Environmental Journalism: A Case Study of the Canadian Bituminous Sands

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Abstract

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This thesis examined news content on the Albertan bituminous sands to document a Canadian contemporary issue and to improve the available conceptual frameworks for analyzing environmental issues covered in the news media. There is currently limited research on the topic from a journalistic perspective, despite a body of literature on environmental journalism that predicts (and cautions that) the environmental news coverage of bitumen will be event-driven, overly simplified, increasingly politicised and economically framed. Building on these predictions, the project uses a case study approach as a bounded illustration of environmental journalism, in combination with content analysis to reflect on the intrinsic, multifaceted and complex attributes of environmental affairs in the news coverage. A typology developed in this thesis allowed for an examination of 409 news articles from five Canadian newspapers from the years 2007 to 2009, and gave evidence: for a sustained interest from the newspapers to report on Alberta bitumen; for an evenly distributed and broad variety, albeit asymmetrical presence of news sources that favored politicians, industrial and environmental interests; and for the presence of multiple types of information in the examined news, though concentrated mostly on economic aspects of bitumen, and lesser on ecological, political, scientific and other dimensions.

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Chapter 1: Introduction

Context and Problem Statement

In a speech given before Great Britain's Chamber of commerce on July 14, 2006, the Prime Minister of Canada, Stephen Harper, pronounced the following: "The oil sands are the second largest oil deposit in the world, bigger than Iraq, Iran or Russia; exceeded only by Saudi Arabia. Digging the bitumen out of the ground, squeezing out the oil and converting it in into synthetic crude is a monumental challenge. It requires vast amounts of capital, Brobdingnagian technology, and an army of skilled workers. In short, it is an enterprise of epic proportions, akin to the building of the pyramids or China's Great Wall. Only bigger". Almost exactly seven years later, the derailment of a cargo train transporting unconventional crude oil from North Dakota and Alberta caused an explosion that killed forty-seven people and spilled 6.5 million litres into the soil and waterways of Lac-Mégantic, Québec, a town of 6000 inhabitants. Stories about Canadian bituminous sands are regularly covered in the news and correspondingly, the topic represents a key, contemporary environmental issue that has increasingly gained public interest and global importance. As one reporter puts it, "It is one of the greatest issues of our time, inside Canada and outside Canada. So you know you are working on something that's vitally important and you know people are going to pay attention to what you produce" (Paskey and Steward 2012, iv). Yet, with the proliferation of industrial projects witnessed over the past three decades (CAPP 2011), only three studies have investigated how the bituminous sands are covered by the Canadian news media.

But perhaps more significantly, the discipline of environmental journalism studies is faced with a deeper foundational issue related to the study of communicating environmental issues in general, over the quasi-absence of a clearer, streamlined articulation on how to best analyze the content of environmental reporting. Because of the complex, interconnected and pressing attributes of environmental affairs, their understanding requires background information that extends to and implicates a wide range of multiple societal issues (Cox 2006; Boykoff et al. 2008; Goodman et al. 2008; Cottle 2009; Olausson 2009; Berglez 2011; Hansen 2011). These include but are not limited to policies and regulations, health and safety, ecosystem and sustainability, science and technology, industrial and commercial developments, and even international relations. Whereas past research has established that environmental news coverage tends to be event-driven, overly simplified, increasingly politicised, and reported in economic terms (see Literature survey, Chapter 2), it fails to highlight how or why these observations are more significant or targeted to environmental news specifically as opposed to other subjects. In other words, such critiques neglect to pinpoint what the commonality shared among environmental journalism is or should be, which seems to fall short of an unspoken standard. Moreover, these predictions can overlook any analysis of the important connections the news media do make, thereby providing little explanation of the value such predicted information could carry.

This thesis sought to put environmental issues at the centre of its methodological inquiry to begin the process of defining a generalized conceptualisation of what constitutes environmental news content. It did this with the goal of enacting a deeper conversation between the literature analysing the content of environmental reporting and

the author's desire to embed a complex, interconnected view of environmental affairs into such methods. To capture this goal in a tangible way, the research used a current topic covered in the print news media. Hence, this research project asks: *Can the assessment of media coverage of the Canadian bituminous sands (case study) provide a bounded example allowing the elaboration of a conceptual framework that is designed to improve content analysis of environmental news coverage*? The presented sought to answer this research question through three objectives: (1) to suggest a conceptual framework for the analysis of environmental issues covered in the news media; (2) to test this conceptual framework on a Canadian contemporary and ongoing issue in environmental journalism studies; and (3) to iteratively refine the produced conceptual framework.

Approach to Overall Problem: Content Analysis of a Case Study

In his book *Environmental Communication* published in 1989, Luhmann wrote that environmental issues have reached an unprecedented intensity over the past decades and can no longer be ignored. Environmental journalism studies have highlighted how news media logic is challenged by the density and interconnectedness of environmental issues, and that the implications of environmental issues transcend temporal and geographical boundaries (Boykoff et al. 2008; Cottle 2009; Olausson 2009; Berglez 2011). Environmental reporting is doubly hindered by internal and external pressures of the professional trade such as journalists' limited knowledge of science, deadlines, technological shifts and political struggles (Friedman 2004; Russell 2006; Boykoff 2009; Hansen 2011). Keeping such considerations in mind, studies have nonetheless established

three central, albeit pessimistic observations regarding the news coverage of environmental issues (discussion of which is expanded in Chapter 2): 1) it remains overwhelmingly centered on occurrences of events (Gamson and Modigliani 1989; Einsiedel and Coughlan 1993; Singer and Endreny 1993; Anderson 1997; Shanahan and Good 2000; Nisbet and Huge 2006; Soroka et al. 2009; Bolsen 2011); 2) it is therefore simplified, superficial, lack context and explanations, dramatized, or subjected to trivial features about celebrities (Friedman 2004; Thompson R. 2005; Gunster 2009; Lyytimaki and Tapio 2009; Olausson 2011); and 3) that increasingly, the coverage of a social, scientific or environmental issue becomes one of politics, ideologies and economics (Nelkin 1995; Reis 1999; Miller and Reichert 2000; Nisbet and Lewenstein 2002; Brossard et al. 2004; O'Donnell and Rice 2008; Cottle 2009; Soroka et al. 2009; Maeseele 2011; Young and Dugas 2011). In turn, these characteristics avoid the very issue and associated science gets lost in political debates, denying not only an understanding of a complex environmental issue, but perhaps a possibility to connect abstract notions like climate change to isolated events that can be more readily grasped by citizens (Gunster 2009; Olausson 2009; Gavin et al. 2011;).

This thesis predicted that such critiques and conclusions will be found in the case study of the Canadian bituminous sands. Its desire, however, was to take a step back to consider the legitimacy of such predicted findings by examining the contextualizing material that informs the coverage of events, the value and description of voluminous but shallow information that has not been further elaborated in the literature, and keying upon how authority figures used their privileged space in the news. Otherwise put, the project's overall approach chose to specifically explore an analysis of news content on the

Alberta's bituminous sands, while in parallel, using this case study for a reflexive assessment of the methodology itself that aimed to offer a generalized framework in tune with the complexity of environmental topics.

In several ways, the research fills a gap where studies on environmental content analyses have provided important contributions to better understanding journalistic processes, but have avoided or neglected the formulation of foundational theoretical concepts of environmental news coverage. As O'Donnell and Rice (2008) point out, an environmental conceptualization or framework in journalism studies remains relatively unchartered territory. One explanation is that, by and large, past environmental media research only engages and is interested in researching a specific topic – e.g. climate change, biotechnology, wind power, etc. as a case study (652). Its purpose offers a narrow scope and partial overview that is not intended to be inscribed within more generalising theoretical concepts of environmental news coverage. Thus, relevant studies only provide sparse conceptual frameworks for addressing existing criteria or standards to be used in content analysis and make no explicit claims related to what makes environmental news environmental. To date, the investigations focus on: attention-cycle theory which informs the cycling nature of news media (Trumbo 1996; McComas and Shanahan 1999; Brossard et al. 2004; Nisbet and Huge 2006), agenda-setting in the media and political landscapes indicating topic salience to the public (Ader 1995; Shanahan and Good 2000; Nisbet and Lewenstein 2002; McCombs 2005), communicating the environmental notion of risk and hazard (Singer and Endreny 1993; Cox 2006; O'Donnell and Rice 2008), and trends, patterns or emerging shifts to be

predicted (Parlour and Schatzow 1978; DeMott and Tom 1990; Mazur 1998; Boykoff 2008; Soroka et al. 2009; Bolsen 2011; Gavin et al. 2011).

Additionally, these studies often provided insufficient details on how their analyses were carried. For example, only the research questions or hypotheses and the choice of data were explained in many studies, with limited or no descriptions or rationales for the methods involved (Mazur 1998; Brossard et al. 2004; Ungar 2008; Das et al. 2009; Mazur 2009; Gavin et al. 2011). This may be due to the limits on the size of a peer-reviewed publication, but is nevertheless troublesome in light of how to go about analyzing and conceptualizing environmental news.

Finally, concerned with the various discourses the environmental news coverage might enclose, other content analyses are more interpretive and, chiefly focused on framing analysis. Journalistic frames are crucial for organizing complex concepts and constitute effective ways for developing cognitive shortcuts. They involve both selection and salience in a communicated text (Entman 1993) and rely on a variety of linguistic devices to promote socio-culturally embedded meanings (Entman 1993, 2010; Van Gorp 2007). Notably, Gamson and Modigliani (1989) have created a typology of discursive frames which influenced subsequent studies on diverse environmental topics (e.g., Nisbet and Huge 2006; Maeseele and Schuurman 2008; Doyle 2011; Maeseele 2011). While framing analysis allows more flexibility in analysis, it is difficult to effectively employ until a more systematic and structural understanding of an issue is established. According to Tankard (2001), the analytical tool of framing analysis subjects the research under study to arbitrary choices in the identification of frames rather than a more systematic process (in Nielsen and Kjaergaard 2011).

Importantly, as Krippendorff (2004) argues, while content analysis does depend on a researchers' objectives, research questions and contexts, the method does share a common procedural logic and is subjected to socially acceptable criteria (xxi). However, past content analysis of environmental issues have so far ignored the necessity to fully articulate this common procedural logic, thereby leaving environmental journalism studies with a lack of uniformity at the least, and perhaps more widely, a missed opportunity for more clearly defining the underlying, implied issues shared in any environmental issue.

Thesis Structure and Specific Aims

The overall objective of this thesis was to provide an assessment of media coverage of the Canadian bituminous sands from selected newspapers, with the goal of elaborating of an improved conceptual framework for the analysis of environmental news coverage. The following specific aims were undertaken:

1. To review the literature and situate the project within the field of environmental journalism studies. This review aimed to examine the intersection of such studies with science and risk communication studies, as well as to introduce the case of bituminous sands in Alberta. Both the reviewed literature and explored topic form the foundation for building a framework of concepts useful to analyse news about the environment (Chapter 2);

2. To develop and pilot a methodology that synthesizes the literature reviewed in Chapter 2 with a normative, conceptual, exploratory and empirical process developed by the author that fulfills the thesis objectives (Chapter 3);

3. To undertake a content analysis with the typology developed in Chapter 3 to provide an account of selected Canadian newspaper coverage of the bituminous sands activities in Northern Alberta (Chapter 4);

4. To present a final reflexive account of the developed typology and to discuss what the findings mean to future prospects in environmental journalism analyses (Chapter 5).

The findings generated from these aims relate to both the reviewed literature in environmental journalism studies and to journalism studies in general. They demonstrate the newsworthiness and complexity of the examined topic which translated into a plurality of underlying, overlapping dimensions while maintaining certain dominating types of information. Despite such asymmetry, the results presented in Chapter 4 help to show how the developed conceptual framework manifested in the examined news coverage, showing that information concentrated mostly on economic aspects of bitumen, and lesser on ecological, political, scientific and other dimensions. More than an added documentation to Canadian contemporary environmental news coverage, this project, by proposing to list and identify the components of environmental affairs as a conceptual framework, contributes an analysis of the textual components that inform environmental news stories and provides future prospects for how to enable more comprehensive reporting on the subject.

Chapter 2: Literature Review

Context

In a North American context, the current scholarship of environmental journalism constitutes a subfield of journalism, communication and media studies. According to Rademakers (2004), it is both part of science journalism and risk communication (in Giannoullis, Botetzagias and Skanavis 2010), which "has grown phenomenally" (Pleasant et al. 2002, 204), along with an increasing academic interest in media depictions of environmental issues since the late 1980s (Hansen 2011). Apart from Canada where its modern environmental reporting from the early1960s has "evolved slowly and erratically over a long period of time" (Keating 1993, 81), the topic of the environment has gained a distinctive strand within media and communication fields (Hansen 2011, 9), mirroring the state of environmental reporting. This chapter reviews the current literature related to the concept of the environment, the critiques of environmental news coverage, current gaps in environmental journalism studies and the bitumen industry in Alberta.

Literature Informing Conceptual Frameworks for Environmental News Analysis

Concept of Environment

The concept of 'environment' consists of two components that are in interaction with each other: nature and humans (O'Donnell and Rice 2008). Nature can be defined as "anything not made by humankind, domesticated, or cultivated" (644), but is also culturally and historically rooted in conflictual terms: nature is an idyll but also a threat.

Nature reflects an image of purity, beauty and spirituality evoking the nostalgia of a simpler time and calling for its protection. To speak of 'the environment' compels to its preservation or conservation (Dennis 1991; Einsiedel and Coughlan 1993). Dryzek (1997) calls such environmental discourse "green romanticism". In contrast, nature is also wild and powerful, a resource for humanity that can be domesticated (Remillard 2011). Thus, anything environmental nowadays relates to pollution, wilderness preservation, population growth, depletion of natural resources, energy supply, animal rights, species extinction, global climate change, depletion of the ozone layer, toxic waste, ecosystem protection, and environmental justice and morality, human livelihood, attitudes and relation to other entities on the planet (Dryzek 1997, 3).

The importance of these issues also relates to the notion of sustainability. According to the Brundtland report (1987), "sustainable development is development that meets the needs of the present without compromising the ability of the future generations to meet their own needs". Moreover, sustainability means that "the natural world and its component life forms and the ability of that world to regenerate itself through its own evolution has basic value. Within and among human societies, fairness, equality, diversity and self reliance are pervasive characteristics of development that is sustainable" (National round table on the environment and the economy from the Government of Canada 1993, 76). Similarly, another definition suggests "meeting basic present human needs in a just and equitable manner that does not deprive future generations to their basic requirements and, in addition, ensuring the health and integrity of ecosystems" (Lemons 2011, 380).

For environmental communication, Keating (1993) insists on grasping the concept of the ecosystem because of the close interrelationships and linkages between the components of an ecosystem. An ecosystem viewpoint therefore asks that communicating about the environment involve a "pragmatic and constitutive vehicle for our understanding of the environment as well as our relationships to the natural world; it is the symbolic medium that we use in constructing environmental problems and negotiating society's different responses to them" (Cox 2006, 16). For some (Gunster 2009; Lindenfeld et al. 2012), this calls for a need to pluralize the communication process in its "methods, discourses and images to open itself toward the possibility of blending with other movements, discourses, practices, and faiths" (Ivakhiv 2010, 119).

Hence, environmental news topics carry a multifaceted dimension. They have "permeated a wide range of fora indicated by the proliferation of sub-topics" (Einsiedel and Coughlan 1993, 142), such as energy and sustainability issues, creating an expansion and diversification of discourses in the media (i.e., from a particular scientific or environmental problem to economic, legal, or ethical discourses) (Hansen 2011; Boykoff 2009). The explanation is that "the increasing interconnectedness of the world that characterizes the process of globalization compels us to interlink local, national, and transnational phenomena, such as environmental risks, in both journalistic and academic discourse" (Olausson 2009, 421). Furthermore, environmental issues transcend temporal and spatial boundaries (Boykoff et al. 2008; Cottle 2009; Olausson 2009; Berglez 2011). To attest, Berglez (2008) raises the notion of global news to argue how the media logic is challenged by the complexity of climate news and how journalists adapt to the changing reality. This media process of organizing material therefore involves style and framing

issues related to communicating news, and faces constraints of news culture, ownership, advertising pressure, time and space (Anderson 1997 in Berglez 2011, 451). Climate change reporting, of which Hansen (2011) considers it a meta-discourse or "umbrella" for any other issue related to the environment (Moser and Dilling 2007 in Hansen 2011), highlights the news media logic of traditionally separating local from foreign news and its limitations of conveying the density of environmental and other global issues (Cottle 2009; Berglez 2011).

In the context of hazards associated with technology, public awareness to climate change and environmental issues as a social problem, another crucial aspect of the environment is the notion of assessing risk, or environmental hazard (Hohenembser, Kates and Slovic 1983; O'Donnell and Rice 2008). Risk "refers to the probability of property damage, injury, illness or death associated with a hazard" (Singer and Endreny 1993, 6). Distinctively, hazards "are threats to humans and what they value, whereas risks are quantitative measures of hazard consequences that can be expressed as conditional probabilities of experiencing harm" (Hohemenser, Kates and Slovic 1983 quoted in O'Donnell and Rice 2008, 641). If the meaning of risk is taken in its purest sense, any action and non-action could entail a possible harm (Friedman 2004). The debate then, for environmental issues, becomes a matter of acceptable risks society can handle, and the media plays a role in defining what is considered acceptable (Cox 2006). However, environmental issues also involve scientific certainty/uncertainty (Friedman 2004; Dunwoody 1982). To expand, German sociologist Ulrich Beck shares a more critical view of the notion of risk, which considerably influenced the literature. He asserts that we live in a "risk society", meaning that risks "induce systematic and often irreversible harm,

generally remain invisible, as based on causal interpretations, and thus initially only exist in terms of the (scientific or anti-scientific) knowledge about them. They can thus be changed, magnified, dramatized or minimized within knowledge, and to that extent they are particularly open to social definition and construction. Hence the mass media and the scientific and legal professions in charge of defining risks become key social and political positions" (quoted in Cottle 1998, 7). With industrialized societies then, such as energy industries in Canada, Kotowitz (2008) refers to moral hazard, which "may be defined as actions of economic agents in maximising their own utility to the detriment of others, in situations where they do not bear the full consequences" (quoted in Gosselin et al. 2010, 245). In sum, environmental issues as a concept implicates multifaceted characteristics that can be viewed as an ecosystem of components that interlink humans' relationships with nature, sustainability, and social risk.

Studies related to conceptual frameworks and environmental reporting

Some research has brought attention to how environmental issues can be articulated when communicated in the media. Inadvertently so, however, these studies shared similarities in conceptualizing the environment but provided little explanations or rationale for such shared articulations. From the studies here listed, the articulations are enumerated and form the basis for this project's conceptual framework. According to Luhmann who directly addressed *Ecological Communication* (1989), the meaningfulness of ecological knowledge must be transferred through social communication by bringing to light ecological changes and problems. The aspects of ecological knowledge include economy, law, science, politics, religion, education, and environmental ethics. Stephens

et al. (2009) borrowed these functional subsystems from Luhmann's social theory of ecological communication. Looking at American newspapers coverage of wind power technology to mitigate climate change, they assessed how risks and benefits were communicated within six frames of technical, economic, environmental, health and safety, political, and aesthetic and cultural (174). In a similar inquiry on whether newspapers contribute to an informed debate on wind energy that situates the topic within important environmental, economic, social, regulatory and global issues, Thompson R. (2005) developed his qualitative analysis using both concept-driven and data-driven approaches in which the collected news stories were organically categorized with NVivo qualitative analysis software program in a hierarchical structure (250). In a doctoral dissertation on media portrayal of global warming, Rhys Jones (2006) used multiple strategic frame analysis to evaluate news content. The frames included spatial-temporal frame, international news media, consensus, skeptic, economic, political, the Kyoto Protocol and individual framing. The analysis also included the type of content found about global warming (i.e., combinations of solutions, causes, effects or nothing) and the dominant issues pertaining to global warming (i.e., global warming, politics, environment, policy, science, lifestyle, etc.). Analogously, a thesis on Mexican newspapers covering global warming by Deines (2007) used the frames of economic, political, ecology, consequences, international relations, scientific controversy or conflict, north/south conflict, other, international treaties solutions, national policies solution, individual call to action solution, and another solution. For the analysis of news coverage on climate change in online news services, Nielsen and Kjaergaard (2011) followed an empirical approach advocated by Tankard (2001) that insures the exhaustion of all

possible frames in a given analysis and identified six dominant frames: public understanding of climate change, ethics and morality, technology and innovation, economy and business, policy-making and legislation, and scientific research. When evaluating the quality in environmental reporting, O'Donnell and Rice (2008) applied a conceptual framework of risk into 14 categories based on the causal structure of technological hazards developed by Hohenemser, Kates and Slovic (1983) which lays out the degrees of harm to humans, from intentionality to satisfy humans beings needs to biological consequences of mortality (641). Their study also captured the number of news articles analysed, their length and locations, as well as the degree of details provided when addressing risk (specificity).

In an attempt to synthesize the above-mentioned studies that best identify the subcategories – usually referred as frames – and encompass the spectrum of all possible related aspects involved when it comes to environmental subjects, the conceptual framework for this project stopped at twelve typological dimensions in environmental news content, and they will be further discussed in the methodology chapter: economic, political, international, legal, scientific, ecological, social, ethical, cultural, temporal, risk, and other.

Environmental Journalism and its Critiques

Given the density of the subject, studies have highlighted the challenges to conveying environmental issues. The scholarship has recognized the difficult journalistic ecosystem that is under external economic, technological, political and editorial pressures (Keating 1997; Friedman 2004; Russell 2006; Boykoff 2009; Hansen 2011; Howard-

Williams 2011). In addition to having to do more with less, reporters' limited technical knowledge of increasingly complex issues related to scientific and environmental topics accentuates the difficulty of their tasks (Singer 1990;; Dunwoody and Peters 1992; Keating 1997; Valenti 1998; Friedman 2004; Sachsman et al. 2006). An area of research focusing on relationships between journalists and their sources further inform these limitations. Sources most accessibly routinized are usually government officials (Peters 1992; Greenberg et al. 1989; Einsiedel and Coughlan 1993; Sachsman 1999; Miller and Reichert 2000; Nisbet and Lewenstein 2002; Carlson 2009 in Paskey and Steward 2012;) and previous contacts (Paskey and Steward 2012). Canadian news media heavily depend on institutional sources as well (45% of governmental sources and 25% scientists in environmental stories published between 1979 and 1991) (Einsiedel and Coughlan 1993, 136). A longitudinal analysis showed an "overwhelmingly positive" tone in the coverage on biotechnology, as journalists greatly depend on scientists, government and industrial representatives for sources (Paskey and Steward 2012; Nisbet and Lewenstein 2002, 18). Such consensus can be worrisome in that reporters become less critical of official claims (Gamson and Modigliani 1989).

Despite journalistic constraints, studies have consistently established three central observations on environmental reporting: the event-driven propensity to cover the environment; its simplification; and its politicization and economic orientation. First, the environment is an abstract notion that isn't readily tangible and seemingly uneventful. However, it is strongly covered when events occur, like disasters, extreme geophysical or meteorological conditions such as earthquakes, tsunamis, flooding, and hurricanes, because they provide strong visuals and potential for numerous news stories and angles

(Anderson 1997; Soroka et al. 2009), typically through an action-response sequence (Einsiedel and Coughlan 1993; Hessing 2003). The event-driven characteristic also feeds the trend of dramatizing elements (Weingart et al. 2000). Nelkin (1995) stated that "risk reporting is widely criticized as hysterical, sensational, and confused" (60). As Soroka et al. (2009) put it, "environmental news is covered sort of like crime news, where the reporter motto "if it bleeds, it leads" is modified with "if it blows, it goes" (15). Again, cases of media hype also tend to present an overly optimistic view on scientific and technological solutions to environmental problems in the news (e.g., nuclear energy, Gamson and Modigliani 1989 or research on genetics, Bubela and Caulfield 2004). However, not everyone agrees, as Freudenburg et al. (1996) claim that the exaggeration of risks is an exception rather than a rule, where hazards can instead be de-emphasized through more in-depth information and contextualization (40). Regardless, this is a potential danger in reporting solely on events, in that reporting can overlook the interconnectedness of the environment and not relate it to larger social issues or patterns broader phenomenon (Gavin et al. 2011; Shanahan and Good 2000).

Second, an environmental issue will inevitably become subject to some degree of reductionism, in that information becomes simplified or lacks in-depth coverage (Weingart et al. 2000 ; Carvalho 2007; O'Donnell and Rice 2008; Wyss 2008; Young and Dugas 2011). This process of reductionism has many implications, such as a dramatization effect previously mentioned. For instance, the news coverage trivializes inherently social issues into a personal choice matter (Singer and Endreny 1993; Allan, Adam and Carter 2000; Cottle 2009; Young and Dugas 2011), such as celebritization (i.e., a public figure endorsement) of environmentalism (Thompson R. 2005; Boykoff et

al. 2009) or a lifestyle trend, like domestic tips to be environmentally friendly (Gunster 2009). The simplification of news has been explored through research on journalistic norms of accuracy and objectivity (e.g., Dunwoody 1982; Singer 1990 ; Valenti 1998; Palen 1999). Such studies assess discrepancies between scientific research and news reports. They find journalistic errors of omission and the tendency to over-generalize the extent of a particular research finding in news stories, thus affecting their meanings and interpretations (Singer and Endreny 1993). Another recurrent criticism of the institutionalised journalistic practice of objectivity argues that it gives a false sense of balance. One classic example is the anthropogenic impact of climate change (Goodman et al. 2008; Nisbet 2011). Showing all sides of the story not only generates a sense of greater uncertainty and a weakening of scientific consensus (Boykoff 2008), such practice tends to confuse the public understanding of an already complex topic (LaMay 1991; Allan et al. 2000; Goodman et al. 2008; Nisbet 2011) while undermining collective action (Olausson 2009). As Gore exemplified in 1991: "More than 700 members of the National academy of Sciences recently wrote to President Bush urging action on global climate change. 6-7 members take the other side of the argument, but they were given equal billing with the 700." (LaMay 1991, 182). However, it seems that Canadian news coverage on climate change has shifted towards less controversy and recognition in its anthropogenic character (Gunster 2009, 25).

Third, environmental issues have increasingly become the subject of polarization in the realms of politics rather than a matter of society's relationship to its ecosystem (Nelkin 1995; Freudenburg et al. 1996; Carvalho 2007; Maeseele 2011; Young and Dugas 2011), and to lesser degree, become economically framed (Soroka et al. 2009).

According to Nelkin (1995), the polarizing effect in the coverage of technological risks is the result of the style of reporting that adopts promotional tendencies where journalists respond to the interests of academics, industrial and research institutions eager to promote their latest innovations (46). Conversely, the technological developments, framed as solutions in the media coverage, require scientific authority to assess social risks and handle the regulatory realm of environmental risks. Eden (1996) called such phenomena the scientization of policy and the politicization of science. This contention partly comes from the competing interests expressed by influential stakeholders that wish to promote certain beliefs or solutions while marginalizing or silencing others (Nelkin 1995; Cottle 1998, 2009). For Carvalho (2007), her critical discourse analysis concludes that downplaying scientific consensus or enhancing scientific uncertainty about climate change allowed for a politicization of the news coverage as well as appropriated the very issue under ideological terms.

Communication through such framing essentially serves the purpose of promoting certain constructions of meanings, interpretations, definitions and problems involving selection and salience (Entman 1993). Gamson and Modigliani (1989) argue that the media represent "critical discourse moments" that provide an essential context for interpreting a given topic or story (2), becoming then "a question of mapping the dynamic and interactive elaboration of issues as they are articulated, [...] hierarchically ordered, and that the "strength" of their interlinkages varies" (Hansen 1991, 449). On the discourse of nuclear power, Gamson and Modigliani (1989) developed a typology of dominant frames used in the media. They include "progress" (a taken-for granted notion that nuclear energy is a nonissue), "energy independence" (freeing the American

dependence on foreign supply), "devil's bargain" (a thoroughly ambivalent package of arguments toward the nuclear energy), "runaway" (a fatalistic attitude and resignation rather than an opposition), "public accountability" (as a matter of profit or financial interests versus transparency, disclosure of information, public safety and governmental regulations), "not cost effective" (a calculation or comparison of costs and benefits), "soft paths" (advocating for major efforts at conservation and developing other alternatives), economic prospect, Pandora's box (action or process of unpredicted and severe consequences), and globalization. These frames are ideologically value-laden and remain relevant in various scientific topics today (e.g., Maeseele and Schuurman 2008; Doyle 2011; Maeseele 2011).

Some academics link media frames to the presence of a variety of perspectives expressed by interest groups. As Gurevitch and Levy (1985) put it, the media represent "a site on which various social groups, institutions, and ideologies struggle over the definition and construction of reality" (quoted in Gamson and Modigliani, 1989, 3). Opposing stakeholders try to gain public and policy-maker support by altering the frames or interpretive dimensions for evaluating the facts, not by offering new facts (Miller and Reichert 2000). The assertion goes further: in matters of science and environment, Carvalho (2007) writes that "there is no such thing as 'pure facts'. Scientific claims are defined by agents of authority from within a given socio-political order and that they are "strongly entangled with ideological" viewpoints in the media" (223). These framed viewpoints affect environmental news coverage in that "'truth claims' are embedded with certain worldviews, judgments and preferences" (225). Like objective reporting, in giving a platform for influential and conflicting opinions, the attention gets deflected from the

pressing and long-term issues (Keating 1997; Gunster 2009; Olausson 2009; Gavin et al. 2011).

Using Content Analysis to Study Environmental Journalism

While this project fully acknowledges the critiques above, it adopts a content analysis (of a case study, see next chapter) to contribute to the relevant yet incomplete literature that addresses content analysis of environmental reporting. First, this project puts environmental affairs at the centre of its objectives. Studies utilizing content analysis more often than not placed the analysis of environmental news content as secondary to testing well-known concepts or theories in journalism, journalism praxis, communication and media studies. For instance, many studies look at attention-cycle theory (Trumbo 1996; McComas and Shanahan 1999; Brossard et al. 2004; Nisbet and Huge 2006), agenda-setting and influence of public perception (Ader 1995; Shanahan and Good 2000; Nisbet and Lewenstein 2002), the environmental notion of risk and hazard (Singer and Endreny 1993 Cox 2006; O'Donnell and Rice 2008), media pattern such as environmental momentum, or shift of tone (Parlour and Schatzow 1978; DeMott and Tom 1990; Mazur 1998; Boykoff 2008; Soroka et al. 2009; Bolsen 2011; Gavin et al. 2011). Hansen (2011) stipulates that the current state of literature on environmental journalism and environmental communication more generally has succeeded in establishing the concerns about the normative objectivity in environmental reporting; how journalists and their sources interact; how the media depict environmental issues; how the media affect the public; and how the dynamics of power relationships are rooted in all aspects of environmental journalism. Although the literature greatly inform the

media landscape and journalistic processes, the environmental topic as a focal point remain only partial. Second, this project is interested in exploring communication of environmental affairs as a generalizing, theoretically and conceptually informed framework. To date, studies provided only sparse conceptual frameworks for addressing how to go about analyzing an environmental topic in the news, while avoiding explicitly addressing what makes environmental news environmental, or what are the common criteria or standards to assess environmental reporting. Additionally, past research mainly examine a specific topic (e.g., climate change, biotechnology, wind power, etc. as a case study) not intended to speak of the environment concept in general. Third, this project proposes to provide more details regarding its approaches, especially in introducing a conceptual framework to analyze environmental news content. As previously mentioned, most relevant studies were limited in their descriptions and justifications for the methods involved which provides little guidance for conducting the examination of a complex topic. Finally, while framing-focused types of content analyses have shed light on socially and culturally embedded meanings behind environmental news and allow more nuanced and flexible analytical inquiries (Olausson 2009), this project favors a streamlined, systematic process (Nielsen and Kjaergaard 2011) to avoid possible arbitrary choices when it comes to identifying the news frames at play (Tankard 2001) in the coverage of Alberta bitumen sands.

The Bitumen Industrial Activities in Northern Alberta: an Overview

Historical Context

The Athabasca bitumen was first discovered near river banks in 1778 by a European fur trader, a material already familiar to the local Aboriginal people who used it as a water repellent for canoes (Gosselin et al. 2010; Syncrude's website). Bitumen commercial production began as early as in 1909, mainly for construction materials for roofing and road surfacing (asphalt). Several attempts to commercially develop bitumen deposits for oil produced a first barrel in 1978 by Syncrude, and functioned at full scale in the mid-1990s due to strong provincial and federal supports favouring massive investments (Gosselin et al. 2010).

The resource is abundant, but bitumen production for hydrocarbon did not become economically sound until the volatile price of oil dramatically rose in the context of diplomatic tension and political instability due to an oil embargo on the United States proclaimed by the members of the Organization of Arab Petroleum Exporting Countries (OAPEC) in 1973 and the Iranian revolution of 1978. Introduced in 1956, the peak oil theory predicts the moment when the maximum of petroleum extraction physically accessible under existing technology in the United States will be reached between 1965 and 1970, and from then on its domestic production rate would decline (Hubbert 1956, 26). It means that in any given geographical region, the production of oil follows a bell-shaped curve in which a finite resource would peak when half has been extracted (Campbell and Laherrère 1998). To estimate global reserves of conventional crude oil or when the decline would start is a complicated task because the definition of "reserves" and "proven" vary in different regions, the predictions of oil demands are inconsistent

through time and in different countries, and the methods to calculate differ (80). Among the many predictions, 'the end of easy and/or cheap oil' was forecast to happen in 2006-2007, before or around 2010 (Campbell and Laherrère 1998; Hirsch, Bezdek and Wendling 2005; Hirsch 2006; Gosselin et al. 2010). Globally (proven) conventional oil reserves are estimated to total 1,400 billion barrels, mainly concentrated in Venezuela, Saudi Arabia, Canada, Iran and Iraq (US EIA 2012; OPEC 2012). The reality of increasing American and global dependence on, security and demand for petroleum require countries to look for what energy experts call mitigation to prevent dire economic, social, and political consequences (International Energy Agency 2009; Giesy et al. 2010). Whereas conventional crude oil reserves – typically extracted with a traditional oil well – start to decline, it makes economical sense for Canada to pursue the exploitation of its abundant resource even though the bituminous sands - classified as an unconventional crude oil - are technically more difficult and require various methods of extraction and processing (see p. 26-29).

Terminology, Bitumen and Reserves

The variety to how the topic is being referred can be confusing: oil sands, tar sands, unconventional oil, synthetic crude oil, crude, extra heavy crude oil, bitumen, etc. Typically, the terms "oil sands" has been used to identify this Canadian energy industry. For an accurate terminology to technically define the topic throughout this thesis, I deliberately adopted "bituminous sands" (and interchangeably bitumen), a literal translation of the terms invariably used in French ("sables bitumineux").

Bituminous sands (or bitumen) are one of a variety of initial resources that are transformed into synthetic extra heavy crude oil. Bituminous sands are formations of biodegraded oil that occur naturally, composed of various mixtures of sand, silt, clay, water, heavy minerals, metals, and hydrocarbons. In its natural state, bituminous sands are a thick, highly dense, extremely crude (unrefined petroleum) and highly viscous. They also contain a non-homogenous amalgamation of ilmenite, rutile, zircon, tourmaline, pyrite, manganese, mercury, cadmium, cobalt, copper, nickel, iron, zinc, selenium, chromium, cobalt, lead, silver, gold, sulphur, nitrogen and arsenic among other compounds, which are later found as residues in the water used for extraction (Liu, Xu and Masliyah 2004; Masliyah et al. 2004; Söderbergh, Robelius and Aleklett 2006; Charpentier et al. 2009; Giesy et al. 2010; Gosselin et al. 2010; Kelly et al. 2010; Almansour and Insley 2011). In Canada, the bitumen deposits are located in the northeastern province of Alberta and northern Saskatchewan where it is found exclusively underground. Because of the cold climate, the feedstock with the appearance of tar is "as hard as a hockey puck" (CAPP 2011). Three main sites are being exploited in Alberta: Athabasca River (mostly), Cold Lake and Peace River. These areas roughly represent the sizes of Lake Superior and Lake Huron.

In Canada, the bitumen feedstock is estimated to range between 1.7 and 1.75 trillion barrels of oil (ERCB 2010), although 10% of the deposits are recoverable (Gosselin et al. 2010), establishing the remaining bitumen reserves at 170 billion barrels of bitumen (CERI 2012; ERCB 2013). The second largest deposits of unconventional oil are found in Central Venezuela (although not from bitumen, commercially developed in Orinoco Belt) where its tropical climate favours the technical extraction process (Hirsch,

Bezdek and Wendling 2005). Smaller reserves are also found in Russia, Middle Eastern and North African countries, China, Brazil, and in the United States and elsewhere, albeit exploited in lesser intensity.

Production

Through economic, industrial and governmental efforts, developments of bituminous sands production for energy have taken considerable proportions. As Stephen Harper puts it, they represent an "enterprise of epic proportion, akin to the building of the pyramids or China's Great Wall. Only bigger" (2006), making them the world's largest energy and capital project (Nikiforuk 2010). The "oil sands" have drawn investments totaling $102 billion between 2000 and 2009 (Government of Alberta online). The proliferation of industrial projects in Canada surpassed 1.25 million barrels per day (bpd) in 2006, 1.5 million in 2010, 1.8 million in 2012 and is expected to double by 2015, or almost triple by 2030 (Grant, Dyer and Woynillowicz 2008; Kelly et al. 2010; CAPP 2011; Rooney, Bayley and Schindler 2012; Government of Alberta). Currently, Albertan bituminous sands mostly serve Americans (two thirds of production), some Asian markets and Eastern and Atlantic parts of Canada (CAPP 2011). Since 2002, Canada has surpassed Saudi Arabia and Mexico to be United States' largest energy supplier (including bituminous sands, crude oil and natural gas, CAPP 2011; Government of Alberta; Nikiforuk 2010).

Extraction

The various operations to the bituminous sands industry in Northern Alberta involve two stages, extraction and upgrade for synthetic crude oil production, before transportation to petroleum refineries. Two types of extraction methods currently exist: surface mining and "in situ" recovery. Most of the bitumen reserve is unevenly spread underground below a large area of boreal forest, 20% of which is found between 10 and 75 metres below the Earth's surface, and the remaining 80% deeper than 400 metres below (Almansour and Insley 2011). In 2009, 55% of the total bitumen production employed open pit surface mining (OPM) in the more shallow deposits because of its lower exploitation cost and better bitumen recovery outcome (Gosselin et al. 2010). As of January 2013, the mineable area covers 4,800 km^2, of which 4,700 m^2 have been approved for mining operations and the disturbed area (pits sizes) is 715 km^2, equivalent to the city of Calgary (Government of Alberta online; Flanagan and Grant 2013). OPM involves bitumen mining, bitumen treatment, and waste management (e.g., tailings ponds). OPM requires first a removal of the forest then excavating a large surface of the soil sitting on top of the bitumen - called overburden and later used for roads and tailings constructions. Bitumen is extracted with particularly outsized trucks - the licensed driver climbs some twenty steps before accessing the driving seat - and massive shovels to sustain the toughness (friable rocks) and weight - about 19 tonnes a scoop - of the raw resource. Due to the size of these uninterrupted operations, such specialized machineries and their various parts require constant repairs and replacements to be shipped from abroad and assembled on site. For example, a heavy hauler truck or vessel weighs 400 tonnes, is 7 metres high and 14 metres long, is imported from the South border and can

cost $6 million, takes three to six regular trucks to move which require authorities to block highways for exclusive access. According to a Royal Society of Canada expert panel (Gosselin et al. 2010), bituminous sands are brought to crushers to be broken in smaller pieces, then to a plant where hot water and chemicals are added to make a slurry preparation that facilitates the separation of bitumen from sands. The bitumen is liberated through hydrodynamic forces (the bitumen is hydrophilic and attaches to bubbles) and collected in flotation facilities where multiple froth cleaning processes start to recuperate as much bitumen by further removing water, air and solids. The cleaning requires solvents to reduce the viscosity and density and increase the concentration of hydrocarbon suitable for upgrading the bitumen. The remaining slurry preparation is released to large stationary particle separation cells, also called tailings, although they differ in composition depending on the process phase. Most of the used water and solvents are treated to be reused as many as eighteen times (NRCan 2008 in Gosselin et al. 2010) and the remaining residue is eventually discharged in final tailings.

The other extraction technique has to be carried “in situ” for deposits found below 150 metres underground and unreachable through mining. This means a variety of drilling technologies done in place, and they include cyclic steam stimulation (CSS) and steam assisted gravity drainage (SAGD). Some remain at an experimental stage, namely the vapor extraction process (VAPEX) and the toe-to-heel air injection (THAI). Typically, the in situ plant has vertical and horizontal groups of wells that necessitate substantial sources of thermal energy (natural gas, but also more recently coal, asphaltene removed from bitumen) and water to produce and inject steam at high pressure and high temperature (350ºC) to melt the raw bitumen into a less viscous state, thus allowing it to

be pumped to the surface. The bitumen mixed with water needs to be soaked in steam for several weeks and repeatedly so for three to eight months. Even though on-site methods require less space to access most reserves (80%), they are expensive, recovering between 20% and 60%, as opposed to 90% via mining.

Upgrading

After extraction, the bituminous sands need to be upgraded before producing liquid fuel like gasoline or diesel. Upgrading involves a transformation of bitumen into synthetic crude oil (SCO) to be suitable for pipeline transportation – necessitating lower viscosity and preventing pipelines damage - and meet the standards of petroleum refineries (in the United States) before processing. It follows two stages of primary and secondary upgrading that consist of heavy chemical-physical treatments intended and use natural gas "to reduce the density, viscosity and molecular weight, increase the hydrogen-to-carbon ratio, and partially remove sulphur, nitrogen, and heavy metals from crude bitumen" (Gosselin et al. 2010, 51). Regardless of stages and technologies used, these tasks include catalytic reactions at high temperature (550ºC) and high pressure (200atm), chemical conversions of sulphur compound to hydrogen sulphide (H_2S) and hydrocarbons, nitrogen to ammonia, hydrogen production, and removal of contaminants (H_2S and ammonia) from the used water (53-5).

Implications

While industrial and governmental stakeholders insist on the benefits of developing bituminous sands, the extraordinary scale of such enterprise has also

transformed Canada's landscape in many regards. As suspected, the undertaking is resource and labour intensive (energy, freshwater, land, human resources). As an indication, three barrels of freshwater are needed for every barrel of oil from bitumen (Allen 2008), and eleven tonnes of bituminous sands are required to produce 1 m^3 (6.3 barrels) of synthetic crude oil (SCO) (Gosselin et al. 2010).

The technological and environmental impacts of the bitumen industry might constitute one of the most crucial challenges. Of the many concerns about industrial by-products, tailings ponds remain one of the most critical. Tailings ponds are large basin constructions where the results of bitumen cleaning processes are discharged. Their sizes have surpassed 130 km^2 in 2008 (Kelly et al. 2010), and store contaminated water with solids particles that can take 10 years to consolidate (44% of solids) and sink to the bottom (Allen 2008, 3). The used water is too toxic for aquatic wildlife populations, ecosystems, habitat and human health to be released back to the river (Allen 2008; Timoney 2012). The lack of understanding and rate of leakages seeping into groundwater and the Athabasca River - bitumen's primary source of water- where local communities reside downstream cause serious concerns (Allen 2008;Gosselin et al. 2010). Although the exact figure is unknown or not made public (Pembina Institute online; Gosselin et al. 2010), a Toronto-based NGO Environmental Defence estimates the amount of seepage to eleven million litres a day for 2007 (Price 2008), with reported species deformities (Peters et al. 2007; Colavecchia et al. 2003 in Gosselin et al. 2010; Melvin and Trudeau 2012). The basins have been present for forty years and will continue to increase in the future. Governmental regulations to reduce the rate of liquid tailings waste was only

introduced in 2009, and as of today, none of the bitumen operators have complied with the directive (CERI 2012; Flanagan and Grant 2013).

Other than water, the greenhouse gas emissions and air quality are also an important aspect to human health concerns. The "oil sands" affect many issues of air pollution such as management and reduction of greenhouse gas emissions (GHGs), other air pollutants (also found in water) and foul odours. Like other energy industries, the bitumen activities are an important source of atmospheric pollution: in Canada, they release considerable amounts of carbon dioxide (CO_2), nitrous oxide (N_2O), and methane (CH_4) among other GHGs. In 2008, 5.2% of the total GHGs emissions in the country was directly attributable to the bituminous sands and their emissions are likely to increase in the future (Gosselin et al. 2010, Environment Canada 2013).

Additionally, depending on the methods and stages of processing, bituminous sands score between third and fifteenth biggest emitters of air pollutants among Canadian industries listed by Environment Canada (Gosselin et al. 2010). Major air pollutants released in large amount as the result of bitumen exploitation include oxides of sulphur (SO_x), oxides of nitrogen (NO_x), coarse particulate matter (PM), carbon monoxide (CO), ozone (O_3), volatile organic compounds (containing carbon, VOCs), polycyclic aromatic hydrocarbons (PAHs), as well as heavy metals in fine dusts like mercury and lead released in vapour, and toxics like benzene (Kelly et al. 2009, 2010; Giesy et al. 2010; Gosselin et al. 2010; Kurek et al. 2013). Technologies for air pollution alleviation have been proposed, namely carbon capture and sequestration (CCS) and CO_2-enhanced oil recovery (EOR), but to date remain unfeasible for implementation (Gosselin et al. 2010).

Usage of land, particularly for mining-related activities, amounts to another industrial externality issue. As previously described, bituminous sands disturb the northern territory equivalent to the size of Calgary, and removed soil that can reach 100 metres deep. The sought resource sit below a landscape located in the boreal zone, 142,200 km^2 of boreal forest land, making it "the world's largest and most important forest carbon storehouse" (Anielski and Wilson 2010; NRCan 2008 in Gosselin et al. 2010; CAPP 2011; Rooney, Bayley and Schindler 2012), and great inland freshwater ecosystems such as rivers, muskegs, lakes and wetlands (Brandt 2009 in Gosselin et al. 2010) both housing a rich and wide range of species of conifers, fishes, birds (450), and mammals (Brandt 2009 in Gosselin et al. 2010; NRCan 2010 in Gosselin et al. 2010). Licensed companies are required to reclaim the disturbed land. Despite the confusing definitions and terms (e.g., distinctions between equivalent land capability, reclamation and ecological restoration), reclamation is defined as "the process of reconverting disturbed land to its former or other productive use", or "to a productive state" (Powter 2002 Gosselin et al. 2010; Government of Alberta 2011;). In 2008, 104ha (hectares, although never mined) out of the total 60,234ha of disturbed land have been reclaimed (less than 0.2%), and successful methods for restoring water areas such as peatlands and wetlands have yet to be proven (Rooney, Bayley and Schindler 2012; Flanagan and Grant 2013).

Despite an acknowledgement of the substantial environmental challenges, and the added technological, temporal and spatial limitations, some believe the efforts deployed are insufficient to minimize waste inventory in the bitumen operations (Gosselin et al. 2010; Rooney, Bayley and Schindler 2012; Timoney 2012). Closer monitoring of and

research on the various aspects of the industry, and effective governance through clearer governmental guidelines directly addressing environmental and public issues, have consistently been advocated.

Other than environmental and technological issues, implications to the bitumen industry are also socially bound. The perception of the "boom-town effect" comes to mind when, compared to other cities, a small community like Fort McMurray has experienced dramatic changes within a short time period. Explicitly, they include a number of issues such as booming economy, population increase and influx (from outside Alberta), population mobility increase (e.g., temporary workers), inflation, higher income levels and gaps, municipal debt increase, and public services deficit (e.g., health care). Social problems also extend to extreme shortages of housing and labour, traffic increases, accidents, injuries and incident increases, lower quality of life, psychosocial issues like stress, isolation, smoking, alcohol and drug abuse, violence and crime increase, health risks (and deaths) such as illnesses linked to food and water exposure to contaminants, higher rates of respiratory infections, influenza, sexually transmitted infections, and potentially cancer (Kelly et al. 2009; Gosselin et al. 2010; Timoney 2012; Government of Alberta).

There are also enormous economic implications to bitumen development. Obviously, the ultimate motivation seeks short and long-term profits. From 2001 to 2012, a total investment of $160 billion went to bitumen development (Government of Alberta 2011). the financial commitments originate from the world's largest oil companies, notably Royal Dutch Shell, ExxonMobil, Chevron, and Total S.A., often in various forms of partnerships, joint ventures and mergers and acquisitions (CERI 2012; Woynillowicz,

Severson-Baker, and Raynolds 2005). Furthermore, investors such as other state-owned enterprises are involved in bitumen-related sectors of equipment supplies and services, and come from as many as 28 countries including China, Malaysia, France, Norway, United States, South Africa, Japan, and United Kingdom, and in the near future India, Kuwait and United Arab Emirates (CAPP 2011; CERI 2012). According to Forest Ethics Advocacy (2012) however, the overall proportion of Canadian ownership is small, in that 71% of bitumen production are owned by non-Canadian shareholders, and over half of the generated revenue go to foreign companies, while only providing 0.8% of total Canadian jobs (citing around 56,000 workers in 2008 in the oil and gas sector). In terms of revenue, the government of Alberta suggests huge benefits to Albertans but also Canadian, and expects to collect about a total of 1.2 trillion dollars in royalty and tax from the bitumen industry over the next 35 years or by 2045, since the natural resource of bitumen is a public good owned by Albertans (CERI 2012).

Environmental Journalism Studies and Bituminous Sands

To date, only a few media studies have examined more closely bituminous sands news coverage. In a comparative content analysis in Canadian and American news television conducted by Soroka et al. (2009), the Albertan bituminous sands is one among the many environmental news topics covered. It represents a major source of news coverage and is of great public interest in recent years in Canada (Paskey and Steward 2012). Way (2011) explored the frame of "energy superpower", stemming from the promotion of Canada's global status to an emerging energy superpower by Prime Minister Stephen Harper, although finds the dominating frame to be economic instead. In

2011, a visual analysis examined the photographs of the Albertan oil sands published in the *National Geographic Magazine* to show how they capture the conflicted and multi-faceted aspects of the resource exploitation by juxtaposing various social discourses (Remillard 2011). Five narratives are identified, namely the industrialization and environmental degradation; social, individual and economic benefits; technical and technological dimensions; negative social and health impacts; and the everyday need for oil. The author concludes that these ambiguous frames emerged from pictorial representations alone do not trigger public engagement to this issue. In 2012, Paskey and Steward (2012) produced a final study that interviewed 20 Canadian reporters on their use of news sources when covering Alberta bitumen stories. Their survey (questionnaires filled by participating journalists) shows that reporters easily recognize the tension between economic/energy security with environmental impact as the crucial issue, and determines on which sources to rely. It indicates journalists' preference to seek comments from decision-makers and experts when dealing with environmental/scientific aspects, but also notes that sources from industry and environmental advocacy groups representatives were seen the most accessible (quickest to respond). The surveyed reporters also expressed that there is a lack of environmental coverage on bituminous sands and issues with limited access to governmental officials.

Chapter 3: Methods

Overview

This thesis made use of concept-driven and empirical-driven approaches to content analysis (Krippendorff 2004) that were piloted before deciding on the final methodology for the main content analysis. For the overall analysis, the pilot testing phase established the processes for sampling the dataset, preliminary information on the dataset, establishing the sources used in the reporting, and the coding for the conceptual framework. The results of the main content analysis are presented in Chapter 4.

Overall Process

Project Objectives

Since the overall goal of the project was to provide a "big picture" of what environmental news content entails, the choice of methods served three purposes:

1) to help articulate conceptual frameworks for the content analysis of environmental news;
2) to test a conceptual framework on a current Canadian environmental issue (case study approach); and
3) to reflect on and adjust the investigated conceptual framework based on the results from purpose #2.

Content Analysis of a Case Study

The use of case study approach was deemed appropriate due to it being an illustration of an object of study as linked to a broader societal phenomenon – in this

case, environmental journalism – and explored within a bounded system (Yin 2009; Creswell 2007; Shoemaker et al. 2004). A case study approach is appropriate when the inquiry concerns an in-depth understanding of one or multiple cases and when this understanding requires precise data collection (Creswell 2007; Yin 2003). For this thesis project, the case study used was Canadian newspapers coverage of the bituminous sands activities in Northern Alberta. This was seen as a bounded example of environmental reporting that could be examined through content analysis as a method of inquiry.

Content analysis has commonly been utilized in studies that investigate media depictions of environmental topics and journalism studies in general (Kolmer 2008, see Literature review). Where the lack of uniformity to conceptualize environmental issues needs addressing, the method of content analysis fulfills a thesis objective as it works towards a common procedural logic (Krippendorff 2004). The method employed here was both quantitative and qualitative, recognizing an integrative character of the methodology in which qualitative data can carry almost quantifiable claims or be numerically codified while quantitative inquiries usually start with qualitative decisions (Krippendorff 2004; Gomm 2009; Woolley 2009). As such, dichotomizing the method as quantitative or qualitative can be misleading (Kolmer 2008), since performing a content analysis implies thinking about how and what to operationalize (e.g. a detailed codebook, Neuendorf 2002, 2009). More than a counting game, the research technique is useful because content analysis is versatile. It is, "an empirically grounded method, exploratory in process, and predictive or inferential in intent" (Krippendorff 2004, xvii-xviii) which encompasses interpretive approaches and allows extrapolations (e.g., to "read between

the lines"), can be replicable and can handle large amounts of unstructured data (Krippendorff 2004; Neuendorf 2009).

The methodology of content analysis used involved both conceptually and data driven approaches which mirrors the thesis objectives. A guiding question was used in order to investigate the improvement of a conceptual framework enabling environmental reporting analysis: What is the most effective way to meaningfully record news content that is reflexive of the coverage at hand – the case study – while not losing sight of the larger objective to provide a theoretical model of analysis for environmental journalism? It follows that, on the one end, the methodological process of designing the content analysis would be inspired, borrowed and integrated from secondary sources (concept-driven and theoretical; Stolterman and Wiberg 2010), and on the other, emerge empirically from the data collection of the case study here explored through the pilot project (data-driven or grounded approach; Yin 2009). The overall process was not linear but rather experimental, organic, intuitive and shifting, with dependence on the iterative analysis of emerging data (Barroso et al. 2003).

Concept-Driven Approach

Stolterman and Wiberg (2010) define the concept-driven approach as "an exploratory investigation of established theories with the overall aim of improving and widening the range of theory and knowledge" (102), which puts the focus on the concepts surrounding (in this case) environmental news rather than on empirical data. The concept-driven approach served two purposes. The first purpose was to better recognize the epistemological scope of the industrial exploitation of bitumen in Alberta in terms of

contextualizing its societal implications and assessing background information from a variety of sources. The second purpose was to sketch an initial conceptual template for coding news content from the chosen case study as to establish an environmental news framework that would create a "compositional whole" (109).

The sources here enumerated are further elaborated in Chapter 2 (13-15). The sources used were non-exhaustive and, instead, purposefully chosen to get acquainted with the subject at hand and allow for mapping out as many underlying issues as possible that infer environmental concepts. They included documentations such as scientific and academic articles (e.g. M.B.Dusseault 2001, 2011; Kelly et al. 2009, 2010;, general books and documentaries (e.g. *Tar sands: dirty oil and the future of a continent, H2Oil, Downstream*), interviews and commentaries from personalities who openly share their opinions about the industry (e.g. journalist Andrew Nikiforuk, media commentator Ezra Levant), and reports and websites from governmental and nongovernmental organizations (e.g. Government of Alberta, Canadian Energy Research Institute, Pembina Institute, the 2010 Royal Society of Canada expert panel report). Other studies, methods and theoretical concepts were used to design a set of societal categories constituent of environmental news content (Hohemenser et al. 1983 Luhmann 1989; Thompson R. 2005; Jones 2006; Deines 2007; O'Donnell and Rice 2008; Gerhards and Schäfer 2009; Stephens et al. 2009; Maeseele and Schuurman 2008; Nielsen and Kjaergaard 2011; Maeseele 2011). These literature-based concepts have been successfully applied to environmental topics in the past, but often used within a limited scope of specific studies without sensitivity to a more generalising inquiry of what is conceptually consistent about environmental news.

Dimensions: Concepts of Environmental News

The literature-based concepts are referred to as *dimensions* throughout the thesis and together form the conceptual template investigated. With prescriptive and normative intentions, these dimensions taken as a whole are an attempt to not only conceptually describe the content of environmental reporting, but also to capture and acknowledge the interconnectivity of environmental issues (UN 1987). To paraphrase the multitude quality in environmental reporting, "a classic environmental story is a 'business-medical-scientific-economic-political-social-pollution-story'" (citing Schoenfeld et al. 1979, in Allan et al. 2000, 4). The typological dimensions of environmental news content used were: economic, political, international, legal, scientific, ecological, social, ethical, cultural, temporal, risk, and other. They are listed below and partially constitute the codebook for the content analysis (see detailed operational definitions and examples in appendices E and F).

Economic. Environmental news have consistently covered the economic side of its news content (e.g., Einsiedel and Coughlan 1993; O'Donnell and Rice 2008; Soroka et al. 2009). News reporting in economic terms provides indications to the size and importance of bituminous sands in Canada (Way 2011; Paskey and Steward 2012). The economic dimension refers to any material about the monetary aspect of the bituminous sands activities.

Political. The political dimension refers to any content that relates to matters of politics. This aspect tends to be overarching of many subjects because of the extensive politicization of environmental issues (Carvalho 2007; Maeseele 2011;). As such, it is

meant to be coded when bitumen news coverage is discussed in a context of (i.e. within the text) a political debate, electoral campaign, strategies, plans, agendas or platforms among the political parties, politicians, or between opposition or minority political parties and government in power, or between different levels of governments and governmental institutions, organisations, ministries, or agencies (i.e., provincial and federal). Other areas related to the political dimension include security, defense, and military issues.

International. The international dimension acknowledges the transcending global scope of environmental issues which become increasingly complex and difficult to geographically locate (Szerszynski and Toogood 2000; Berglez 2008; Boykoff et al. 2008; Boykoff 2009; Bromley, Meyer and Ramirez 2009 in Hadler and Haller 2011; Olausson 2009). It involves any bituminous sands articles referring to one or different regions, countries, foreign affairs or diplomatic relations, global events such as official visits or group summits or (e.g., UN, EU, WTO, Greenpeace International). Essentially, the international dimension refers to anything that is not exclusively local, national or Canadian.

Legal. Environmental topics, along with scientific, technology and biotechnology issues have gained greater importance from policymakers worldwide from the 1970s throughout the 1990s (Boykoff 2008). The legal dimension encompasses any content related to subjects that are legal, judicial and constitutional matters, legislations, rules and regulations, leases, licenses, permits, standards, propositions or modifications of bills, bills, policy and policy-making, as well as other law infringements and lawsuits, arrests, charges, fees, trials, penalties, violations, prosecutions, crimes, law enforcement, and monitoring panel.

Scientific. Since the field of environmental journalism studies crosses over both disciplines of science journalism and risk communication (Giannoullis, Botetzagias and Skanavis 2010), science is an inherent aspect for understanding environmental issues. The dimension here labelled scientific comprises of a wide range of categories that include research and development, technical details, innovation and technology. This dimension involves any factual information, description, or explanation regarding the bituminous sands industry, the industrial facilities, planning and management, equipment, the techniques and methods of extraction, treatment processes and production, the technical or technological options, advancements or solutions and their pros and cons including limitations and consequences, conducted studies or assessments, comparative analyses, impacts, factors, and physical conditions.

Ecological. The ecological facet is another important constituent of the environment. Here, the ecological dimension refers more broadly to news content indicating a relationship to various elements between human society and nature (including living organisms and their natural habitats) or any of these components in relation to each other (O'Donnell and Rice 2008), as well as the recognition of the complexity of such dynamics (Clark and Dickson 2003), terms, expressions or meanings that connect two or more different elements together, but also references to or relation between air, water, land, climate change, or biodiversity.

Social. The social component is an integral part of environmental communication in general and environmental reporting in particular. As Eisenhauer and Nicholson (2005) assert, to identify and include diverse stakeholders of society who affect or are affected by environmental issues contribute greatly to effective environmental communication

designs (28). The social dimension refers to material that explicitly raise matters of society such as public opinion, community, local development, quality of life, housing, infrastructures, public safety, public services, education, protests, and citizenship. In the case of the interdisciplinary health, public health and safety related issues, these were considered as manifesting both the social and scientific dimensions.

Ethical. The ethical component has been historically rooted in environmental reporting and writing (Neuzil 2008; Carson 1962; Leopold 1949). However, ethical considerations are often tied to the notion of risk (below), and are often not readily explicit in risk and science communication (Thompson P. 2012). This dimension regroups news content that tackle the "oil sands" in ethical, moral, ideological, philosophical or religious terms. It includes news material that infer professional and ethical conduct, integrity and obligation, any form of human betterment (Thompson P. 2012), moral justifications between industrial development and protection of vital resources for wildlife, natural habitats, people and communities.

Cultural. While cultural representations of nature in environmental risk as a social construct have informed environmental discourses (Cox 2006; Remillard 2011), the cultural aspect has been identified as another underlying environmental issue (e.g., Thompson R. 2005; Rhys Jones 2006; Stephens et al. 2009). News content that is coded under the cultural dimension includes mentions related to entertainment, celebrities or renowned public figures, topics related to multimedia, art or literary forms such as movies, or books, and any associations to aesthetics such as tourism, popularity, social customs and traditions.

Temporal. Time is often implied when discussing energy supply and environmental issues reflect both their examinations through a long period of time and a sense of urgency calling for action in order to understand their evolutions (e.g. peak oil assessments; Rhys Jones 2006; Intergovernmental Panel on Climate Change 2007; Carvalho 2008). Above such evaluations, environmental issues go beyond temporal and spatial boundaries (Boykoff et al. 2008). The temporal dimension involves references related to time, both historically and projected. It includes timeframes, environmental or business deadlines, short or long-term future plans, time periods, trends or patterns, historical references, events or explanations such as the national energy program (NEP) or the discovery of bitumen.

Risk. Risk is a fruitfully explored notion in the environmental risk communication literature (Hohemenser et al. 1983; Beck 1995; Cottle 1998; Weingart et al. 2000; O'Donnell and Rice 2008; Remillard 2011), although "risk communication inevitably involve ethical considerations" (Thompson P. 2012, 636) and broadly applies when the data material raises questions of hazards, threats, probability and scale of harm, consequences from action and non-action, uncertainties, tradeoffs, pros and cons of solutions.

Other. The 'other' is not a specific dimension in itself but rather a residual category in which the remaining news content either do not apply or fall outside of any of the stated dimensions. Keeping record of such material was deemed important for further reference, even though the value and meaning might be lost in a "catch-all" category (Bender and Ewbank 1994; Hopkins and King 2010). No references were found to defend

the relevancy of having or not having an additional "other" category, but it was added to keep track of the remaining news content.

Text-Driven Approach

The text-driven aspect of the content analysis is a grounded method of inquiry emerging from empirical evidence of the selected data (Krippendorff 2004). Its goal is aimed at bridging the gap between the concepts theoretically identified in the literature and the manifest content from newspapers articles. According to White and Marsh (2006), content analyses are often validated by engaging in a study of multiple data sources – or triangulations – for which their interpretations support the same concept. Furthermore, the strength of a content analysis can be acknowledged when findings are "supported by textual evidence from texts and consulted literature" (Krippendorff 2004, 89). This process allowed not only the identified dimensions to emerge from the news coverage, but also a readjustment of the initial concepts. This element of reciprocal inquiry permitted empirical validation of the concepts reflective of a bounded example (Krippendorff 2004; Creswell 2007; Yin 2009).

Pilot Project

The concept-driven and data-driven approaches were applied through a pilot project, a testing phase prior to the main content analysis. In mass communication studies pilot trials are encouraged, especially for content analysis beginners to get an adequate sense of a larger study (Lombard et al. 2002; White et al. 2003; Krippendorff 2004) Although the processes of content analysis never really end (Krippendorff 2004), the

pilot project provided stronger methodological guidelines for capturing environmental news coverage before moving on to conduct the main content analysis of the case study. The trial solidified the processes in four areas: 1) considerations for data selection; 2) a preliminary examination of information relevance analysed through the recording of number, length, location, topics, and authors of news items; 3) a procedural scheme to examine sources of information used news items; and 4) a coding procedure for the typological dimension analysis.

Data Selection

The overall sample for the case study is shown in Table 1. It comprised 409 news items of Canadian newspaper coverage of the bituminous sands in Alberta over a three-year period from January 1, 2007 to December 31, 2009. The rationale for this particular time period was to have a large enough sample to provide a deeper analysis yet small enough to be diligently handled by one researcher. Another reason was the importance of 2007 to the case study. While industrial operations started years before, environmental concerns were viewed as an economic burden from industrial and financial sectors as of 2006 (Pasqualetti 2009) while no formal process (i.e. public agency or monitoring panel) for environmental protection was implemented in Alberta until mid-2000s. 2007 was also timely in the decline of global conventional crude oil production (see overview of the bitumen reserves p. 30). These news items came from print edition of five dailies: *National Post*, *Globe and Mail*, *Edmonton Journal*, the *Toronto Star*, and *La Presse*, retrieved via *Factiva* and *Eurêka* databases (for publications in English and French respectively). Despite the changing contemporary media landscape of information,

digitalized content, multiplicity of news alternatives and technological convergence (Bogart 1968; Neuman 1992;Deuze 2003, 2008; Hafez 2007; Castells 2009), mainstream news remain the leading and dominant tone in that they hierarchically and vertically set the news agenda to smaller and local news media (Nisbet and Lewenstein 2002; Brossard et al. 2004; Nisbet and Huge 2006), and still play a vital role in promoting democratic processes and informed citizenship (Scheufele and Nisbet 2002). The selection of newspapers for the study considered the breadth or reach of Canadian readership and Canadian news ownership to ensure the contextual representativeness of the data. For example, the *Edmonton Journal* was selected for its geographical proximity to the bitumen sands industry in Northern Alberta, but also for its proprietor *Post Media*, which is a sizeable news media owner in Canada. The pilot project examined all 139 news articles generated from *The Globe and Mail* (Table 2). The smaller sample for the pilot project was chosen to insure variability while being feasible (Schreier 2012). Eventually, results from the pilot project (*The Globe and Mail*) were absorbed into the main content analysis presented in the next chapter.

Table 1. Data Sample

Publication	Database	Total
Globe and Mail (GM)	Factiva	139
National Post (NP)	Factiva	66
Edmonton Journal (EJ)	Factiva	52
La Presse (LP)	Eurêka	90
Toronto Star (TS)	Factiva	62
Total		409

Table 2. Pilot Project Data Sample

Database	Factiva			
Publication	*The Globe and Mail* print version			
Period	January 1, 2007 to December 31, 2009			
Item	News articles			
Keyword Search	"oil AND sands"			
Search Parameters	Search within headlines and leads			
	"environmental news" category			
Results	2007	2008	2009	Total
	34	46	59	139

In selecting the sampled data, two aspects were considered particularly important: keyword searches and search settings. One challenge of the chosen case study was the diversity of terminology used in the news. The Alberta bitumen industry and its activities were interchangeably identified in the news as oil sands, oilsands, tar sands, tar-like sands, tarry sands, unconventional oil, synthetic oil, crude oil, heavy crude oil and bitumen. In turn, each term would generate different results while not necessarily targeting the relevant news topic, as shown in Table 3. This confusion required additional testing of the most appropriate keywords to be used for data retrieval. In order for the initial searches to be as inclusive as possible based on the limits of keyword searches, "oil AND sands" in English and "sables bitumineux" for *La Presse* were searched within headlines, the leading paragraph and the "environmental news" self-generated category from *Factiva* and within main subject for *Eurêka* (further explained below).

Table 3. Keywords Search

Keywords	Results
Oil sands	780
Oilsands	14
Tar sands	32
Tar-like sands	1
Tar-like oil	0
Tarry sands	0
Unconventional oil	2
Synthetic crude oil	5
Crude oil	536
Heavy crude oil	4
Bitum*	78
Bitumen	77
Bituminous	1
Bituminous sands	0
Oil AND sands	**800**

A second challenge related to data selection was to limit the number of news articles retrieved, while maintaining relevant data variability (Schreier 2012). To illustrate the issue of news volume, a general search on the "oil sands" in the *Factiva* database generated 9549 results on all available news media publications within three months[1]. To address the issue of volume and relevance (only occurring in English-language publications), searches were built from three sets of filters: (1) the settings were configured to search keywords within headlines and leading paragraphs only; the search excluded duplicated text (2); and (3) the "environmental news" category generated by the inquiry was selected[2]. Searching newspapers headlines and leading paragraphs ensured an optimized contextualisation for the relevancy of news items (Dor 2003; O'Donnell and Rice 2008), the environmental coverage of Alberta's bituminous sands being the dominant topic. The "environmental news" category is compiled and denominated by

[1] English language news publications only, as of June 11, 2012.
[2] In *Factiva* database only.

Factiva[3], a tool predicted to result in more targeted news items and in more limited amount. With such filters in place, the database searches resulted in 800 hits (in contrast to 2124 hits searched within all text[4]). The data was finalized by visually scanning through the article's topic, headline and first paragraphs and eliminating irrelevant items such as opinion/editorial pieces or commentary articles. Editorial pieces or comments were considered irrelevant for the overall project as it focuses on capturing contents from traditional reporting of mainstream news topics carrying an underlying role of objective delivery of news (Carpentier 2005), and not concerned with capturing opinions from editorial commentaries. This follows the distinction made by the selected newspapers and seeks to avoid any conflation of style/purpose by "isolating opinion/editorial journalism from the 'traditional' approach by clearly demarcating editorial comments and separating them from the news articles/items" (206).

Assessment of the Sample

The main content analysis and pilot project explored the preliminary information that included a recording of the number of news articles per year for each newspaper publication and in total, the number of words per news item and its average length per publication, location or placement of the news items, topics and types of events covered about bituminous sands in Alberta, and authors of the news articles (pilot project only). Information regarding news articles placement was considered relevant because order relative to front pages and news sections of a newspaper can highlight news importance

[3] The *Factiva* customer service has provided the following regarding its news categories: "A central team of editors is responsible for adding new categories, maintaining and modifying existing categories, and providing alternate terms and language translations in accordance with user needs. This is done through continuous consultation with a large number of Factiva staff around the world and draws on customer feedback, content coverage, user research metrics and analysis of accuracy of application."
[4] As of June 11, 2012.

and value (Clayman and Reisner 1998; Krippendorff 2004; O'Donnell and Rice 2008). The A section of a newspaper usually appears first and consists of current affairs including general, local, regional, provincial, national, foreign, political news and "actualités". The B section of a newspaper stands for business-related news (e.g., "investing", "energy business", "La Presse Affaires"). News items that appeared elsewhere apart from A and B sections (the only two commonly found news sections among the selected newspapers) were categorized as "other". Depending on the publication, these usually translated to arts and life, and weekends editions. Regarding authorship, the relevance of such information to the analysis of news content of bituminous sands coverage is obscure. While this information is useful to a structural analysis of the inner workings of a news organisation, characterisation of business models or the concentration of news media ownership (Castells 2009), it is not conclusive whether keeping track of the authorship provided information directly relevant to the text under analysis.

News Sources

A second area of analysis focused on the usage of sources of information and their frequency in the news content of bituminous sands. The purpose of examining sources was to allow more specific information on whom/what was identified as a source of material and information in the stories. Considering the complexity of the implications involved in exploiting bitumen (see overview in the second chapter), capturing all the sources used in the case study is paramount as they reflect the different perspectives of various active stakeholders in civil society who play a role in institutionalizing

communication processes in the public sphere (Gerhards and Schäfer 2009). These stakeholders are also termed "actors", that is "the actual protagonist of the facts and actions described" (Maeseele and Schuurman 2008, 447). Other than determining identities, content analyses in communication studies often also uses a sources' rate of recurrence in the news stories as an indication of orientation to particular types of information and prominence of certain views. The frequency "with which a symbol, idea, reference, or topic occurs in a stream of messages is taken to indicate the importance of, attention to, or emphasis on that symbol, idea, reference, or topic in the messages" (Krippendorff 2004, 59). For the main content analysis, the operational definition of a source was a provider of quoted text. The provider of information can be an individual, an organization, or a type of documentation (e.g., a spokesperson, a company, a report, Durant et al. 1998) that uses quotation marks with attributions or verbs such as "said" or "reported" (Charpentier 2008). Unspecified sources were also taken into account (e.g., "an official said", "a spokesperson stated"). For practical reasons and to eliminate all possibility of ambiguity, indirect references to sources and vague references to an undefined group of individuals were excluded from this analysis (e.g., "the producers argued", "scientists believe"). Table 4 presents the scheme used to conduct the main news sources analysis. The categories and subcategories used to catalogue sources were chosen to represent the various voices or stakeholders of society (Gerhards and Schäfer 2009). Column A shows the number of different sources found in each category and subcategory of sources. Column B shows the proportion of category and subcategory of sources from the total of 558 different sources found within the dataset. Column C shows the number of times each category and subcategory of sources were quoted in the text.

Column D shows this in proportion from the total number of quotations found within the dataset. Column E shows the number of times, on average, a quoted category and subcategory of sources would appear in an article. Such results were obtained by dividing the frequency of quoted sources (i.e., results from column C) by the total number of news items (i.e., 409 articles). Column F shows the number of times, on average, a quoted category and subcategory of sources would appear in an article, whenever these sources are quoted in an article. Every time a particular category or subcategory of quoted source appears, column F shows the number of times it is likely to appear in one article, on average. Such results were obtained by dividing the frequency of quoted category and subcategory of sources (i.e., column C) by the number of sources (i.e., column A). While some source analyses use the concepts of primary and secondary definers to examine the hierarchy and order in which the sources appear as a way to "cue in" and thus define and orient the news stories (Hall 1978), these six indicators organized within the full spectrum of sources provided sufficient information to fulfill this project's objectives to examine more closely the case study and serve the environmental conceptual framework.

Table 4. Proposed News Sources Analysis Model

	(A) Number of sources	(B) Number of sources in percentage (%)	(C) Frequency of quoted sources	(D) Frequency of quoted sources in percentage (%)	(E) Average frequency of quoted sources per article	(F) Average frequency of quoted sources per article per category
Political						
Executive						
Legislative						
Judiciary						
Parties						
Economic						
Scientific						
Pure and Applied Sciences, health						
Social sciences, arts and humanities						
Administrative sciences						
Other scientists and academics						
Civic society						
NGOs/lobbyists						
Public						
Other						
International or foreign organizations						

The chosen scheme culminated from conducting multiple testings by replicating the methods from Maeseele and Schuurman (2008) and Gerhards and Schäfer (2009). For Maeseele and Schuurman, their method included the public sector (e.g., sources from governmental institutions), universities and scientists, the private sector (e.g., from industrial or commercial enterprises), citizens or the public, interest and pressure groups or lobbyists, and international or foreign organizations. For Gerhards and Schäfer, their method provided greater details about the sources in supplying more and narrower categories and subcategories. The utilized scheme in Table 4 adopted an abridged version

of Gerhards and Schäfer's model (2009), with the "international" category borrowed from Maeseele and Schuurman (2008) and broadened the definition of news information sources to include documentations.

Typological Dimensions

The third layer of exploring the bituminous sands' environmental news content utilized typological dimensions based on concepts found in environmental issues (see p. 39-43). By extension, content analysis through typological dimensions aimed to increase the depth of analysis and, ultimately, iteratively test the proposed conceptual framework as a template for environmental news content analysis. The approach involved an active reading of the written, manifested text (or data, Krippendorff 2004) and its distribution along the applicable and predefined dimensions: economic, political, international, legal, scientific, ecological, social, ethical, cultural, temporal, risk, and other. More precisely, results in the next chapter are shown in percentages to indicate the presence of each dimension found in the body of text. Although meant to be mutually exclusive, subjects about the environment can interconnect and overlap. Hence, the presence of multiple dimensions within each coding unit is more common. In the coding process, this means a high number of units to belong to more than one dimension.

Unit of Analysis. The main content analysis used the paragraph as unit of analysis. Its operational definition was established as text that visually starts at the beginning of a new line and ends with a period punctuation after which follows a blank linear space. It is usually longer than a sentence but in some cases, one sentence can amount to a paragraph. The dataset had 409 news articles totaling 6708 units of analysis (paragraphs).

In content analysis methodology, the unit of analysis or segmentation offer options for a more manageable coding, particularly when navigating through a large sample of text (Krippendorff 2004). For this case study, many possible units were dismissed for being too small or irrelevant (e.g., word, line, headline, set measurement, metaphor, or sentence). The pilot project evaluated units of analysis between unitizing the paragraph or the whole news article. Using the paragraph is small enough to allow a more literal reading and avoid outweighing, but sufficiently large to keep its immediate context and meaningfulness relative to the text. For this project, it provided a more appropriate reading for the dimensions distribution (i.e., coding) in the news content and more validity in the results than would smaller units like words or sentences (Krippendorff 2004).

Coder Reliability

Methodological problems can arise – such as elevated risks of arbitrary decisions, human inconsistencies and fatigue (Barroso et al. 2003; Krippendorff 2004) – through one-person coding. To address these issues of reliability and validity, the coding in this thesis was executed twice by the same coder (or double-coding, Schreier 2012), from a smaller sample based on Lacy and Riffe's (1996) reliability check method. A break of two weeks elapsed between both codings. This stratified random sampling (to insure the inclusion of all newspaper publications within the sought 2007 - 2009 time period and a slight overrepresentation of the only newspaper in French) regrouped 15.4% of the entire dataset (or 63 articles), following a guideline of more than 10% of the full sample when it involves a larger sample or if the assumed agreement level is low (Lombard et al. 2002).

Additionally, this reliability sample was verified by two revisers since all the main coding was carried out by one person. This entailed a detailed explanation of the coding process and an examination of the coder's work by two independent researchers. The reliability sample testing used 2 indices (Lombard et al. 2002) and scored on average 97.5% on a simple percentage agreement measure (number of total agreement out of total decisions on a dichotomous decision – agree/disagree basis, Lacy and Riffe 1996), and 0.87 on Krippendorff's alpha, which accounted for chance probability. Both indices were generated by *ReCal*, an online web service (see Freelon 2010).

Summary

This research attempts to answer the following research question: can the assessment of media coverage of the Canadian bituminous sands provide a bounded example allowing the elaboration of a conceptual framework that is designed to improve content analysis of environmental news coverage? In doing so, this research examines a case study through the method of content analysis that follows conceptual and empirical approaches. Taken as a whole, the examination of the case study would concern itself with a general representation of what type of information about environmental news is covered, as opposed to looking at distinctions in environmental reporting or making comparative observations between newspapers. Table 5 below summarises how and which information was recorded for the main content analysis, the findings of which are presented in the next chapter.

Table 5. Summary of Information

Assessment sample indicators	Number of news items (per year and in total); Length of each article (number of words per article) and the average length of an article (per - year and in total); News item placement (page number and newspaper's section); General topic of each news item and events covered						
News sources		(A) Number of sources	(B) Number of sources in percentage (%)	(C) Frequency of quoted sources	(D) Frequency of quoted sources in percentage (%)	(E) Average frequency of quoted sources per article	(F) Average frequency of quoted sources per article per category
	Political Executive Legislative Judiciary Parties **Economic** **Scientific** Pure and Applied Sciences, health Social sciences, arts and humanities Administrative sciences Other scientists and academics **Civic society** NGOs/lobbyists Public Other **International or foreign organizations**						
Typological dimensions (Unit of analysis: Paragraph)	Dimensions	In percentage (%)					
	Economic Political International Legal Scientific Ecological Social Ethical Cultural Temporal Risk Other Total						

Chapter 4: Findings

This chapter presents the results of the main content analysis of the news coverage of the bituminous sands industry in Alberta. It is divided into four parts: (a) a description of the sample used and the findings from an assessment of the number of news items (the data sample), length of articles, their placement in the newspaper (page number and section), and the general topics covered; (b) a news source analysis that examines the sources used; (c) the results of the typological dimension analysis, a conceptual framework previously introduced in the methods chapter (see p.39-43); and (d) the final observations that synthesise findings from the three previous analyses (a, b and c).

4a. Assessment of the Sample

From the 409 news items analysed, the research first examined basic information to provide a preliminary exploration of the case study, by way of using indicators to describe its presence in the selected newspapers.

The numbers of articles per year are presented in Table 6.

Table 6. Article retrievals with keywords "oil AND sands" and "sables bitumineux"

Publication	Database	Number of articles			Total
		2007	2008	2009	
Globe and Mail	Factiva	34	46	59	139
National Post	Factiva	7	30	29	66
Edmonton Journal	Factiva	13	26	13	52
La Presse	Eurêka	27	38	25	90
Toronto Star	Factiva	19	20	23	62
Total		100	160	149	409

From 2007 to 2009, all the selected Canadian print publications covered the bituminous sands in Alberta. In all cases, the volume of coverage peaked in 2008. The *Globe and Mail*, *Toronto Star* and *National Post* showed a sustained or increased level of interest throughout the three-year period, whereas *Edmonton Journal* and *La Presse* mildly decreased their coverage from 2008 onward. Both the *Globe and Mail* and *La Presse* generated more news articles than the other dailies (139 and 90 items respectively, versus 66, 62 and 52 items for *National Post*, *Toronto Star* and *Edmonton Journal* respectively). While the data range is small, the overall increase of coverage may indicate a growing attention to the subject. O'Donnell and Rice (2008) have assumed that a greater number of articles covering a given topic can represent an indication of its increased newsworthiness.

Table 7 shows the length of news items per publication. For this research, a short article was defined as containing less than 400 words; a medium-length is between 400 and 799 words; and long articles have over 800 words.

Table 7. News articles Length

Article length per newspaper (%)	LP	NP	GM	EJ	TS	Average
1 - 399 words	46	24	20	10	27	26
400 – 799 words	47	48	60	54	44	52
800 + words	8	27	20	37	29	22

Most of the sample contains medium-length news articles (52%). Overall, approximately a quarter of the articles (26%) were short and slightly less than a quarter (22%) were over 800 words. However, differences were found at the publication level. *La Presse* stands out from its English-language counterparts where most of its articles are

primarily short and medium size (46% and 47%, a total of 93%). Long news items in both 2007 and 2009 were absent from the Montreal-based daily. In contrast, newspapers in English shared a greater proportion of "oil sands" coverage forming lengthier pieces (37% for *Edmonton Journal*, 29% for *Toronto Star*, 27% for *National Post*, and 20% for the *Globe and Mail*). For example, in the *National Post*, almost three out of four articles in the sample (74%) covered the bituminous sands using more than 400 words. The publication of long articles such as investigative pieces suggests not only the potential importance and newsworthiness of the case study in these newspapers, but also that its coverage had greater depth (O'Donnell and Rice 2008).

Table 8 presents the news articles locations, distributed along the publications' sections: first news sections (section A), business (Section B), and other.

Table 8. Articles Placement per Newspaper

	A1	A Section (including A1)	B1	B Section (including B1)	Other Sections
Globe and Mail	1	50	5	32	8
National Post	6	22	11	44	0
Edmonton Journal	7	56	16	78	5
La Presse	8	28	0	11	13
Toronto Star	4	33	9	22	7
Total (%)	26 (6%) of A1	189 (46%) of A	41 (10%) of B1	187 (46%) of B	33 (8%) of other

Indications of newsworthiness are further shown by looking at articles placement (O'Donnell and Rice 2008). Most were located in news and business sections (92% together), and less elsewhere (8%). Newspapers were split between both sections: *La Presse*, *Toronto Star* and *Edmonton Journal* had more articles placed in the A section;

while *National Post* and the *Globe and Mail* had more articles placed in the B section. Overall, the total results show that the topic was treated just as much as a matter of general news and current affairs as one of business, sharing equal proportion of 46%. For all publications, the Alberta bituminous sands has been on the front page. Twenty-six items made the front page (6% of the dataset), whereas 41 items appeared on the front page of the business section (10%). The remaining 8% of the sample were placed in various other sections, notably "plus", "cityplus", "focus", "health and environment", "what's on", "Sunday reader", "living green", "books", "ideas", "insights", (and in French "arts et spectacles" and "environnement"). To put the findings in perspective, newspapers in general tend to cover more dominantly political and economic news than any other subjects (Charpentier 2008; Pew 2012), and news stories on the topic of bitumen predominantly appear in newspapers sections where most news are found.

Table 9 summarizes the topics and types of events reported about Alberta bitumen in the sample, from most to least covered.

Table 9. Topics and Types of Events Covered

Topic/Type	2007	2008	2009	Total	Total (%)
Reports	31	47	22	100	24
Responses	22	18	25	65	16
Policy	19	20	18	57	14
Summits	6	16	28	50	12
Projects	16	18	12	46	11
Campaigns	3	17	25	45	11
Others	3	15	9	27	7
Lawsuits	0	9	10	19	5

Generally, the data is somewhat evenly spread, with a slight inclination to cover released reports (Table 9, Reports; 24%). These reports typically included polls such as

public opinion surveys, reviews or environmental, scientific and economic assessments concerning Albertan bituminous sands. Sixteen percent of news items reported on responses (Table 9, Responses). As found in other studies (Einsiedel and Coughlan 1993; Hessing 2003), responses included articles about follow-up feedback after announcements of policies, expressed through political stances and speeches, disagreements or criticisms, interviews, further analytical observations to research reports spoken by active stakeholders like politicians, industrialists, environmentalists and experts. Fourteen percent of articles were devoted to policy (Table 9, Policy). These included examples such as discussions of regulations and announcements related to bitumen. Twelve percent of articles focused on international meetings like the 2009 United Nations Climate Change Conference held at Copenhagen (Table 9, Summits), while 11% of the coverage reported on the subject's extensive industrial developments (Table 9, Projects) and another 11% on the issue related to political realms of lobbying, social protests and electoral campaigns for federal and presidential in both Canada and the United States (Table 9, Campaigns). Other topics reflected various incidents, like the unusual high cancer rate observed in affected communities, the drowning of migratory waterfowls in tailings ponds (facilities of Syncrude), in-depth series on bituminous sands, or the image of corporations (Table 9, Other; 7%). The least covered events were lawsuits, which in the sample began to appear in 2008 due to cases of environmental breach and the deaths of birds (5%). Overall, the types of topics covered show an orientation of the coverage toward evaluations related to the bitumen industry, personal positions on Alberta bitumen reported as news, policy news articles and the topic as a point of discussions in international meetings.

In sum, this first exploratory examination of the case study reveals some indications of newsworthiness to cover the bituminous sands in Alberta between 2007 and 2009 in that an overall increase of news items written on the subject, especially from 2007 to 2008; a news story devoted to the topic appeared in the front page at least once in all the selected newspapers; over 90% of the sample appeared in the current affairs and business news sections of newspapers; and most of the news articles were written in more than 400 words, suggesting more attention drawn to the subject. The underlying stories to cover Alberta bitumen were related to environmental and economic reports released and policy discussions.

4b. News Sources Analysis

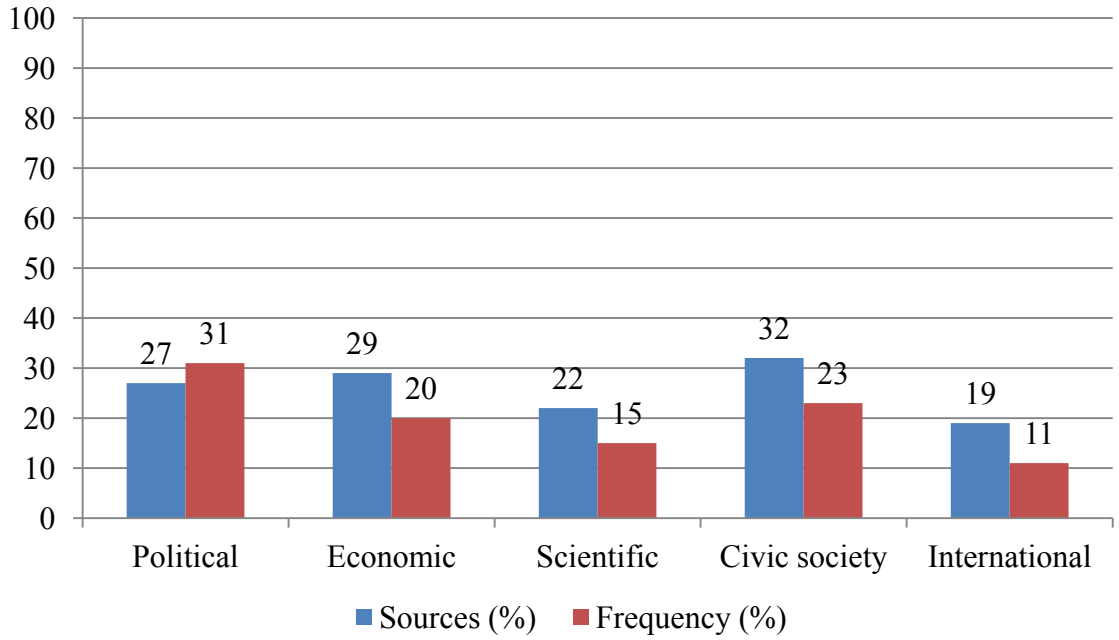
The second area of analysis monitored the sources used in the sample. Results in the Table 10 shows the number of different sources found (A), their proportion in the data sample (B), the number of times they were quoted (C), the proportion of these quotations (D), the average number of times each source category was cited in an article (E), and the average number of times each source category was cited in an article when cited (F) (see methods chapter p. 52-54). Figure 1 shows in percentage columns B and D from Table 10. From the corpus, the figures compiled are based on a total of 558 different sources found in the bitumen news coverage (i.e., column B in Table 10 and blue column in Figure 1) with a total of 2639 direct quoted text found in the dataset (i.e., column D in Table 10 and red column in Figure 1). Table 10 does not include a row for the total as it remained non applicable in most findings. For example, the percentages presented in

columns B and D do not add up to one or 100% because the source can share more than one category (e.g., a U.S. lobbyist).

Table 10. News Sources

	(A) Number of sources	(B) Number of sources in percentage (%)	(C) Frequency of quoted sources	(D) Frequency of quoted sources in percentage (%)	(E) Average frequency of quoted sources per article	(F) Average frequency of quoted sources per article per category
Political	**150**	**27**	**815**	**31**	**0.5**	**5.4**
Executive	79	24	574	22	1.4	7.3
Legislative	42	8	109	4	0.3	2.6
Judiciary	6	1	15	1	0.0	2.5
Parties	23	4	117	4	0.3	5.1
Economic	**160**	**29**	**540**	**20**	**1.3**	**3.4**
Scientific	**124**	**22**	**402**	**15**	**0.2**	**3.2**
Pure and Applied Sciences, health	57	10	178	7	0.4	3.1
Social sciences, arts and humanities	7	1	19	1	0.0	2.7
Administrative sciences	35	6	124	5	0.3	3.5
Other scientists and academics	25	4	81	3	0.2	3.2
Civic society	**179**	**32**	**599**	**23**	**0.5**	**3.3**
NGOs/lobbyists	101	18	390	15	1.0	3.9
Public	44	8	117	4	0.3	2.7
Other	34	6	92	3	0.2	2.7
International or foreign organizations	**107**	**19**	**283**	**11**	**0.7**	**2.6**

Figure 1. Distribution and Frequency of Sources (%)



As Table 10 (columns A and B) and Figure 1 indicate, the various sources examined were relatively evenly spread among the economic, political, scientific, civic society and international categories, mirroring the active societal stakeholders involved in and affected by the bitumen industry. The number of sources representing civic society made up the largest proportion with 179 different sources (or 32%). This finding might be partly due to the fact that all the selected publications are based in different locations (e.g., headquartered in Edmonton, Montreal, Toronto) and potentially seeking more local sources for their reporting. Nonetheless, the bigger proportion of the category represented non-governmental organisations and other interest groups, namely the Pembina Institute (an environmental research organisation), and the Canadian Association of Petroleum Producers (CAPP, an industry lobby group). In second position were chief executive officers (CEOs) and other spokespersons of commercial enterprises who accounted for

160 sources used (or 29% of economic category). One hundred fifty sources or 27% represented governmental or political institutions. It is possible that industry representatives were more readily accessible than government officials (Paskey and Steward 2012). The fourth place is occupied by 124 sources from a scientific background, representing 22% of total sources. Among these sources were predominantly experts in scientific and administrative fields (57 sources or 10% and 35 sources or 6%, respectively) such as energy (petroleum), climate change (environment), chemical engineering, as well as energy industry economists, and energy and environment policy specialists. The least sourced in this category were social scientists (e.g., political science and history) and environmental and energy law specialists (7 sources or 1% and 25 or 4% respectively). Finally, journalists used 19% non-Canadian sources (107 sources). Utilizing foreign sources seems to position the Albertan bituminous sands as larger than a domestic issue, with most of the vested interest originating in the United States (e.g., American oil company representatives, politicians, advisors and environmentalists).

As shown in Table 10 (columns C and D) and Figure 1, to view the sources in terms of frequency of quotations – i.e. the number of times the different sources from a category were cited and in percentage – gives insight on the leading providers of information and their nature, and hence on the news content (see methods, chapter 3). The dataset was compiled from a total of 2639 direct quotations from the news sources. From most to least repeated, the 150 different sources from the political category were directly quoted 815 times in the case study, followed by the civic society (179 sources quoted 599 times), the economic category (160 sources quoted 540 times), the scientific category (124 sources quoted 402 times) and the international category (107 sources

quoted 283 times). For instance, Ed Stelmach, then Prime Minister of Alberta, was quoted 117 times over the three-year coverage across five newspapers, Canadian Prime Minister Stephen Harper 79 times, and 70 times for Jim Prentice, the former federal minister of environment. In terms of percentage, political sources shared the biggest proportion. Thirty-one percent of the quotations from the sample originated from political sources, followed by 23% of quotations from civic society, 21% from economic sources, 15% from the scientific category, and 11% of international sources. In fact, political sources are the only category whose proportion of frequency surpassed its proportion of number (Figure 1). Such predominant space given to official voices is consistent with environmental reporting but also North American journalistic practice in general (Boyd-Barrett 2004; Schudson 1989; Herman and Chomsky 1988).

Column E in Table 10 shows on average the number of times a source was quoted within an article. For instance, for every news article, a little more than one quotation originated from the executive political subcategory (1.4 times) and economic sources per article (1.3 times); whereas five news articles would be required to find one quotation from a scientific expert (0.2 times).

The last column (F) in Table 10 compiles the average number of times the sources were quoted within an article in their category. When cited, sources from the political realm were much more frequently quoted than any other (more than fivefold on average), particularly political leaders of the executive branch such as prime ministers and ministers (seven times more frequently quoted), but also political figures of the oppositional parties (five times as much). These numbers mean that whenever an executive political source is quoted within an article, the subcategory was cited 7.3 times

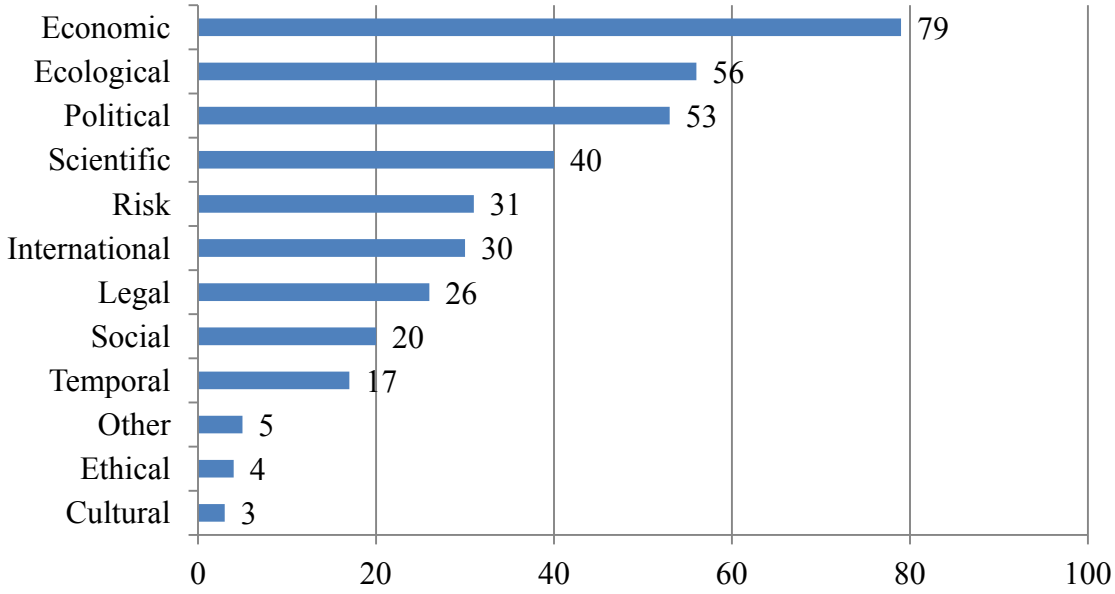
on average in that article. In contrast, the least frequently quoted of all sources were from the legislative and judiciary branches of the political sphere (2.6 and 2.5 times respectively). For instance, six different sources from the judiciary branch were found and quoted fifteen times over the course of three years. Between 3.9 times and 3.4 times more frequently quoted sources were representatives of interests groups (environmental non-governmental organizations and lobbyists, 3.9 times), specialized economists (and business professors, 3.5 times), and private companies representatives (CEOs and spokespersons, 3.4 times). Lesser recurrent sources were from the civic society (3.3 times), the scientific category (directly quoted 3.2. times), scientists of various fields (such as law, unspecified researchers and consultants, 3.2 times), and scientists from natural, applied and health sciences (3.1 times). Sources quoted equally often as 2.7 fold were social scientists, the subcategories of the general public and of the other members of the civic society like journalists or artists.

In sum, the news sources analysis shows a somewhat even distribution of the 558 different sources across categories, although the civic society had the most diverse sources, followed by the economic and political categories. Lesser proportions were experts of energy, climate change and economy, and the least sought were foreign, though mostly American sources. Such an even spread variety of sources that inform news on the bituminous sands in Alberta might point to the complexity of the environmental topics. Despite the broad range, prime ministers were by far the most frequently quoted than any other sources, along with a prominent presence of economic sources. Also, despite the finding that more news articles were written about reports (see 4a), scientific sources fared among the least used (ranked fourth).

4c. Typological Dimensions Analysis

A third analysis examined the case study through the multidimensional concepts of environmental issues. These typological dimensions were economic, political, international, legal, scientific, ecological, social, ethical, cultural, temporal, risk and other (see appendix E for descriptions). The dataset consisted of 6708 units of analysis (paragraphs) from the sampled body of text (409 news items). The presence of multiple dimensions within one paragraph of a news article was common, and by extension, any given news article was multidimensional (i.e., containing more than one dimension). Figure 2 displays in percentages the presence of each of the twelve dimensions found in the collected text. As presented, the results can be read as an average summary of the occurrence of information pertaining to any of the twelve dimensions appearing in one hundred paragraphs, regardless of which news articles they originate. To reiterate, for every slice of one hundred units (paragraphs), the results show an average percentage of the typological dimensions occurrences. When viewed in this way, the typological analysis suggests that a story would contain, on average, 79 paragraphs out of 100 that were based in economic information; indications of ecological information were present in 56 paragraphs; and so on. As such, a typical news item provides information about the Alberta bituminous sands that predominantly utilizes economic (79%), ecological (56%), political (53%), and scientific (40%) dimensions, with lesser presence of risk (31%), international (30%), legal (26%), social (20%), and temporal (17%) dimensions in its paragraphs, and more scarcely showing signs of other information (5%), ethical (4%) and cultural (3%) dimensions.

Figure 2. Presence of Typological Dimensions per Paragraph



4d. Findings Synthesis

The last section of this chapter reviews the findings from the three previous analyses. It takes a more qualitative approach to deepen the analysis and centralizes on detailing each of the twelve dimensions presented in 4c by showing excerpts from the sample that exemplified the most commonly found news content.

The Political and Global Attention of the Alberta Bitumen

Clearly, the reportage carries an important economic value: the news stories are often found in the business section and the presence of the economic dimension in the reporting is overwhelming (Table 8 and Figure 2). The predominance of the economic dimension is noticeable when looking at how the reported numbers emphasize bitumen as

a key component in Canada's economy: "Alberta's oilsands industry plans to boost production from currently 1.3 million barrels of oil a day to 3.5 million barrels over the next decade" (*Edmonton Journal*, June 25, 2008). This economic dimension was about more and bigger development projects, which also meant massive injections of capital from both industrial and governmental sides. The numbers noted are imposing: "Projected investments on oil sands has increased 35% at $15,5 billion this year. These correspond to a third of the expenses for the oil and gas sector, against a quarter two years ago" (*La Presse*, March 26, 2007)[5]. Also commonly reported were promises of generous funding allotted to counter environmental impacts, such as the following quotes: "Vowing not to let others determine Alberta's future, Premier Ed Stelmach yesterday committed $4-billion from this year's expected budget surplus to fight climate change – including setting up a $2-billion fund for carbon capture and storage projects that will help the image – challenged oil sands industry" (*National Post*, July 9, 2008), "Prime Minister Stephen Harper has announced $155.9 million in federal funding for Alberta projects he said would result in real reductions in greenhouse gas emissions, but environmentalists remain skeptical" (*Toronto Star*, March 9, 2007).

The newspapers put emphasis on the economic side of bitumen not only because the financial investments involved was substantial, but especially because the economic aspect was stressed by politicians. The political dimension percolated throughout the case study as bitumen was an item of priority in the political agenda, mainly through active stakeholders voicing their respective stance on bitumen in Alberta (arguments for, against, or critical of, Table 10, Figures 1 and 2). Commonly and frequently reported

[5] All loose translations: "Les investissements prévus dans les sables bitumineux sont en hausse de 35 % pour s'établir à 15,5 milliards de dollars cette année. Ils correspondent au tiers des dépenses du secteur pétrolier et gazier, contre le quart il y a deux ans."

across newspapers, the promotion of its remarkable economic benefits to Canadians and the world was especially made by the Premier of Alberta, the Prime Minister of Canada and ministers of his cabinet and correspondingly, reactions sought from oppositional parties. Unsurprisingly from the viewpoint of both politicians, this industry is clearly of economic and political importance to the province and the country. Happening beyond national borders, the subject took international proportions and stood at the heart of diplomatic discussions and debates among political figures including those like the American presidential candidate in 2008, Barack Obama.

Indeed, 30 paragraphs out of a hundred included an international feature. Foreign sources of information used for covering the bituminous sands also made up almost 20% of the total used. Twelve percent of the news stories covered diplomatic events like summits, 11% covered social protests and political campaigns. The following political stance was consistently cited: “Barack Obama on Tuesday vowed he would break America's addiction to ‘dirty, dwindling, and dangerously expensive’ oil if he is elected U.S. president – and one of his first targets might well be Canada's oil sands” (*Edmonton Journal*, June 25, 2008). Such contentious positions imply that exploiting bitumen poses a threat outside Canada. News sources and topical coverage revealed a vested political interest by following what went on in the United States and how much is at stake for Alberta. This was found in the coverage of official meetings between Canadian and American leaders (e.g., politicians, lobbyists) to discuss energy and environmental plans affecting both countries, such as the U.S. Conference of Mayors annual meeting (*National Post*, *La Presse*) and the meeting of governors of western U.S. states (*Edmonton Journal*), with the outcomes of such gatherings expressing a potential for a

major economic impact on the province. For example, all the dailies reported on the Low Carbon Fuel Standard, a bill from California, and the U.S. Energy Independence and Security act of 2007 which bans the use of oil from "oilsands" in federal vehicles. The international dimension was further linked to the economic dimension, evidenced by economic and social involvements of foreign companies (e.g., Total SA), organisations (e.g., Natural Resources Defence Council (NRDC), and protesters against bituminous sands in various parts of the country, in the United States and Europe.

Attention to the Alberta bitumen was also evidenced through the coverage of other incidents. Among the least covered aspects, the residual category "other" in both the topics covered (Table 9) and typological dimensions analysis (Figure 2) captured the image and reputation issue of bituminous sands. The news media became aware of Canada's "oil sands" reputation worldwide, citing headlines from various international media: "Alberta has been under attack over the damage oilsands development is causing to the northern boreal forest and the Athabasca River. Last spring's highly publicized deaths of about 500 ducks on a Syncrude tailings pond drew international attention, and critics said the industry gave the country a black eye" (*Edmonton Journal*, 4 February 2009). "Syncrude originally estimated that 500 migratory birds died when they landed on its Aurora tailings pond last spring – news that sparked international outrage and further intensified the oil sands' ugly reputation" (*National Post*, April 1, 2009). Such global attention hinted at discussions of the image and reputation of oil companies, issues that fall outside of the typological dimensions, like the practice of public apology by high-profile companies (*Edmonton Journal*, May 4, 2008). For instance, three newspapers covered a decision issued by an advertising regulator on the misleading character of a

Royal Dutch Shell PLC advertisement (*Edmonton Journal*, *National Post*, and *La Presse*). The newspapers also reported whenever a book or documentary investigating Albertan bitumen was released. Media attention was also drawn when the American magazine National Geographic published a controversial article in its March 2009 issue, or when chairwoman of the Council of Canadians Maude Barlow compared the northern Alberta region to Mordor, a fictional dark universe from a fantasy novel written by J. R. R. Tolkien (*La Presse*, *Edmonton Journal*) (the most commonly found indication of a cultural dimension in the press, 3 paragraphs out of 100). However, it is to be noted that these stories on reputation also shared an international dimension (see multiplicity of dimensions p. 82-84).

Downsides of the Alberta Bitumen

Politicians have identified the underlying tension between economics and the environment and the reportage mirrored such observation: "'All Canadians are looking for a balance between economic growth and environmental protection,' Harper said. 'Finding that balance is the fundamental challenge of our time'" (*Toronto Star*, March 9, 2007). To some extent, the news content balanced this economic weight when environmental concerns related to bitumen were mostly tied to legislation discussions and information about how bituminous sands industrial activities in Alberta perturb the environment. From the findings on Figure 2, the ecological dimension was manifested in 56 paragraphs out of 100, the legal dimension 26, and political dimension 53. All publications followed up every year and regularly updated on the unfolding of provincial and federal governments' announcement plans to address climate change, linking a

potential impact from the development of bituminous sands. Also, in Table 9, 24% of the sample covered the releases of environmental, scientific, economic reports and other assessments related to the topic, 14% were regulatory news announcements and 16% paid attention to various responses to these "green plans". Canada had set a target to reduce greenhouse gas emissions by 20% from 2006 emission levels by the year 2020 and this typical formulation of environmental legislation was recurrently mentioned between 2007 and 2009, with some newspapers publishing more details by enumerating the major points of the federal plan, and others further comparing it with other proposed targets (e.g., from the Liberal party' plan, the Kyoto Protocol, other provincial or American standards). As suggested in the *Edmonton Journal*, "the oilsands are at the centre of Canada's global-warming debate because they, and their emissions, are growing so fast" (August 5, 2007). In that regard, the environmental dimension also focused on fresh water, forest land usage and air pollution, although greater attention was drawn to carbon dioxide output, and significantly less on other greenhouse gases releases such as methane, or other air pollutants like sulphur oxide. However, it is to be noted that most of the ecological dimension relied more on the use of terms like "climate change" or "greenhouse gas emissions", than bridging seemingly distant elements together. A rare occasion in the following example directly addressed how much of the GHG released in Canada was caused by bituminous sands operations. From the *Globe and Mail*, bitumen would be responsible for three per cent of the total greenhouse gas emissions in Canada in 2004 to 15% by 2020, depending on which processing stage and methods were employed, and the organization's specific calculations (e.g., Environment Canada, World Wildlife Fund Canada). The environmental concerns were further informed by expert

input other than governmental and industrial authority figures, such as the Pembina Institute (and its representatives), a local environmental, policy and energy research organization that closely monitors bitumen activities.

Similar to the ecological dimension, and despite a prominent scientific dimension present in 40% of the corpus, the newspapers only offered general descriptive facts and sporadic explanations to help readers to understand and contextualise the industrial operations. The press stated on a few occasions that Canada possesses the second largest oil reserves, second to Saudi Arabia, with 178 billion barrels, and that the processes available for extraction require massive amount of water and energy to separate the bitumen from the sands. At times, brief explanations and definitions were provided (e.g., extraction via steam-assisted gravity drainage, what tailings ponds are). But mostly, the scientific dimension stopped at the frequent usage of terms related to technological advances aimed to minimize the impact of resource exploitation on the environment. A classic example found across all newspapers is "carbon capture and storage technology" (CCS). "Harper said Canada and the U.S. are 'looking at things like carbon capture and storage as a way of minimizing or cutting down on some of those emissions'. And he said the new Obama administration presents new opportunities for co-operation that didn't exist under the previous Bush administration." (*Edmonton Journal*, February 19, 2009). The scientific dimension was complemented by information on released reports from various sources inquiring on potential social (e.g., health) and environmental concerns. However, when looking more closely at how the risk involved in bituminous sands was addressed, the news contained report releases that further emphasized the destructive nature of exploiting that resource: "According to a shattering report from the

Environmental Defence organization, obtained by La Presse, the oilsands developments constitute nothing but 'the most destructive project on Earth'"[6] (*La Presse, Globe and Mail*, February 15, 2008).

The unusually high number of skin cancer cases found in the local population residing near the Athabasca River also garnered media attention, implying a causal link with the bituminous sands. Additionally, the aspect of risk intensified as news content was devoted to the incident in April 2008 of 500 migrating mallards landing and dying on a giant basin of toxic water. In this regard, the implementation of environmental legislation through courts decisions was occasionally reported (five per cent of the sample covered lawsuits, Table 9, legal dimension of 26%, Figure 2). For example, the press reported on the federal court decision in which the company Imperial Oil lost its approval for a water permit to develop a $8 billion exploitation project for lack of environmental considerations.

While ethical considerations and risk have been part of environmental journalism and science communication (Methods, p. 42-43), only four out of a hundred paragraphs addressed ethical questions related to bitumen development in the sample. When this arose, ethical issues took the form of morality issues. Evidence in the reporting was articulated by a catholic bishop whose letter was excerpted: "I am forced to conclude that the integrity of creation in the Athabasca oil sands is clearly being sacrificed for economic gain. The proposed future development of the oil sands constitutes a serious moral problem" (Luc Bouchard, *Globe and Mail* and *Edmonton Journal*, January 27,

[6] "Selon un rapport accablant de l'organisme Défense environnementale, obtenu par La Presse, le développement des sables bitumineux constitue rien de moins que 'le projet le plus dommageable au monde'".

2009). To that extent, governmental and corporate messages about commitments to social responsibility and environmental sustainability were also delivered.

When it was present, the social component of the news coverage humanised the case study (32% of the news sources from civic society category, Figure 1, social dimension of 20%, Figure 2). Found in most lengthier, investigative pieces (Table 7), it was encapsulated by news stories focusing on the local aspect of the bituminous sands, particularly the quality of life of First Nations communities (e.g., Chipewyan and Mikisew Cree), workers and local residents of the Athabasca region. *La Presse* for example, had testimonies of Quebecers experiencing the Albertan industrial expansion such as price of housing, working conditions, traffic, and personal relationships: "Hired by different firms, Ann and Bernard live in separated "labour camps". Now the majority of camps prohibit visits, even from a spouse. Companies maintain that it's a way to preserve the peace of residents. "But even in prison, we have the right to conjugal visits", grumbled a union delegate who prefers to remain anonymous.[7]" (September 27, 2008).

Environmental implications were further explored in the sample through a temporal dimension (17%, Figure 2). This temporal dimension functioned in the sample to inform on environmental policy deadlines, business objectives to reduce environmental impact such as increases of oil production and development of green technologies, but also to remind readers of key past events relevant to a current article. However, longer-term indications offered interesting perspectives of the bituminous sands expansion. We learned from the *Edmonton Journal* for example, that the first mining for bitumen

[7] "Employés par des firmes différentes, Ann et Bernard vivent dans des "camps de travail" séparés. Or, la majorité des camps interdisent les visites, même quand il s'agit d'un conjoint. Les compagnies soutiennent que c'est une façon de préserver la paix des résidants. "Mais même en prison, on a le droit à des visites conjugales", maugrée un délégué syndical qui préfère garder l'anonymat."

happened fifty years ago (May 27, 2009), but that up until now, "only 100 hectares of torn-up forest, a dumping ground for overburden, has been reclaimed"(June 15, 2008). From the *Toronto Star*, moreover, oil companies were granted a tax break 35 years ago (March 20, 2007), while "[t]he oil sands account for nearly a third of Alberta's natural gas consumption, and the amount used is expected to jump four-fold over the next 10 years as development of the oil sands gathers momentum" (February 10, 2007).

As a whole, the case study provided variety in its wide range of news sources and different types of information. However, the economic aspect was clearly the dominant focus of the case study. To refer to the Prime Minister's view, on one side of the balance, the reporting accentuated on the benefits and the important economic role of bitumen for the prosperity of Canada and abroad in terms of expansion, long-term commitment of the industry, and substantial financial means to promote green technology. On the other side of the balance opposite to the economic prospects, the reporting addressed environmental concerns through coverage of policy plans disclosed by public officials and academic and public reports, and documented other effects of the bitumen industry, such as potential social risks in health, local safety, and work issues, with less reporting on issues regarding timeframe, ethical concerns or the cultural dimension.

A Multiplicity of Dimensions

Even though these dimensions in Figure 2 were meant to conceptually suggest mutually exclusive topical categories as one way to dissect environmental news content, they remain entwined to one another. In fact, several typological dimensions appeared within one unit. For that very reason, the proportions of the twelve typological

dimensions shown in Figure 2 do not add up to one hundred percent (100%). On average, three different dimensions were present in a unit of analysis (3.37 dimensions per paragraph), with the most frequent combination of economic, ecological and political dimensions (and to a lesser extent the inclusion of scientific elements) within one unit. 83% of the units shared between two to five dimensions, with almost half including three or four dimensions (48%). A tenth of all units presented one dimension (usually economic, scientific or other) and seven percent shared over five dimensions.

To consider this, the following paragraph shows such dimensions regarding a governmental promise to fund clean technologies to bitumen-related projects:

"A $2-billion commitment from the Alberta government to build carbon capture and storage technology is a good start, she [former federal energy minister Anne McLellan] said. However, the oilsands also consume more energy and water to produce than conventional oil." (*Edmonton Journal*, February 22, 2009).

This example indicates how each conceptual dimension did not appear in isolation; the text instead shows a political intervention (a presence of political dimension) involving a monetary plan (a presence of economic dimension) to incite research and development while identifying the technical difficulty (a presence of scientific dimension) to remediate to environmental concerns (a presence of environmental dimension).

To summarize the research findings, results show that all the selected Canadian newspapers have covered the subject with sustained interest throughout the 2007-2009, evidenced with coverage highest in 2008; predominately medium-length and longer

articles; and front page stories on the topic across publications. In terms of topics, most stories covered reports releases, responses and discussions of policies to the bitumen industry. In terms of source usage, the overall reportage was mainly informed by political authorities even though they were outnumbered by sources from the civic society and despite the relatively even distribution among societal stakeholders. This echoed the multidimensional character of environmental conceptualization and highlighted the economically driven news content initiated by political messages, although most typological dimensions acted as supplementary and contextualizing information. Rather than lacking in-depth coverage, findings in this project found more tangible evidence in observing the repetition of quoted messages from most frequently used sources and terminology without further elaborations which resulted in inflating the presence of some dimensions (e.g., ecological, scientific).

Chapter 5: Discussion

This thesis explored environmental journalism as a specialized form of journalism (similar to foreign correspondence, sports, arts, crime reporting, etc.). Its primary goal was to conceptually analyze the news content of a Canadian topic that garners media attention due to its relation to the environment. The environment was conceptualized as implicating the definitional notions of humans and nature relationships, sustainability and societal risk (see Literature review chapter), and operationally articulated into a template of underlying issues (see appendix E). In considering the challenge of communicating complex environmental subjects (Boykoff et al. 2008), this project selected a case study – Canadian newspaper coverage of the Alberta bituminous sands – that carried contemporary importance and was clearly linked to the environment and complex social issues (Paskey and Steward 2012). This case study served as an epistemological focal point to ask: Can the assessment of media coverage of Canadian bituminous sands provide a bounded example allowing the elaboration of a conceptual framework that is designed to improve content analysis of environmental news? The answer was partially affirmative. On the one hand, the subject of Alberta bitumen effectively enabled the exploration of the multilayered complexity of environmental issues within society (see Literature review chapter) which allowed for the testing of a conceptual framework (see pp. 39-43) that attempts to examine new coverage as a "compositional whole". On the other hand, as a bounded example, the bitumen's news media representation limited the spectrum of underlying issues, some of which were regarded as integral to environmental journalism in the relevant literature (see Literature review chapter and appendix E). The text-driven approach to this content analysis (see methodology, p. 44) helped rectify this

partial affirmative. Nevertheless, there are some merits to the developed conceptual framework and the potential for comparative observations between future case studies and thereby future research possibilities.

Findings Summary

The research was based on news articles published in five Canadian newspapers between 2007 and 2009 via three sets of analysis: a preliminary assessment of the sample, the news sources, and the typological dimensions, and concluded with a synthesis of the analyses. The groundwork provided indicators to qualify and quantify the dataset, the news sources mapped out the range of providers of information used in the coverage, and the dimensions conceptually suggested mutually exclusive topical categories as one way to dissect environmental news content. The results showed that all the selected dailies covered Alberta bitumen with sustained interest which might point toward the newsworthiness of the topic (overall increase of news articles over years, Table 6). About half of the dataset contained medium-length articles (52%) and four out of the five publications devoted some in-depth series to the subject (Table 7). The Alberta bituminous sands made front page news across newspapers, although the subject was equally considered an important current affairs and business topic (Table 9).

The pool of sources used (558 different source in total) remained relatively evenly spread among the societal stakeholders (Table 10 and Figure 1a), albeit more concentrated on public officials, industry and environmental organizational representatives, and mostly occupied by political authorities whose messages were reported repeatedly (7.3 times compared to the total source average of 3.6 times), even

though sources from the civic society outnumbered them (Table 10 and Figure 1). As Albertan bitumen is partially involved in economic priorities and policies issued by decision-makers, such results are not surprising when considering two general standpoints: the predominance of authority figures is typical of environmental reporting but also consistent with North American standards of journalism practice in general (Boyd-Barrett 2004) and the predominance of political and economic news in newspapers (Pew 2012).

From the typological dimensions analysis, the results showed a presence of several dimensions in a unit of analysis (3.4 conceptual dimensions on average, see p. 82). The most commonly reported information among the selected newspapers contained news information of economic, ecological, political, and scientific dimensions, and less on the remaining dimensions (79%, 56%, 53% and 40% respectively, Figure 2), in great part due to the usage of preferred quoted sources, such as the predominance of politicians who valued the economy and promoted the benefits of bituminous sands development and added to a considerable proportion of economic sources that also discussed business affairs. Another indication is that almost half of the news stories appeared in the business section of the newspapers (46%). Despite the relative prominence of the scientific and environmental dimensions, the coverage provided less description and analysis to explain their implications in the bitumen industry. According to Paskey and Steward (2012), reporters might have positioned the bituminous sands as an issue causing tension between the economy and the environment. In fact, the case study generated more content reflecting this dichotomy, mainly with reportage on politicians' negotiations between the economic size of the flourishing industry of bituminous sands in Alberta and the

environmental policies and strategies to regulate it. Also, the reportage provided content focusing on other societal issues of risk, health and safety, namely through covering releases of scientific and economic reports and other assessments related to the development of bitumen.

By using the twelve typological dimensions, it is possible to construct a "generic" newspaper story on bituminous sands from 2007-2009. While an artificial composite, such an exercise provides insight into the news media content on the topic by showing the extent of how the coverage was multilayered/multidimensional and interrelated. Essentially, a "generic" newspaper story in the data sample on the bituminous sands showed strong political and industrial support to its development from Canadian governments (federal and Albertan), which concurrently involved considerable economic commitments (economic and political dimensions seen in 79 out of 100 paragraphs and 53 of 100 paragraphs, respectively). This was the dominant concept expressed in news stories. Economic expansion and approval of bituminous sands projects, however, did trigger growing concerns about ways to legislate the reduction of GHG emissions from the oil and gas industries by setting percentages, megatonnes caps and timeframes. This added new ecological, legal, temporal dimensions to stories (seen in 56 out of 100 paragraphs, 26 of 100 paragraphs and 17 out of 100 paragraphs, respectively). Meanwhile, the scientific dimension (seen in 40 out of 100 paragraphs) hinted at environmental concerns by explaining some of the mining techniques for bitumen extraction while also insisted on supporting new technology development (via repeated use of same terminology). Stories might have stopped there, except the Albertan

bituminous sands became a topic discussed worldwide, especially in the United States because many international economic and political partners have vested interests in such developments (international; seen in 30 out of 100 paragraphs), and the topic was followed closely, especially when a flock of ducks died in toxic water of tailings ponds and cases of cancers in the region were brought to light (risk, seen in 31 out of 100 paragraphs). This resulted in a few trials and penalties in the news (legal, seen in 26 out of 100 paragraphs) and generated local worries, protests and reflections on life quality (social, seen in 20 out of 100 paragraphs). Finally, on limited occasions a religious source would question the morality of the bituminous sands (ethical, seen in four out of one hundred paragraphs), or the subject would inspire documentaries and publications worthy of news coverage (cultural, seen in three out of one hundred paragraphs).

Findings as Related to the Literature

In many regards, the overall findings of the case study showed a consistency with the reviewed literature in terms of event-based reporting, dependence on influential news sources and politicization, and complexity of environmental affairs.

Findings from the sample assessment (Table 9) validate for the most part the event-driven character of environmental reporting but also journalism in general. Twenty-four percent of news stories consisted of incidents, reports and study releases (Gamson and Modigliani 1989; Anderson 1997; Soroka et al. 2009; Bolsen 2011), 16% reported on viewpoints and reactions to messages (Einsiedel and Coughlan 1993; Singer and Endreny 1993), particularly mapping the range of views about governmental

announcements on environmental regulations – 14% – that affect Canadian energy industries.

Findings from the news sources analysis perpetuate the reliance on authority figures (Table 10 and Figure 1), namely public officials, and industry and environmental organisations representatives (Boykoff 2009). As anticipated in environmental coverage, the bituminous sands were led by politicians and hence politicized as an important item on the political agenda and an issue of political interest locally and globally (Nelkin 1995; Miller and Reichert 2000; Nisbet and Lewenstein 2002; Brossard et al. 2004; O'Donnell and Rice 2008; Cottle 2009; Soroka et al. 2009; Maeseele 2011; Young and Dugas 2011). The evidence for this was seen through the allotted space given to those influential voices whose interests were often in conflict – politicians, industry and environmental organisations representatives. In fact, messages from prime ministers and their spokespersons were quoted more than seven times more often than other sources whose average frequency was 3.6 times.

Apart from political prevalence, the sample also revealed a diverse collection of news sources. One explanation is that journalists require more specialised experts to cover the complexity and controversial nature of bituminous sands (Paskey and Steward 2012). The other reason speaks more to journalistic practice in general than informing the case study where reporters' systematic approach seeks 'all sides of the story' within limited resources (Tuchman 1972; Gans 1979; Dunwoody and Peters 1992; Bennett 2002; Boykoff 2008) and as a result, can be interpreted as a tendency to increase uncertainty and provide a false sense of balance in environmental reporting (Goodman et al. 2008; Nisbet 2011).

Akin to sources, findings from the typological dimensions analysis have shown an asymmetry of the news content, emphasizing the economical, ecological, political, and scientific dimensions, with lesser attention towards risk, international, and the remaining dimensions. Despite the broad spectrum of issues covered and many dedicated in-depth series devoted to the topic (Table 7), news from the sample may be perceived as simplistic, superficial or lacking depth (Friedman 2004; Thompson R. 2005; Gunster 2009), in part due to its repetitiveness (Paskey and Steward 2012) by recycling the same material followed by limited explanations. To illustrate, the following example refers to governmental promotion of the carbon capture and storage technology. These terms or the acronym, "CCS", were used 170 times across the dailies[8] in majority without explanations on the technology. In so doing, these terms circulated without apparent meaning associated to them and divert the attention from asking about the current technologies under use.

Nonetheless, and despite the dominance of some elements noted above, the interconnectivity and multifaceted nature of environmental issues were reflected in the sample through the numerous dimensions of the news content (Stocking and Leonard 1990 in Allan et al. 2000). On average, three different dimensions were present in a unit of analysis (3.4 dimensions per paragraph). The interplay between economics, politics, science or other related issues were often expressed together rather than in isolation (p. 82). The coverage provides contextual information evoking various dimensions to situate a story. For example, information from international, political, economic and environmental dimensions were present to understand why the bituminous sands is an electoral issue in Norway: Statoil is a Norwegian state-owned energy company that has to

[8] Includes the equivalent in French: captage et stokage/séquestration du dioxyde de carbone/de gaz à effet de serre.

decide whether it wishes to stay financially involved in Alberta bitumen, considering its environmental record, as the electorate is about to vote (*La Presse*, September 10, 2009).

Opportunity for Economic News?

From the reviewed literature, the findings from this thesis agree with Way (2011) who concluded a dominant economic frame of the bituminous sands coverage. From article placement (Table 8), findings show strong reporting as both a matter of current affairs and business (both 46% of the dataset). Such results might be a methodological limitation from search settings that filtered out many financial reporting such as stock market or management updates. Regardless, the news content on bituminous sands from the selected Canadian newspaper is heavily oriented to economic news (see Figure 2, p. 77). However, the coverage was tempered by a predominance of political sources that, by means of public announcements of rules to monitor the bitumen and other energy sectors, also oriented the coverage towards environmental considerations. This seems to show an active interaction between politics, economics, and the environment. While many recognise the tensions between economic and environmental concerns that lie at the heart of bituminous sands reporting (Way 2011; Paskey and Steward 2012), the economic inclination as a journalistic approach can also be seen as an opportunity for environmental reporting. This is to suggest that business and energy reporters, for example, will have to address the usually unintended effects of economics that are becoming harder to ignore. Indeed, the notions of negative and positive externalities in environmental economics might address some disconnects of unaccounted and indirect impacts, such as work conditions, health and safety. There are social, environmental and

economic costs and gains, especially when it comes to tackling the "pressing and complex problems" of greenhouse gas emissions and pollution of other public goods like clean water or biodiversity (Helbling online).

Lack of Ethical Interrogation

Ethical interrogations, especially when involving scientific and technological advancements, have been one of the many issues that are part of risk communication, environmental reporting and writing (Gamson and Modigliani 1989; Neuzil 2008; Hansen 2011; Thompson P. 2012). The case study has illustrated the rarity of explicit indications of an ethical dimension (see Figure 2, p. 77).

In fact, from the author's viewpoint, the environmental news examined seemed immune to raising moral and ethical concerns. This is perhaps related to journalism practitioners' awareness of their audience. The profile of the public today is being recognized as plural and diverse (Hessing 2003), more scientifically literate (National Science Board 2008), having more agency in seeking information by themselves (Brossard and Shanahan 2006; Kahlor and Rosenthal 2009), and in making up their own minds about what is good or bad on the subject (Gillmor in Bowman and Willis 2003). The virtual absence of moral and ethical discussions in the case study where so much is at stake poses a real challenge to journalism, especially within a complicated context of unequal and competing agencies with vested interests and thus ideological values (Carvalho 2007; Hansen 2011), and unproven claims on environmental impacts, thus leaving not only the public but also reporters to figure out what or who to believe (Gosselin et al. 2010; Paskey and Steward 2012).

A Suggested Typology for Future Work

To conclude on a broad, reflexive note, I would like to suggest a scheme to improve the conceptual framework for environmental news content analysis. The scheme below is borrowed from the same literature used to identify the recurring subset of environmental affairs, namely; Luhmann 1989; Thompson R. 2005; Jones 2006; Deines 2007; O'Donnell and Rice 2008; Nielsen and Kjaergaard 2011and particularly inspired by Stephens et al. (2009). It lists the same previous dimensions except the concept of risk is presented as an additional variable to the dimensions. It would be interesting to further explore the kinds of risk most covered in the media, an examination that could not be done with the typological dimensions analysis used in this thesis. Does the economic predominance in energy or environmental news topics tend to cover more economic risks as well (e.g., bankruptcy, massive layoffs), or is the coverage still event-driven (e.g., oil spills)? When the environmental reporting does not mention any risk (Table 11), this template can still capture its underlying aspects. The positioning of these dimensions need not be linear. They can reflect a hierarchical structure to stress the order of prominence (see Thompson R. 2005), depending on empirical evidence. Its challenge and limitations though, require closer attention to determine where such risk stands without further details regarding the level of risk intensity (Hohenmenser et al. 1983) or to provide a stronger grasp on the connections between these dimensions. Other possibilities include a network-type visualisation to grasp the web of connections established between the underlying dimensions of environmental topics. Such an approach might require an application to generate a graphic representation, similar to NodeXL, Thinkmap or

myFnetwork (from the social media platform Facebook) in which webs of links clustered towards a point would suggest a concentration or strength of the dimensions involved.

Table 11. Scheme Suggestion

Dimensions	Presence of risk
Ecological	Threats to air, land, water, biodiversity
Economic	Costs
Scientific	Limitations or uncertainty
Political	Governmental struggle, political instability or threats to security
International	Weakened interdependence
Legal	Sanctions
Social	Threats to human livelihood, public health or safety
Ethical	Consequences of choices
Cultural	Loss of aesthetic or cultural values
Temporal	Consequences of action or non-action
Other	Other possible impacts

In hindsight, this initial sketch of a conceptual framework for environmental news content analysis can benefit from extra exploratory experiments, particularly by implicating multiple coders, and by questioning the validity of each dimensions: Should some of them be removed, combined or are missing? Doesn't it appear tautological to have an ecological dimension in a conceptual framework that specifically targets environmental reporting? When smaller proportions of dimensions were present, such as ethical or cultural, would it be preferable to eliminate them altogether? Is there use for a residual category (other dimension), and if so, how does it offer a better analysis? If the underlying issues of risk and ethics/morality are so tied together, should they be merged as a single dimension? Because of the interconnectedness of the dimensions involved in environmental journalism, are there other ways to measure them? Seeking answers to some of these questions represents fruitful ground for future thesis projects that can assist

in improving the initial typology suggested here. Such future work would, in particular, benefit from using the conceptual framework with different environmental case studies (e.g. extreme weather, blue-green algae).

Future research is certainly needed in the area of environmental reporting. Building on previous studies (Boykoff 2009; Soroka et al. 2009Hansen 2011; Way 2011) and the work presented here, a hypothesis suggesting how environmental affairs in the news media are tackled under an economic frame is needed and should be pursued as a thread in North American journalism studies. This research approached the case study as a generalising embodiment of environmental affairs to conceptualise a framework but overlooked that its economic discourse was rooted specifically in energy as an environmental subtopic, particularly within a globalized context of the need for fuel. For instance, Takach (2013) points out the visual representations of Alberta bitumen connected to societal processes of globalisation, consumerism and neoliberalism, but also a re-branding which corresponds to similar findings in this research. Such directions acknowledge precedent values in society and could introduce ethical questions. Comparing the news items with commentaries and opinion-driven journalistic pieces, along with capturing positive and negative perspectives might offer more evidence of ethical questions and contextualise how the environmental notion of risk is positioned vis-à-vis ethics. For instance, under what circumstances do reporting on various levels of societal and environmental harm set off conversations regarding ethics or vice-versa?

Lastly, regarding the case study itself, additional work is required using other analytical methods such as textual, framing or critical discourse analyses to provide a complementary insight on the thematic interplay when it comes to addressing the

environmental issues related to bituminous sands. Approaches from linguistics would shed light on meanings behind words used. In English, the terms "oil sands" suggest an abundance of rich, natural resource – it has been referred to as "black gold," just like petroleum, in both languages – (Nikiforuk 2010) that is pure, thus seemingly easy to extract. As frequently evidenced, this implies a simple operation necessitating only hot water to separate the oil from the sands. "Oil sands" sounds arguably better than "tar sands," terms often employed by environmentalists, implying something dirty, or better than "extra heavy crude oil" (crudo extra pesado), a third largest petroleum reserves so referred to in Venezuela that is often compared to the Canadian deposits, despite its inferior degree of viscosity to that of bitumen. "Oil sands" almost carries a national identification. In French, the invariable and more technically accurate terms "sables bitumineux" seemed to be progressively abandoned and absorbed into the more generic vocabulary of oil ("pétrole") used interchangeably as shorthand or as synonyms, following the Anglophone media trend.

Hence, the evolution of terminology use in this dossier is worth exploring, for instance with the concept of re-lexicalisation in linguistic analysis of texts (Fairclough 1989). Critical discourse analyses are needed to gain better understanding of the existing media discourses at play. For instance, while it seems possible that the press have pitched the contentious subject as one issue of economy against the environment (an assertion that falls outside the objectives of this thesis), examining the discourses might elucidate in what ways this was done in the news media, the tone and implied ideologies put forth. Perhaps a smaller data sample should be designed to investigate this idea. Also, targeting the bituminous sands to a specific incident would assist in exploring the various

meanings involved on the issue. The much debated Keystone XL pipeline construction project for example, might convey some "not in my backyard," "Pandora's box," the "devil's bargain," or other conflicting frames to position the issue to the public (Gamson and Modigliani 1989; Maeseele 2011). These areas of research would be valuable addition to the currently scarce collection of communication studies on this key Canadian issue.

Strengths and Limits

This thesis has several strengths. The research achieved a reorientation of ways to think about communicating environmental issues by recognizing to the fullest the existence of many components relevant to environmental issues that would otherwise go unnoticed. Whereas the reviewed literature have established how media coverage fail to grasp how environmental affairs take part in and implicate a wider scope of societal and globalized issues (Cox 2006; Boykoff et al. 2008; ; Olausson 2009; Berglez 2011; Hansen 2011), the research offered a space for articulating the underlying environmental concepts through the suggested typology to explore news content. After such identification, the research succeeded in highlighting which of the concepts (typological dimensions) were covered, how much or how little, as well as the interplay between them. Hopefully, this triggers further conversations to ask why some concepts prevail in the news discourse over others (e.g., economic value, optimism in technological solutions), how diverse types of information should be conveyed, or how these concepts should be calibrated. Although no comparison was intended in the project, this typology might also provide research ideas to make comparative observations of media coverage

between environmental topics (e.g., energy topics cover more economic aspects than topics about biodiversity loss), between publications (differences between local and national press, mainstream and alternative media, or print and online), or journalistic cultures (e.g., cultural or linguistic differences).

Additionally, the examination of the case study was thorough and allowed for nuanced and detailed reading of a large dataset. Validation of the research results was reinforced across its three layers of analysis. Further than cursory indications such as story length and page number, the analysis established stronger findings between the news sources and coverage. Both examinations clearly indicate economic, political and environmental predominance. The most sought news sources originated from the spheres of civic society (mostly environmental NGOs and lobbyists), business and governmental representatives and mirrored the bituminous sands reporting which mostly evoked information of economic, ecological and political dimensions. More precisely, the subject was more about environmental regulations toward energy sectors rather than direct environmental impact of bitumen, discussed among political leaders (prime ministers) rather than public officials who enforce the laws, industrialists, and environmentalists who are also scientists (e.g., biologists).

The thesis also has some limitations. First, regarding the sample's representativeness, the research material only targeted a three-year period of environmental news coverage of Alberta's bituminous sands in five Canadian newspapers depended on two databases (*Factiva* and *Eurêka*)[9]. The search filters used to facilitate data retrieval might have excluded some bitumen-related issues covered between 2007 and 2009 in the newspapers examined. A wider data sample or replication of the analysis

[9] Between November 2011 and December 2012

by other researchers is needed to confirm the representativeness and validity of findings in this thesis. In addition, the choice of these databases and the selection criteria (e.g. using stories tagged as "environmental news"), of course, led to a particular set of search results that may have ignored some environmental news coverage. Second, regarding the news sources analysis, for practical reasons of time and clarity, the results under-represented the extent of sources in the sample due to the common journalistic practice of using indirect citations. Restricting to only direct quotations was meant to eliminate all possibility of ambiguity, particularly as this research was conducted by one coder. Consequently, indirect references were not analyzed and should be addressed in future investigation. Third, regarding the analysis based on the conceptual framework, the coding process was inferential and interpretive. The background of the author therefore may have affected the coding process, which should be thought of as linked to assumptions, training and methods of the author. Further work is needed to examine how the conceptual framework is applied by other researchers to better understand the nuances of its use for coding news stories.

Conclusion

The idea that communicating on the environment implicates a wide spectrum of societal issues is not novel in the field of environmental journalism studies; however its systematic scholarly analysis has yet to be streamlined in terms of which underlying issues encompass environmental affairs in general. This project provides a contribution in that regard, in terms of assessing more systematically who aided in informing coverage of the bituminous sands (news sources analysis) and what was published (conceptual

framework). Overall, the case study revealed a breadth of underlying issues involved in the bituminous sands, as well as an even spread of news sources. While the coverage of Alberta bitumen as a lucrative industry for the province and the country has positioned the economic outlook against the environment, the complex, interconnected and pressing attributes of environmental issues require a more complete background context to inform the readers through twelve types of information suggested in this research. In the bituminous sands, there are massive economic interests involved, ecological repercussions, and they are an important matter on the political agenda. Such industrial scale requires scientific explanation and coverage on the increasing and intensified risk, with sensitivity to the international aspect of the case study. The topic requires reporting on policy discussions and enforcements, raising social implications, identifying short and long-term goals and impacts, ethical concerns, cultural aspects, and other matters on bitumen that could come up. This is not to assert that any news reporting on the environment should take all concepts into account, but the possibility for a full depiction of what an environmental news story might entail is there, and the awareness for such possibility can offer a space other than a critique of oversimplification or politicization.

Based on this project, I offer two final suggestions. First, given the information found in the 409 news articles analysed, environmental journalism practitioners can choose what content to emphasize to benefit the quality of environmental news. Reporters can repeat certain information more than others. For example, choosing "Each year between 22 and 170 million birds breed in the 14 million hectares of boreal forest that could eventually be developed for the oilsands, the report says. 'Not only do many adult birds die when faced with lost and fragmented habitat and ponds of mining waste,

but future generations of birds will have lost their chance to exist'" (*Edmonton Journal*, December 2, 2008), over "One of the world's largest man-made structures is not a tourist attraction, such as the Great Wall of China or the Hoover Dam, and few in Canada--where it's located -- know it exists. But when about 500 migrating ducks landed on its oily waters last month and died, the Mildred Lake Settling Basin in northern Alberta suddenly found itself in an international spotlight" (*National Post*, May 17, 2008). Second, environmental journalism practitioners can choose which sources to use more often, or prefer their own analysis rather than rephrase the cited messages. For example, quoting the following statement "The federal government has made a leap of faith that Canada's oil industry and coal-fired utilities can quickly incorporate carbon capture and storage technology that remains largely untested and is fraught with legal uncertainties" (*Globe and Mail*, March 11, 2008), over "'Like coal in the United States, the bituminous sands represent a technological challenge in Canada, M. Prentice simply said. The answer to all of this is innovation, in order to develop carbon capture and storage technology, the reduction of greenhouse gas emissions'[sic]" (*La Presse*, March 4, 2009)[10]. The value of these final suggestions and the presented framework, it is hoped, will be deemed not only useful to content analysts and researchers but also to environmental reporters and general journalists. This usefulness come from an awareness of what is missing or what is unnecessarily too often divulged in environmental topics, additional to the typical "Five W" questions, and perhaps more importantly to help the news media readers to navigate through complex stories in an age of information overload.

[10] Loose translation: "Comme pour le charbon aux États-Unis, les sables bitumineux représentent un défi sur le plan technologique pour le Canada, s'est contenté de dire M. Prentice. La réponse à tout ça est l'innovation, afin de développer la séquestration du carbone, la réduction des gaz à effet de serre."

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Appendices: Content Analysis Codebook

A. Data Selection

Data selection	• Keywords "oil AND sands" and "sables bitumineux" in headlines and leads only; • Within "environmental news"; • Removal of editorial pieces and irrelevant items

B. Indicators for Preliminary Assessment of Sample

Indicators	• Number of news items (per year and in total); • Length of each article (number of words per article) and the average length of an article (per - year and in total); • News item placement (page number and newspaper's section); • General topic of each news item and events covered

C. News Sources Analysis

Operational definition of source	Operationally, a source was defined as a provider: • includes an individual, an organization, or a type of documentation (e.g., a spokesperson, a company, a report, Durant et al., 1998); • of visually direct quoted text (i.e., use of quotation marks); • with attributions or verbs such as "said", "stated", or "reported" (Charpentier, 2008). • Unspecified sources were also taken into account (e.g., "an official said", "a spokesperson stated"). • Indirect references to sources were not taken into account (e.g., "she said" or "the doctor explained" were not measured) • Vague references to a group of individuals were not taken into account (e.g., "the producers argued", "scientists believe").

D. Scheme for News Sources Analysis

	(A) Number of sources	(B) Number of sources in percentage (%) [A/Total sources 558]	(C) Frequency of quoted sources	(D) Frequency of quoted sources in percentage (%) [C/Total quotations 2639]	(E) Average frequency of quoted sources per article [C/ Total articles 409]	(F) Average frequency of quoted sources per article per category [C/A]
Political Executive Legislative Judiciary Parties						
Economic						
Scientific Pure and Applied Sciences, health Social sciences, arts and humanities Administrative sciences Other scientists and academics						
Civic society NGOs/lobbyists Public Other						
International or foreign organizations						

E. Typological Dimensions

DIMENSION	DESCRIPTION
Economic (a)	Refers to any material about the monetary aspect of the bituminous sands activities, related to either of the following social sectors: governmental, fiscal, public, financial, or commercial: budgets, investment, funding, subsidy, price and other expenditures, price fluctuation, profit, growth, loss, trade, tariff, exchanges, benefits, mergers, joint ventures or other commercial partnerships, investors, labor, workforce, workplace, unemployment, recession, revenue, income, salary, tax, royalty, market, competitors, small and medium businesses, corporations, companies, industry, producers, production, refineries, pipelines, projects, development, and expansion.
Political (b)	Refers to any content that relates to matters of politics. To be coded when in a context of (i.e. within the text): a political debate, electoral campaign, strategies, plans, agendas or platforms among the political parties, politicians, or between opposition or minority political parties and government in power, or between different levels of governments and governmental institutions, organisations, ministries, or agencies (i.e., provincial and federal, or Canadian and United States, etc.), including security, defense, and military issues.
International (c)	Refers to one or different regions, countries, bilateral or multilateral relations, foreign affairs or diplomatic relations, global events such as official visits, group summits or worldwide conferences, international governmental or non-governmental organizations (e.g. UN, EU, WTO, Greenpeace International). Essentially, the international dimension refers to anything that is not exclusively local, national or Canadian.
Legal (d)	Refers to subjects that are legal, judicial and constitutional matters, legislations, rules and regulations, leases, licenses, permits, standards, propositions or modifications of bills, bills, policy and policy-making, as well as other law infringements and lawsuits, arrests, charges, fees, trials, penalties, violations, prosecutions, crimes, law enforcement, and monitoring panel.
Scientific (e)	Refers to a wide range of categories that include research and development, technical details, innovation and technology: any factual information, description, or explanation regarding industry, the industrial facilities, planning and management, equipment, the techniques and methods of extraction, treatment processes and production, the technical or technological options, advancements or solutions and their pros and cons including limitations and consequences, conducted studies, investigations or assessments, reviews, evaluations, comparative analyses, measurements, impacts, factors, and physical conditions. Reaserch from either academics, NGOs, think tanks, market report, or industry. Example: carbon and capture storage (CCS) and steam-assisted gravity drainage (SAGD).
Ecological (f)	Refers more broadly to news content indicating a relationship to various elements between human society and nature (including living organisms and their natural habitats) or any of these components in relation to each other, as well as the recognition in the complexity of such dynamics, terms, expressions or meanings that connect two or more seemingly different elements together, ecosystem, food chain, life cycle, pollution, toxic waste, conservation, climate

	change, global warming, as well as issues evoking land, water, air and biodiversity, such as land use, reclamation, agriculture, greenhouse gas emissions (GHG), emissions, wildlife, natural resources, environmental impact, environmental footprint, carbon footprint, sustainability, and green or clean energy, weather or climate conditions, forest, plants or animal species. Also environmental speakers,/environmentalists.
Social *(g)*	Refers to material that explicitly raise matters of society: public opinion, attitude, community, collectivity, local development, quality of life, livelihood, lifestyle, consumers, Canadians, voters, housing, infrastructures, public safety, public services such as schools, roads and hospitals, public understanding or knowledge, or awareness, education, public hearings, polls and surveys, critics, protests, and citizenship. For health, public health and safety related issues: both social and scientific dimensions.
Ethical *(h)*	Also tied to risk. Refers to content that tackles "oil sands" in ethical, moral, ideological, philosophical or religious terms: suggestions of professional and ethical conduct, integrity and obligation, responsibility and accountability, any form of human betterment, moral justifications between industrial development and protection (of vital resources for wildlife, natural habitats, people and communities), instances of sacrifices, dilemmas, or unfairness.
Cultural *(i)*	Mentions related to entertainment, celebrities or renowned public figures, topics related to multimedia, art or literary forms such as movies, documentaries, or books, any associations to aesthetics such as tourism, popularity, social customs and traditions, symbolic gestures, cultural references.
Temporal *(j)*	References related to time, historically or projected: timeframes, timelines, inferences to specific targets (to environmental problems), predictions (related to environmental consequences), oil sands productivity, deadlines, expiration dates, short or long-term future plans or projections, time periods, trends or patterns, historical references, events or explanations such as the national energy program (NEP) or the discovery of bitumen.
Risk *(k)*	Refers to material raising questions of hazards, threats, probability and scale of harm, consequences from action and non-action, uncertainties, tradeoffs, pros and cons of solutions, and using words that infer danger, biophysical damages or destruction.
Other *(l)*	Not a specific dimension : any remaining news content either do not apply or fall outside of any of the stated dimensions.

F. Examples of Typological Dimensions Coding

Examples (unit of analysis: paragraph)	a	b	c	d	e	f	g	h	i	j	k	l
1- “But with the oil industry slashing capital budgets and once-booming Alberta teetering towards recession, the fragile economy is top of mind”	x											
2- “The federal government launched an effort days after Mr. Obama was elected in November to persuade the Democratic standard-bearer that the U.S. and Canada should enter into a climate change accord that would also protect U.S. energy security by ensuring the oil sands development isn’t derailed by tough new emissions regulations”.	x	x	x	x		x						
3- “The concerns environmentalists express are highly credible,” Bishop Bouchard wrote in his pastoral letter. “I am forced to conclude that the integrity of creation in the Athabasca oil sands is clearly being sacrificed for economic gain.”	x					x		x			x	
4- “Earlier this year, the Alberta Cancer Board released a report that found elevated cancer cases in Fort Chipewyan over the 1995 to 2006 study period. While public health officials found many of the numbers to be wrong, the cancer board discovered 51 cancers in 47 individuals, compared with 39 cancers expected.”					x		x			x	x	
5- She also included on her website images some might construe as negative about Alberta, such as a tourist promotion offering a gas-guzzling Hummer as a prize and a shot that shows a Fort McMurray street clogged with fuel-wasting pickup trucks.									x			x