewable (Tables SI.7.1 and SI.7.2).
Those who aligned with ST-nature values were more likely to be against the pipeline expansion (Table SI.7.2), but this was not the case for the run-of-river project, where environmentalists with similar ST-nature values were at odds. Support for the projects was weakly or moderately correlated with hierarchy and mastery values, and negatively correlated with egalitarianism and harmony values (Table SI.7.3).

Associations were stronger when considering actual, versus hypothetical projects (Tables SI.7.1 and SI.7.2). Notably, nearly 63% of project supporters - all with high SE and low ST-nature scores, said they would be neutral should energy projects conflict with environmental protection, claiming their position would be context-dependent.

Social network analysis revealed the structure of the combined pipeline expansion and run-of-river project networks was largely position-based. Between supporters and opponents, there were limited flows of information (Figure 7.2), and relationships were overwhelmingly negative in the pipeline expansion component (Figure 7.3). This component also showed extensive cooperation and collaboration among well-established environmental organizations and new, project or issue-based organizations. Older organizations had greater reach (i.e., most of the flow network was within two steps), akin to government agencies and political organizations in the network (Figure 7.2). Groups that had formed in response to the project were brokers or bridges across organizations in the network, influencing the connectedness of the network and flow of information. For example, Burnaby Residents Opposed to Kinder Morgan Expansion (BROKE) had the greatest number of connections (i.e., degree=139), and the highest levels of centrality (e.g., closeness centrality=0.8, a measure of the distance from one organization to all others in the network).
Figure 7.2 Network flows. Groups n=195, participants n=43. Created with Kumu, 2017.
Figure 7.3. Positive and negative network relationships. Groups n=195, participants n=43. Created with Kumu, 2017.
Although some environmental groups were in opposition with respect to run-of-river projects, members tended to report positive relationships. The run-of-river component also included a subset of the BC Energy Forum, a professionally facilitated collaborative dialogue process among environmental groups and the clean power industry, to address energy, climate, and ecosystem challenges (Energy Forum, n.d.). Relationships between clean energy companies and other collaborators were more positive than those between companies and non-profit groups outside of the Forum, reflecting either the design of the forum to include industry-friendly organizations, or its ability to build trust.

A Twitter network associated with a day of protest of the pipeline expansion showed an extensive national and global reach (Figure 7.4). The hashtag #breakfreeCan included 950 tweeters linked primarily through well-established activist organizations and prominent members (i.e., Greenpeace Canada, 350 Canada, and Wilderness Committee). Leaders had strong positions and messages that were quickly disseminated through the network.

**Ungrouped: Depolarization Through Anonymity**

We analyzed frames in online media stories and materials shared by organizations, finding these emphasized polarities - pipelines or no pipelines, coastal BC versus Alberta, a moratorium on run-of-river projects or not, a clash of greens (i.e., climate action versus biodiversity conservation). Yet, anonymous interviews with survey respondents revealed such positions were regarded as extreme and inconsistent with what most people felt:

How can one person say that this is the only way our economy moves forward, and another organization is saying this will be the death of our society? So the truth lies somewhere in the middle (Participant (P)18, TMPE opponent and organization leader).
Figure 7.4. Twitter network of Break Free Canada protest of the Trans Mountain Pipeline Expansion on May 14, 2016, by time zones. Pacific Time is local to BC. The inset shows Greenpeace Canada communicating from Quito, Ecuador. Created with Gephi, 2016, Yifan Hu layout. More than 800 people surrounded the company’s facility in Burnaby, BC, to demand a renewable energy future and send a message to Canada’s prime minister (Pawson, 2016). They locked messages onto the gates, staged a sit-in, and painted a mural. On the water, they surrounded the tanker terminal with a flotilla of kayaks and canoes.
Rather than reiterating the messages of their organizations, they often viewed them as part of the problem, seeing aggressive rhetoric on both sides as barriers to productive dialogue:

I understand the value of hyperbole and alarmist language to get people to pay attention. I actually felt a little uncomfortable with the sky is falling kind of rhetoric we were employing (P54, BIHP opponent and organization spokesperson).

Foremost was the notion that honest, charitable conversations were missing. They wanted to see productive exchanges of ideas leading to mutual agreement:

I’m not talking from the perspective of who I work for. As myself, I just feel like the issues everybody brings forward - both sides are all important issues, and they have to be, because those are perspectives of individual people, and it’s what’s important to them, and that needs to be respected and it needs to be frankly embraced. I feel like there’s no middle ground (P15, TMPE supporter and organization spokesperson).

The debate is so polarized... you end up with only a few people really wanting to engage in that conversation - environment on one end, oil companies on the other, and the rest of the public is kind of left switching off from that. It’s like sitting at a dinner table conversation where your uncle and your sister are fighting, and everyone else is just tuning out (P17, journalist).

**Challenge My Views, Not My Values**

To overcome values-based polarization, it may seem reasonable to try to modify people’s values to be more similar, or to achieve a certain end. To safeguard biodiversity, we may wish key decision-makers to prioritize ST-nature values, for example. However, values are mostly stable, enduring over a range of scenarios and time (Schwartz, 1992; Ciuciuch, Davidov, &
Algesheimer, 2016). If we care for nature now, we will probably care later, too. Efforts to shift people’s values are also stymied by strong social-psychological forces that entrench our thinking, coax us into comfortable echo chambers, and move us towards positional extremes (Clermont, Dale, King, & Reed, 2017, *Science-based*; Grube, Mayton, & Ball-Rokeach, 1994; Kahan, Jenkins-Smith, & Braman, 2011). This is partly why campaigns tend to ‘preach to the choir’, rather than change minds and lifestyles.

Values are generally accepted as causally prior to views (Dietz, Fitzgerald, & Shwom, 2005). However, in 33 views statements across a range of issues relevant to *economy versus environment* (e.g., nature’s role in the economy, urgency of climate change and biodiversity loss), only two were moderately or strongly correlated with values scores and level of support for the project (Tables SI.7.4 and SI.7.5). Views either varied over the range of responses, or people on either side of the project and values divides mostly agreed; divergent values had not prevented them from developing similar views. On areas of disagreement, supporters and opponents alike were willing to have their views challenged.

**Values-based Deliberation**

In order for productive exchanges of ideas and meaningful dialogue to occur, I contend that a values-based deliberation process is necessary, *prior to* the onset of traditional planning and assessment processes, such as land use planning and environmental assessment. Deliberation must occur before organizations have been created or mobilized in response to a project, and before media outlets and others have framed contentious issues. The engagement process itself can take many forms (e.g., virtual real-time dialogues (Dale & Newman, 2006), virtual World café (Gilson, 2016), or Delphi methods (Skulmoski, Hartman, & Krahn, 2007), respecting a
plurality of values. The remainder of this paper outlines key elements of an appropriately principled process, including selecting participants, removing the ambiguity from key terms, and addressing the assumptions behind areas of disagreement.

**Select participants, not leaders.**

Including deliberators who are arms-length from leadership, or are otherwise detached from the extreme voices in their networks is an important first step in a productive values-based deliberation process. People are more innovative and open to ideas, and better able to engage in complex thinking when they are free from such influences (Tetlock, Skitka, & Boettger, 1989).

Uniting participants with a range of SE/ST-nature values, with knowledge of the issues at hand and sincere interest in productive dialogue, is fundamental to values-based deliberation. Here, diverse values are sociological and psychological raw material, flowing through our networks and ourselves, shaping everything we do with respect to a natural resource project, including whether we decide to engage with it in the first place (Clermont et al., 2017, *Science-based*). As such, they are untapped assets, representing different angles on problems and solutions (Holling, Johansson, 2004, Meadows, 2008). Meadows (2008, p. 6) believed that multiple lenses allow for a more complete understanding. “When the world is more messy, more crowded, more interconnected, more interdependent, and more rapidly changing than ever before, the more ways of seeing, the better.”

**Come to terms with a common vocabulary.**

When people lack a common vocabulary, it hinders mutual understanding and may act as a barrier to exchanges of ideas and agreement. We found values-based disparities in the interpretation of terms routinely used in natural resource decision-making, such as risk,
uncertainty, and mitigation. Discrepancies associated with two goal-oriented terms, public interest and balance, are illustrated here.

**Public interest.**

Regulators are tasked with determining whether a project is in the public interest. Public interest is not defined in environmental impact legislation, however Canada’s National Energy Board (NEB), the regulator for the Trans Mountain pipeline expansion, referenced the term in its final report. It referred to public interest as “a balance of economic, environmental and social interests that change as society’s values and preferences evolve over time” [emphases ours] (NEB, 2016, p. 13). In determining the project was in the public interest, the Board placed significant weight on its national economic benefits, namely access to Pacific Rim markets. It noted that most of the residual burdens - such as the risk of marine spills, were regional or local (NEB, 2016). The Board also contradicted itself by saying the project would have significant effects on an endangered Killer Whale population, and that it was unlikely to cause significant adverse environmental effects.

Our research participants knew they disagreed on what was in the public interest, but were mostly unaware that the disagreement was rooted in their interpretation of the term itself. In describing public interest, project supporters focused on the economic and social benefits accruing to society from private development. Dating back to the gold rush and national railway, private enterprise had “built the fabric” of the province and nation and made them strong and prosperous (P58, BIHP supporter). Communities had become better places to live. Supporters believed companies could and should be constrained with conditions, such that publicly-owned lands and resources were respected and investments remained attractive. They believed people
directly affected by a project were entitled to advocate for their interests, with caveats that legal, traditional, and ethical rights must underpin the paramountcy of national over regional, regional over local, and local over individual interests. This was a predominantly utilitarian view, where public interest was interpreted as the greatest good for the greatest number. What public interest was not, however, was social license (i.e., broad local support) or consensus.

By contrast, project opponents mainly emphasized the responsibility to protect the public and its interests from self-serving corporate interests. This was perceived as a shared responsibility - among decision-makers, scientists, non-profit organizations and others. As such, it encompassed the freedom to advocate for the public interest and the ability to make a difference. Considering long-term impacts to the environment and future generations, maintaining functioning ecosystems to meet basic needs such as clean water, recognizing when regions were already oversubscribed with development, exploring less harmful alternatives, ensuring any environmental losses provided public goods more than private gain, requiring monitoring and compensation, and preventing companies from supplanting the rights of citizens were all included in the responsibility to protect. Integrity, in the form of neutrality or independence from industry and ideological governments, was seen as co-requisite with responsibility to acting in the public’s best interest.

The pipeline expansion could destroy our environment, the ecological food chain, property values, and the health of our citizens, but even if that is the case, it is possible that, in the view of the National Energy Board, there exists a national interest that is so great that this risk is justifiable (P40, TMPE opponent).

Unlike supporters, they did not see hierarchical paramountcy as a factor in public interest.
You can’t say we’re going to destroy this region in a whole bunch of ways, but don’t worry, this is for the good of the country. From my perspective, that isn’t the public interest (P59, BIHP opponent).

Balance.

Striking a balance is a common refrain in environment versus economy debates. Seventy-seven percent of project supporters and 43% of opponents selected the survey statement, *We should strive to maintain a balance between ourselves and nature, over Nature is a resource for prosperity. We benefit from directing and changing the world around us* (a mastery values statement) and *We should adapt to nature and fit harmoniously into the natural world* (a harmony values statement). When survey respondents were asked why they chose the balance statement and what it meant to them, *balance* was perceived as a general compromise or a trade-off rather than a 50:50 split - where half of an ecosystem is developed and half is preserved, for example.

Some descriptions leaned towards self-transcendence and harmony. Participant comments included: “Nature is at the top.” “Work with nature (not against it).” “Live as part of the land, taking only what is needed.” “We’re interconnected and embedded in ecological relationships, so don’t live at the expense of the land and other species.” “Live within our ecological means.” “Preserve ecological diversity, function, and health.” “Site projects to avoid environmental damage.” “Manage and care for the land as a steward, and not be some sort of rapacious parasite that comes in and exhausts a resource and leaves it.”

Descriptions tending towards mastery included religious references. “God gave us resources to use, but respect the gift.” “We need nature, nature needs us” (to look after Creation).
“Man is at the pinnacle, so disturb but reclaim.” Less spiritual descriptions focused on responsible resource use and restoration of impacted environments. “Minimize waste.” “Mitigate.”

In leaning towards self-enhancement and mastery, the ranking was clear - live, maintain a lifestyle, manage resources for communities, but - do what we can to protect the environment, step a little more lightly, preserve what we can. One described balance as going for win-wins, and respecting ecological limits when we are closer to them. Another said it was to be more open-minded towards industry.

Closer to the middle, where neither economy or environment held greater weight, balance was depicted less as a value and more as a planning objective. “Achieve the most economic benefit with the least environmental impacts.” “Know the true costs, and capture externalities with innovation and technology.” “Lessen impacts by building life cycle awareness so we can see how our consumption affects local environments.” Balance in the middle was sustainability (in the Brundtland sense of the word (World Commission on Environment and Development, 1987)) and integration of the social and ecological (i.e., “humans are part of nature, and nature is not a park”). In these middle and near-middle descriptions of balance, values scores were not mixed or moderate, but tending towards self-transcendence (i.e., very low SE scores and moderate to high ST-nature scores).

In evaluating public interest, people were speaking different languages. SE-oriented people largely welcomed resource applications, seeing them as opportunities for gaining advantage for best possible living, while ST-nature-oriented participants judged them with suspicion, as potential threats to biodiversity and a stable climate. Balance was perceived,
mindfully or not, as a compromise slanted towards prioritized values. Confronting such ambiguities in a values context, to either integrate the most important definitions or find a single one that works for all, allows future deliberations to be grounded in the same basic language.

**Challenging competing facts: The case of transition time.**

The views of survey respondents diverged significantly on two statements related to the transition of fossil fuels to renewable forms of energy (Table 7.1). Follow-up interviews revealed that most project opponents believed the transition was within reach, while many supporters - particularly pipeline supporters, felt the transition would take a long time.

At the same time, more than 90% felt climate change and biodiversity loss were interconnected and pressing problems that must be considered in all decisions for lands and resources, more than 9% believed climate was more important than biodiversity loss, and no one saw climate change and biodiversity loss as distant threats. The issue was the speed of transition, not the need for transition.

Table 7.1. Energy views. The lower a person’s SE values score, the more likely they were to choose as their least preferred statement, Fossil fuel-based energy projects are necessary evils. Rationale were assessed in follow-up interviews.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Pipeline expansion</th>
<th>Run-of-river project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Best choice in 3-statement best-least survey</td>
<td>Supporters</td>
<td>Opponents</td>
</tr>
<tr>
<td>Energy production must become more ecologically sustainable to avert catastrophic climate change and biodiversity loss.</td>
<td>33%</td>
<td>95%</td>
</tr>
<tr>
<td>Fossil fuel-based energy projects are necessary evils, as energy needs are increasing and alternate technologies cannot meet these needs</td>
<td>50%</td>
<td>0%</td>
</tr>
</tbody>
</table>

However, the intensity of the threats was felt differently. Level of concern ranged from relaxed to tense, the latter seeing additional fossil fuel infrastructure as an imminent danger to
Earth’s ecosystems and inhabitants. In believing that an expeditious transition was accessible, pipeline opponents, and climate action advocates especially, felt the pipeline expansion was immoral. It would disproportionally externalize the costs of climate change to those least able to contend with them - poor human populations and innocent wildlife.

Less concerned about transition time were those who understood fossil fuels to be firmly entrenched in a global economic system. Most did not view fossil fuels as necessary evils, but as a critical source of energy upon which most of Earth’s inhabitants rely. For them, a hasty transition would result in widespread hardship, disproportionally affecting vulnerable regions with limited or no energy services. The pipeline expansion was viewed as tried-and-true transportation infrastructure connecting a largely land-locked resource to a lucrative market, not a dangerous turning point for humanity.

Examining nine opposing arguments on transition time, we found facts supported both sides in every instance. For example, in support of a short transition, project opponents argued that global demand for oil will depend on global agreements and the policy choices we make. In support of a long transition, supporters argued the global demand for oil would be high for decades. In its final report regarding the pipeline expansion, the NEB was of the view that world demand would increase for the next 20 years, long enough to justify the project (NEB, 2016). The International Energy Agency’s 2016 World Energy Outlook based its main scenario on the Paris Agreement on climate change. In this scenario, growth in oil demand slowed, but topped 103 million barrels per day by 2040 (from the current 98 mb/d). However, the Outlook also stated that the signal from governments was that fossil fuels would continue to be a bedrock of the global energy system for many decades to come. It warned the fossil fuel industry to prepare
for policy shifts and a much sharper transition. In other words, both arguments were supported by the world’s most authoritative source of energy market analysis and projections (International Energy Agency, 2017). By confronting the assumptions behind dissenting views with factual information, it is possible to bridge the gap between views - without condemning people on either side of a values division to one position or another.

Run-of-river opponents made the case that new energy projects were not needed since energy demand was flat in British Columbia. The province was already powered largely by renewable energy in the form of large hydroelectric dams, and the western U.S. was increasingly producing its own renewable power, limiting the potential for Canadian exports. In 2016, the Province approved a new large hydro project, preempting other projects and effectively impeding a growing renewable energy industry in the province. Some opponents were concerned that the new dam could be used to power fossil fuel extraction, thereby perpetuating a sunset industry. Few emphasized the role a thriving renewable energy industry could play in hastening a broad transition that necessarily includes electric transportation, low carbon extraction in other industries, and carbon capture (Bataille et al., 2015; International Energy Agency, 2016), marking a significant gap in the energy transition narrative.

Appreciating Values Diversity

In addressing complex problems such as biodiversity loss and climate change, values-based deliberations are critically important. Although it is foolhardy to typecast individuals onto one side or another of a values divide, the stereotypical strengths make a compelling case. People prioritizing ST-nature values may be more likely to recognize local ecological thresholds, safeguard ecosystem connectivity, or assist the migration of species. Those who prioritize SE
values may be more likely to develop inexpensive renewable technologies that hasten transition, or promote carbon capture technologies that allow fossil fuels to be safely used. Both values dimensions are necessary to elicit a Medici effect (Johansson & Amabile, 2017), where intersections of diversity lead to extraordinary insights and innovation. With values diversity, bridging language, and common fact-finding, values-based deliberations can move beyond ‘economy versus environment’ towards sustained biodiversity protection and economic prosperity.

References


https://doi.org/10.1038/463296a


https://doi.org/10.1080/13669877.2010.511246


http://www.naturalcapitalism.info


**Supplemental Information**

Table SI.7.1. Correlations among values scores and support for energy projects, cases combined.

<table>
<thead>
<tr>
<th>Value Score</th>
<th>View</th>
<th>Spearman’s rho</th>
<th>Chi-Square and Cramer’s V</th>
</tr>
</thead>
<tbody>
<tr>
<td>SE</td>
<td>Support+/Oppose- TMPE or BIHP</td>
<td>0.606**</td>
<td>χ(14)=49.852, p=0.000, Cramer’s V=0.619, n=65</td>
</tr>
<tr>
<td></td>
<td>Support energy projects</td>
<td>0.371**</td>
<td>χ(7)=33.515, p=0.000, Cramer’s V=0.741, n=61</td>
</tr>
<tr>
<td></td>
<td>Support environmental protection</td>
<td>-0.371**</td>
<td>χ(7)=24.507, p=0.001, Cramer’s V=0.624, n=63</td>
</tr>
<tr>
<td>STN</td>
<td>Support+/Oppose- TMPE or BIHP</td>
<td>0.478**</td>
<td>χ(10)=24.474, p=0.002, Cramer’s V=0.46, n=65</td>
</tr>
<tr>
<td></td>
<td>Support energy projects</td>
<td>-0.295*</td>
<td>χ(5)=13.706, p=0.018, Cramer’s V=0.474, n=61</td>
</tr>
<tr>
<td></td>
<td>Support environmental protection</td>
<td>0.428**</td>
<td>χ(5)=15.107, p=0.01, Cramer’s V=0.49, n=63</td>
</tr>
</tbody>
</table>

SE scores ranged from -1 to +0.4, STN scores ranged from -1 to +1. STS scores, which were not significant, ranged from -1 to +1.

Significant *p<0.5 ** p<0.01.

Due to small sample sizes, chi square cell counts were commonly less than expected.

Values and views statements were approximately ordinal; there may be order and overlap effects.

Table SI.7.2. Significant correlations among values scores and support for energy projects, split by case.

<table>
<thead>
<tr>
<th>Values Score</th>
<th>Case</th>
<th>Values or views statement as best choice</th>
<th>Spearman’s rho</th>
<th>Chi-Square and Cramer’s V</th>
</tr>
</thead>
<tbody>
<tr>
<td>SE</td>
<td>TMPE</td>
<td>Support+/Oppose- TMPE or BIHP</td>
<td>0.615** strong</td>
<td>χ(6)=34.171, p=0.000; Cramer’s V=0.811, n=52</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Support Energy Projects</td>
<td>0.437** moderate</td>
<td>χ(6)=26.901, p=0.000; Cramer’s V=0.749, n=48</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Support Environmental Protection</td>
<td>-0.455** moderate</td>
<td>χ(6)=23.071, p=0.001; Cramer’s V=0.679, n=50</td>
</tr>
<tr>
<td>STN</td>
<td>TMPE</td>
<td>Support+/Oppose- TMPE or BIHP</td>
<td>0.415** moderate</td>
<td>χ(4)=10.09, p=0.039; Cramer’s V=0.44, n=52</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Support Environmental Protection</td>
<td>0.406** moderate</td>
<td>χ(4)=13.384, p=0.010; Cramer’s V=0.517, n=50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Support Energy Projects</td>
<td>-0.378** weak</td>
<td>χ(4)=13.115, p=0.011; Cramer’s V=0.523, n=48</td>
</tr>
</tbody>
</table>
### Table SI.7.3. Significant correlations among values scores and values statements.

<table>
<thead>
<tr>
<th>Values statement as best choice</th>
<th>Values Score</th>
<th>Spearman’s rho</th>
<th>Chi-Square and Cramer’s V</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is important to me to be the one who makes decisions. I like to be the leader. (measures power, v. achievement, social justice)</td>
<td>SE</td>
<td>0.302*</td>
<td>(\chi(7)=28.188, p=0.000; Cramer’s V=0.664, n=64)</td>
</tr>
<tr>
<td>Success is important to me. I want to have an impact on people and events, and I like to show others how capable I am. (achievement, v. power, social justice)</td>
<td>SE</td>
<td>0.394**</td>
<td>(\chi(7)=20.842, p=0.004; Cramer’s V=0.571, n=64)</td>
</tr>
<tr>
<td>Everyone should be treated justly, even people I don’t know. It is important to me to protect the weak in society. (social justice, v. power, achievement)</td>
<td>SE</td>
<td>-0.504**</td>
<td>(\chi(7)=25.535, p=0.001; Cramer’s V=0.627, n=65)</td>
</tr>
</tbody>
</table>

#### SE scores and STN scores:
- SE scores ranged from -1 to +0.4.
- STN scores ranged from -1 to +1.
- Significant *\(p<0.5\) ** \(p<0.01\).
- Due to small sample sizes, chi square cell counts were commonly less than expected.
- Values and views statements were approximately ordinal; there may be order and overlap effects.
- 0.8 to 0.9 very strongly correlated, 0.6 to 0.8 strongly correlated, 0.4 to 0.6 moderately correlated.
<table>
<thead>
<tr>
<th>Values statement as best choice</th>
<th>Values Score</th>
<th>Spearman’s rho</th>
<th>Chi-Square and Cramer’s V</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is important to me to listen to people who are different from me, even when I disagree with them. (broadmindedness, v. care for nature, achievement)</td>
<td>STS 0.431**</td>
<td>χ(7)=20.103, p=0.005; Cramer’s V=0.556, n=65</td>
<td></td>
</tr>
<tr>
<td></td>
<td>STN not significant</td>
<td>χ(5)=11.018, p=0.051; Cramer’s V=0.412, n=65</td>
<td></td>
</tr>
<tr>
<td>Looking after the environment is important to me. I strongly believe that people should care for nature (v. broadmindedness, achievement)</td>
<td>STS 0.390**</td>
<td>χ(7)=18.124, p=0.011; Cramer’s V=0.528, n=65</td>
<td></td>
</tr>
<tr>
<td></td>
<td>STN -0.609**</td>
<td>χ(5)=29.787, p=0.000; Cramer’s V=0.677, n=65</td>
<td></td>
</tr>
<tr>
<td>Advancement is important to me. I strive to do better than others. (achievement, v. care for nature, broadmindedness)</td>
<td>STS -0.285*</td>
<td>χ(7)=14.913, p=0.037; Cramer’s V=0.479, n=65</td>
<td></td>
</tr>
<tr>
<td></td>
<td>STN 0.677**</td>
<td>χ(5)=31.318, p=0.000; Cramer’s V=0.694, n=65</td>
<td></td>
</tr>
<tr>
<td>The distribution of resources and power should be proportional to merit, effort, contribution, or ability. (proportionality, v. hierarchy, egalitarianism)</td>
<td>SE 0.421**</td>
<td>χ(7)=33.019, p=0.000; Cramer’s V=0.713, n=65</td>
<td></td>
</tr>
<tr>
<td></td>
<td>STS -0.371**</td>
<td>χ(7)=34.558, p=0.000; Cramer’s V=0.729, n=65</td>
<td></td>
</tr>
<tr>
<td></td>
<td>STN not significant</td>
<td>χ(5)=15.224, p=0.009; Cramer’s V=0.484, n=65</td>
<td></td>
</tr>
<tr>
<td>To ensure socially responsible behaviour, a hierarchy of roles and an unequal distribution of resources and power are necessary. Those in charge are entitled to respect and deference but must also lead, guide, direct, and protect others. (hierarchy, v. proportionality, egalitarianism)</td>
<td>SE 0.497**</td>
<td>χ(7)=27.071, p=0.000; Cramer’s V=0.645, n=65</td>
<td></td>
</tr>
<tr>
<td></td>
<td>STS -.245*</td>
<td>not significant</td>
<td></td>
</tr>
</tbody>
</table>
Values statement as best choice | Values Score | Spearman’s rho | Chi-Square and Cramer’s V |
--- | --- | --- | --- |
We are all moral equals, and should transcend selfish interests to cooperate voluntarily with others to distribute resources and power for everyone's benefit. (egalitarianism v. proportionality, hierarchy) | SE | -0.692** | \(\chi(7)=39.650, \ p=0.000; \ \text{Cramer’s V}=0.781, \ n=65\) |
| STS | 0.444** | \(\chi(7)=18.528, \ p=0.010; \ \text{Cramer’s V}=0.534, \ n=65\) |

We should adapt to nature and fit harmoniously into the natural world. (harmony, v. mastery, balance) | STS | -0.354** | \(\chi(7)=17.658, \ p=0.014; \ \text{Cramer’s V}=0.521, \ n=65\) |
| STN | 0.845** | \(\chi(5)=49.748, \ p=0.000; \ \text{Cramer’s V}=0.875, \ n=65\) |

Nature is a resource for prosperity. We benefit from directing and changing the world around us. (mastery, v. harmony, balance) | SE | 0.316* | \(\chi(7)=48.234, \ p=0.000; \ \text{Cramer’s V}=0.861, \ n=65\) |
| STS | -0.246* | \(\chi(7)=17.751, \ p=0.013; \ \text{Cramer’s V}=0.523, \ n=65\) |

We should strive to maintain a balance between ourselves and nature. (balance v. harmony, mastery) | STS | 0.438** | \(\chi(7)=18.109, \ p=0.011; \ \text{Cramer’s V}=0.528, \ n=65\) |
| STN | -0.798** | \(\chi(5)=43.357, \ p=0.000; \ \text{Cramer’s V}=0.817, \ n=65\) |

Humans have a duty to care for nature. It is important to me that people be accountable for their impacts on the environment. (v. power, equality) | STS | -0.443** | \(\chi(7)=32.895, \ p=0.000; \ \text{Cramer’s V}=0.711, \ n=65\) |
| STN | 0.596** | \(\chi(5)=27.022, \ p=0.000; \ \text{Cramer’s V}=0.645, \ n=65\) |

It is important to me that people have equal opportunities to succeed and prosper. (equality v. care for nature, power) | STS | 0.443** | \(\chi(7)=32.895, \ p=0.000; \ \text{Cramer’s V}=0.711, \ n=65\) |
| STN | -0.596** | \(\chi(5)=27.022, \ p=0.000; \ \text{Cramer’s V}=0.645, \ n=65\) |

It is important to me that my nation contributes to efforts that make the world more peaceful, free of war and conflict. (world at peace, ST-social, in harmony) | STN | 0.298* | not significant
<table>
<thead>
<tr>
<th>Values statement as best choice</th>
<th>Values Score</th>
<th>Spearman’s rho</th>
<th>Chi-Square and Cramer’s V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efforts to protect our nation from harm must preserve fundamental freedoms (e.g., freedom of expression, peaceful assembly). (self-direction, in opposition to security and adjacent to self-transcendence; note biodiversity loss and climate change may be security issues)</td>
<td>STN</td>
<td>-0.338**</td>
<td>$\chi(5)=11.841, p=0.037; \text{Cramer’s V}=0.430, n=64$</td>
</tr>
</tbody>
</table>

Table SI.7.4. Significant correlations among values scores and views statements.

<table>
<thead>
<tr>
<th>Values Score</th>
<th>Views statement as best choice</th>
<th>Spearman’s rho</th>
<th>Chi-square and Cramer’s V</th>
</tr>
</thead>
<tbody>
<tr>
<td>STS</td>
<td>Regular time outdoors in natural settings is important for my physical, mental, and spiritual health.</td>
<td>-0.273*</td>
<td>not significant</td>
</tr>
<tr>
<td>STN</td>
<td></td>
<td>0.374**</td>
<td>$\chi(5)=13.037, p=0.000; \text{Cramer’s V}=0.779, n=62$</td>
</tr>
<tr>
<td>SE</td>
<td>When the economy is doing well, people are better able and more likely to care for nature. Efforts that unnecessarily limit economic growth and prosperity inevitably harm the environment.</td>
<td>0.291*</td>
<td>$\chi(7)=37.664, p=0.023; \text{Cramer’s V}=0.451, n=64$</td>
</tr>
<tr>
<td>STS</td>
<td></td>
<td>-0.317*</td>
<td>$\chi(5)=32.813, p=0.000; \text{Cramer’s V}=0.727, n=62$</td>
</tr>
<tr>
<td>STN</td>
<td></td>
<td>not significant</td>
<td>$\chi(5)=18.046, p=0.032; \text{Cramer’s V}=0.540, n=62$</td>
</tr>
<tr>
<td>SE</td>
<td>Fossil fuel-based energy projects are necessary evils, as energy needs are increasing and alternate technologies cannot meet these needs. (renewables not ready)</td>
<td>0.478**</td>
<td>$\chi(7)=28.949, p=0.000; \text{Cramer’s V}=0.695, n=60$</td>
</tr>
<tr>
<td>STN</td>
<td></td>
<td>-0.313*</td>
<td>$\chi(5)=12.194, p=0.032; \text{Cramer’s V}=0.451, n=60$</td>
</tr>
<tr>
<td>SE</td>
<td>Energy production must become more ecologically sustainable to avert catastrophic climate change and biodiversity loss. (sustainable for the climate)</td>
<td>-0.412**</td>
<td>$\chi(7)=28.922, p=0.000; \text{Cramer’s V}=0.689, n=61$</td>
</tr>
<tr>
<td>STN</td>
<td></td>
<td>0.326*</td>
<td>$\chi(5)=11.824, p=0.037; \text{Cramer’s V}=0.440, n=61$</td>
</tr>
</tbody>
</table>
Table SI.7.5. Significant correlations among support for actual energy projects and views statements.

<table>
<thead>
<tr>
<th>Views statement as best choice</th>
<th>Spearman’s rho</th>
<th>Chi-square and Cramer’s V</th>
</tr>
</thead>
<tbody>
<tr>
<td>When the economy is doing well, people are better able and more likely to care for nature. Efforts that unnecessarily limit economic growth and prosperity inevitably harm the environment.</td>
<td>-0.322**</td>
<td>( \chi(2)=7.715, p=0.021; \text{Cramer’s V}=0.350, n=63 )</td>
</tr>
<tr>
<td>Economic growth is a root cause of environmental problems. Limits to growth or de-growth are prerequisites for sustainability.</td>
<td>-.248*</td>
<td>not significant</td>
</tr>
<tr>
<td>renewables not ready</td>
<td>-0.672**</td>
<td>( \chi(2)=29.197, p=0.000; \text{Cramer’s V}=0.692, n=61 )</td>
</tr>
<tr>
<td>energy sustainable for the climate</td>
<td>0.643**</td>
<td>( \chi(2)=26.258, p=0.000; \text{Cramer’s V}=0.651, n=62 )</td>
</tr>
</tbody>
</table>
Chapter 8: Synthesis and Conclusion

This research began with the question, “What are the influences on decision-makers that lead them to either protect or further endanger sensitive or at-risk ecosystems and species?” Integrating various social theories, I suggested these influences included sense of place, perceptions of science, media frames, values, and networks of relationships - the expression of the latter two shaped by mechanisms of cultural cognition, such as the cultural availability effect. It is clear from my findings, that there were likely only two foundational, synergistic influences; these were values (as configured by Schwartz, 1992) and sense of place. My findings concur with Kahan’s (2012) thesis of cognition, in showing how personal, or internal mechanisms, such as the cultural availability effect, act on values through networks of relationships to filter and shape decisions. However, there were external mechanisms as well. These included media effects, such as framing, algorithms that personalize our news feeds, and journalistic and business practices used by media outlets that interfere with otherwise organic processes (Miller & Riechert, 2001; Pariser, 2011; Viner, 2016). Since these influences and mechanisms were integrated - evidenced, for example, by the multiple relationships between values and access to information, they influenced whether people were exposed to certain science and other information, and how they perceived and understood it. They affected how people weighed biodiversity science with economic analyses, and predicted which side they would choose in a conflict depicted as economy versus environment.

This chapter integrates information from the four papers (see Chapters 4 through 7), and reports more recent outcomes of the Trans Mountain pipeline expansion, to illustrate how foundational influences and various mechanisms influenced decision-making. Focusing on six
main findings, I demonstrate how the influences are intertwined, and why they must be considered together in addressing environment versus economy conflict and biodiversity conservation.

1. Positions in economy versus environment conflicts were proxies for self-enhancement and self-transcendence values.

2. Sense of place manifested as a way of life.

3. Policy gaps were antecedents to conflict.

4. In examining science and other information, people took cognitive shortcuts, turning to routinely accessed media and trusted networks.

5. At the crux of the pipeline conflict, was the speed of transition from fossil fuels to renewable energy.

6. Biodiversity loss was subsumed and sidelined by climate change.

My conclusion describes how values and sense of place are the ‘underbelly’ of natural resource decisions, and how these, as well as network effects and media effects, are lenses through which we see biodiversity loss or conservation and economy versus environment conflicts. Finally, I provide overall recommendations and suggests areas for future research.

**The Role of Values in Economy v. Environment Conflicts (Finding #1)**

Although 'economy versus environment’ is a false dichotomy insofar as it ignores planetary limits, there are genuine divisions that underlie this dichotomy. I found ‘economy’ to be an effective proxy for self-enhancement values (i.e., achievement, power), and ‘environment’ a surrogate for self-transcendence values that emphasize a concern for nature. People share these values, but prioritize them differently. Since self-enhancement and self-transcendence values are
in direct opposition and cannot be simultaneously prioritized (Schwartz, 1992), those engaged in a natural resource conflict tend to choose either development or environmental protection.

‘Economy’ tends to predominate in decision-making, because developers and final decision-makers often prioritize or lean towards self-enhancement values. These values are similarly embedded in institutional structures, such as Cabinets and government-appointed boards, which have been drawn together by values homophily and other mechanisms of cultural cognition (Dale & Sparkes, 2008; Kahan, 2012, McPherson, Smith-Lovin, & Cook, 2001). Canadian politicians, for example, frequently have corporate legal and business professional backgrounds where achievement and power are valued (Parliament of Canada, 2009).

These same mechanisms tend to exclude people prioritizing self-transcendence (nature) values from both project development and final decision-making. Self-transcendence types who care about nature, and are more likely to hold harmony cultural values that lead them to seek unity with nature and protect the environment, are relegated to the periphery or outside of key decisions that affect the places, ecosystems, or species they care about. Values homophily and the mechanisms of cultural cognition act upon their tendency towards egalitarian values, which predict political activism, drawing some together to mobilize for protests or other forms of activism. Natural resource conflicts then, appear to stem from opposing values, and from power disparities emerging from those values (cf., Dale, 2001; Kuhn, 1996).

In a 2015 blog, I described homophilic groups as ‘nests’ in a ‘nestwork’, places where individuals feel safe and comfortable in a social network structure based on cultural communities. Cultural communities may arise through many avenues, including, for example, the nature of one’s employment (Kahan et al., 2012). Academics in my Trans Mountain sample
tended to have low self-enhancement scores and high self-transcendence scores, and to oppose the project for reasons they could support with rationale from their own research or that of the peers. Regulators, who over the years had cultivated relationships with the companies and organizations in their sector of expertise, had moderate values scores but were self-enhancement-oriented in other ways – most notably in the risks and benefits they associated with pipelines and tankers more generally. Generally, participants reported more positive and complex connections (e.g., cooperation, collaboration, or support) with the organizations that appeared to share their values and views (Janis, 1972; Kahan, 2010, 2012). In a ‘nestwork’, nests with opposing values and views may belong to the same ne(s)twork, but have fewer, weaker, negative, or distant ties among them. In the Trans Mountain case, individuals for and against the projects were less likely to be completely siloed than to report relationships (at the organization level) that were were strained or negative, and limited to one-way flows of information or advice.

Although it is inappropriate to generalize from two case studies, the alignment of project positions, survey statements, and interview comments with self-enhancement and self-transcendence categories, and the relationships among groups, suggest combined values and network effects are critical elements in decision-making for natural resources, and indeed, for understanding why the economy versus environment divide persists.

There is a rapidly growing body of literature examining values-based categories such as political affiliation and religion, as well as education, class, age, and other attributes that might divide us (see Gruzd & Roy, 2014 for a Canadian social media example). Yet, the role of self-enhancement and self-transcendence values in polarization and conflict is under-studied and worthy of much further attention. Affirming the need to consider values in conflict, Schulz,
Martin-Ortega, Ioris, and Glenk (2017) found conflict over the Paraguay-Parana Waterway in Brazil was an expression of much deeper and persistent value conflicts. Project supporters (mostly business sectors and government) expressed economic values with respect to the waterway, and governance-related values including economic efficiency, effectiveness, pragmatism, order, and development. Project opponents (water resource users such as fishermen, environmental non-profit organizations, and some academics) held ecological/cultural values with respect to the project, and governance-related values emphasizing equity, social justice, solidarity, and conservation/tradition. Power imbalances favoured those with economic-oriented value landscapes.

The stability of values priorities explains - at least in part, why natural resource conflicts are intermittently revived without any consensus or compromise (cf., Schulz, Martin-Ortega, Ioris, & Glenk, 2017). Persuasion is unlikely to work; it is difficult to talk people out of their values. Indeed, there is substantial evidence that value priorities are relatively stable in adults, shaped over time in a cultural context (Rokeach, 1968; Schwartz, 2008). And, there is an emerging body of literature that suggests values may be quite stable in children as well (Cieciuch, Davidov, & Algesheimer, 2016). Using picture-based measures of Schwartz values, Cieciuch, Davidov, & Algesheimer’s (2016) conducted a longitudinal study of 7 to 11-year-old Polish children. They showed that hierarchies of value priorities became more stable as the children aged. This is important because the notion that values are stable confounds a key premise of environmental education - that people must embrace environmental values before environmental protection or biodiversity conservation can occur (cf., WWF, 2016).
Notably, Schwartz’ (1992, 2008) felt value priorities could evolve or rapidly change – temporarily at least – in response to major upheavals (e.g., technological, political). Biodiversity loss and climate change could be counted as major upheavals.

**The Role of Sense of Place in Economy v. Environment Conflicts (Finding #2)**

Resource conflicts may also be rooted in senses of place, which, like values, develop over time and form part of who we are (Cross, 2015; Hay, 1998). Senses of place are intertwined with historical events and the cultures of communities, often at regional scales (cf., Dakin, 2003). Certain west coast environmentalists and First Nations people were empowered by earlier feats of activism, particularly over long-standing forestry issues, and there is evidence, looking backwards, of a strong nature-based identity on Canada’s southwest coast. Indigenous people who saw themselves as interconnected with land and sea, well-known conservationists such as Ian McTaggart-Cowan, and environmentalists such as David Suzuki, were instrumental in cultivating a regional sense of place centered on an appreciation and concern for the natural world (cf., Penn, 2015). Scaling up, BC has long been promoted as Canada’s most biodiverse province, attracting the attention of scientists and naturalists alike. For more than 30 years, the province has worn the brand, *Super, Natural British Columbia*. Based on the overlap I found between favourite places and a protected area system built over many decades, I suspect appreciation and preservation of natural areas have grown in tandem.

Importantly, a nature-centric sense of place was evident in and around urbanized areas where nature was readily accessible, such as BC’s Lower Mainland. My experiences as a biologist had shown environmental concern is heightened in populous areas, where more people are aware of and personally affected by development affecting places they frequent. As pressure
increases, so too do the social stresses that cause people to mobilize (cf., Breslow, 2014; Collins & Kearns, 2013). Future research into contentious developments and environmental movements might consider both the proximity of proposed projects to urban centres and the proportion of protected natural areas on and near the urban landscape.

The gradual development and evolution of a regional sense of place applies, of course, to other regions. The oil and gas industry has shaped much of Alberta for decades. Albertans appreciated bitumen much the same way that west coast residents appreciated nature - for its role in their way of life. Where the pipeline was perceived as a threat to BC nature, the lack of one was seen as perilous to Alberta’s petroleum-based economy and Albertans’ standard of living. In fact, the pipeline seemed to be an extension of their sense of place. For many of these participants, the environment was not sensitive but resilient; the Rocky Mountains were an enduring part of the landscape, wildlife and plants required control lest they encroach on farms and ranches, and disturbed areas inevitably rebounded.

Regions are cultural settings, where sense of place and values converge. The majority of coast residents surveyed and interviewed was opposed to the pipeline expansion, had deeper place connections relative to pipeline supporters, and prioritized self-transcendence values. Bitumen spills, a highly salient topic for intervenors and commenters in the environmental assessment process, were a threat to both place and self-transcendence values. By contrast, pipeline supporters had more superficial place connections to affected places and prioritized self-enhancement values. In other words, regional sense of place and values were stabilizing factors within groups, and divisive between groups.
Importantly, self-enhancement scores aligned with positions taken on the run-of-river project, yet self-transcendence scores and sense of place did not. This demonstrated the sometimes rival nature of climate and biodiversity interests. It also indicated that some regions may have more varied place connections, which merits further investigation. It also suggested that values are more salient in decision-making for energy projects than sense of place.

The following story showcases one of the better outcomes for a species-at-risk facing a development project, and illustrates how different values and sense of place influence, or fail to influence, decision-making for at-risk species. Self-transcendence values for nature often enter environmental assessment indirectly, as ‘valued ecosystem components’ (VECs). These are tangible, mapped features of concern that may be affected by a project. The southern resident Killer Whale population is a VEC. Federally endangered and provincially red-listed, it fell to 78 animals during the course of the Trans Mountain environmental assessment (Center for Whale Research, 2017).

In 2012, the Federal Court of Appeal had ruled the Harper Government must identify and protect the whales’ critical habitat (Hume, 2012). For years, the Government had avoided requirements under the *Species at Risk Act (2002)*, fearing they might limit tanker traffic, among other things. This was a harbinger of the Trans Mountain result. NEB (2016), appointed by the Harper Government, determined the Trans Mountain project would not likely cause significant adverse environmental conditions, categorizing the whale population as a ‘residual burden’, since there were impacts to them that could not be mitigated by conditions. For Alberta-based and likely self-enhancement-oriented NEB panel members, the whales were collateral damage in a project that would increase markets, create jobs, and generate considerable government
revenues. The $24.5 million in whale watching revenues the whales generated each year could not compare to the revenue derived from increased sales of oil sands bitumen (Raincoast Conservation Foundation 2016). Trans Mountain ULC reported that producers would see $73.5 billion in increased revenues, and federal and provincial governments would collect $46.7 billion in additional taxes and royalties over 20 years of pipeline operation (TM, n.d.).

For west coast residents prioritizing self-transcendence values, the iconic orca was perhaps the most beloved creature in the Salish Sea. Many had seen the whales from their boats or the ferries. Scientists have named each one and know their family trees. When an individual dies, they are described as matriarchs, sons, or daughters. For those who have embedded the orca in their sense of place, the connections appeared to be long and deep. Expressions of values and sense of place with references to whales were scattered throughout my interviews, in filed documents to NEB, and later to the Ministerial Review Panel appointed by the Trudeau Government. My own connections, which lack the depth of many others, include many treasured sightings as well as memories of school kids with orca-adorned sports jerseys beginning and ending each game with, “1-2-3 Whalers!”; small children hugging Klee-wyck, the anthropomorphic Killer Whale mascot for the 1994 Commonwealth Games in Victoria; and Luna, the little whale who lost his way and became the star of Nootka Sound. The south resident population is an integral part of west coast culture.

The Government, on approving the controversial pipeline, adopted the recommendations of NEB, which lacked sufficient measures to protect the whales. Augmenting vocal resistance, Ecojustice filed a federal court case on behalf of two science-based non-profit organizations (i.e., Living Oceans Society and Raincoast Conservation Foundation) to block the approval based on a
failure to protect the endangered population. In 2017, the Government published a new action plan for the whales and promised it would ‘more than mitigate’ the effects of the project (Government of Canada, 2017). At the time of this writing, the case was still pending, and only time will tell how the action plan serves the whale population.

From the perspective of self-transcendence individuals, rarely do governments - even progressive governments, protect species-at-risk on their own. Intervention from networked activists and non-profit organizations, and/or the courts, is perceived as necessary to limit the continuing failures of governments and others to protect environmental values. Here, a lack of enforcement of existing legislation and gaps in policy to guide the management of the whale population were antecedents to the conflict and to population decline.

Policy Gaps as Antecedents to Economy v. Environment Conflicts (Finding #3)

Indeed, policy gaps were precursors to the conflicts, as much or more than controversial legislation or aggressive media frames. A lack of clear and credible scale-relevant policy complicated assessment processes by making more room for debate. For the Trans Mountain project, there were policy gaps in energy and climate action, spill risk assessment, spill response, and management of the southern resident Killer Whale population, among other things. For run-of-river projects, ecological concerns focused on cumulative effects from a ‘gold rush’ of stream-staking. Opponents sought to address these, more than the mechanics of the individual projects.

Yet, outstanding policy issues were outstanding for a reason; they were exceedingly complex and without clear solutions. When Trans Mountain supporters and opponents debated whether one or a handful of pipelines would, or could increase Canada’s production and global
use of bitumen, there were a host of heady topics worthy of consideration. Supply and demand for the full range of energy sources, geopolitical strife in oil-producing regions and other sources of volatility in energy markets, are just a few among many. Few people have in-depth knowledge of these areas, and those who do have plenty of critics (cf., Paraskova, 2016). Therefore, policy gaps also set the stage for conflict by fueling uncertainty and confusion, which led people to take cognitive shortcuts (described in the next section, the Role of Network Effects and Media Effects).

Many participants felt recognizing and addressing policy gaps was fundamental to mitigating development project conflicts, since assessment processes were ill-suited to address policy. I cautiously suggest the federal Liberal Government, elected in 2015, recognized the policy gap and regional interests regarding marine spills and set about addressing them. One of the most significant issues in the Trans Mountain case was the notion that national public interest should supersede regional interests. Using both self-enhancement and self-transcendence interpretations of the term ‘public interest’, projects in the public interest contribute tangible public benefits, while protecting significant existing ecological, social, and Indigenous cultural values as well as future benefits. This infers there can be no disconnect between resource wealth or consumer use and local impacts, since the structure and functioning of ecosystems and the communities that depend upon them are both current and future benefits. It also suggests that national and regional interests must be considered together. If a coastal country prevented an adjacent landlocked nation from exporting the resources that underpinned its economy, most would agree that would be entirely unjust. However, if that nation was transporting goods at great risk to coastal communities and ecosystems, that would also be unfair. Threats to regional
places can manifest as social stress and unrest, underscoring the importance of regional considerations in issues of national interest.

The spills issue had become an argument over the behaviour of diluted bitumen in marine waters. Project supporters contended diluted bitumen floats, opponents said it sinks. Since coastal residents would oppose large increases in tankers carrying crude oil as much as diluted bitumen, the behaviour of bitumen was a red herring. The pipeline expansion had raised a largely unaddressed policy issue, that is, how existing and future spill risk from tankers and other vessels traveling in and out of a busy port in a populous city could be reduced, since the area was already under great ecological stress. The Oceans Protection Plan offered by the Trudeau government prior to the approval of the Trans Mountain pipeline included few details but addressed research for new methods and technologies that could increase the efficiency of marine spill response, provided more resources to support spill response and new systems to direct marine traffic (Government of Canada, 2016). The question now is whether the plan can reduce risks associated with spills to an extent that compensates for the increased risks associated with the project.

By contrast, the rationale offered by the Liberal Government for approving the Trans Mountain pipeline expansion provided a clear example of how a decision might fail to resonate with opponents when policy gaps are not adequately addressed. To reassure climate action advocates, the pipeline was said to fit within Canada’s climate plan to 2030 (CBC News, 2015; Government of Canada, 2017), a plan with targets set by the former Harper Government, a government which had earned Fossil and Lifetime Unachievement Awards at international climate talks (Service Plan, 2017). A new carbon tax and 100 megatonne cap in greenhouse gas
emissions for the oil sands were set by the Province of Alberta, led by a social democratic government with a tenuous grip on power in Canada’s most politically conservative province. The International World Energy Agency’s (2016) World Outlook likely informed the federal government’s decision to approve the pipeline, but it was never offered as rationale. Thus, no sound political or scientific explanations were provided that would appease climate concerns.

Within a climate and energy strategy, a policy framework must be in place that says, ‘yes, we do want pipelines/run-of-river projects’, or ‘no, we do not’. If yes, we need ‘x’ number of them, and they are best situated in ‘y’ places because they present the greatest economic opportunities with the lowest risk to ecological resources and communities. Further, ‘z’ are the conditions that will help mitigate losses or degradation of ecological or social and Indigenous cultural resources. Then, companies can bid for needed projects in places set aside for project infrastructure, and environmental assessments become a technical exercise (as opposed to a policy one). There was widespread agreement among participants that national and regional conversations over climate and energy, and multiple landscape-level plans are still needed to complete such a framework.

The Northern Gateway project, its approval overturned when the Trans Mountain project was approved, exemplifies the need for planning at appropriate scales. The company, NEB, and Harper Government, all based in Alberta, underestimated the opposition to the project. To many British Columbians, the route was illogical, since it would pass through the Great Bear Rainforest - formerly the most contested provincial Crown lands outside of Clayoquot Sound. Then, tankers would travel through a patchwork of small, mostly rocky islands, all sheltered by another BC treasure - Gwaii Haanas National Park Reserve and Haida Heritage Site. These were
clear indicators that a regional sense of place exists here, respecting nature and Indigenous sacred sites. If an appropriately-scaled plan had been in place, the Northern Gateway route would never have been considered for an interprovincial pipeline.

Although BC has a number of strategic landscape and marine plans at appropriate scales for energy infrastructure and transport or transmission, there was little evidence they had been used to plan an appropriate pipeline route - conceding there are gaps in coverage and many plans require updating. In my view, such plans are well worth the time and expense needed to create them. With zoning and other tools that protect communities and sensitive ecosystems, they lower costs for companies and minimize conflicts as resources are developed. And, as noted by several participants, hypothetical developments are typically less contentious than actual ones.

In the heat of the conflict, project supporters, who had confidence in their organizations and sectors, and in the technologies used in the projects, were interested in overarching policy issues to an extent that allowed the projects to proceed. Similarly, opponents tackled the policy gap with a goal to stopping the projects. At this stage, they were not interested in filling the gap with evidence-based or consensual policy. They only wanted to know about the other sides’ views insofar as they could do or say something to counter them. Already polarized, this affected where they turned for information.

The Roles of Network Effects and Media Effects in Economy v. Environment Conflicts
(Finding #4)

To address uncertainty, complexity, and everyday information overload, people took cognitive shortcuts through media, networks, or both in combination (Kahan, Jenkins-Smith, & Braman, 2011; Kelly, 2011; Miscolta-Cameron, 2016). Most project supporters relied on
proponent materials, sector resources, and right-leaning news sources for information, whereas opponents leaned heavily on their networks for information. With frames often appearing in different sources, and limited critique of information flowing through trusted networks, participants were, at least to some extent, in filter bubbles and echo chambers where they were more likely to be exposed to information that conformed to their values and confirmed their views (cf., Pariser, 2011). This is where the economy - environment divide inherent in foundational elements (i.e., values and sense of place) appears to deepen, as people are exposed to mechanisms of cultural cognition that increase bias or displace critical analysis (Kahan, 2012; Kelly, 2011; Pariser, 2011). Conflict frames - which are already divisive, prime values and gain strength to an extent where ‘best possible living’ (from Rohan’s 2000 definition of values) is perceived to be under threat (Fairhurst, 2005; Nelson & Willey, 2001; Schultz et al., 2005). For example, self-enhancement values were primed by media frames threatening a way of life made possible by the oil and gas economy. Frames primed self-transcendence-nature values by suggesting environmental values such as marine ecosystems and Grizzly Bears were under threat, and by amplifying existing threats to the climate and at-risk species and ecosystems. When frames resonate with a critical mass, they exacerbate natural resource conflicts.

No frame was more influential in advancing a conflict narrative than the identity frame Anti-petroleum Extremists. This frame, together with new anti-terrorism legislation and leaks of RCMP and CSIS documents suggested pipeline protesters were being watched. This stirred intense feelings of unease and genuine fear that ultimately transformed a pipeline argument into a revolt for freedom of expression and peaceful assembly. Among environmentalists and some others - already feeling despair from a lack of traction on climate change and biodiversity loss,
there was a sense that Canadianism was under attack. For Indigenous people in the throes of a decolonization movement, it was yet another intolerable affront. Since identity frames link to agency and injustice frame elements (Gamson 1992; 2009; Noakes & Johnston, 2005), Anti-petroleum Extremists provided more than enough justification for principled, fervent resistance. With this frame, the Harper Government and pipeline protesters became enemies. After the government’s defeat in 2015, the simmering distrust it precipitated was ascribed to more abstract adversaries (e.g., Conservatives).

Self-identified pipeline opponents loathed the Harper omnibus budget Bill C-38 (Jobs, Growth, and Long-Term Prosperity Act, S.C. 2012, c.19), for having dismantled generations of responsible environmental regulations. Losses had piled up with the regulator, governments, and the courts, such that the environmental assessment process was perceived to entirely lack legitimacy. When injustices accumulate to a point where they become intolerable, a No Choice and/or Restoring Democracy frame (or a frame with similar motivational elements) arises. Far from a standalone project to be judged on its merits, the pipeline expansion appeared to be nearing unguarded goalposts in a bloody game orchestrated by the referees to guarantee a win. Protesters who stepped forward to be arrested on Burnaby Mountain perceived themselves as a last line of defense. They recounted the event as scary, but the right thing to do. Since the process lacked legitimacy, project opponents tasked themselves, and felt burdened with, the role of protectors of the environment and a poorly informed public. Indeed, these participants self-identified as Devoted Guardians, akin to the identity frame found in early media.

Yet, media documents used in the frame analysis showed that group leaders often took extreme, all or nothing positions. When these documents were combined with network data from
the survey and the #BreakFreeCanada protest, it was apparent that certain group leaders used their social capital - their centrality and reach in established networks, and their knowledge of how to motivate people to action, to disseminate persuasive but frequently divisive frames and messages. Some more moderately positioned participants, who did not approve of the rhetoric and tactics employed by the group that they had inadvertently or tentatively joined, described feeling drowned out or ostracized, believing they must align with the group or abandon the cause.

I contend that addressing media frames that provoke or sustain conflicts with extreme or aggressive messaging will require cross-pollinating media and networks with frames and information people might not typically see in filter bubbles and echo chambers. Frames with both self-transcendence and self-enhancement qualities can begin to create the conditions for projects to be widely accepted across a range of value priorities. For example, a nucleus of contention was the length of time it would take for the world to transition from fossil fuels to renewable energy (discussed in the next section, Transition Time). Mixing Energy is an example of combined self-enhancement, self-transcendence values frame that might interject a new conversation in siloed networks. The core framing elements are described in Table 8.1.

Beyond the scope of this research, there is a growing body of scholarly and policy work examining how to manage algorithms and other media effects that contribute to filter bubbles and echo chambers.
Table 8.1. Mixing Energy, core framing elements.

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<thead>
<tr>
<th>Diagnostic</th>
<th>Prognostic</th>
<th>Motivational</th>
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<tr>
<td>Fossil fuels and renewable energy sectors are competitive, such that one source wants to secure as much market share as possible. Anticipating climate-friendly policies and divestment, fossil fuel companies are eager to extract and sell as much product as possible, as soon as possible, increasing GHG emissions.</td>
<td>Transition time can be reduced by combining fossil fuel-based and renewable energy sources wherever possible, to lower emissions from fossil fuel-based sources and stabilize or back up variable renewable sources. Financial and regulatory incentives can encourage energy mixing.</td>
<td>There are ecological, economic, and social risks associated with both fossil fuel and renewable energy sources that can be reduced when combined (e.g., hybrid cars, using renewable energy for fossil fuel extraction). Some fossil fuel companies are already investing in renewable energy.</td>
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The roles of science and public consultation in economy versus environment conflicts.

Science and public consultations are often viewed as moderating influences in conflict. Indeed, science - particularly academic, peer-reviewed science, was widely trusted as a general source of information. Yet, in the context of the projects, it carried little weight unless decision-makers saw it as salient, credible, and legitimate. To some extent, this can be attributed to science as evidentiary proof or disproof, by decision-makers with legal backgrounds trained to find evidence to support a case, and those with business training, skilled in taking extreme negotiating positions with the understanding they will arrive at a more central place. It may also be attributed to win-lose approaches to decision-making, or in the case of project supporters, ‘win with conditions’. Regardless, cognitive shortcuts strongly affected perceptions and use of all information. In general, people generated, sought, and shared information that supported their positions. Both sides relied on non-profit or sector organizations to disseminate or lend credibility to claims.
For the environment, agency tended to be in numbers (of protectors), rather than tangible power. Among many project opponents, this manifested as a demand for ‘social license’, amassed through network mobilization. Participants varied on their views about social license. Some corporate representatives recognized the goodwill social license provides; others saw it as barrier to overcome. For regulators, social license translated to public opinion; not only was it seen as having limited worth, but addressing it in a review process was a logistical challenge. Participants generally agreed, that for the politicians who must consider social license, available votes and proximity to elections help determine whether the project is a quick win or loss, or part of a political legacy. Some aspire, as a legacy, to build a strong economy, while others have created protected area systems, for example. For nearly everyone, public opinion was easily dismissed as an uninformed public. On its own, public opinion did not appear to be an influence on decision-making.

Importantly, public consultation appeared to exacerbate conflict as much as having been denied the opportunity for public consultation, because both conditions evoked issues of injustice. Through party platforms, obvious political leanings, or explicit media comments, political leaders sometimes revealed their decisions before public consultation even began. Prime Minister Harper, for example, who served from 2006 to 2015, expressed enthusiastic support for pipelines prior to environmental reviews. Pal (2006, p. 263) described “empty theatrics where groups rant predictably while decision-makers watch the clock, waiting for it all to be over so that they can then go and make the decisions they were going to make anyway.” If a project is approved in the absence of social license, it is seen as unjust. If people are not allowed to
participate at all, that too is considered unjust. Yet, regulators resisted the notion that project review be a numbers game, and rightly so.

Importantly, public consultation should not be confused with the obligation to consult Indigenous people. In conducting this research, I discovered incongruities in sense of place and values among Indigenous participants that merit further, culturally sensitive examination. The Indigenous leaders I interviewed exhibited geopiety, sometimes described as a reverence for sacred places, or special connections to locales or natural features in the environment that have highly personal and specific meaning (Knowles, 1992). Geopiety is a spiritual and cultural place category of its own. The Facebook network, Send Kinder Morgan Your Food Fish highlighted the discounting of traditional use and its ties with sense of place, values, and perhaps other foundational social structures. Also, Indigenous knowledge networks are unlike other networks, since knowledge is entrusted to designated keepers and traditional language speakers, with protocols on how it is disseminated and used. These factors were significant elements in the conflict; the routine disregard for them was probably an additional antecedent to conflict.

**Transition Time, the Crux of the Trans Mountain Conflict (Finding #5)**

In general, participants had similar views on many issues, such as whether species and ecosystems at-risk of extinction signaled a much larger environmental problem, or whether climate change and biodiversity loss were interconnected and pressing problems; ninety-one percent of participants prioritized these statements. Only one set of views statements significantly and strongly split along project positions, and this was only for the Trans Mountain case, regarding the speed of transition from fossil fuels to renewable energy. Most project
opponents believed the transition could happen quickly, while supporters felt it would take a long time.

On this issue, there was a view that the other side suffered from a lack of awareness or ‘common sense’. (Notably, Lakoff (2005) viewed common sense as reasoning within a frame having broad appeal.) In examining transition time arguments, however, I found the claims people used to support their views were supported by factual information from authoritative sources. On the issue of global energy demand, for example, those who felt transition was within reach argued that global energy demand for oil will depend on policy choices, particularly those within global agreements. Those who believed transition would take a long time argued that global demand for oil will be high for decades. The International Energy Agency’s 2016 World Energy Outlook based its main scenario on the Paris Agreement on climate change. In this scenario, growth in oil demand slowed, but topped 103 million barrels per day by 2040 (from the current 98 mb/d). These numbers, based on the signal from governments was that fossil fuels would continue to be a bedrock of the global energy system for many decades to come, suggested global demand would indeed be high for decades. However, the Agency also warned the fossil fuel industry to prepare for policy shifts and a much sharper transition. Both arguments were true. For many issues - job numbers, the status of renewable energy, the signals the Trans Mountain project sends to markets, and so on, opposing arguments were similarly supported by authoritative sources.

Although participants tended to present valid arguments (oriented to their value orientations), the deep, curious, introspective thinking required for complex problem-solving was notably scarce. It was common for people to demonstrate sector-based groupthink, another
consequence of cultural cognition and media effects. I offer two examples. First, project supporters in both cases advanced frames that characterized their sector as an economic engine for the region and the country. The project was then positioned as an opportunity central to the prosperity of the country. The fossil fuel industry pointed to prosperity already realized, while the renewable energy sector showcased its growth and growth potential, as well as the moral imperative of a rapid transition. One might argue that a single economic engine is detrimental, and given the right policy mix, both can benefit by serving a rapid transition.

Secondly, with transition time as a point of contention, the anti-run-of-river frame Unnecessary Power struck a curious chord. In 2016, Site C was approved, a large hydroelectric dam in northeast BC. The project was viewed as the best way to service oil and Liquid Natural Gas industries and sidestep opposition to run-of-river projects, however it abruptly curtailed a flourishing and diverse renewable energy sector. With no large clean power calls in the foreseeable future, many companies were forced to look outside of the province for work. Given the need for a thriving renewable energy industry, including widespread expansion into the transportation sector, both Unnecessary Power and the provincial strategy to pursue Liquid Natural Gas and Site C in lieu of a thriving renewable industry appeared short-sighted.

This finding is important because it allows decision-makers to elevate the climate change conversation, beyond the barrier that is denialism (cf., Pew Research Center, 2017). While transition time is a values-based division, it is accessible. It can be addressed by developing a collective ‘fact base’, scenario planning, and seeking leverage points (cf., Kahane, 2012).
The Role of Climate Change in Economy v. Environment Conflicts Affecting Biodiversity (Finding #6)

Addressing the divide on transition time is important for biodiversity, because views on climate change may be another influence on the priority people place on biodiversity conservation. When activists on the BC coast were fighting for old growth forests in the 1990s, climate change was not on their radar. Today however, many west coast environmentalists are embracing climate concerns and climate action. In fact, biodiversity loss appears to have a lesser role when compared to climate change. Participants either viewed biodiversity loss and climate change as interconnected (more than 90%), or saw biodiversity loss as the lesser of the two challenges (9%). When viewed as interconnected, the emphasis was on the impact of climate change to biodiversity, rather than the resilience of social-ecological systems conferred by biodiversity. As a result, biodiversity and climate action advocates were on the same side in the Trans Mountain case, but at odds in the Bute Inlet case. Had BIHP proponents, and other climate action advocates in that case, taken the view that biodiversity conservation was a significant contributor to climate change mitigation and adaptation, they likely would have prioritized both, protecting or advocating for the protection of sensitive ecosystems and rare species prior to and while developing the project. I contend this could have prevented the Bute Inlet conflict altogether. Instead, there was little recognition that biodiversity conservation and climate action are largely compatible objectives, or how synergies or trade-offs between them might be negotiated. There are two leverage points here, to advance the notion of biodiversity conservation as a climate change mitigation and adaptation mechanism, and to bridge the gap on transition time to ensure biodiversity loss is addressed more urgently.
Learning from the Bute Inlet Case Study

The Bute Inlet run-of-river project was not a sense of place conflict and there were self-transcendence values on both sides, compared to the pipeline conflict which could be described as a values conflict as well as a clash of regions.

Furthermore, antecedent stressors were present in the Bute Inlet project but lacked the intensity and range apparent in the Trans Mountain project. Cumulative effects as a policy gap did not have the same potency as climate change, perceived as a technical challenge more than an ethical issue. Whereas federal deregulation was tied directly to pipeline approvals, environmental deregulation in the provincial sense was detached from run-of-river projects. Its impact was also dulled by the passing of time; important provincial environmental legislation and regulations had been reversed years before and some, like the *Wildlife Amendment Act (2004)* to list species-at-risk had never been enforced by regulation. Although Bill 30 had reduced community influence over private power projects, provoking a Restoring Democracy-like response, the large number of frames appeared to dull the impact of any single one. And, whereas the size and complexity of the Trans Mountain application prompted frustration as well as cognitive shortcuts, the Bute Inlet terms of reference was a manageable read. The federal review process, which had barely begun, was seen as legitimate; in fact, opponents had advocated for it. By contrast, the Trans Mountain review process was viewed as devoid of legitimacy; the regulator was perceived to be beholden to the pro-fossil fuel government and conspiring with industry.

The values of the parties in power typically take precedence in policy-setting, and over the course of the Trans Mountain conflict, all of the relevant senior governments were replaced
in elections where the projects were included as pivotal issues. Contrast this unsettled political setting with that of the Bute Inlet project, where there were many fiery exchanges and calls for a moratorium on run-of-river projects before the incumbent government was re-elected in 2009. At this juncture, there would have been some acknowledgement that run-of-river projects did indeed have social license to operate, causing opponents to lose momentum. Although I did not explore the temporal aspect of media frames, the post-election narrative appeared to focus on the solvency of BC Hydro and broader energy concerns more than environmental issues.

Had the project review gone ahead, the relative lack of cogent antecedents suggests it might have been considerably less contentious than the pipeline expansion. If the BIHP is revived, participants will benefit from knowing some antecedents have been addressed. In 2016, the Province developed a cumulative effects framework and interim policy for the natural resource sector (BC Government, 2016). Academics partnered with industry and others to develop a tool to assist with run-of-river site selection. Several run-of-river companies, academics, non-profits and others formed an organization to share views, ideas, and scientific information. Environmental groups had landed on the same side in later campaigns, including Trans Mountain, suggesting they shared the same networks and were subject to similar frames and information. There is more space for biodiversity considerations in this, less antagonistic setting, than in the one before.

**Conclusion: The Underbelly of Economy v. Environment Conflicts**

Values and sense of place are powerful influences. Values are multi-dimensional constructs that guide our most important decisions, including, for example, how we vote. Still, many of us rarely talk about values or sense of place. They are the underbelly of natural resource
decisions, because they are critically important and yet, many perceive them as personal vulnerabilities. And in some cases, they are indeed vulnerabilities. In war-torn countries, people are killed for expressing their values. Etiquette says, if you want to stay friends with people, don’t discuss politics (or religion). Mechanisms of cultural cognition discourage us from revealing too much, in fear that our values may collide with those of people who are important to us.

Similarly, sense of place for some participants reflected deeply rooted ways of life. In my interviews, I deliberately interspaced place-based questions half-way through each interview, to provide a reprieve from questions focused solely on conflict. When people described their favourite natural places, their voices would soften, and often there appeared to be a reluctance to share details. These were their sanctuaries, settings for some of their best memories, and they were somewhat protective of the locations and the stories of their experiences there.

Instinctually, we keep certain values and place connections hidden unless it becomes important to expose them. For example, some participants reported reluctantly coming forward to protest or otherwise contribute to the conflict when their values and place connections were under threat. Some people needed reassurance that they would remain anonymous should they agree to participate in my research, including leaders who had staunchly defended their groups’ values, positions, and views online – but later expressed more moderate views in their interviews with me.

Amid this trepidation, we want to celebrate our special places and express our values. We may share our sanctuaries with close friends and family members. When we have children, it becomes critically important to bestow our values upon them. Digital technology has provided
venues to share and experience shared values in relative privacy (e.g., Pringle, 2017). With personalization algorithms, we feel understood (Pariser, 2011). In social media and comment forums, many people give voice to their values behind pen names and with anonymous personas (e.g., Toepfl & Piwoni, 2015).

I contend that time, expense, and consequences of division resulting from economy versus environment conflicts can be mitigated by ensuring self-enhancement and self-transcendence values and senses of place are represented in decision-making processes for natural resource projects. Notably, I found most of the politicians participating in my research who prioritized self-transcendence values had higher self-transcendence (social) scores than self-transcendence (nature) scores, and were more concerned about social justice than biodiversity protection. People prioritizing self-transcendence (nature) values and nature-centric senses of place must be prepared to engage at higher levels of decision-making.

There are clear benefits for all parties, first of all because decision-making benefits from diverse perspectives (Holling, 2006; Johansson, 2004; Meadows, 2008). Although it is more difficult, the results are generally more robust. Intersections of diversity can lead to a Medici effect, characterized by extraordinary insights and innovations (Johansson & Amabile, 2017). Secondly, with self-transcendence (nature) values and nature-centric senses of place at early and final decision tables, nature and biodiversity have a voice. Pre-planning processes that explore environmental impacts with this level of diversity are likely to be more thorough and defensible to a broader audience. Projects can ‘fail early’ before significant resources are invested, and if subjected to a formal process, will have self-transcendence-oriented champions to advocate for it and address lingering concerns. Once people acknowledge there are different values and
approaches consistent with those values, and agree to consolidate them to determine the best way forward, values divisions are no longer barriers, but assets.

There are several ways to ease these integrative processes, first of all by being amenable to them. My participants were weary of conflict, and ready to dialogue and work towards solutions. However, activists must be less confrontational if they wish to be welcomed to decision tables. Those who prioritize self-enhancement values also tend to prioritize hierarchy values that appreciate social order. (This is one reason why we rarely see rallies to promote pipelines.) Similarly, self-enhancement-leaning individuals must avoid offering disingenuous invitations to participate. Most people who prioritize self-transcendence values also prize egalitarianism, a state where we are all moral equals, transcending selfish interests to cooperate for everyone’s benefit. Similarly, decision-makers should anticipate clashes of regions in cross-boundary projects, and make sense of place explicit before siting them.

Secondly, when planning and assessing projects, a ‘fact base’ should be developed or built upon. When the Bute Inlet hydro project stalled, opponents and supporters created the Energy Forum, where they could share information and build productive relationships. Here, specific arguments may be critically examined without confronting the broader foundations of values or sense of place. Recall that claims regarding transition time were oriented towards self-enhancement or self-transcendence values orientations, and were also supported by authoritative sources, often the same sources. In this venue, scientific uncertainty or complexity associated with policy gaps can be addressed by considering science as enlightenment, rather than as proof or falsification of an established position. Integrating western science with Indigenous and local knowledge not only facilitates a process that appreciates science as enlightenment, but brings a
diversity of values to bear on intractable, multi-scale natural resource issues. Ongoing, concerted efforts integrating these knowledges will best determine how to learn from them.

In both resource conflicts, cultural cognition and media effects appeared to amplify stereotypical, dismissive, and even contemptuous voices. A third way to ease integrative processes is to recognize and reiterate that we all share the same values, we just prioritize them differently (Schwartz, 1992). Self-transcendence-oriented individuals were not all altruistic, back-to-nature types. Nor were people with self-enhancement values self-absorbed, power-hungry overachievers. In discussing transition time from fossil fuels to renewables, individuals prioritizing self-enhancement did not exclude care for others, typically a self-transcendence (social) orientation. Rather, they focused less on ecological and social concerns than socio-economic ones, such as the inability to escape poverty without stable, cheap energy sources. Participants with clear self-enhancement orientations enjoyed the outdoors or drove hybrid cars. Examining sense of place, ‘NIMBYs’ were generally not unyielding and irrationally anti-development extremists; rather, they were people experiencing disruptions to their deep place connections and place identities (Devine-Wright, 2009).

The fourth and final way to ease integrative processes is to build awareness of, and manage divisive media effects. By appealing to a broader audience and seeking a wide or diverse distribution, frames can break free from the filter bubbles and echo chambers that contribute to polarization. An example of a widely distributed, effective frame was Restoring Democracy, the most prominent frame in the Trans Mountain case; it was repeated in mainstream news and elicited response from the new Trudeau Government. To defuse destructive frames such as Anti-petroleum Extremists, building awareness of frames is essential, together with techniques used to
frame and counter-frame issues and conflicts. Developing and advancing media frames that combine self-enhancement and self-transcendence qualities, such as the Do It Right frame in the Bute Inlet case or a Mixing Energy frame, give credence to some middle ground.

The middle ground is where dialogue, consensus and compromise resides. It is also where we will discover a range of values and sense of place, offering a suite of lenses with which to view complex problems (Meadows, 2008). Just as biodiversity confers resilience to ecosystems, values diversity and an array of place connections bring innovation and deep thinking to decision-making. Respect for opposing values may help overcome the power disparities in economy and environment conflicts, and enable the productive dialogues that have been wanting in 37 or more years of biodiversity conversations. When processes are designed that allow people the spaces to discuss deeply held values, and the meaning and significance of place, we will finally begin to reduce the conflictual nature of natural resource decisions.

**Future Research**

Important areas of future research are many. These include Indigenous sense of place and values, the nature of regional senses of place, the social considerations that flow from sense of place, how incongruent senses of place can be reconciled in inter-jurisdictional processes, how values and sense of place interact, and values and sense of place as forces of stability and resilience in times of change. For example, an ethnographic study with Canadian elders, examining connections to place and nature, might explore the role of these in adaptation and resilience. One might examine how values and cultural cognition affect the uptake of guidelines and other voluntary measures (compared to regulatory measures), how environmental education can shift values and sense of place over time, or the role of other opposing values in conflicts
(e.g., security and self-direction values in conflicts over immigration). A large social media study might examine values in political affiliation, relative to different governance structures, such as various forms of proportional representation. One can use experimental methods to determine how moderate views may be promoted in filter bubbles and echo chambers, to evaluate the efficacy of mixed values frames in defusing media conflict, and to explore new ways to mitigate the polarizing effects of cultural cognition and media. Governments may wish to investigate how to identify and address volatile No Choice frames before they precipitate social movements. Participatory research with Indigenous people to improve consultation processes, might examine sense of place, the integration of of western scientific, Indigenous, and local knowledges, and the traditional ecological knowledge of biodiversity. As a priority, I would like to pursue case studies exploring how affected communities respond to challenges associated with climate change and biodiversity loss – considering, for example, sense of place in forced evacuation and migration, values diversity in adaptive innovation, and the use of biodiversity conservation in adaptation (e.g., for pollination).

My research suggested that biodiversity conservation does not necessarily flow from appreciation of other environmental attributes. One environmental education topic that merits exploration is whether promoting biodiversity as an attraction among those who already have nature-centric place connections based on other attractions (e.g., beauty or tranquility) leads to greater appreciation and concern for biodiversity. Finally, education on the pivotal role of biodiversity in mitigating and adapting to climate change, and its contribution to overall resilience of Earth’s social-ecological systems, is paramount.
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**Survey Questions**

**Values Survey**
There are 6 questions in the Values Survey. Please read the 3 statements, then choose 1 statement that BEST describes how you feel, and 1 statement that LEAST describes how you feel.

At the end of this section is a text box where you can record any comments. For example, if none of the choices for a given question accurately reflect your values, you may write a statement that best describes how you feel.

<table>
<thead>
<tr>
<th>Values Set 1</th>
<th>Best describes how I feel</th>
<th>Least describes how I feel</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is important to me to be the one who makes decisions. I like to be the leader.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Success is important to me. I want to have an impact on people and events, and I like to show others how capable I am.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Everyone should be treated justly, even people I don’t know. It is important to me to protect the weak in society.</td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Values Set 2</th>
<th>Best describes how I feel</th>
<th>Least describes how I feel</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is important to me to listen to people who are different from me, even when I disagree with them.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Looking after the environment is important to me. I strongly believe that people should care for nature.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advancement is important to me. I strive to do better than others.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Values Set 3

The distribution of resources and power should be proportional to merit, effort, contribution, or ability.

To ensure socially responsible behaviour, a hierarchy of roles and an unequal distribution of resources and power are necessary. Those in charge are entitled to respect and deference but must also lead, guide, direct, and protect others.

We are all moral equals, and should transcend selfish interests to cooperate voluntarily with others to distribute resources and power for everyone's benefit.

<table>
<thead>
<tr>
<th>Best describes how I feel</th>
<th>Least describes how I feel</th>
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<tbody>
<tr>
<td></td>
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</tbody>
</table>

### Values Set 4

We should adapt to nature and fit harmoniously into the natural world.

Nature is a resource for prosperity. We benefit from directing and changing the world around us.

We should strive to maintain a balance between ourselves and nature.

<table>
<thead>
<tr>
<th>Best describes how I feel</th>
<th>Least describes how I feel</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Values Set 5

It is important to me to have money and expensive things. Wealth makes life easier and more pleasurable.

Humans have a duty to care for nature. It is important to me that people be accountable for their impacts on the environment.

It is important to me that people have equal opportunities to succeed and prosper.

<table>
<thead>
<tr>
<th>Best describes how I feel</th>
<th>Least describes how I feel</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</table>
Views survey.

There are 12 questions in the Views Survey. Please read the 3 statements, then choose 1 statement that BEST describes how you feel, and 1 statement that LEAST describes how you feel.

At the end of this section is a text box where you can record any comments. For example, if none of the choices for a given question accurately reflect your views, you may write a statement that best describes how you feel.
### Nature Appreciation

<table>
<thead>
<tr>
<th>I appreciate nature for what it provides to me (e.g., job, recreation, foods).</th>
<th>Best describes how I feel</th>
<th>Least describes how I feel</th>
</tr>
</thead>
<tbody>
<tr>
<td>I appreciate nature for its beauty.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I appreciate nature for its life-sustaining qualities (e.g., biodiversity, climate regulation).</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Extinction

<table>
<thead>
<tr>
<th>Species and ecosystems that are at risk of extinction signal a much larger environmental problem.</th>
<th>Best describes how I feel</th>
<th>Least describes how I feel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extinction is about &quot;survival of the fittest&quot; - let nature take its course.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>My religious or spiritual beliefs include a moral duty to care for all creatures.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Trust in Information

<table>
<thead>
<tr>
<th>Perception</th>
<th>Best describes how I feel</th>
<th>Least describes how I feel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scientific evidence is more reliable than other types of information.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Most of the information from the media is reliable (e.g., TV and radio</td>
<td></td>
<td></td>
</tr>
<tr>
<td>news, online or paper newspapers, news magazines).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The information I receive from others in my organization or sector is</td>
<td></td>
<td></td>
</tr>
<tr>
<td>more reliable than other types of information.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Role of Nature in My Life

<table>
<thead>
<tr>
<th>Perception</th>
<th>Best describes how I feel</th>
<th>Least describes how I feel</th>
</tr>
</thead>
<tbody>
<tr>
<td>I would rather spend time with people, or in urban settings, than in</td>
<td></td>
<td></td>
</tr>
<tr>
<td>nature.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regular time outdoors in natural settings is important for my physical,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>mental, and spiritual health.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I like both natural and built settings; one is not more important to me</td>
<td></td>
<td></td>
</tr>
<tr>
<td>than the other.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
When environmental protection conflicts with energy projects...

<table>
<thead>
<tr>
<th>Best describes how I feel</th>
<th>Least describes how I feel</th>
</tr>
</thead>
<tbody>
<tr>
<td>...I am more inclined to sympathize with or support advocates of environmental protection.</td>
<td></td>
</tr>
<tr>
<td>...I am more inclined to sympathize with or support advocates of energy projects.</td>
<td></td>
</tr>
<tr>
<td>...I am more inclined to be neutral, as one argument is no more compelling than the other.</td>
<td></td>
</tr>
</tbody>
</table>

Nature's Role in Economy

<table>
<thead>
<tr>
<th>Best describes how I feel</th>
<th>Least describes how I feel</th>
</tr>
</thead>
<tbody>
<tr>
<td>When the economy is doing well, people are better able and more likely to care for nature. Efforts that unnecessarily limit economic growth and prosperity inevitably harm the environment.</td>
<td></td>
</tr>
<tr>
<td>A healthy economy is contingent on a healthy environment; economic prosperity will inevitably decline if nature is not protected. Protecting nature can benefit the economy and lead to a more sustainable kind of prosperity.</td>
<td></td>
</tr>
<tr>
<td>Economic growth is a root cause of environmental problems. Limits to growth or de-growth are prerequisites for sustainability.</td>
<td></td>
</tr>
<tr>
<td>Energy Projects</td>
<td>Best describes how I feel</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>Fossil fuel-based energy projects are necessary evils, as energy needs are</td>
<td>![Radio button]</td>
</tr>
<tr>
<td>increasing and alternate technologies cannot meet these needs.</td>
<td></td>
</tr>
<tr>
<td>New energy projects are critical to economic stability and national security.</td>
<td>![Radio button]</td>
</tr>
<tr>
<td>Energy production must become more ecologically sustainable to avert catastrophic</td>
<td>![Radio button]</td>
</tr>
<tr>
<td>climate change and biodiversity loss.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Biodiversity Science in Decision-Making</th>
<th>Best describes how I feel</th>
<th>Least describes how I feel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biodiversity science, which includes the designation of certain ecosystems as</td>
<td>![Radio button]</td>
<td>![Radio button]</td>
</tr>
<tr>
<td>'sensitive' or 'at-risk', is one of the most important considerations in decisions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>for lands and resources, because it is factual and objective.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biodiversity science is one of the most important considerations in decisions for</td>
<td>![Radio button]</td>
<td>![Radio button]</td>
</tr>
<tr>
<td>lands and resources because the risks are too great if ignored or minimized.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biodiversity science is less important than most other considerations in land and</td>
<td>![Radio button]</td>
<td>![Radio button]</td>
</tr>
<tr>
<td>resource decisions.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Climate Change and Biodiversity Loss

<table>
<thead>
<tr>
<th>Best describes how I feel</th>
<th>Least describes how I feel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Climate change and biodiverse loss are distant threats, and there is much to be determined before they can be weighed against other factors in decision-making for lands and resources.</td>
<td></td>
</tr>
<tr>
<td>Scientific evidence has shown that climate change and biodiversity loss are interconnected and pressing problems that must be considered in all land and resource decisions.</td>
<td></td>
</tr>
<tr>
<td>Climate change is more urgent and pressing than biodiversity loss, and must be considered in all land and resource decisions.</td>
<td></td>
</tr>
</tbody>
</table>

#### Comparing Science

<table>
<thead>
<tr>
<th>Best describes how I feel</th>
<th>Least describes how I feel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compared to biodiversity and climate science, other types of science - such as economics, are equally or more important in decisions for lands and resources.</td>
<td></td>
</tr>
<tr>
<td>Compared to science, public opinion should be considered equally or more important in decisions for lands and resources.</td>
<td></td>
</tr>
<tr>
<td>Compared to academic or government science, local and/or indigenous knowledge and experience should be considered equally or more important in decision-making for lands and resources.</td>
<td></td>
</tr>
</tbody>
</table>
Reports survey.

Reports Survey
Below is an incomplete list of reports that a) have been developed in response to the Trans Mountain Pipeline Expansion (TMPE/TMEP/TMX) project, or b) have been mentioned as relevant to the project. They are divided into several parts for readability.

To complete this survey, it is not necessary that you find and view the reports.

In my view, this report is...

Decisions survey.
Decisions Survey

Below is a partial list of decisions associated with the Trans Mountain Pipeline Expansion (TMPE/TMEP/TMX) project.

I, or my organization/group, made the decision to...

| Yes | No |

Network survey/questionnaire.

Network Questionnaire

Below is a partial list of the organizations/groups engaged with the Trans Mountain Pipeline Expansion (TMPE/TMEP/TMX) project.

Please characterize your relationship (or your organization/group's relationship) with each organization (or any of its members) as it relates to the TMPE project. Choose the response that BEST characterizes this relationship.

Note: If you are not associated with an organization, simply speak for yourself. For example, "No Relationship" would be: "I do not communicate with this organization".

No Relationship: My organization does not communicate with this organization.
Informative (in): This organization provides information to my organization.
Informative (out): My organization provides information to this organization.
Directive (in): This organization provides advice to my organization (or calls it to action).
Directive (out): My organization provides advice to this organization (or calls it to action).
Cooperative: Our organizations work separately or side-by-side to achieve common goals.
Collaborative: Our organizations have a formal arrangement to achieve common goals.
Supportive (in): This organization provides $ or human resources to my organization.
Supportive (out): My organization provides $ or human resources to this organization.
My Organization: This is my organization.

This is the longest survey, and is a very important one. It creates the network for network analysis. Your efforts are appreciated!
Questions for Semi-structured Interviews

Do you have any questions before we begin?

Fill in any gaps in demographic info (e.g., Do you self-identify as Indigenous, Aboriginal, or First Nation?).

Please tell me about your experience with the [project name].

Values and Views: Clarify or explore values and views survey responses (e.g. What does balance mean for you?)

Place: I would like you to think of a place, a natural area where you like to spend time. Where is this place? How would you describe your connection to this area? What do you do there? What is it that attracts you to this place? How long have you been going there?

Have you been to [the project area]? Repeat earlier place questions. Become clear enough to categorize place connections by Hay (1998) and Cross (2015) categories.
Networks: Ask about relationships to organizations nominated since his/her responses were collected. Explore the nature of his/her organization (number of members/reach).

Reports: Ask about reports nominated since his/her responses were collected.

Where do you typically get your news? Do you think these sources have portrayed the project accurately? What do you read to stay current (in your work)? Where did you get your information regarding the project? For TMPE participants: Did you review the Trans Mountain (2013) application?

Decisions: Explore some or all of his/her decisions from the survey. Please tell me about your decision to... What influenced your decision? Did you discuss this with anyone before you made the decision? Who?

What do you think a person needs to know to make good decisions for energy projects affecting sensitive ecosystems or the climate?

Appendix B. Measuring Value Priorities

Measuring Self-transcendence and Harmony

To examine self-transcendence values, including the universalism personal values type and the harmony cultural values type, it is necessary to understand them as motivations (Schwartz, 1992; 1994). The defining goals of the universalism value type include understanding, appreciation, tolerance, and protection for the welfare of all people and for nature (Schwartz, 2012). Schwartz (1992, 2012) believed that universalism values arise from an awareness of the scarcity of natural resources, and from encounters with others beyond extended primary groups. Those who prioritize universalism values believe a failure to protect the natural environment or to understand people who are different, and to treat them fairly, will lead to conflict and to
destruction of the resources on which life depends (Schwartz, 1992; 2012). People may develop universalism values because they believe in a shared fate, and therefore have an incentive to ensure others’ welfare (Rohan, 2007). Universalism values therefore contribute to positive social relations, and are especially important when people must relate to out-groups and others with whom they do not readily identify (Schwartz, 2012). Like achievement (a self-enhancement value type), universalism is a value rooted in survival (Schwartz, 2012).

Although a concern for nature is closely linked to a concern for the welfare of all humankind, universalism can be divided into nature and social subtypes. The nature subtype includes unity with nature, protecting the environment, and a world of beauty (Fischer & Schwartz, 2011; Schwartz, 1992, 2012).

To capture the subtleties in values discourses, I measured care for nature (protecting the environment), adapt to nature (modified from unity with nature), and duty of care. Duty of care was identified as a key factor in a Canadian World Values Survey study of faith, politics, and the environment (Clermont, 2012). Here, it may lack the religious or spiritual emphasis but still connotes the notion that one is accountable to nature. A moral duty to care for all creatures, arising from a spiritual or religious orientation, was included in the views survey (extinction set) to assess beliefs about species and ecosystems at risk of extinction; this was also used to examine duty of care values. World of beauty was excluded from the values survey but added to the views survey (nature appreciation set) to distinguish an appreciation of nature for its aesthetic qualities from other types of appreciation.

The harmony cultural value orientation encompasses the universalism elements of protecting the environment, unity with nature, and a world at peace (Schwartz, 2006). The vision
of the Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets is “a world of living in harmony with nature where by 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people” (Pisupati & Prip, 2015, p. 22). In this work, harmony is measured with the universalism value *adapt to nature*. “We should adapt to nature and fit harmoniously into the natural world.” *A world at peace* is measured in a security values set.

The social universalism subtype includes *broadmindedness* (tolerance of different ideas and beliefs), *equality* (equal opportunity for all), *social justice* (correcting injustice, care of the weak), *inner harmony* (at peace with myself), *wisdom* (a mature understanding of life), and *a world at peace* (free of war and conflict). (Fischer & Schwartz, 2011; Schwartz, 1992, 2012). Of these, I measured *broadmindedness*, *equality*, and *social justice*. Together with *a world at peace*, they most often refer to the welfare of others beyond the in-group (Schwartz, 2007). Notably, Kristiansen & Zanna (1994) found that both sides of a contentious issue (e.g., abortion) may value *a world at peace*.

**Measuring Equality, Hierarchy, and Proportionality**

Schwartz’ (1994) cultural value *hierarchy* construct was combined with Rai and Fiske’s (2011)’s equality and *proportionality* to develop a measure of how people feel resources should be distributed. Equality is one of three universal constructs described by Rai and Fiske in their work with moral motives and Relationship Regulation Theory. In Kahan-like fashion, Rai (2012) asserted the motives for evaluating and guiding one’s own judgments and behaviours are morally referenced to social relationships (Rai & Fiske, 2011). He compared equality - the motive for balanced, in-kind reciprocity, equal treatment, equal say, and equal opportunity, with
hierarchy, proportionality, and unity as components in a universal structure of motivations.

Unity, focused on eliminating threats to cultural contamination, was irrelevant to the Canadian context and has been omitted here.

“Hierarchy is the motive to respect rank in social groups where superiors are entitled to deference and respect, but must also lead, guide, direct, and protect subordinates” (Rai & Fiske, 2011, abstract). In Schwartz cultural values, hierarchy emphasizes power and authority (Vauclair, Hanke, Fischer, & Fontaine, 2011).

“Proportionality is the motive for rewards and punishments to be proportional to merit, benefits to be calibrated to contributions, and judgments to be based on a utilitarian calculus of costs and benefits” (Rai & Fiske, 2011, abstract). It is this that underlies market pricing models (Rai & Fiske, 2011).

An equality motive would provide equal legal rights to every person (e.g., in National Energy Board hearings), whereas a hierarchy motive would entitle superiors to greater rights and responsibilities, and a proportionality motive would assign rights based on merit, effort, contribution, or ability (Rai & Fiske, 2011). Rai and Fiske (2011) found that opposing groups use different motives to frame issues; for example, arguments for affirmative action are framed in terms of equality, whereas arguments against are framed in terms of proportionality.

By including proportionality, Rai and Fiske’s definitions add further substance to the measurement of Schwartz’ hierarchy vs. egalitarianism cultural dimension. The proportionality motives could be used to frame acceptable losses (e.g., incremental biodiversity loss) for a greater good (e.g., strengthening ‘the economy’) (Rai & Fiske, 2011). Rai’s work also emphasizes the moral imperative, which has tended to get only a passing glance in the
environmental values literature. Table 4 demonstrates how proportionality, hierarchy and egalitarianism were assessed.

Table 4. Best-least survey question, derived from Rai and Fiske (2011).

<table>
<thead>
<tr>
<th>Best</th>
<th>Values, Set 3</th>
<th>Least</th>
</tr>
</thead>
<tbody>
<tr>
<td>V7.</td>
<td>The distribution of resources and power should be proportional to merit, effort, contribution, or ability. <em>(Proportionality)</em></td>
<td></td>
</tr>
<tr>
<td>V8.</td>
<td>To ensure socially responsible behaviour, a hierarchy of roles and an unequal distribution of power and resources are necessary. Those in charge are entitled to respect and deference but must also lead, guide, direct, and protect others. <em>(Hierarchy)</em></td>
<td></td>
</tr>
<tr>
<td>V9.</td>
<td>We are all moral equals, and should transcend selfish interests to cooperate voluntarily with others to distribute resources and power for everyone’s benefit. <em>(Egalitarianism)</em></td>
<td></td>
</tr>
</tbody>
</table>

**Measuring Self-enhancement and mastery**

People may develop a self-enhancement focus because they believe others are not dependable or trustworthy, and therefore must develop expertise or dominance to ensure survival (Rohan, 2000, 2007). The self-enhancement orientation encompasses two mostly compatible value types: achievement and power.

The defining goal of the achievement value type is personal success (Schwartz, 2012). People who emphasize achievement values demonstrate competence in terms of prevailing social or cultural standards, thereby obtaining approval from others (Schwartz, 2012). Competent performance is needed for individuals to generate the resources needed to survive, and for groups and institutions to reach their objectives. Achievement values may motivate individuals to invest in group tasks, or they may disrupt social relationships and interfere with group goals. People
that prioritize *achievement* prize ambition, success, capability, influence, intelligence, self-respect, and social recognition (Fischer & Schwartz, 2011; Schwartz, 1992, 2012). Here, *achievement* is measured by *success to impress*, and *better than others*, using statements borrowed from Schwartz values surveys.

The defining goals of the *power* value type are social status, prestige, and control or dominance over people and resources (Schwartz, 2012). A fundamental premise of the *power* value type is that social institutions require a degree of status differentiation, i.e., a hierarchy, in order to function (Schwartz, 2012). People that prioritize a *power* value type prize authority, preserving public image, social power, social recognition, and wealth (Fischer & Schwartz, 2011; Schwartz, 1992, 2012). *Decides and leads* and *important to be rich* were used to measure *power* values.

*Mastery* was measured in direct contrast to *harmony* and only within a nature context: “Nature is a resource for prosperity. We benefit from directing and changing the world around us”.

**Measuring Security**

A *security* values set probed the need for protection from enemies relative to *a world at peace* (a social self-transcendent value), and a desire for fundamental freedoms (e.g., expression, peaceful assembly). *Security* is more closely aligned with self-enhancement values than self-transcendent ones (see Figure 3.1), while fundamental freedoms are encompassed by *self-direction*, a value orientation in opposition to *security* and adjacent to self-transcendence in Schwartz’ circumplex structure of basic values. While concerns for biodiversity loss and climate change may be construed as security issues, underlying prospects for a world at peace, security
was also measured due to circumstances in the TMPE case, where anti-pipeline protesters were framed as risks to national security, and protesters were concerned about their fundamental freedoms.

In summary, there are two motivations outlined in the cultural values and moral motives literature that align with personal self-transcendence values: egalitarianism/equality and harmony, and three that align with self-enhancement values: hierarchy, mastery, and proportionality. Personal self-transcendence values are split into nature universalism and social universalism values, while self-enhancement values include power and achievement value types. Security values espousing protection from enemies are more closely aligned with self-enhancement values, whereas values promoting freedom of expression and peaceful assembly are more compatible with self-transcendent values.

Notably, Kahan (2012) used two attitudinal scales: hierarchy-egalitarianism and individualism-communitarianism to measure cultural cognition. Survey statements were oriented to social and economic issues, for example, “The government should stop telling people how to live their lives.” Schwartz (1992; 1994) measurements were deemed to be better suited to natural resource issues.