

Oil pipelines, climate change, and frames: Local news coverage of the Enbridge Line 3
pipeline replacement project in northern Minnesota

A thesis
SUBMITTED TO THE FACULTY OF THE UNIVERSITY OF MINNESOTA
BY

Lauren Joan Lenroot Ernt

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF ARTS

Christopher Terry, Ph.D., Advisor

December, 2020

Copyright © 2020 by Lauren Joan Lenroot Ernt

Acknowledgements

So many people have helped me throughout the process of writing this thesis. I would like to thank my advisor, Christopher Terry, Ph.D., and my committee members, Amy O'Connor, Ph.D., and Gabriel Chan, Ph.D. I am deeply grateful to Dr. Terry for his expertise, guidance, and support throughout this project, especially during the unexpected and extreme challenges of 2020. My sincere thanks go to Dr. O'Connor and Dr. Chan for their helpful suggestions and steadfast interest in my topic. My heartfelt thanks go to Natalie and Marlena for working as coders on this project. Their hard work, enthusiasm, and commitment, especially during the difficult circumstances surrounding the Covid-19 pandemic, are to be commended. Thanks as well to the Hubbard School of Journalism and Mass Communication for awarding me a Kriss research grant, which funded coding expenses.

I truly appreciate the Hubbard School's faculty and staff for fielding my endless supply of questions. Special thanks go to Dr. Susan LoRusso for her advice, sense of humor, and encouragement. Dr. Emily Vraga was so helpful in answering my questions and clarifying the finer points of statistics in content analysis, as were the consultants from the University's Liberal Arts Technologies and Innovation Services. The University of Minnesota Libraries' staff were invaluable sources of information, technical assistance, and moral support. The good people of the Silha Center provided wisdom and excellent company. My fellow graduate students helped me slog through with their kindness and camaraderie.

Finally, I would like to thank my family and friends for their unwavering support over the past few years. I could not have done this without you.

Abstract

Communications scholars have proposed that the U.S. media's depictions of climate change have contributed to (often partisan) public disengagement and doubt about the issue. This quantitative framing content analysis shifts analytical focus from climate change news in large media outlets to local coverage of the Enbridge Line 3 oil pipeline replacement project in northern Minnesota. The study asks how local newspapers define the Enbridge Line 3 project and whether their coverage introduces climate change discussions that may either repair or damage climate change opinions. Its tentative findings suggest that (in line with previous research) local news coverage depicted Line 3 most often through government/politics, economic, and environmental frames and rarely discussed climate change. Climate change depictions (as examined here) do not suggest broad potential to shift public opinions on the topic. More detailed analyses on these features could signal divergences and are suggested for future study.

Table of Contents

List of Tables	iv
Chapter 1: Introduction.....	1
Chapter 2: Literature review.....	18
Chapter 3: Methodology.....	63
Chapter 4: Results.....	93
Chapter 5: Discussion.....	121
Chapter 6: Conclusion	163
References	172
Appendix A: Sample background and details	185
Appendix B: Data collection disruption and transition	191
Appendix C: Pipeline frame selection, development, and refinement procedure details.....	194
Appendix D: Codebook refinement details—General processes and non-pipeline frame variables	218
Appendix E: Coder training procedures	225
Appendix F: Coding instructions.....	226
Appendix G: Data cleaning procedures.....	248
Appendix H: Results tables	252

List of tables

Table 1: Newspapers in sample	64
Table 2: Climate change frame concept operationalization	79
Table G1: Article ID entry errors and resolutions	249
Table H1: Pipeline frame frequency: All outlets, from single-variable frequency tables.....	252
Table H2: Pipeline frame proportions	252
Table H3: Presence of any frame	253
Table H4: Frame appearance frequency by outlet.....	254
Table H5: Frame appearance proportion by outlet.....	255
Table H6: Dominant frame frequency and proportion, by story type	257
Table H7: Dominant frame frequency and proportion, by Enbridge Line 3 focus level.....	258
Table H8: Frequency of articles by Enbridge Line 3 focus level.....	258
Table H9: Dominant pipeline frame attitude frequency and proportion	259
Table H10: Dominant pipeline frame attitude frequency and proportion, by news outlet.....	260
Table H11: Actor type frequency and proportion, across sample	261
Table H12: Actor type frequency in relation to dominant pipeline frames.....	262
Table H13: Proportion of articles featuring combination of actor and dominant frame, out of all articles with a given actor type	263
Table H14: Climate change presence, across sample.....	264
Table H15: Climate change presence, divided by outlet.....	265

Table H16: Climate change presence, divided by story type	266
Table H17: Chi-squared test of association for story type and climate change presence	266
Table H18: Climate change presence in relation to dominant pipeline frames...	267
Table H19: Climate change frame frequency, broken out by story type.....	268
Table H20: Climate change frame types, broken out by story type	268
Table H21: Climate change frame frequency, broken out by dominant frame attitude position	269
Table H22: Climate change frame frequency, broken out by outlet	270
Table H23: Climate change frame types, broken out by outlet.....	271
Table H24: Climate change frame frequency, broken out by dominant pipeline frames	272
Table H25: Intercoder reliability results.....	273

Chapter 1: Introduction

Climate change is a difficult problem for humans to address. The sheer practical requirements of mitigating its severity and adapting to its impacts present a daunting set of tasks: reduce greenhouse gas emissions (without damaging the economy); respond to natural disasters like flooding and wildfires; manage land use to protect agriculture and food supplies. Each of these is a challenging task in its own right. A confluence of psychological, political, and social conditions has exacerbated the difficulties in establishing a common foundation upon which to build solutions, especially in the United States (e.g. Nisbet, 2009 and 2010b; Oreskes & Conway, 2010; van der Linden, Maibach & Leiserowitz, 2015). News media depictions of climate change have played a role in complicating public perceptions of the issue (e.g. Bolsen & Shapiro, 2018; Nisbet, 2009, 2010b). Climate-focused news reports are logical locales for problematic depictions, and indeed, much research addresses them specifically (e.g. Boykoff & Boykoff, 2004; Trumbo, 1996). Climate change connects to other important issues like energy (Liu et al., 2008), too, and journalists addressing these issues may discuss climate change as a component (Gibson et al., 2016). Despite a growing body of literature on energy topics like fracking (e.g. Hedding, 2017), renewable energy (e.g. Zukas, 2017), and oil pipelines (e.g. Kojola, 2017), a focus on depictions of climate change within that news coverage (with the exception of Dusyk and colleagues, 2018) is uncommon. This study, then, examines news coverage of the Enbridge Line 3 pipeline replacement project in northern Minnesota to ascertain how it is presented and whether and how climate change is incorporated within it.

A smattering of human psychological traits have the potential to undercut people's ability to situate their quotidian realities within the greater context of a changing global climate (van der Linden et al., 2015). The tendency to use direct experiences to ascertain imminent dangers and plan for short-term action—potential assets on an immediate, personal level—become liabilities in the fight against climate change (van der Linden et al., 2015). People may not have connected their lived experiences to climate change impacts and instead perceived the issue as a “psychologically distant, future threat” (van der Linden et al., 2015, p. 760). Public opinion polls in the United States echo this claim: though many Americans recognize that climate change is a real threat, many still perceive that they personally will be less likely to suffer its negative impacts than other Americans or developing countries' populations (Leiserowitz et al., 2019). But humans' cognitive and emotional tendencies do not exist in a vacuum. The form climate change information takes may also influence people when they weigh the pros and cons of climate change responses: if messages highlight “losses,” both the short-term ones that people may face as the result of climate mitigation policies and the “distant future” ones that climate change may wreak in the long term, they may prioritize their immediate well-being and shy away from mitigation efforts (van der Linden et al., 2015, p. 760).

Research on climate change communication is rife with examples of how media messages may influence people's climate perceptions (see for example Corbett & Durfee, 2004; Hart, 2011; Hart & Nisbet, 2012). Although this study does not directly examine media messages' effects on climate change understanding, their potential impacts strongly inform its rationale and design. Varying presentations of uncertainty in climate change-related science news have been shown to either weaken or enhance individuals'

certainty that global warming exists (Corbett & Durfee, 2004). By virtue of their propensity to either uphold or question climate change, ideologically-shaded news outlets' content may reflect, modify, or solidify their audiences' perceptions of the issue, their continued media outlet choices, and their willingness to participate in related political activities of either pro- or anti- climate inclinations (Feldman, Myers, Hmielowski, & Leiserowitz, 2014; Hmielowski & Nisbet, 2016). If media messages can strengthen the public's accurate or distorted climate change perceptions or influence their involvement in climate response initiatives (whether at the individual, social, or political level), they are worth examining.

History of climate change in the news: Major trends and conceptual themes

It is no surprise, then, that mass communications research has investigated the past three decades of climate change news coverage news coverage extensively. Climate change's shift from a scientific to a political issue and the evolution of climate change uncertainty and skepticism in the news are both prominent research trends (e.g. Bolsen & Shapiro, 2018; Painter & Ashe, 2012; Trumbo, 1996). Political partisanship, ideology, and journalistic norms stand out as common, intertwined concerns throughout this body of research as well, as Bolsen and Shapiro's (2018) detailed review of polarization and framing in climate change news points out.

Bolsen and Shapiro's (2018) comprehensive article presents a useful history of climate change in news media, a summary of which is presented here. As they described it, a collection of important events in the late 1980s, including James Hansen's (of NASA) avowal of changing climate conditions and human responsibility, the formation of the Intergovernmental Panel on Climate Change, extreme heat and drought, and

attention from then-presidential candidate George H. W. Bush elevated the issue in the U.S. Bolsen and Shapiro argued that the media frames that appeared during this period reflected general agreement that climate change required a unified response. In the 1990s, an influx of skepticism and uncertainty about climate change in the media and public discourse, often courtesy of representatives from conservative political and industrial sectors, began to erode the formal portrayal of the issue. By the time the Kyoto protocol entered the political conversation and U.S. support for it fizzled out, the political discourse around it provoked a spate of scientific uncertainty and political conflict frames and “balanced” (i.e., providing perspectives of climate change doubters on equal footing with mainstream climate scientists) (Bolsen & Shapiro, 2018, p. 152) media coverage that are now widely recognized as foundational contributors to polarized climate change views among Americans.

In Bolsen and Shapiro’s view (2018), the 2000s media landscape presented additional fodder for American polarization as big-budget disaster films and former Vice President Al Gore’s documentary *An Inconvenient Truth* showcased sensational or dramatic “disaster” (p. 152) frames that became aligned with Democratic or liberal political persuasions in the public eye. They noted that starting in the mid-2000s through the late 2010s, political and international events spurred additional coverage of climate change. The issue was presented in varied ways depending on the context of the news outlet and the surrounding current events: cable news outlets’ presentation differed along ideological lines and news coverage of the Climategate scandal (a controversy over alleged academic dishonesty found in British climate scientists’ emails) and other events deflated the news media’s theretofore growing commitment to depicting climate change

and “scientific consensus” accurately (particularly in conservative-leaning outlets) (Bolsen & Shapiro, 2018, p. 153). The expansion of online media choices meant that writers could produce more climate news and information. Writers were not uniformly governed by the same journalistic expectations as their print media counterparts, which Bolsen and Shapiro explain led in some cases to more sensationalized or less rigorously-produced content.

Similar to other researchers, Bolsen and Shapiro (2018) argued that the limited U.S. public opinion and interest in climate change is politically and ideologically polarized. That polarization begets more as people rally around ideologically-slanted media outlets, and motivated reasoning processes channel public opinions along separate paths. To combat this trend, they suggested that certain frames, when directed at the right groups, can “resonate with” and “engage” people (Bolsen & Shapiro, 2018, p. 156). Such frames would be ones that emphasize people’s ability to implement climate remedying actions (efficacy) or increase their optimism that action could lead to results. Similarly, they could highlight the way that climate change would impact individuals and how mitigation strategies could alleviate other problems, such as air quality-related health problems. Bolsen and Shapiro furthermore entreated climate communicators to reinforce the idea that scientists agree on climate change’s existence and human involvement and encourage audiences to think actively and critically about the information they receive, a strategy that may make people less likely to allow existing partisan biases to color their opinions. Finally, they argued that the scientific community must host a greater assortment of ideological participants in the cause so that “credible voices” are available to reach and persuade a broader range of Americans about the issue’s importance (Bolsen

& Shapiro, 2018, p. 159). Bolsen and Shapiro's review provides a solid foundation on the trajectory of climate change in the media and its significance. The following section discusses a selection of the frequently-cited research in the field (some of which appears in Bolsen and Shapiro's review) and key concepts in greater depth.

Climate coverage from 1980s–1990s: Setting the stage

Early research from Boykoff and Boykoff (2004), Carvalho (2007), Trumbo (1996), and Zehr (2000) examined how the first decade of climate change news coverage transferred the issue from scientific to political domains and depicted the concept of scientific uncertainty alternately as an expected dimension of or an obstacle to addressing the problem. American news in the late 1980s generally affirmed the scientific community's perspective that human activity triggered climate change, but by the early 1990s increasingly incorporated skeptical voices and relied upon political figures as sources instead of scientists (Boykoff & Boykoff, 2004; Trumbo, 1996). British news coverage demonstrated a similar science-to-politics revision (Carvalho, 2007). Zehr (2000) offered a different perspective on scientific uncertainty in major U.S. newspaper coverage during this period, arguing that journalists presented climate change and its multifaceted uncertainties—from disagreement about its existence and potential impacts to how to improve and propel research—as an exclusive domain in which scientists held a privileged and dominant position. Their contrasting portrayal of public reactions to global warming as irrationally worried and “misinformed” may have alienated audiences from the issue (Zehr, 2000, p. 86). Regardless of the form it took or the public figures presenting it, these researchers seem to agree that uncertainty in climate news could

damage public understanding and commitment to the issue and align with the effects research previously discussed here.

Boykoff and Boykoff's (2004) frequently-cited paper argued that the journalistic norm of balance was partially responsible for the early preoccupation with climate science uncertainty in the United States. Journalists covering climate change in the 1990s fulfilled their professional obligations by presenting opposing points of view—"both sides of the story"—even though mainstream climate scientists' general agreement in climate change's human causes and the need to respond to its threats outweighed detractors' arguments (Boykoff & Boykoff, 2004, p. 134). In doing so, they inadvertently miscommunicated the degree of certainty that global temperatures were rising and that human activity was responsible, instead suggesting that scientists disagreed about the issue (Boykoff & Boykoff, 2004).

For balance-seeking journalists to include skeptical counterpoints in their coverage, sponsors of those perspectives had to be available: ideologically- or politically-motivated organizations and public figures established themselves as authoritative voices of anthropogenic climate change denial (e.g. McCright & Dunlap, 2003; Oreskes & Conway, 2010). Conservative think tanks published oppositional materials from "skeptical" scientists and provided promotional platforms for their ideas; these skeptics additionally testified in Congressional hearings and were consulted for news articles (McCright & Dunlap, 2003). Those organizations' interests frequently aligned with commercial or industrial interest groups whose business operations relied on carbon-intensive energy sources (Oreskes & Conway, 2010; Schlichting, 2013). McCright and Dunlap (2003) even identified the 1994 "Republican takeover" (p. 348) of the national

legislative scene and the subsequent Senate rejection of the 1997 Kyoto protocol as a notable example of the connection between the U.S. Republican party and conservative climate change deniers and skeptics. Although uncertainty and skepticism about climate change cycled through public discourse in various forms, they too would remain a part of news media coverage (albeit in changed forms) and an object of scholarly inquiry (for example, Elsasser & Dunlap, 2013; Painter & Ashe, 2012; Schmid-Petri et al., 2017).

In addition to compelling journalists to provide balanced coverage of the climate issue, Boykoff and Boykoff (2007) argued that journalistic values and norms inadvertently drove journalists to prioritize certain aspects of the climate change story and as a result “misrepresent” the overall scientific consensus on the issue (p. 1191). Norms like “novelty” and “drama” informed tendencies to focus on specific events involving political entities or figures like the United Nations or U.S. presidents, which journalists covered in line with professional values of personalization (i.e. presenting news stories with specific “characters” (Bennett, 2002, as cited in Boykoff & Boykoff, p. 1192) and the norm of authority bias (i.e., consulting authoritative, and thus, often political) figures. Focusing on these aspects of the issue instead of drier, tentative, but more scientifically substantive developments thus weakened news coverage (Boykoff & Boykoff, 2007).

Climate coverage in the 2000s and 2010s: After building consensus, shifting and fracturing of skepticism, ideology, and politics

Research on climate change media coverage continued to investigate ideology and partisan politics’ influence on how the issue was portrayed during the first decade and a half of the 21st century. Outright anthropogenic climate change denial receded from

major mainstream U.S. newspapers during this period, though varied forms of skepticism and less obvious evidence of ideological influence persisted in the media under certain conditions (Feldman et al., 2017; Painter & Ashe, 2012; Schmid-Petri et al., 2017).

Feldman and colleagues (2017) found evidence that the *Wall Street Journal*'s conservative ideology could seep into reporting via its comparatively infrequent portrayals of climate change “impacts” and “threats” and its tendency to attenuate discussions of climate mitigation strategies with “negative efficacy” and “conflict framing,” divergences from other mainstream U.S. papers that could presumably drain readers’ interest and engagement in the topic (p. 493). Schmid-Petri and colleagues (2017) by contrast found that statements questioning the likely gravity of climate change’s effects (“impact skepticism”; p. 501 and throughout) appeared in major conservative- and liberal-aligned American newspapers and magazines. This finding, the authors argued, demonstrated how skepticism could now filter into the public sphere in more insidious ways.

Ideology seems to align more consistently with skepticism in the opinion pages (Elsasser & Dunlap, 2013; Painter & Ashe, 2012). “Right-leaning” news outlets in the U.S. and the U.K. tended to publish opinion pieces that presented skeptical statements about climate change without offering climate science-affirming alternatives, in contrast to “left-leaning” outlets that presented them together (Painter & Ashe, 2012, p. 6). In a study of nationally-distributed conservative U.S. columnists’ work from 2007–2010, many continued to question climate change’s reality and causes, even as some like-minded colleagues adjusted course to express doubt about climate change’s impacts or the effectiveness of mitigation strategies (Elsasser & Dunlap, 2013). This finding

presents an interesting contrast to Schmid-Petri and colleagues' (2017) work. Thus, newspaper outlets' and writers' ideological leanings could track partially, but not uniformly, with expressions of climate skepticism and uncertainty.

Political figures, having edged scientific experts out of the spotlight in early coverage (Trumbo, 1996), continue to play an important role in how climate change media has been researched. Merkley and Stecula (2018) observed in their analysis of mainstream television news broadcasts and conservative newspapers and television outlets that “pro-climate” statements from Democratic politicians expanded over climate change’s 30 years in the news whereas statements from Republicans appeared in lower quantities and fluctuated in terms of their support or opposition. They argued that this split between “elite cues” from the different parties and Republican “boomerang” responses to Democrat politicians’ statements may have driven U.S. polarization over the topic instead of denialist organizations’ messaging through the media, which did not appear as frequently (Merkley & Stecula, 2018, p. 269). Interestingly, they also found more evidence of “expert” perspectives appearing in coverage than Trumbo (1996). Bolsen and Shapiro’s (2018) detailed review also noted the politicization of climate coverage.

Media environment today: Constricted resources, shifting beats, and smaller-scale outlets

Larger structural issues concerning the media industry come into play as well (e.g. Gibson et al., 2016), which could have implications for newspaper climate coverage at the local and regional level. Gibson and colleagues’ interview study with environmental journalists revealed that as newspaper journalism’s financial resources and audiences

have changed, newsrooms have either allocated fewer staff and resources to areas like science and environmental reporting, or have eliminated those staff altogether and given their stories to general reporters. Facing these conditions, they found that some environmental reporters pivoted to new, specialized digital publications that cater specifically to climate-interested audiences, leaving general papers without their experience or insight. A journalist's level of experience covering climate and science issues can affect their ability to appropriately convey complex climate information or their willingness to include scientific sources in their news stories (Gibson et al., 2016; Takahashi et al., 2017). Experienced climate journalists fear these economic conditions may push inexperienced or poorly supported journalists to rely on "false balance" reporting conventions instead of digging into the issue (Gibson et al., 2016, p. 427). Environmental reporters themselves may be absorbed into other newspaper beats and "fold" climate news into other topics including extreme weather events, the energy industry, and the political sphere (Gibson et al., 2016, p. 425).

Locating climate coverage within related topic areas—policy, in particular—may have further implications for the quality and presentation of climate change information (Gibson et al., 2016; Hiles & Hinnant, 2014). Even though experienced climate journalists may no longer feel compelled to include skeptical positions when reporting on the topic of climate change itself, some have noted that they do abide by the expectations of balance when reporting about climate policies (Hiles & Hinnant, 2014). Feldman et al. (2017) drew upon this literature when building their argument for how journalistic norms might invite (or not) certain depictions of climate threats and responses into their work. The present project instead notes Hiles and Hinnant's findings along with the tendency

that Gibson and colleagues (2016) point out for journalists to address climate change in related topics in the face of economic pressures and asks: In a smaller paper, either local or regional, with less income than a national, prestige paper and perhaps a reduced capacity to focus on scientific or environmental issues, how does climate coverage change?

Indeed, with the exception of Takahashi and colleagues' work (2017) much of research on climate change news coverage reviewed here draws its data from national or prestige press (e.g. Boykoff & Boykoff, 2004, 2007; Feldman et al., 2017; Hart & Feldman, 2014; Schmid-Petri et al., 2017; Trumbo, 1996). Liu, Vedlitz, and Alston (2008) articulated the importance of refocusing research on previously-ignored regional coverage and argued that news coverage emphasizing how climate change would affect people at the local level could improve communities' mitigation and adaptation planning efforts. Could local papers' coverage of topics related to climate change be places where climate change is discussed, and could those discussions be compromised in the way that Gibson and colleagues' (2016) respondents suggest? After all, smaller papers' staff—including those covering energy news—may need to adapt their work habits to fit their shoestring budgets (Evensen et al., 2014, as cited in Ashmoore et al., 2016).

Energy, fossil fuels, and oil pipelines—why they matter in climate discussions and news

Energy news represents one area of news where journalists could potentially address climate change (Gibson et al., 2016); by extension, energy infrastructure projects and their related public policies may as well. Between 2000 and 2010, CO₂ emissions from “fossil fuel and industrial processes” expanded, making up a share of greenhouse

gas emissions that rose from 62%–65% (IPCC, 2014a, p. 7). As of 2010, “electricity and heat production” accounted for about a quarter of greenhouse gas emissions, and transportation accounted for 14% (IPCC, 2014a, p. 9). Since greenhouse gas emissions reduction forms a cornerstone of climate change mitigation strategies, news stories about both fossil fuel and renewable energy sources could logically include climate discussions; as Liu et al. (2008) indicated, energy and transportation were frequently discussed in the *Houston Chronicle’s* regional climate change news coverage. For instance, news about the natural gas industry could highlight its potential as a cleaner energy source compared to coal (Pacala & Socolow, 2004). Climate discussions have also surfaced in coverage of oil pipeline construction projects like the Keystone XL (e.g. Kojola, 2017). Some recent national news examples include statements that questioned the wisdom of permitting infrastructure that would support using carbon-intensive energy sources (e.g. Friedman & Davenport, 2018). Climate change competes with many other concerns, though, and climate change may appear in the coverage of these issues like oil pipelines at an inconsistent rate (Dusyk, Axsen, & Dullemond, 2018; Kojola, 2017).

Indeed, as media researchers on this important but infrequently-studied (Dusyk et al., 2018) topic have noted, the contexts surrounding energy projects are extremely complex (e.g. Olive & Delshad, 2017). The extraction and transportation of “unconventional fossil fuels” like shale oil and gas or oil sands raises considerable environmental concerns such as seismic activity and water supply contamination in addition to their potential greenhouse gas emissions (Dusyk et al., 2018, p. 14; Olive & Delshad, 2017; Wood, 2019). Pipeline construction projects must also account for the rights of Indigenous groups and landowners whose properties fall along their proposed

routes (Orenstein, 2018a). These projects do not only present environmental threats and social or legal challenges; their potential to expand local and national economic growth is also frequently identified in media coverage (e.g. Kojola, 2017, Raso & Neubauer, 2016). Renewable energy development news coverage reflects similar concerns as fossil fuel coverage, including among others environmental and economic concerns, energy independence, political strategy, and technological details (Haigh, 2010; Kim, Besley, Oh, & Kim, 2014; Kojola, 2017; Stephens, Rand, & Melnick, 2009; Zukas, 2017). Various actors in society, from politicians to industry leaders to social or environmental activists (among others), may champion certain aspects of the issue over others in conflicting ways to achieve their respective goals, a phenomenon that media researchers have investigated from the often-connected perspectives of power, elite discourse, and journalistic work routines (Djerf-Pierre, Cokley, Kuchel, 2016; Hedding, 2017; Kojola, 2017; Raso & Neubauer, 2016; Wood, 2019; Zukas, 2017). With these many competing concerns, could climate break in at all?

Context of present study: Enbridge Line 3 oil pipeline in Minnesota

This study adds to the existing literature with an analysis of competing issue perspectives and portrayals of climate change in local news coverage of the Enbridge Line 3 oil pipeline replacement project. The existing Line 3 pipeline, built in the 1960s, runs from Alberta, Canada to a refining facility in Superior, Wisconsin, through three Canadian provinces (Alberta, Saskatchewan, and Manitoba) (Enbridge, n.d.-d) and three U.S. states (North Dakota, Minnesota, and Wisconsin) (Enbridge, n.d.-b). As the existing pipeline has aged, its transmission capacity has diminished and its risk for leakage has increased (Orenstein, 2018a). After evaluating the Line 3 in 2013 (Enbridge, n.d.-b)

Enbridge decided to replace the pipeline and filed a Notice Plan with the Minnesota Public Utilities Commission in October 2014 (Enbridge, n.d.-c).

The permitting review process in Minnesota, through which the bulk of Line 3's U.S. portion runs, has been the site of vigorous oppositional activity (e.g. Orenstein, 2018a). Environmental groups have argued against Enbridge's proposed routes on the basis of Indigenous rights and have questioned the necessity of replacing the pipeline altogether (MN350.org, n.d.). Likewise, a citizen group known as the Youth Climate Intervenor was accepted to provide input during the government review process and raised objections to the pipeline project based on what they identified as its contribution to climate change, and climate change's long-term impacts on "young people" like them (e.g. Dunbar, 2017, paras. 2, 4). Portions of the review process and responses to it have been subject to political uncertainty and influence (Orenstein, 2018b). Routing recommendations from an administrative law judge in 2018 and an ongoing series of appeals from the Minnesota Department of Commerce against the Minnesota Public Utilities Commission's project approvals have continued to complicate the proceedings (Kraker, 2020b; Orenstein, 2018a). Finally, some arguments in favor of replacing Line 3 (i.e. to avoid leaks) edge into environmental protection territory that opponents usually occupy (Orenstein, 2018a). As such, the Enbridge Line 3 replacement project presents the opportunity to examine energy and climate change news coverage in a unique context.

Summary and preview of study's contents

In the U.S., media coverage has been an important yet imperfect source of climate change information for the public. From giving disproportionately large volumes of coverage to climate skeptics to presenting the issue in alienating or polarizing

frameworks, news coverage of climate change has complicated the already difficult task of communicating the issue to people and motivating them to respond (e.g. Bolsen & Shapiro, 2018; Boykoff & Boykoff, 2004; Nisbet, 2009; van der Linden et al., 2015). Coverage has improved in some contexts, but changes to the media business have raised the potential need for financially-constrained news outlets to either address climate in the context of related topics or rely upon inexperienced reporters who may reintroduce skepticism through balanced reporting (Gibson et al., 2016). The way information is framed in the news and other media can both affect how people process it and reveal the dominant social, cultural, and political understandings of an issue (e.g. Chong & Druckman, 2011; Entman, 1993). News coverage of energy projects like oil pipelines can be venues for discussing climate change amidst an array of other concerns (e.g. Dusyk et al., 2018; Kojola, 2017).

Against this backdrop, this content analysis study asks broadly how local Minnesota newspaper coverage presents the Enbridge Line 3 oil pipeline, whether climate change emerges within that coverage, and if those depictions of climate change have the potential to invite readers into responding or repel them into inaction or ideologically-opposed camps. The following literature review will explain framing as the study's theoretical foundation, how framing has been used in the broader context of science, environmental, and climate change research, and how it has been used to examine energy news coverage and pipeline projects specifically. The literature review will present the study's research questions in greater detail. The following methodology chapter and accompanying appendices will explain how news outlets were selected, how frames for the oil pipeline and climate change were identified and refined, how other

concepts of interest such as issue-defining power were operationalized, and how coders were trained and deployed for data collection.

The results, discussion, and conclusion chapters will demonstrate how in many ways local news coverage of the Enbridge Line 3 pipeline resembles coverage of other North American oil pipelines. Governmental, environmental, and economic components of the project were strongly represented. Climate change was a sporadic but—within the boundaries of the study’s design—potentially neutral presence. Underneath the study’s broad findings, however, some of Line 3’s contextual idiosyncrasies displayed some notable divergences from the rest of the field. Research from a variety of different perspectives would be necessary to explore those divergences further and assess the public impacts of climate change depictions in the context of Enbridge Line 3.

Chapter 2: Literature Review

Framing Theory

Countless mass communication studies have employed framing as a theoretical and methodological tool over the years. Although studies' applications of framing theory can be inconsistent (e.g. Cacciatore, Scheufele & Iyengar, 2016; Entman, 1993; Scheufele, 1999), framing theory can yield valuable insights into how news media portray important events and issues and how people may respond to those depictions. Moreover, its prevalence in research about oil pipeline news coverage—the present topic at hand—makes it a useful choice for this study. The following section will provide an overview of framing in communications theory with commonly-used definitions and models and will explain which ones provide this study's foundation.

A few common points form a general understanding of what a frame is and does. At its core, framing theory suggest that when presenting a given issue or topic, media practitioners tend to highlight certain aspects of it and minimize or omit others. Robert Entman's (1993) perennially popular definition situates framing in the realm of articulating the shape of an issue and its relationship to society. He asserts that "To frame is to select some aspects of a perceived reality and make them more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation for the item described" (Entman, 1993, p. 52). Drawing from Gitlin, Gamson and Modigliani (1989) focus less on the idea of how frames define a problem and more on frames as an embodiment of the overall way something is presented: "Media frames, largely unspoken and unacknowledged, organize the world for both journalists who report it and, in some

important degree, for us who rely on their reports (Gamson & Modigliani, 1989, p. 3). These choices in turn may influence how people understand or respond to the issue, whether in developing cynical feelings towards politics (Cappella & Jamieson, 1997), assessing responsibility for current events (Iyengar, 1991), or affecting the way people discuss issues (Price, Tewksbury, & Powers, 1997) (among others). Conceptually, frames and the way they are studied in communications research fall into two very broad camps: “media” frames (the frames selected and found in media production and texts) and “individual” frames (individuals’ mental frames and their resulting interactions when encountering frames in media texts) (Scheufele, 1999, p. 106).

Research on media production and media effects, then, both call upon framing, and it is important to distinguish the two. The term “frame” describes not only aspects of media items and their production processes, but the mental structures that help individuals process information as well (e.g. Shah et al., 2009).

The frequently-invoked metaphors of picture or camera frames and construction frames provide a useful way to visualize the two and understand how they work (e.g. Shah, McLeod, Gotlieb, & Lee, 2009; Tankard, 2001). Just as a painter might choose a certain vantage point from which to depict a scene, or a photographer might foreground certain figures in their shot and exclude others, a journalist chooses a specific viewpoint and key ideas when producing a story—choices that guide a reader’s understanding of the story and constitute a media frame (e.g. Shah et al., 2009; Tankard, 2001). For example, when writing about a major natural disaster a journalist may focus on a single family’s survival experiences (an episodic frame), or present an overview of how various local and state governments have responded to different natural disaster events in different

circumstances (a thematic frame) (Iyengar, 1991). The building construction frame metaphor applies to audience frames—the mental structures individuals possess that provide interpretive skeletons that indicate how pieces of incoming information fit together—which ones are important, which ones inform others, and how an individual can make sense of them (Shah et al., 2009, citing Bock & Loebell, 1990). Pinpointing the cognitive mechanisms that produce effects when individuals’ mental frames encounter media frames and differentiating them from those that produce other media effects remains a research challenge (Cacciatore, Scheufele, Iyengar, 2016). Scholars agree that media frames that privilege one set of emphases over another still have the capacity to produce some form of effects in their consumers (Scheufele & Tewksbury, 2007).

Media production/frame building influences

A discussion of the factors that drive the news framing process help to explain what frames appear in media texts and why they might affect media consumers. Gamson & Modigliani’s (1989) foundational work explains what many other framing scholars have observed as well: journalistic practices and working environments, cultural milieu, and stakeholders’ strategic communication efforts converge to influence how reporters tell their stories.

The news industry operates according to external and internal pressures that ultimately shape journalistic output; Shoemaker and Reese (2014) conceptualize these as layered, interacting “hierarchies of influence.” Financial obligations and the need to appeal to readers and advertisers are both apparent (Olive & Delshad, 2017, citing Carper, 1997 and Corbett, 2006; Shoemaker & Reese, 2014). News values like drama, novelty, conflict, and localism inform journalists’ storytelling choices and translate into

corresponding news frames (Price & Tewksbury, 1997, citing Gamson, 1992 and others). Professional norms like objectivity inform journalists' newsgathering routines. For example, in order to report accurate accounts of events, journalists tend to rely on authoritative sources like government figures, business or industry spokespeople, or academic experts; along with other professional standards and routines, these habits tend to present a specific and limited view of the world that Tuchman (1978) argues reinforces the social "status quo" (p. 5 and throughout). As for pressures from their broader contexts, journalists may call upon their own experiences, interests, and prior knowledge to frame an issue or story (e.g. Scheufele, 1999). Their cultural contexts may influence frame selection as well (Gamson & Modigliani, 1989). Van Gorp (2007) argues that cultural norms, values, and references establish a kind of repository of frames that both journalists and audiences draw from in producing and interpreting news stories. Similar to Scheufele's (1999) framing model, prominent symbols, ideas, or interpretations of an issue might exist within a culture and inform how a journalist might understand an issue, and thus inform the devices and techniques they use to tell stories about it (Van Gorp, 2007). The interconnected concepts of journalists' work habits, the expectations they establish for themselves, and the "elite" sources they consult inform much of the research from both framing and non-framing theoretical foundations, including (but not limited to) research on health news (Fowler & Gollust, 2015), climate change (Boykoff & Boykoff, 2004 & 2007; Brossard, Shanahan, & McComas, 2004, Wozniak, Wessler, & Luck, 2017), and energy (Bolsen, 2011; Kojola, 2017; Olive & Delshad, 2017; Raso & Neubauer, 2016; Stephens, Rand, & Melnick, 2009; Wood, 2019).

Media frames and social and political stakeholders' efforts to shape the way that the public or relevant decision-makers see public issues are also connected (Entman, 1993; Gamson & Modigliani, 1989). Press releases, public relations materials and events, and interactions with journalists are all means by which stakeholders may try to influence news coverage (Gamson & Modigliani, 1989). These activities dovetail with media professionals' internal pressure to gather reliable information (Tuchman, 1978). The combined internal and external pressures result in a complex media environment with multiple "competing" frames, sometimes in the same article (Chong & Druckman, 2007, 2011). Some stakeholders may have more resources at their disposal than others to advance their preferred frames (Pan & Kosicki, 2001, as cited in Chong & Druckman, 2007). Frames' presence and absence in the media environment, then, may reflect the broader political power dynamics at play in a society (Entman, 1993). The diverse array of potential frames holds implications for the ways in which audiences receive and process information (Chong & Druckman, 2007), which will be discussed in greater detail below.

As Nisbet and Hoge (2006) point out, media framing research in many ways intersects with problem definition and agenda setting research in political science, which suggests that the way a problem is defined in the policy sphere dictates the kinds of policy solutions that may be devised to resolve it (Rochefort & Cobb, 1994). Stakeholders within or outside of government attempt to change policies by transplanting their chosen issue from one "policy venue" to another, thereby presenting the opportunity for that issue to be seen in a new light and for interested parties to advocate for their preferred fix (Baumgartner & Jones, 2009; Kingdon, 2003). Baumgartner and Jones's

(2009) account of the media's role in this process echoed aspects of second-level agenda setting (McCombs and Ghanem, 2001) and pointed out the media's capacity to help shift policy through channeling public attention to new issues or new facets of old ones. While these models' focus on attention and political agendas align most clearly at first with media agenda building theories, the actions and processes that build agendas in media and in politics contribute to frame building as well (Scheufele, 1999; Scheufele & Tewksbury, 2007). Entman's (1993) frame definition alone suggests parallels—frames have the power to “define problems” and “suggest remedies” (p. 52).

These intersections speak to the ongoing debates about how to tease apart agenda setting, priming, and framing effects theories in communications scholarship (e.g. Cacciatore et al., 2016). Indeed, Cacciatore and colleagues argue that media effects research too often has misconstrued Entman's (1993) reference to “salience” and as a result has conflated the cognitive mechanisms in agenda setting, priming, and framing theories. Nonetheless, this study accepts the broader connection between these theoretical perspectives.

Relationship between media frames and framing effects

While the present study is focused on measuring the presence of frames in newspaper coverage of the Enbridge Line 3 pipeline and does not measure the effects themselves, an overview of framing effects theory provides useful context. Riffe and colleagues' (2014) content analysis textbook explains that content analyses should be situated in a broader context in order to build theory: connecting the textual objects under study to the conditions that produce them or their eventual impacts. Similarly, others critique media frame studies' tendency to disregard frames whose presence in media and

“resona[nce]” with the public are already established in the literature (Cacciatore et al., 2016, p. 14). Although this study is largely descriptive and does not test these connections between frames and effects, it does respond in part to those critiques. A portion of the frames under investigation in this study were selected because of the effects they may produce in audiences and their relevance to broad public understanding of climate change (Nisbet, 2009, 2010b). The following discussion responds to this critique as well by providing a basic discussion of common frame effects and how they are produced. For the purposes of organization, types of frames and their contingent effects will be broken out into generic and issue-specific frames.

Generic frames and effects

Generic media frames can be applied to a range of topics (e.g. Zukas, 2017). Episodic and thematic frames are two well-known generic frames that theoretically evoke predictable audience responses (Iyengar, 1991). Recall the previous hypothetical news story about a natural disaster that compares local government responses to the incident with other local governments’ responses to previous disasters. This thematically framed story would be likely to remind audiences of their government leaders’ responsibility for emergency preparedness and increase their support for policies (Iyengar, 1991). The hypothetical episodic frame for this natural disaster event—the focus on a single family’s survival experience—may boost audiences’ interest in the story itself, but it without supplying issue’s broader context it may also provoke readers to deem the family responsible for its own struggles and reduce support for remedial policy measures (Iyengar, 1991).

The conflict and strategy frame is another common generic frame whose observed effects carry particular significance for this study. Cappella and Jamieson (1997) found that journalists' habit of framing political or governmental news as disputes by using competitive, combative language, regardless of whether or not these frames reflected real-world conditions, encouraged public cynicism about politics and the media both—a process that they argued results in disengagement. According to the authors, the frames trigger cynicism in a variety of ways. Strategy frames portray political stakeholders' actions as superficial but strategic performances designed to help them advance their positions. In doing so, they dredge up and build upon audiences' existing negative evaluations and assumptions about politicians' selfish motivations, exacerbating public cynicism about politicians and the overall political process. They also showed evidence that audiences' resulting enhanced negative evaluation of a given political figure can stand in for their evaluations of such political figure's favored policy positions. Thus, the authors argued, instead of judging a policy based on its concrete recommendations, audiences may instead judge it based on their assessments of the politician behind it.

Although Cappella and Jamieson (1997) identified strategy and conflict as discrete frames, their finding that they produced similar cynicism-related effects may explain why other researchers (Hart & Feldman, 2014; Nisbet, 2009, 2010b) have conceptualized them as a unified frame. Nisbet (2009, 2010b) includes the frame in his typology of science and technology frames that are frequently used to describe climate change; Hart and Feldman followed suit and highlighted Cappella and Jamieson's findings on the frame's association with public cynicism in their climate engagement-focused work. This study follows their example.

Media frames can also influence how audiences view an issue. Recall that one of media frames' defining traits is that they highlight certain parts of an issue to facilitate a specific interpretation (Entman, 1993). These more salient issue aspects have the potential to register with audiences and shape the way that they think about the issue. For instance, experimental studies have shown that audiences who were exposed to conflict and strategy frames then used similar language and style when asked to write about the topic on their own (Cappella & Jamieson, 1997; Price et al., 1997).

Framing effects and agenda setting effects: similarities and disagreements

Scholarly disagreement does persist about what kinds of effects media frames provoke in audiences and how media and audience frames relate (Cacciatore et al., 2016). Some scholars argue that framing and agenda setting as theories are similar enough at a conceptual level—especially in how they apply to media messages—to be “converged” (e.g. McCombs & Ghanem, 2001), while others insist that the effects from framing, agenda setting, and priming are distinct (e.g. Scheufele, 2000). Cacciatore and colleagues (2016) argued along these lines that frames exhibiting only a very narrow set of characteristics can produce a framing effect. In their view, the only frames that produce framing effects are “equivalence frames,” which use different linguistic or stylistic devices to present multiple sets of factually-identical information (Cacciatore et al., 2016, p. 8 and throughout). Frames that cover a common issue but present different sets of information, or “emphasis frames,” (a designation that aligns with the common media frame definitions) may still produce effects, but via cognitive mechanisms found in agenda setting and priming effects (Cacciatore et al., 2016, p. 8 and throughout). Regardless of the cognitive mechanism that produces the effect, media frames that

privilege one set of emphases over another still have the capacity to produce some form of effects in their consumers even if they would be better understood, theoretically, in a second-level agenda setting capacity (Scheufele & Tewksbury, 2007).

How frame effects are produced

Differentiating the cognitive processes and mechanisms that produce frame effects from those that produce priming and agenda setting effects is thus somewhat contentious, but a general explanation of the framing effects process will provide helpful context for this study. A key component of the debate rests in distinguishing between the cognitive mechanisms of accessibility and applicability (Cacciatore et al., 2016). Springing from Price and Tewksbury's knowledge activation model (1997), Cacciatore and colleagues (2016) argued that framing effects result only from *applicability*, in which an individual receiving a message with particular "salient" attributes deems that assemblage of thoughts compatible with their own. Priming and agenda setting effects, by contrast, occur when such messages stir up certain thoughts and enhance their *accessibility*, thereby rendering the individual more likely to call upon them when "evaluating" other items such as political figures (Cacciatore et al., 2016). This distinction informs their contention that only equivalence frames truly produce framing effects: they argue that equivalence frames present the same core information about an issue but in different ways that can engage individuals or not depending on whether they share those more abstract perspectives—hence, applicability. Emphasis frames, on the other hand, might present the same issue but highlight different informational facets that most people could reasonably be aware of; highlighting those facets simply makes them

more *accessible* (Cacciatore et al., 2016). In their view, any resulting effects may be misleadingly similar to agenda setting or priming effects.

Previously, though, scholars have acknowledged the potential interplay between accessibility and applicability in framing effects models in terms of how close to the forefront a certain way of looking at an issue might be in people's minds (Scheufele & Tewksbury, 2007). Chong and Druckman's (2007) theory includes both applicability and accessibility in producing framing effects, and posits that these mechanisms may be significant in determining a frame's efficacy in a "competitive environment" (p. 99 and throughout). Their theory presents an array of potential hypotheses to predict whether frames might have an effect on individuals, including that their relative "strength" (associated with applicability) or "prevalence" (associated with accessibility) play a role (Chong & Druckman, 2007, p. 110).

Another view on framing effects: Chong & Druckman's competitive environments

In Chong and Druckman's (2007) theory, a combination of factors determines how strong or weak a frame might be and whether it will produce effects (i.e. affect an individual's opinions about an issue), including the degree to which an individual is "motivated" to think about the frames they encounter (based on their personal interest levels or prior knowledge), and whether they encounter multiple (potentially contradictory) frames. If the individual is less "motivated" to think about the issue due to lack of personal interest or relevance, or is less "able" to ingest new information due to an insufficient knowledge base, they will be less likely to consider the ideas presented within the frame "actively" and instead will process them based on tertiary cues and "heuristics" (Chong & Druckman, 2007, p. 109). In other words, the frame's interpretive

goals might not register with the reader or audience member, but certain properties of the article or frame may provide alternate means by which they can form their views. In circumstances where disparate frames appear, both motivated and unmotivated people may contemplate them consciously with potentially surprising results. External frames that fail to mesh with the individual's may be dismissed and may even spark a "countereffect"—a renewed commitment to the previously accepted frames and related opinions, (Chong & Druckman, 2007, p. 111). Later health and science communications research has woven these threads with motivated reasoning theories to investigate frames' potential to divide public opinion (Druckman & Bolsen, 2011; Gollust, Barry, & Niederdeppe, 2017), a line of research with implications for climate change communication.

Framing theories and definitions to be used in this study

The present study uses Entman's (1993) definition of framing as a theoretical and methodological foundation: "To frame is to select some aspects of a perceived reality and make them more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation for the item described" (p. 52). Although Cacciatore and colleagues (2016) criticized research that relies on too heavily on features' "salience" in a way that muddies the distinctions between agenda setting, priming, and framing effects, their points of contention on the topic—namely, whether conflating the effects models in research makes them appear more powerful than they may be—are not the focus of this study. Instead of measuring framing effects themselves, this study assesses the presence of certain frames in coverage. At the very least, Cacciatore and colleagues recommend

specifying whether a study examines equivalence frames (which they associate with pure framing effects) or emphasis frames. This study's use of frames aligns more closely with emphasis frames.

Chong and Druckman's (2007, 2011) work on competitive framing environments further informs this study's conceptualization of frames. They (2007) argued that many experimental framing effects studies' use of a limited number of clearly-defined frames falls short of resembling the *mélange* of elite actors' competing frames that appear in real-world news coverage. Their findings that news pieces themselves may contain multiple frames inform the study's design as well (Chong & Druckman, 2011); their frame identification methods will be used in this study (see Methodology chapter).

Framing and Politicization of Science, Technology, and Health

Theoretical work in media frame building demonstrates that both journalists' work conditions and powerful social actors' communicative efforts construct perspectives through which audiences are invited to understand current events (e.g. Entman, 1993; Gamson & Modigliani, 1989; Scheufele, 1999). Framing effects work has shown how frames can promote cynicism and disengagement amongst audiences and either change or solidify their personal opinions (e.g. Cappella & Jamieson, 1997; Chong & Druckman, 2007). As the next section will demonstrate with work from Fowler and Gollust (2015), Nisbet and Hoge (2006) and Shih, Wijaya, and Brossard (2008), these processes shape news about science, technology, and health as well and in some cases imbue them with a decidedly political tint.

Influences on frame building in science, technology, and health

Social, political, and industry stakeholders engage in strategic framing efforts when science, technology, and health topics enter the public policy sphere (e.g. Nisbet & Huge, 2006; Shelton et al., 2017). Outside of news reporting contexts, stakeholders may try to sway the policy process by submitting public comments during regulatory procedures, as both food industry professionals and public health advocates did when the U.S. Food and Drug Administration introduced nutritional information “menu-labeling policies” in accordance with the Affordable Care Act (Shelton et al., 2017).

Journalistic practices and political involvement can intersect and shape framing patterns over time (Fowler & Gollust, 2015; Nisbet & Huge, 2006). In their study of attention cycles and framing of biotechnology news reporting, Nisbet and Huge (2006) proposed a model based on Downs’s issue attention cycle (1972) in which news frames would appear in patterns as a function of the issue’s passage through the policy cycle over time. According to the authors, more “dramatic” frames highlighting conflict and debate that could appeal to wider audiences would appear when the issue was being actively debated in legislative or executive circles and potentially shift regulatory debate. By contrast, drier “technical” frames highlighting research, patenting, and other highly-specialized topics would characterize coverage when administrative agencies were in control, ostensibly to dissuade public and political interest and concentrate influence among scientists and biotechnology industry representatives. Despite some modest cyclical growth and decline in attention and dramatic frame usage, Nisbet and Huge found an overall low level of coverage that corresponded to a high proportion of technical frames, suggesting that such frames did sap interest. The news coverage was largely relegated to specialized business and scientific reporters, also suggesting a restricted

audience, with influxes of dramatic frames appearing in opinion sections courtesy of external interest groups (Nisbet & Huges, 2006).

Fowler and Gollust (2015) argued that an overall frame of politicization emerged fairly quickly and persisted over time in coverage of political mammography recommendation changes and HPV vaccine requirement debates in the United States. The frame was marked by journalists' decisions to include political sources who highlighted the given health issue as an object of discord or to present it within a possibly contentious "political context" (Fowler & Gollust, 2015, p. 157). In the case of mammography recommendations, Fowler and Gollust suggested that the impulse to provide novel perspectives may have motivated journalists to seek out political sources (or "interested players") after they established the story's basic facts (p. 159).

Politicized framing of science and health issues as a result of journalistic decision-making and political maneuvering is not, however, a foregone conclusion (Shih et al., 2008). Shih and colleagues (2008) investigated the *New York Times's* framing and coverage volume of three epidemic diseases in another attempt to refine Downs's issue attention cycle and found that politicization emerged in coverage of only one. In contrast to the persistent politicization Fowler and Gollust (2015) found in mammography and HPV vaccine coverage, journalists instead allowed the diseases' respective developments and direct government responses to drive their storytelling and frame selection (Shih et al., 2008). Aside from overall common usage of consequence and action frames, avian flu, West Nile virus, and mad cow disease coverage employed mixes of frames in accordance with each epidemic's particular context (Shih et al., 2008). Shih and colleagues (2008) suggested that the necessity for different countries involved in the mad

cow disease epidemic to “negotiate” policy solutions may have corresponded to the news coverage’s modest use of conflict frames (p. 155). The fact that conflict was still only the third most common frame for mad cow suggests that there may be cases where journalists may not adopt politically-tinged frames (Shih et al., 2008).

Science, technology, and health frames and public opinion

Media frames matter in science, technology, and health communications contexts because they can shift how people think about these issues, whether along political lines or by sapping enthusiasm for related policy ideas (Bolsen et al., 2014; Gollust et al., 2017). For instance, when people participating in research experiments received information about controversial vaccination requirements or proposals to impose taxes on sugar-sweetened beverages, the amount of previous exposure they might have had to those topics had the potential to sway their emotional and/or cognitive responses to experimental stimuli according to their prior beliefs (Fowler & Gollust, 2015; Gollust et al., 2017).

Gollust and colleagues (2017) showed how frames and motivated reasoning processes can divide public opinion in their study of partisan responses to media messages about sugar-sweetened beverage taxes, or “sugary drink taxes” (p. 1006). Study participants responded to experimental messages differently according to their political affiliations and/or whether or not they could reasonably have consumed news that likely highlighted “debate” about the proposed taxes prior to the study. Republicans in their study reduced their favor for the beverage tax after receiving a media message that simultaneously offered “pro- and antitax frames” (Gollust et al., 2017, p. 1025). Receiving a “source refutation” framed message—which asserted that the beverage

industry's public appeals against a sugary drink tax were little more than self-interested arguments veiled in conservative-friendly language of "personal choice" (Gollust et al., 2017, p. 1035) and freedom—divided tax opinions between Republicans and Democrats or independents. When Republicans in their study received the refutation message, support for the tax was comparatively lower among those who were frequent viewers of local television news in states where the beverage tax was likely to be discussed. The authors argued that motivated reasoning was likely at play, in that these participants may have drawn both upon their personal pro-business, regulation-skeptical beliefs and the perspectives they had already developed about the issue in response to media coverage to reject the refutation message.

Even without considering politicized frames' potential to drive wedges between voting constituencies, their impact on public support for technologies or policy solutions is relevant (Druckman & Bolsen, 2011; Fowler & Gollust, 2015). Fowler and Gollust's (2015) work on politicized HPV vaccine news frames found that previous exposure to politicized information about the vaccine affected public support for proposed adolescent HPV vaccination requirements. Overall levels of support dampened slightly with politicized information environments in their survey-based experiment, but respondents from those environments expressed stronger support for the policies when the information they received in the experiment did not highlight the issue's political dimensions (Fowler & Gollust, 2015). Additionally, politicization heightened mistrust of the government and medical sectors (Fowler & Gollust, 2015). In another set of experiments, exposure to messages that framed science as being susceptible to political influence weakened respondents' support for nuclear energy (Bolsen, Druckman, &

Cook, 2014). Bolsen and colleagues reasoned that the politicization frame would reduce their support levels by stoking people's uncertainty about scientific integrity and their anxiety about nuclear power. Their findings suggest a potential connection with Cappella and Jamieson's (1997) insights about political conflict/strategy frames and public cynicism and disengagement: in addition to provoking anxiety that would then erode certainty in the science of nuclear technology, it could also logically follow that being reminded of the political conflict surrounding the technology could trigger cynical responses and reduce certainty and support as well.

To summarize: News media do not consistently separate science from politics in their publications and broadcasts (Fowler & Gollust, 2015; Shih et al., 2008), and audiences are not immune to the effects of this politicization (Fowler & Gollust, 2015; Bolsen et al., 2014). Interested parties in political, social, or industry spheres may actively frame issues in a way that would benefit them (Shelton et al., 2017). Journalists themselves may inject a degree of politicized conflict into science, technology, and health news coverage regardless of external influence (Fowler & Gollust, 2015; Nisbet & Huges, 2006). Politicized news coverage about public issues in the scientific realm can divide public opinion and deflate public approval (Bolsen et al., 2014; Fowler & Gollust, 2015); frames can do the same even without direct political messages (Gollust et al., 2017). Politicization and polarization have factored strongly into news media coverage and public opinion on climate change as well (e.g. Bolsen & Shapiro, 2018), an observation that informs the direction of this study. Amongst the many recommendations in their review, Bolsen & Shapiro (2018) advocated for changes in climate communication to

address the problems of politicization, motivated reasoning, and disengagement in media consumers.

Framing and Climate Change News Coverage

The following section will provide the context for how politicization and polarization took hold in climate coverage over the past three decades, and how frames are being called upon as a potential means to counteract these effects (Bolsen & Shapiro, 2018; Maibach et al., 2010; Nisbet, 2009, 2010b). Just as frames can politicize science, technology, and health news coverage and negatively impact audiences, frames in climate communications can do the same (Nisbet, 2010b). Identifying the frames present in climate change news coverage over the years has helped to elucidate the patterns of public understanding and engagement (or lack thereof), and ideological or partisan divisions that can foster or impede large scale climate action (e.g. Bolsen & Shapiro, 2018; Hart, 2011; Nisbet, 2010b), a set of conceptual concerns that occupy non-framing climate communications research as well (e.g. Feldman et al., 2014; Hmielowski & Nisbet, 2016; Merkley & Stecula, 2018; Painter & Gavin, 2016).

Nisbet (2009, 2010b) has argued that frames in climate change communication have the power to politicize the topic and public responses to it. Working from a compilation of frames discussed in science and technology communication literature, Nisbet described (in both texts) how these frames manifested in climate change news media and explained their potential effects. For instance, economic consequence frames' suggestion that climate change mitigation efforts would damage the economy reflected conservative ideological positions in the United States. The so-called "Pandora's Box" frame, which emphasized the potential for widespread disastrous climate change impacts,

was conversely associated with liberal American perspectives or political figures like Al Gore. Such “ideologically friendly frames,” Nisbet argued, set conditions for motivated information processing, public opinion bifurcation, and for loss of public interest (2010b, p. 53).

It is also possible that some news frames could assist in improving the way the public views climate change and related policies (Nisbet, 2009, 2010b). Consistent with previous research, thematic frames depicting climate change-induced threats to polar bears bolstered support for climate change policy when tested in experimental settings (Hart, 2011). Nisbet (2010b) argued that frames that highlight how climate change might affect people on a personal level may enhance the issue’s public resonance. Public health frames can alert news consumers to the impact that a changing climate might have on their seasonal allergies, asthma, heat-related illnesses, or other diseases (Nisbet, 2009, 2010b), a theme that other researchers have taken up and which will be discussed further below (e.g. Hart & Feldman, 2014; Weathers & Kendall, 2016). Morality and ethics frames may use religious arguments or depictions of civic collaboration to engage people’s “common values” and compel them to act (Nisbet, 2010b, p. 57). Economic development frames that foreground the potential benefits of developing “clean energy” and other climate-friendly innovations can draw in members of the public who might not typically respond to calls for environmental protection (Nisbet, 2010b, p. 57). Providing the public with information and messages that will establish productive relevance is essential to move public opinion on climate change, but divisive or disengaging frames have permeated coverage throughout its history as a public issue (Bolsen & Shapiro, 2018, Nisbet, 2009, 2010b). It should be noted, however, that Nisbet’s frames may not

resolve all media-related climate communication issues—Feldman and Hart (2018) used adaptations of Nisbet’s frames to test whether the engagement-oriented ones could encourage people to choose and read articles on climate change, and found only a “small” impact with public health frames that was divided along predictable partisan and ideological lines (p. 519). Nonetheless, Nisbet’s frames are of interest here for the potential effects they can provoke. The following sections will discuss key concepts in climate change communications research and how various frames have cycled through coverage.

Politicization, uncertainty, and ideology in climate change communications

Nisbet’s (2009, 2010b) frames reflect a number of common concepts in the climate change communications literature. The scientific/technical uncertainty frame itself reflects an important theme in the literature (e.g. Corbett & Durfee, 2004; Schneider, 2010) and intersects with climate skepticism-specific literature (e.g. Painter & Ashe, 2012). Nisbet’s definitions for the economic consequences, conflict/strategy, public accountability, and Pandora’s Box frames, for instance, demonstrate political and ideological elements (2009, 2010b). Researchers from theoretical perspectives outside of framing have used these concepts to explore why climate change became an increasingly political problem. Corbett and Durfee’s (2004) exploratory message effects experiment provided insights about how the context in which people encountered information about potential climate change uncertainty could affect their own certainty. Their study participants’ certainty levels were higher after reading mock news articles that positioned the uncertainty information in relation to a wider body of research that still supported the

existence of climate change. By contrast, certainty levels were lower for participants to whom articles that featured dissenting statements from other scientists were assigned.

Ideology surfaces as a dimension that intersects with science, uncertainty, and politics as well, as Bolsen and Shapiro's (2018) climate change framing literature review and research from other perspectives have as well (Carvalho, 2007; Corbett & Durfee, 2004; McCright & Dunlap, 2003; Oreskes & Conway, 2010) demonstrate. A critical discourse analysis of three British news outlets (the *Times*, the *Independent*, and the *Guardian*) revealed that their climate change reporting from the late 1980s through the early 2000s reflected their underlying ideologies in their decisions about how to present scientific facts and which figures—e.g. mainstream scientists or skeptics—to rely upon for climate change information (Carvalho, 2007). Carvalho (2007) found the more conservative *Times* expressed more climate skepticism and couched the issue in terms of economic and market needs, evincing “free market, individualism, and a Promethean view” (p. 239) of humans' place in the natural world, whereas the *Independent* and the more “leftist” *Guardian* presented any uncertainties about climate change as a rationale for taking action to protect the greater collective social interest (p. 226). From a sociological perspective, McCright and Dunlap (2003) argued that 1990s conservative think tanks presented climate change as “non-problematic” (p. 368) through supporting and amplifying the perspectives of climate change skeptical science figures, whose work filtered into news media and the Republican controlled national legislative arena. Corbett and Durfee's (2004) experiment found that participants who had strong “environmental ideologies” (i.e. they would prioritize environmental protections over human enterprise and the economy) tended to also display stronger “prior certainty about global warming”

(p. 141). Oreskes and Conway (2010) argued that a Cold War-era aversion to government regulation and the threat of communism motivated key figures like Fred Singer, Fred Seitz, Bill Nierenberg, and Robert Jastrow (former researchers in physics who had participated in a variety of important government projects) to produce materials in opposition to climate change science. In the range of studies on this topic, ideology, politicization, and uncertainty exhibit an array of conceptual configurations, whether politics stand in as a measure of ideology, or depictions of uncertainty are an outcome of ideology. It is difficult to disentangle these concepts, and they have continued to show up in shuffled configurations as climate news research has developed.

Development of frames in climate change news

Early research on climate change and media frames addressed how science, politics, industry interests, and uncertainty appeared in news coverage (e.g. Trumbo, 1996; Zehr, 2000). Their insights aligned with research from other theoretical and methodological perspectives that similarly examined these influences (e.g. Boykoff & Boykoff, 2004; McCright & Dunlap, 2003), and set the tone for future research as well. Climate change coverage became increasingly politicized in its first decade in the news (Carvalho, 2007; Trumbo, 1996). Trumbo (1996) demonstrated that shifting frame usage from the 1980s to the 1990s reflected this politicization. At the outset of coverage in the mid- to late-1980s, he found that mainstream legacy newspapers in the United States employed frames that established the potential impacts of climate change (a problem definition) and its scientific explanations (an example of diagnosing causes). These papers' frames gradually shifted to ones that argued for whether and how the United States should respond. The public figures that were typically associated with those frames

similarly fell and rose in prominence in this study: journalists tended to quote scientists in problem/cause framed articles and political or industry actors in response-framed articles. Trumbo argued that the shifts he found indicated which actors were most successful in promoting their views, and that scientists participated less in the journalistic discourse as it became more politicized.

Zehr (2000) offered a different perspective in his argument that climate change news coverage from 1986–1995 presented the topic through a scientific uncertainty frame that presented potential barriers to public and citizen action. Scientific uncertainty frames took multiple forms, from focusing on scientists’ conflicting perspectives to discussing new or related areas of research that presented climate change in the context of ever more unanswered scientific questions. In this view, news coverage’s scientific uncertainty frame cast the scientific community as the gatekeeper of “authoritative” climate knowledge (Zehr, 2000, p. 98): uncertainty was presented as a part of the scientific process that simply signaled the need for continued research. By contrast, the coverage presented the general public as fundamentally “misinformed,” an approach that Zehr surmised could be related to the theretofore public “inaction” (2000, p. 98).

Communications scholars working in a variety of theoretical and specialty perspectives, from issue attention cycles (Brossard et al., 2004) to climate skepticism (Painter & Ashe, 2012) have observed an overall lack of research on non-U.S. climate change news. Similarly, a large portion of English-language climate news framing research focuses on American and British newspapers; scholars like Dirx & Gelders (2010) and Takahashi & Meisner (2013) have expanded this scope more recently with studies on cross-cultural and under-studied international contexts. Studies assess a similar

set of frames in news coverage (e.g. conflict, consequences, responsibility, morality, politics, environment, etc.) (e.g. Dirikx & Gelders, 2010; Takahashi & Meisner, 2013). Dirikx and Gelders (2010) found that French and Dutch newspapers consistently preferred two frames (economic consequences and responsibility) to cover the United Nations' Conferences of the Parties on climate change from 2001–2007 over frames like conflict, human interest, and morality. While the effects of these frames were not studied, their possible implications in affecting public motivation to take “action” or confidence in their ability to do so are notable (Dirikx & Gelders, 2010, p. 739). Interestingly, the authors noted that conflict frames in this body of news coverage were more likely to focus on the climate action-focused negotiations taking place at the COPs instead of presenting the existence of climate change itself as a point of debate. This lack of skepticism about the origins or reality of climate change has been suggested in other international news contexts as well, in framing studies of news from countries like Peru and Sweden (Olausson, 2009; Takahashi & Meisner, 2013); skepticism-focused studies showed considerably less evidence of skepticism in the mid- to late-2000s newspaper coverage from Brazil, China, France, and India than coverage from the U.S. or U.K (Painter & Ashe, 2012). Takahashi and Meisner (2013) found that framing patterns in Peru's national and local news coverage resembled international wire service coverage and suggested that such tendencies (whose causes were not explained in their research) limited the amount of Peru-centric coverage. Moreover, Takahashi and Meisner (2013) noted that the overall scope of climate coverage research, although it had expanded from U.S. and U.K.-centric research to examine coverage in developed national economies, largely ignored developing countries until the late 2000s/early 2010s as a rationale for

their focus on Peru. Their observation underscores the notion that expanding the scope of climate change communications research beyond national, major newspapers may improve the way specific regions' coverage are understood.

New(er) directions in climate news and framing research

As climate change skepticism became a less-prominent feature of mainstream news outlets' reporting, research too has shifted its focus to identify other ways that frames may draw in or distance the public and/or reflect continued ideological forces (Feldman, Hart, & Milosevic, 2017; Hart & Feldman, 2014; Weathers & Kendall, 2016). As the aforementioned scholars have pointed out, Maibach, Nisbet, Baldwin, Akerlof, & Diao (2010) have proposed that public health frames could serve as devices to strike personal chords and enhance the relevance of climate change in people's lives. In newspapers covering national issues (the *New York Times* and the *Washington Post*) and in those covering select regions of the United States whose residents may be particularly susceptible to climate change health impacts (the *Atlanta Journal Constitution*, the *Houston Chronicle*, and the *Tampa Tribune*), the use of public health frames increased from 2007 to 2012 as a proportion of climate change coverage (although climate news decreased overall) (Weathers & Kendall, 2016).

In their study on threat and efficacy statements and the framing of climate change "impacts" and "actions", Hart and Feldman (2014) observed that network television news broadcasts from 2005 to 2011 tended to use conflict/strategy frames to present individual- or government-level climate change "actions" (p. 325). Their focus on threat and efficacy—stemming from a combination of political communication theories and the extended parallel process model—provides the basis for their interest in engagement: for

people to be able to respond to threats in a productive manner, they need to both understand them and understand what can be done about them (Feldman et al., 2017; Hart & Feldman, 2014). Without those messages appearing together, or when those messages are framed in unhelpful ways, people's understanding may be distorted or their motivation to act may be stifled (Feldman et al., 2017; Hart & Feldman, 2014). At the same time, they found a decreased likelihood for broadcasts to use "positive efficacy information" when conflict and strategy frames were at play (Hart & Feldman, 2014, p. 340). They argued in line with Cappella and Jamieson (1997) that such framing could further compel the public to withdraw from the issue (Hart & Feldman, 2014). Using the same theoretical foundation as their 2014 study, Feldman and colleagues (2017) examined mainstream U.S. newspapers (the *New York Times*, the *Washington Post*, *USA Today*, and the *Wall Street Journal*) to assess whether the outlets' respective ideological perspectives were reflected in their climate coverage. Negative efficacy statements and conflict frames surfaced more frequently in the more conservative, pro-industry *Wall Street Journal*, a finding that the authors argue could further polarize climate change opinions in the paper's main audience (Feldman et al., 2017).

As the scientific, political, and social discourses surrounding climate change have become more complex, researchers have examined the associated news coverage in more complex ways as well (e.g. Hart & Feldman, 2014). Much of climate change communications research focuses on news pieces in which climate change is the central topic (e.g. Boykoff & Boykoff, 2004; Carvalho, 2007; Dirikx & Gelders, 2010; Feldman et al., 2017; Hart & Feldman, 2014; Olausson, 2009; Takahashi & Meisner, 2013; Trumbo, 1996; Weathers & Kendall, 2016). Climate change, its drivers, and its impacts,

however, are tightly woven into many sectors of human society (IPCC, 2014a); restricting our analysis to climate-specific news may not give us a complete picture of how media professionals treat the issue. Moreover, fewer reporters may focus primarily on climate change or other environmental issues as financial crunches and the transition to digital media have changed the news industry, and instead integrate it into related topic areas (Gibson et al., 2016). Agriculture, global health, transportation, urban infrastructure, and energy (among others) are climate-related topics (IPCC, 2014a) whose news coverage could conceivably serve as a venue for climate discussions.

Framing and Energy News Coverage

News coverage of the energy sector is a logical place to look for secondary discussions of climate change. Burning fossil fuels like coal and oil for energy releases carbon dioxide, a greenhouse gas, into the atmosphere. The International Panel on Climate Change's 2014 synthesis report (2014b; p. 94) emphasized the importance of "low-carbon and carbon-neutral energy technologies" in facing the challenges of greenhouse gas reduction and increasing "resilience" in the face of climate change. While climate change does show up in energy resource news coverage to varying degrees, it is not the only consideration in public discourse; economic, environmental, and political concerns (among others) also affect its framing (e.g. Djerf-Pierre et al., 2016; Olive & Delshad, 2017).

Climate change's prominence as a topic of inquiry in energy communications research varies as well. Endres and colleagues (2016) argued that this nascent subfield's main "frame" is crisis, whether by investigating climate change itself as a crisis in relation to energy, or by looking at communication about specific energy-related disasters

like oil spills or nuclear accidents as discrete crises. Likewise, scholars might deliberately address climate issues in energy news (e.g. Stephens et al., 2009) or focus on other issues instead, like the manner in which state legislative contexts may predict patterns in overall energy news coverage (Hedding, 2017).

In studies that make a special point of examining the role of climate in energy-related news stories, the degree to which climate factors into stories varies. For instance, climate change was the second-most-frequent environmental frame in German and British news coverage of the Canadian oil sands (Firtova, 2017), but was an uncommon consideration in U.S. and Canadian coverage of fracking (in the form of greenhouse gas discussions) (Olive & Delshad, 2017) and U.S. coverage of wind power (Stephens et al., 2009). Cultural, economic, and political differences between states or countries appear to affect overall framing patterns in coverage to varying degrees. Firtova (2017) found evidence that French and German papers' dominant framing of the Canadian oil sands split along ideological lines with environmental frames appearing more in left-leaning papers and economic frames in right-leaning ones (though economic frames did recede in the countries' coverage overall over time), whereas British newspapers' most common frame (environmental) was consistent across outlets regardless of slant. Olive and Delshad (2017) found similarities in Canadian and American newspapers' primary preoccupation with water safety in their framing of hydraulic fracturing and usage of economic frames, but found cross-national divergence in each country's next most common frames: American papers addressed wildlife and public health, whereas Canadian papers discussed policies to end fracking and "energy independence" (p. 795). In the U.S., the inclusion of climate change in coverage of wind energy technology in the

Boston Globe, the *Minneapolis Star Tribune*, and the *Houston Chronicle* was roughly equal and fairly infrequent, though it increased in later years represented in the study (Stephens et al., 2009). The application of risk versus benefit frames did differ, however, by state: the *Boston Globe* tended to use risk frames more frequently than either the *Minneapolis Star Tribune* or the *Houston Chronicle*, a discrepancy that Stephens and colleagues attributed Massachusetts residents' unease about the proposed wind turbine project in their state and the issue's overall "controversial" status (2009, p. 182).

In energy news research, as in climate news research, politics, conflict, and journalistic norms are often linked, even when climate change is not the main focus (Djerf-Pierre et al., 2017; Hedding, 2017). In these studies, too, researchers have examined how different countries or states' political, industrial, and cultural contexts influence how journalists cover energy topics. In Australia and Sweden, the degree to which journalists sculpted renewable energy issues to reflect each country's interests influenced how they were covered and framed (Djerf-Pierre et al., 2017). "Elite" papers in each country used a relatively high volume of economic frames along with perspectives from industry and government actors, underscoring a "dependence" on elite sources that the authors argue contributes to an issue's particular national flavor (Djerf-Pierre et al., 2017, p. 651). Australia and Sweden's coverage differed in other key respects: overtly political figures appeared more frequently in Australia's coverage, pointing (the authors argue) to the political tenor in the country's discussion of the energy sector and its broader connections to climate change. Sweden's coverage featured more environmental frames than Australia's (though they were still uncommon), but explored the issue of renewable energy from a more fractured perspective. The status of an issue's

development in a political entity's legal landscape may also affect how it is framed in the news (Hedding, 2017). When laws concerning hydraulic fracturing were newly established in New York and being debated in North Carolina, journalists relied heavily on conflict and strategy frames (Hedding, 2017). The study showed that concurrent news coverage of the same topic in Pennsylvania, which had an established hydraulic fracturing industry and laws, instead used environmental impact frames most frequently.

Contextual regional differences are not the only factors that inform framing choices. True to theoretical work in frame building, journalistic practices influence how energy stories are presented as well (e.g. Haigh, 2010; Kim et al, 2014; Zukas, 2017). A comparison of ethanol reporting from oil producing and ethanol producing U.S. states revealed that journalists in both contexts gravitated toward policy frames more frequently than science, economic, or other frames (Kim et al., 2014). Kim and colleagues (2014) reasoned that in addition to fitting the surrounding current events, part of policy frame's appeal was its "conflict" and "drama," qualities that reflect traditional journalistic values and help draw readers (p. 229, 231). Similar to Nisbet & Huge (2006), Haigh's (2010) analysis of renewable energy news coverage in major Midwestern and coastal papers in the U.S. (the *New York Times*, the *Washington Post*, the *Los Angeles Times*, the *Chicago Tribune*, the *Omaha World Herald*, the *Dallas Morning News*, the *Kansas City Star*, the *Minneapolis Star Tribune*, and the *Des Moines Register*) found a correspondence between articles' locations in a paper's main section or business section and the most prevalent frames (political and economic, respectively). Reliance on elite authoritative sources persists as a prominent factor as well: press coverage of wind energy technology

in Wisconsin from 2009–2010 favored political and energy industry figures and the employment and economic frames that they pushed into the public sphere (Zukas, 2017).

Connections to key concepts from climate change news

How journalists approach their work and frame stories, then, can emphasize the political aspects of an issue (Kim et al., 2014; Zukas, 2017). Uncertainty and ideology also have the potential to seep into energy news coverage to varying degrees (e.g. Firtova, 2017; Haigh, 2010; Stephens et al., 2009). The *Boston Globe*'s use of environmental risk frames to cover wind energy in Massachusetts underscored opponents' requests for more research on a controversial wind farm's potential environmental impacts and may have impeded its construction (Stephens et al., 2009). This trend interestingly resembles the strategies that the tobacco and oil companies used to thwart regulation of their industries (e.g. Oreskes & Conway, 2010). Scientific uncertainty was not, however, a common frame for alternative energy news coverage in other U.S. papers from 2004–2008 (Haigh, 2010). Divisions between left- and right-wing pro-environment and pro-free market perspectives appeared in French and German newspapers' coverage of Canadian oil sands according to the papers' respective ideologies, but were muted or absent in the coverage from their British counterparts (Firtova, 2017). While ideology and uncertainty may not be the only academic interests in energy news, their presence in the literature nonetheless indicates that these topics share conceptual interests with climate change news research.

Framing and Pipeline News Coverage

Oil pipeline construction projects present a rich topic for research in energy and climate change communications fields. As major pieces of energy industry infrastructure,

they are designed to transport oil in various stages of refinement—for example, crude oil from the site of extraction to a refinery—which can be then used as an energy resource (e.g. Enbridge, n.d. -a.). Oil pipelines also have the potential to serve as symbols for the larger issue of humans’ inadequate responses to climate change (concept of “emblematic issues” from Hajer, 1995, cited in Dusyk et al., 2018, p.13). Indeed, climate change advocacy groups like 350.org and its local chapter MN350 actively oppose construction projects like the Keystone XL pipeline (350.org, n.d.) and the Enbridge Line 3 pipeline on the grounds that they provide infrastructure for the continued use of particularly “dirt[y] oil” (MN350.org, n.d.).

But contributions to climate change are far from the only issues at play in the public debates surrounding oil pipelines. The well-being of both nearby communities and the larger national (and international) contexts are both implicated in pipeline projects (e.g. Lawlor & Gravelle, 2018). Communities close to pipeline construction sites might benefit from expanded work opportunities and countries like the United States and Canada might enjoy economic advantages from exploiting nearby resources (e.g. Kojola, 2017; Lawlor & Gravelle, 2018). On the other hand, local environments could suffer in the event of a pipeline leak; the larger environmental risk of climate change has already been discussed (e.g. Kojola, 2017; Dusyk et al., 2018). Moreover, the companies building pipelines and the presiding governmental authorities must contend with the logistics of crossing landowners’ properties and Indigenous reservations (Dusyk et al., 2018; Orenstein, 2018a). With so many potential perspectives on the issue, the use of framing as a theoretical and methodological tool is logical: it permits scholars to identify the way an issue is being defined (Moore, 2019; Wood, 2019) and which facets of it are discussed

to promote a particular worldview (Kojola, 2017; Raso & Neubauer, 2016). That said, it should be noted that scholarly research on media coverage of oil pipelines is emerging but limited (Dusyk et al., 2018). This study's investigation of Enbridge Line 3 news coverage contributes analysis of a new pipeline project in the literature.

Major or most common frames in oil pipeline news coverage

In many cases, newspapers in the United States and Canada have tended to frame pipeline projects and the controversy surrounding them as a matter of economic interests, environmental interests, or a conflict between the two (Dusyk et al., 2018; Raso & Neubauer, 2016; Wood, 2019). Though these frames may be the most prevalent in newspaper articles about pipeline projects overall, the theoretical and conceptual questions they have been used to answer vary considerably.

As with energy and climate change reporting, researchers have questioned whether geographic location might influence framing practices (Crow & Lawlor, 2016; Dusyk et al., 2018; Lawlor & Gravelle, 2018). Efforts to assess the impact that proximity to a pipeline site might have on framing strategies have yielded mixed results. Lawlor and Gravelle's (2018) comparison of local and national U.S. and Canadian newspapers' Keystone XL pipeline coverage showed a limited relationship between frame usage and location. Local coverage featured safety frames more frequently than national in both countries, although safety was the most "prominent" frame overall regardless of location (p. 677). Environmental frame usage embodied their proximity hypothesis to some degree, with a higher proportion in U.S. national coverage (as compared to local); the concentration of environmental frames in Canadian national papers was only slightly higher than in their local ones. Crow and Lawlor (2016) examined both paper proximity

and ideology impacts on framing in a study designed to integrate frame analysis with narrative analysis, and found that national papers' ideological leanings made little difference in how Keystone XL was framed, whereas "regional" papers' decreased distance from the proposed pipeline sites did (p. 485). Papers in the pipeline's planned path were more likely to use environmental, safety, and trade frames, whereas papers both near and far from the line used employment frames in similar proportions. In contrast with Lawlor & Gravelle's (2018) paper, Crow and Lawlor (2016) found that environmental frames were most prevalent overall. Provincial location made little difference in framing of the Northern Gateway pipeline project in Alberta and British Columbia, a finding that Dusyk and colleagues (2018) attributed either to the common ownership of newspapers in their study's sample or their study's quantitative research approach.

Wood (2019) used frames to expand academic understanding of various oil industry groups'—from corporations to their affiliated citizen interest groups—strategic interactions with news media and issue-defining power in a resource-constricted environment where public relations activity informs journalists' work more and more. Quotes in U.S. and Canadian newspaper coverage of the Keystone XL pipeline (the *Wall Street Journal*, the *New York Times*, the *Lincoln Journal Star*, the *National Post*, the *Toronto Star*, and the *Calgary Herald*) were analyzed to discern which oil industry actors achieved the greatest media prominence. While only a small percentage of quotes featured frames (30% in Canada and 20% in the U.S.), Wood found that environmental and economic frames appeared in greatest volume. Both proponents and opponents of the project relied on environmental frames to bolster their respective positions. Keystone XL

opponents (e.g. environmental advocacy groups) cited the project's potential to harm the environment. Along with arguing for the pipeline's economic opportunities, proponents (mostly corporate oil industry representatives) defended their project's environmental safety, deflected arguments about leak impacts, and declined to address climate change. Each side rarely, if ever, deviated from their typical statements, creating a metaphorical "shouting match" in news coverage (Wood, 2019, p. 306).

Dusyk and colleagues (2018) used the SPEED (Socio-Political Evaluation of Energy Deployment) theoretical framework to examine how Canadian provincial and national newspapers portrayed public, government, and other involved parties' perspectives on aspects of the Northern Gateway Pipeline project. The multidisciplinary SPEED framework examines "the interconnections among various actors and socio-political factors," looking at energy technology and infrastructure projects from a variety of dimensions, including political, technical, environmental, and economic, with the intention of understanding what contributes to a successful embrace and implementation of energy projects in different geographical regions (Dusyk et al., 2018, p. 14). These elements served as the foundation of their frames; they similarly identified competing environmental risk and economic benefit frames in newspaper coverage of the Canadian Northern Gateway pipeline project, with the former exhibiting a "surprising" lead (Dusyk et al., 2018, p. 18). This framing pattern, they argued, reflected an underlying social mentality that environmental well-being and economic growth are diametrically-opposed goals, an assumption that hampers innovation and creativity in meeting the country's climate change challenges.

Critical/cultural communications research investigating how ideological and political perspectives permeate oil pipeline discourse found evidence of environmental and economic framing as well (Kojola, 2017; Raso & Neubauer, 2016). A critical analysis of Keystone XL coverage in the *New York Times*, the *Wall Street Journal* and the *Washington Post* argued that the dominant frames “political controversy,” “creating jobs and economic growth,” “promoting the national interest,” and “environmental risk” painted the pipeline as the object of economic versus environmental conflict (Kojola, 2017, p. 903). News coverage aligned labor groups with pro-jobs frames, absorbing their interests into an economic ideology that upheld existing capitalist/elite power structures and disregarded intersections between workers’ goals and environmentalists’ concerns (Kojola, 2017), a conclusion that recalls Dusyk and colleagues’ (2018) interpretation of Northern Gateway coverage. In contrast to Dusyk and colleagues’ study, Raso and Neubauer’s (2016) analysis of Northern Gateway pipeline news articles suggested that representatives from Canada’s political and ideological right wing successfully promoted a media image of the pipeline and oil sands extraction as an “economic imperative” at the expense of other perspectives (p. 130). (Differences in the two studies’ approaches and sampling frames may account for the discrepancy in their findings. While both examined papers that were owned by the Postmedia chain, Dusyk et al. restricted their use of regional papers to Alberta and British Columbia, whereas Raso and Neubauer included any articles that were duplicated in multiple sources throughout Postmedia’s newspaper holdings across multiple provinces. Dusyk and colleagues also included the *Globe and Mail*, whereas Raso and Neubauer did not.)

A critical/political economic analysis of the Dakota Access Pipeline/Standing Rock protests in national and regional news coverage provides a somewhat divergent perspective on frames in pipeline news (Moore, 2019). Moore's examination of how commercial, corporate, and political conditions limit the range of perspectives or frames that U.S. and Canadian journalists might use to cover the Standing Rock protests does share much with Kojola's (2017) and Raso and Neubauer's (2016) critical perspectives. Moore argued the overall framing patterns in U.S. and Canadian coverage reflected trends in which mainstream news organizations' heavy reliance on advertising revenue and official sources in an oil-dependent national economy dissuades them from challenging its dominant actors and narratives. Frames in the *Bismarck Tribune* varied in tandem with different phases of the Standing Rock's development as an issue, but "law and order" and economic frames did appear more frequently than in the other two U.S. outlets, predominantly during and after the protests. By contrast, the *New York Times* and the *Indian Country Media Network* relied more upon environmental justice and/or empathy frames (especially over time, in the case of the *New York Times*, which had used an even mix of frames early on) to present the Standing Rock Sioux Tribe's position. Moore attributes these differences to geographic proximity and to financial obligations. Whereas the *New York Times* was operating at a distance, the *Bismarck Tribune* was deeply connected to the political, economic, and social interests of an oil-producing state. The *Indian Country Media Network's* alternative funding structures afforded them the independence to consider different perspectives from mainstream news outlets. Moore argued that Canadian coverage was subject to similar pressures. Low Standing Rock coverage volumes overall and a heavy use of "law and order" and economic frames in the

Calgary Herald and the *National Post* suggested the Canadian media's reluctance to critique the oil industry—one of the country's major economic drivers.

Moore's (2019) analysis is unique, though, in its specific focus on how mainstream news frames marginalized the Standing Rock Sioux Tribe's perspectives. For instance, she argued that the *Bismarck Tribune*'s eventual adoption of law and order frames emphasized the allegedly criminal aspects of some protesters' actions and downplayed their nonviolent actions and "legitimate environmental concerns" (Moore, 2019, p. 105). Even news frames that offered multiple perspectives on the issue—including those of the Standing Rock tribe—could be seen as undermining their authority: the use of what Moore calls a "professional journalism" or "balanced" frame deprived the Tribe of the opportunity to act as the issue's primary definer in news media.

Sources, framing, and power

Analyses of which figures journalists choose to consult and quote in their articles are frequently used in research on climate change and energy news, often to explain or examine concepts like power and media access (Dusyk et al., 2018; Hedding, 2017; Kojola, 2017; Raso & Neubauer, 2016; Takahashi & Meisner, 2013; Wood, 2019; Wozniak, Wessler, & Luck, 2017) and in relation to theories like the media's tendency to index (or record) societal elites' points of view (Bolsen, 2011; Djerf-Pierre, 2016; Zukas, 2017). The intersection between frames and involved parties can help elucidate their respective goals and interests (Raso & Neubauer, 2016; Wood, 2019; Zukas, 2017). Research on a variety of subnational, U.S., and international contexts also shows an interest in charting the comparative use of different groups with framing influence, with government and/or industry sources appearing frequently in energy (Djerf-Pierre et al.,

Wood, 2019; Zukas, 2017) and environmental (Taylor, Lee, & Davie, 2000) news, with environmental groups or NGOs rising in prominence as well (Wood, 2019; Wozniak et al., 2016).

Research questions

This overview of major framing patterns in the oil pipeline news coverage literature, taken with foundational literature in framing theory, informs the first set of research questions. The primary definitions of framing used for the study from Entman (1993) and Chong and Druckman (2007, 2011) emphasize the ability of media frames to define issues, reflect the positions of social actors who have the power to define those issues, and affect public opinion. While not all of the studies reviewed here adopt issue definition as a core concept, their common interest in tying frames to various facets of oil pipelines (for example, environmental, economic, and safety concerns) motivates the interest in issue definition taken here.

RQ1: How does local newspaper coverage define (i.e. frame) the Enbridge Line 3 pipeline replacement project (“Enbridge L3”) as an issue?

The research question is broken down into three components. The common environmental versus economic framing patterns (Dusyk et al., 2018; Kojola, 2017; Wood, 2019) suggest a competitive frame environment, prompting:

RQ1a: What are the dominant definitions (i.e. frames) of Enbridge Line 3 in local newspaper articles/coverage?

Framing theorists (Chong & Druckman, 2011; Entman, 1993) and oil pipeline media scholars alike (Dusyk et al., 2018; Lawlor & Gravelle, 2018; Wood, 2019) have noted media frames’ flexibility in expressing positive or negative aspects of an issue.

Given those insights and the observations that environmental frames have been used by both opponents and proponents in pipeline news coverage (Wood, 2019), the next research question asks:

RQ1b: To what degree will articles' dominant definitions of Enbridge L3 support the project, oppose the project, or remain neutral?

Building on the insights above and the cited critical scholars' emphasis on the interplay between having access to media and being able to broadcast a given point of view (Moore, 2019; Raso & Neubauer, 2016), the next research question asks:

RQ1c: What types of actors will have the greatest degree of visible power to define issues?

Role of climate change in pipeline news scholarship

Given the connections between fossil fuel energy usage and greenhouse gas emissions, it is not surprising that media coverage of oil pipeline projects would include discussions of climate change. Scholars emphasize the role of climate change in pipeline news coverage in varying degrees. They do share, though, a tendency to consider climate change as an indicator or subset of larger frames.

The quantifiable degree to which climate plays a role in framing different oil pipelines varied. On the higher end, climate change appeared in approximately 28% of articles about the Keystone XL project from the *New York Times*, the *Washington Post*, and the *Wall Street Journal* and served as a “substantial critique” (Kojola, 2017, p. 909).

National and provincial coverage of Canada's Northern Gateway pipeline, however, offered climate change as an environmental risk subframe in a mere 4.5% of the relevant articles, suggesting that the pipeline had not become a symbol for climate change "inaction" (Dusyk et al., 2018, p. 19). Dusyk and colleagues suggested that climate change may have been skirted for multiple reasons, including Canada's economic reliance on its fossil fuel industry, the lack of resonance that climate change arguments may have had with the residents close to the pipeline route, their sample's conservative ideological skew, and the failure to consider greenhouse gas emissions and climate change in the project's regulatory review. The observation of inconsistent inclusion of climate change in oil pipeline project news coverage raises the following question:

RQ2: To what degree will local newspapers include climate change in its coverage of the Enbridge Line 3 pipeline?

Climate change discussions or related keywords are often treated as variables to indicate the presence of environmental frames in newspaper coverage of the Keystone XL and Northern Gateway oil pipelines (Dusyk et al., 2018; Kojola, 2017; Lawlor & Gravelle, 2018; Wood, 2019). Kojola's (2017, p. 903) qualitative, inductive framing analysis included "climate change" as a code for content whose presence would signal a larger "environmental risk" frame. Similarly, Lawlor & Gravelle's (2018, p. 673) computer-assisted quantitative analysis used keywords such as "global warming," "emission*," "greenhouse," "climate," and "carbon" to indicate the presence of an environmental frame. Wood's (2019, p. 311) analysis of Keystone XL coverage

conceptualized instances of climate change as contributing to a “carbon” frame, which similarly to other studies belonged to a larger “environment” parent frame.

Climate change references occasionally constituted a frame itself. Raso & Neubauer’s (2016) critical study identified a pro-Northern Gateway frame that decried the use of pipelines as “undeserving lightning rods for oil sands/climate change criticism” (p. 127). Instead of indicating the presence of an environmental perspective, this frame used climate change in the context of defusing Northern Gateway pipeline critiques. (Raso and Neubauer did not report the indicators for anti-pipeline frames in their paper.) By contrast, climate change was associated with an environmental frame in Dusyk and colleagues’ (2018) study on Northern Gateway pipeline coverage. They designated climate change as both a code and as a subcategory, suggesting some overlap between use of climate change as an indicator and as its own frame. With the exception of Dusyk and colleagues’ study (to be discussed further below), climate change is thus rarely the primary focus in the limited supply of pipeline framing studies. Instead of offering detailed examinations of how climate is framed in pipeline news, scholars understandably look for the role that climate plays (or doesn’t) in framing pipelines.

The overwhelming tendency for research to designate climate change as an environmental frame indicator presents an additional research question when considered in the context of a competitive framing environment per Chong and Druckman (2007, 2011). Given the assumption that multiple frames may be used in a given news article to explain the significance of the Enbridge Line 3 pipeline, climate change could show up most frequently in articles that feature a dominant environmental frame. By contrast, climate change could be used to signal a secondary environmental frame to complement

or counter a dominant economic one. Additional knowledge about the context in which climate change is being presented would provide additional nuance to this study, prompting the following question:

RQ3: Is there a relationship between the use of a dominant pipeline frame and the mention of climate change in local newspaper articles about Enbridge Line 3?

The limited attention that oil pipeline news coverage research has devoted to analyzing climate change itself within the coverage points to an additional line of inquiry. In an exception to the general trend, Dusyk and colleagues (2018) supplemented their quantitative analysis of Northern Gateway pipeline news with a qualitative review of the climate change mentions that did appear and found that they provided very little—if any—additional context. The present study wishes to investigate how climate change is presented in oil pipeline coverage in a new context. Drawing from insights in the framing, science communication, and climate change communication literature about public polarization and disengagement when confronted with news tinged with politics, ideology, and uncertainty—in particular Nisbet’s (2009, 2010b) work on climate change frames—this study takes a different approach from Dusyk and colleagues and asks:

RQ4: Will local newspaper coverage of Enbridge L3 define (i.e. frame) climate change in a way that would promote public disengagement and polarization?

Finally, the study will draw the two main “parts” of this study together—namely, the investigation into how Enbridge Line 3 is framed in local news coverage and whether

and how climate change is framed within that coverage. Similar to the reasoning presented for RQ3 and in line with the observation that much of the oil pipeline literature presented a clash between environmental and economic frames, it would be advantageous to know if certain oil pipeline frames set the stage for problematic depictions of climate change in the news. This study therefore asks:

RQ5: Is there a relationship between the way Enbridge L3 is defined (i.e. framed) in local news coverage and the inclusion of potentially polarizing/disengaging climate change frames?

One additional facet of this research should be acknowledged. Recall as well how developments in the newspaper industry have affected science, environmental, and therefore climate journalists: with more limited financial resources, newspapers either eliminate specialist reporters from their staff or move them to different news beats (Gibson et al., 2016). Coverage of climate, especially in smaller or cash-strapped papers, could be incorporated into different topics or simply handled by reporters without a background in climate. For those reasons, this study will focus its attention on smaller-circulation Minnesota newspapers' coverage of the Enbridge Line 3 to answer these questions.

Chapter 3: Methodology

Sampling Frame

This study used a selection of local northern Minnesota newspapers to assess the research questions in the literature review. Minnesota is an appropriate state to focus on because the bulk of Enbridge Line 3's U.S. route runs through northern Minnesota and at the time of writing was the site of ongoing permit challenges (Kraker, 2020a, 2020b).

News outlet sampling strategies and criteria

Newspapers were selected according to purposive and convenience sampling criteria (Riffe et al., 2014). The purposive sampling strategy identified fifteen Minnesota counties—located on either the current or proposed replacement Enbridge Line 3 pipeline—from which to select newspapers (Minnesota Public Utilities Commission, n.d.). These counties were selected in order to target local newspapers that would be likely to cover the issue. Convenience sampling was used to select newspapers from the University of Minnesota's subscription to the Access World News NewsBank database that met the county criteria. The final sample of newspapers included the *Duluth News Tribune*, the *Bemidji Pioneer*, the *Walker Pilot-Independent*, the *Crookston Times*, and the *Grand Rapids Herald-Review*.

Convenience sampling is not ideal for producing representative or generalizable population data, but it is an appropriate strategy to take when “material is difficult to obtain..., resources limit the ability to generate a random sample of the population..., [and] when a researcher is exploring some under-researched but important area” (Riffe et al., 2014, p. 75). Given the limited availability of local newspapers in university-accessible databases, financial resource constraints, and the scant supply of research that

focuses on either oil pipelines or climate change in local newspapers, this project met Riffe et al.'s criteria for convenience sampling. Despite the use of convenience sampling, the selected newspapers do share characteristics that provide some continuity. All papers are located in their respective county's seat, and all but two of the papers selected (the *Walker Pilot-Independent* and the *Crookston Times*) enjoy the highest circulation in their respective counties (Minnesota Newspaper Association, 2020).

Table 1

Newspapers in sample

Newspaper	County	Circulation	County seat?	County's pipeline route placement
Duluth News Tribune	Saint Louis County	Su: 27,301; Mo-Sat: 20,550	Y	On existing pipeline route
Grand Rapids Herald Review	Itasca County	5,781	Y	On existing pipeline route
Bemidji Pioneer	Beltrami County	4,434	Y	On existing pipeline route
Walker Pilot-Independent	Cass County	1,965	Y	Both on existing pipeline route and replacement route

Crookston Daily Times	Polk County	711	Y	Both on existing pipeline route and replacement route
-----------------------	-------------	-----	---	---

Note: Circulation figures from Minnesota Newspaper Association, updated to reflect 2020 figures (Minnesota Newspaper Association, 2020)

Articles were collected from January 1, 2013 (the year that Enbridge began assessing Line 3, according to its website; specific dates for assessment were not provided) through July 31, 2019 (Enbridge, n.d.-b). July 31, 2019, was selected as the endpoint in the summer of 2019 in order to include coverage of the Minnesota Court of Appeals' June 3, 2019, ruling against the Public Utilities Commissions' environmental impact and project decision from the previous year (Wareham, 2019). Following the advice from the University of Minnesota librarian serving the Hubbard School of Journalism and Mass Communication, the following search term was used to locate articles in the Access World News database: ("line 3" AND enbridge) in All Text, searching from 1/1/2013 to 7/31/2019 (personal communication, May 14, 2019).

Establishment of sampling frame

The search results yielded 604 articles. 19 duplicate articles were removed according to the criteria below and left 585 articles in the sampling frame. A sample size of 210 articles was established to achieve a 5% margin of error at 95% confidence using an online calculator (SurveyMonkey.com, n.d.). Earlier project plans had specified a larger sample size, but were reduced in order to accommodate budgetary constraints.

Duplicate articles were removed from the search results in order to establish the sampling frame (e.g. Feldman et al., 2017). The researcher distinguished between

duplicate articles that appeared multiple times within a single outlet and duplicate articles that appeared across multiple outlets in the sampling frame. It was observed during the process of evaluating search term results that articles distributed by news services such as Forum News Service appeared in multiple outlets. These articles were kept in the sampling frame in order to maintain the full range of articles that addressed the topic across the geographic area; the idea that an article may have appeared in the *Duluth News Tribune* a day before appearing in the *Bemidji Pioneer* does not negate the fact that it did appear in the *Bemidji Pioneer* and that paper's readers may have seen it there first.

Note: the across-outlet duplicates were reviewed and compared prior to data collection and analysis to assess their similarity and determine which ones to keep in the sampling frame. Although the across-outlet duplicates were ultimately kept in the sample, it should be acknowledged that the researcher did see the contents of those articles prior to coding but did not pre-code them.

Articles that were duplicated within outlets were identified by analyzing a spreadsheet listing the articles' metadata (e.g. headlines, author, publication date). Some potential duplicates had been identified in the first review of the overall search results in October 2019. A subsequent review in February 2020 confirmed which articles were duplicates and identified additional ones. When articles were duplicates, the article that appeared last in the chronological sequence was kept and earlier articles were removed. This approach was designed to keep the most up-to-date version of the article, if multiple versions had been published. Some articles were true duplicates, in that the headlines, authors, and outlets were identical (though listed publication dates could vary). In other duplicate articles headlines, publication dates, and authors were very similar but

contained small variations such as changes in word order or indications that the article was a corrected or updated version.

News and opinion articles were both included in the final sampling frame. Definitions for each type in coding instructions were adapted from Littau (2016). The researcher had considered removing letters to the editor as a means of narrowing the sampling frame, but determined that the news outlets' conventions for identifying reader letters were inconsistent. As such, all opinion articles were kept in the sampling frame to avoid erroneous deletions.

Proportionate random sampling techniques, stratified by outlet, informed the number of articles to be drawn from each outlet; note that this strategy was chosen instead of a non-proportionate strategy to facilitate data analysis (Neuendorf, 2017). Ten articles were drawn from the *Crookston Times* (5% of the total sample); 105 articles were drawn from the *Duluth News Tribune* (50% of the total sample); 36 articles were drawn from the *Grand Rapids Herald-Review* (17% of the total sample); 36 articles were drawn from the *Walker Pilot-Independent* (17% of the total sample), and 23 articles were drawn from the *Bemidji Pioneer* (11% of the total sample).

Criteria for establishing an article's relevance to study

The criteria for establishing articles' relevance for inclusion in the study evolved over the course of several months (October 2019 through January 2020) as the researcher established the study's sampling frame and developed the coding instructions.

Determining how to handle articles that addressed the Enbridge Line 3 pipeline for only a portion of the whole was a major consideration. When reviewing search results to establish an appropriate search term, it was observed that some articles were likely not

predominately about Enbridge Line 3. For example, some headlines suggested that the article might address elections or animal species in the newspaper's geographic area; it was unclear based on the search results whether the articles discussed Line 3. Other articles appeared to address the now-abandoned plans for the Sandpiper pipeline and Line 3 in the same article, as some governmental decisions about the lines were considered simultaneously. Test coding conducted in October 2019 and in January 2020 also revealed articles where Line 3 was discussed in addition to other topics, including Sandpiper. These examples would inform later decisions about including articles in which Enbridge Line 3 was not the main topic in the final sample. The researcher's previous knowledge about Enbridge Line 3 and existing research were considered to establish relevance criteria. See Appendix A for details.

Article relevance was included in the coding instructions as a variable, and irrelevant articles were removed and subsequently replaced during the coding process in order to achieve the desired sample size. Hart and Feldman's (2014) requirement for an article to include at least one sentence about the topic under inquiry informed this study's inclusion criterion of having at least one sentence about Enbridge Line 3. While some content analyses remove irrelevant articles prior to coding (e.g. Carlson, 2018; Hart & Feldman, 2014; Takahashi & Meisner, 2013), others remove such content during coding (Nisbet & Huges, 2006), and others do both (Feldman et al., 2017). Including relevance as a variable also provided an opportunity for the researcher to test the criteria's reliability (Hart & Feldman, 2014).

Sampling articles from sampling frame

Proportionate, stratified, simple random sampling strategies were used to select articles from the sampling frame (Neuendorf, 2017). The sampling frame was stratified by news outlet in order to ensure proportional amounts of articles from each outlet. Sampling with replacement techniques informed the random selection procedure, though the techniques were modified to avoid article duplications in the sample. The researcher used a random number generator to select articles (Haahr, n.d.); see Appendix A for details about the procedure.

Intercoder reliability subsample selection

Fifty articles were randomly selected from the final sample list for the intercoder reliability subsample. Content analysis scholars offer a variety of recommendations for establishing intercoder reliability subsample sizes. This study followed Neuendorf's (2017) observations that intercoder reliability subsamples "should be at least 10% of the full sample, probably never smaller than 50" (p. 187). Though a 50 article sample was on the low end of Neuendorf's scale, it represented 23.8% of the 210-article sample size. Other scholars' recommendations were considered, wherein intercoder reliability subsample sizes are chosen as a function of the sample's size and the desired confidence level—smaller sample sizes would require a larger percentage for an intercoder reliability subsample in order to achieve sufficient variation (Riffe et al., 2014). However, Neuendorf's recommendation of at least 50 articles was chosen because it was more feasible given hiring budget constraints.

Intercoder reliability subsample articles were selected in a process similar to the one used to draw the initial sample. The initial batch was drawn before the study coding began. When intercoder reliability subsample articles were identified as irrelevant during

the coding process, new ones were randomly selected from the original sampling frame and added to the coders' assignments. Errors in this process resulted in only 48 articles being coded by all coders for reliability testing. See Appendix A for details.

Assignment of articles to coders

The remaining articles in the sample were divided between three coders: the researcher and two undergraduate student coders. The original study design attempted to follow content analysis best practice guidelines that recommend having individuals other than the researcher code material: two undergraduate coders were each intended to code half of the remaining 160 articles from the original 210-article sample (Neuendorf, 2017). A new list was made of the non-intercoder reliability articles by copying the full sampling frame list (which was created by copying the article IDs in the order in which they were randomly selected and included the highlighted intercoder reliability article IDs). The highlighted intercoder reliability article IDs were deleted from this new list. Systematic random sampling techniques informed the method of assigning articles to coders (Neuendorf, 2017). Articles were assigned to coders by selecting a random starting point in the list, assigning the corresponding article ID to one coder (selected by flipping a coin) and then assigning subsequent articles to each coder in alternating order. While this method of assignment was not fully randomized, the structured assignment approach with a random starting point did offer a level of randomization. It also ensured that coders would receive an approximately even number of articles from each outlet.

The number of articles that the undergraduate coders were able to code was reduced in response to budget constraints and unexpected training and data entry costs. The researcher coded 33 articles from the undergraduates' original assignments that they

were unable to complete, along with nine new articles that were randomly selected to replace ones identified as irrelevant (selected using random.org on May 24, 2020) (Haahr, n.d.), and the 62 total intercoder reliability articles that were assigned to both undergraduate coders. When coding, the researcher replaced newly-found irrelevant articles (selected on June 12, 2020, and June 18, 2020) (Haahr, n.d.). Content analysis textbooks acknowledge the potential necessity for researchers to code material due to practical constraints (Neuendorf, 2017). The researcher was informed of which articles in the intercoder reliability sample were designated as irrelevant during the coding process; coders were instructed to do this so that the researcher could assign new intercoder reliability articles as needed during the coding process. In order to roughly anonymize which articles belonged to the intercoder reliability subsample and reduce unconscious coding biases (Riffe et al., 2014), the researcher randomized the order of article IDs when establishing her own coding schedule.

Coding schedule and sequence

Coders were assigned articles in a sequence designed to ensure that each would be able to code enough articles for the intercoder reliability subsample. The 50 randomly selected intercoder reliability articles were placed at the beginning of the coding schedule. While content analysis methodology resources recommend assigning double-coded intercoder reliability articles along the coding process's duration (Riffe et al., 2014), this front-loading strategy enabled the researcher to track and replace the irrelevant articles on a rolling basis while funds remained in the coding budget. To the best of the researcher's recollection, coders were unaware of which articles were being double-coded (Riffe et al., 2014), although they had been told during training that a

selection of articles would be placed in their respective assignments for reliability testing purposes. Ten replacement intercoder reliability articles were assigned to coders after all original intercoder articles were completed. Each coder completed approximately 5–7 individually assigned articles prior to receiving their intercoder replacement article assignments. Intercoder reliability replacement articles were the first to be assigned upon re-starting the study after Covid-19 disruptions (see Appendix B for details). Thirteen uncoded articles from a previously assigned individual batch remained in one coder's schedule when the post-disruption replacement intercoder reliability articles were assigned. She was instructed to code the newly-assigned articles first without being informed that they belonged to the intercoder reliability subsample. Although there is a possibility that this may have alerted her to their special status as intercoder reliability articles, it was determined that having her complete these articles first before any further unforeseen disruptions might occur was advantageous to the project. Two more intercoder reliability articles were replaced in the coders' next batch of articles. Aside from the replacement intercoder reliability articles, each coder was assigned articles in sequence from the lists constructed at the beginning of the study.

Concepts and operationalization

Media frames were assessed at two levels within this study's conceptual framework. On the first level, media frames apply to a newspaper article's main focal issue; they can represent the way the writer suggests that readers should understand the issue (Entman, 1993). Multiple frames for a given issue may appear in an individual article (Chong & Druckman, 2011). The first level frames in this study apply to the way the Enbridge Line 3 pipeline is framed. Early iterations of the study assumed that

Enbridge Line 3 would be the primary focus of all articles, and so conceptualized an equivalence between an article's dominant frame and the dominant frame for the pipeline. As the study developed to include articles where Enbridge Line 3 was discussed but not as the main topic, dominant frames were reconceptualized to encompass the main way the pipeline itself was framed. Following Chong and Druckman (2011) and Nisbet and Hoge (2006) the pipeline frame level also permitted complementary or competing secondary frames of Enbridge Line 3 to be identified.

On the second level, media frames are analyzed surrounding the issue of climate change. This study draws its inspiration for analyzing specific mentions of climate change from Hart & Feldman's (2014) paper, in which they examine framing of climate change impacts and actions specifically within a news program instead of identifying the program's single "overarching" frame (p. 340). There are conceptual similarities to the first level of frames: here, again, media frames are considered to be representations of the way the issue of climate change is being defined within the news coverage of the oil pipeline project. Nagler and colleagues' (2016) investigation of how health disparities were framed in local newspapers' health stories provided similar methodological insights. While it is unclear whether they, like Hart and Feldman, distinguished between the frames presented with individual health disparity mentions and frames for an entire article, their additional interest in quantifying the number of health articles that did or did not include health disparities and their use of Entman's frame functions (i.e. causes and solutions) to identify frames were informative. Others like Dusyk and colleagues (2018) have also examined frames on a statement level. Drawing from Nisbet (2009, 2010b), however, the climate change frames under analysis here also operationalize the potential

for this news coverage to produce certain positive or negative perspectives on climate change as an issue itself.

Operationalization of concepts related to pipeline/article-level frames

Foundational aspects of framing theory inform this study's first concept of interest: issue or problem definition. Recall that media frames highlight select aspects of a given issue to present specific ways to define it, and that stakeholders or actors might push their own preferred definitions into the media landscape (Chong & Druckman, 2007, Entman, 1993). The definitions that audiences receive have the capacity to shape the way they understand the issue (e.g. Price, Tewksbury, & Powers, 1997). Moreover, receiving multiple competing versions of an issue may compel individuals in audiences to respond to and process those messages in unanticipated and possibly unintended ways (Chong & Druckman, 2007).

As discussed in the literature review, the theoretical stance that many stakeholders or actors may offer competing frames to control the presentation of a given issue introduces another key concept: power. Actors' and sources' presence in news coverage has been conceptualized in a variety of similar ways, including as a demonstration of what parties' perspectives are included in the media (Takahashi & Meisner, 2013) and in the context of control over what information might appear about a given issue in public fora, whether from elites or other actors (Hedding, 2017; Kojola, 2017; Taylor, 2000; Zukas, 2017). This study thus operationalizes power over issue definition as the first-mentioned actor that appears in support of a dominant pipeline frame in news coverage of the Enbridge Line 3 pipeline, adapting Djerf-Pierre and colleagues' (2016) definition for actors as "Individuals or organizations that are described as doing or saying something in

an article” for the codebook (p. 644). While their means of measuring those actors within articles and their end goal for measuring actors differed from this study’s, the definition was deemed useful because the researcher could envision scenarios where an actor might not be quoted, but may be given prominent placement in an article.

Operationalization of concepts related to climate change

The climate change frames under investigation here do not just tell us how pipeline news coverage defines that issue; they also suggest potential effects that such coverage could produce in the audience. Polarization and disengagement (and their conceptual antipodes of unification and engagement) are the primary media effects-related concepts of interest in this portion of the study. As concepts for which empirical evidence would be found in individuals’ reactions to media, polarization and disengagement clearly cannot be tested for directly in a content analysis. What can be tested for, however, are the frames that could produce those effects. Nisbet (2009, 2010b) proposed a set of frames that he argues could polarize or unify, disengage or engage audiences. These frames will be the focus of the study’s second component. Nisbet’s frames also notably integrate key concepts—uncertainty, politicization, and ideology—that previous research on climate change communication have identified in various forms in news media. The preceding literature review discussed these concepts in greater depth, but a brief recap to connect them to Nisbet’s frames and their proposed effects is worthwhile.

Both content analyses and experiments in climate change communications research address the concept of uncertainty. Uncertainty has taken multiple forms, whether in early depictions of legitimate scientific unknowns about climate change (Zehr,

2000) or in politically-motivated climate skepticism campaigns (McCright & Dunlap, 2003). Exposure to messages that highlighted controversy was shown to dampen people's certainty about climate change, in comparison to messages that explained the issue's overall context (Corbett & Durfee, 2004). Nisbet (2009, 2010b) included "scientific uncertainty" in his set of science communication frames, attributed much of its use to conservative political interests, and suggested that the scientific uncertainty frame is one that "reinforces perceptual divides" (Nisbet, 2009, p. 18). Examples of partisan climate change denial emphasize the interconnection between these key concepts in climate change news research: when political forces enter the fray, they call upon uncertainty and ideological affiliations to make their points, making it occasionally difficult to pull these concepts apart based on the research literature.

Like uncertainty, politicization has been a frequently-identified concept in climate change media research with important media effects implications. Beginning in the 1990s, with a shift from scientist-led explanations of the problem to politician-led debates over what should be done, frames in climate change coverage were increasingly politicized (Trumbo, 1996). The implications of politicized climate change news extend beyond framing as well. A surplus of Democrat-led discussions on climate change in the media and a dearth of Republican-led ones has been offered as an alternative explanation for divided partisan opinions on the matter in the U.S.; Republican voters' exposure to Democrat politicians' consistently pro-climate-science messages may have triggered a "boomerang effect" and divergently shaped their opinions (Merkley & Stecula, 2018, p. 269). Researchers working from the perspective of motivated reasoning similarly suggested that Republican-identifying individuals were less likely to support climate

mitigation policies than Democrats in experiments that portrayed climate change impacts on people in distant countries, thus reflecting levels of political division on the topic (Hart & Nisbet, 2012). Politicization of the topic may contribute to reduced public policy support as well, with potential connections to disengagement (Cappella & Jamieson, 1997), as aforementioned research from health and science communications fields suggests (Druckman & Bolsen, 2011; Fowler & Gollust, 2015). Nisbet (2010b) advanced an overall argument of climate change politicization and polarization and argued that any frames that take on a partisan political bent—whether they define climate change action in terms of negative economic outcomes, catastrophic disaster, conflict and strategy, or political accountability—risk increasing audience division (which this study interprets as polarization).

Finally, ideology plays a key conceptual role in climate change news research and in Nisbet's frame typology. Pro-business and anti-regulation conservative ideologies have been shown to be connected to anti-climate action or skeptical positions (e.g. Carvalho, 2007; McCright & Dunlap, 2003). Conservative-leaning news outlets demonstrated heightened use of conflict frames and presentation of "negative efficacy" in discussing human responses to climate change (Feldman et al., 2017). Ideological divides amongst media consumers and the ideological bents of the media outlets through which they encountered climate change coverage reinforced people's existing climate beliefs and levels of climate support, informed their future ideologically-based media choices, and thereby further solidified their increasingly separate positions (Feldman et al., 2014). Thus ideological media and beliefs, like politicized ones, can serve to divide opinion.

Since the key concepts identified in the climate change literature—uncertainty, politicization, and ideology—each intermingle and contribute to the eventual effects of reducing public support for policies or dividing public opinion, the present study will focus on the related concepts of disengagement or engagement of interest in the topic and polarization or unification of perspectives. Nisbet’s (2009, 2010b) reviews, however, do not distinguish cleanly between frames that provoke polarization and disengagement or unification and engagement, and instead designate frames that “reinforce perceptual divides” or “break perceptual gridlock” (Nisbet, 2009, pp. 19–20). As a result, this study will follow that breakdown (see Table 2).

“Economic development” frames and “morality/ethics” frames, which may help unify and engage public opinion on climate change, present alternative images of ideology and politicization (Nisbet, 2009, 2010b). Citing Nordhaus and Schellenberger (2007), Nisbet explained the economic development frame’s potential appeal to groups such as Republicans and “labor advocates” whose pro-business priorities may lay outside of the stereotypical environmentalist fold (2010, p. 57). Rather than thrusting partisan posturing into the foreground, Nisbet explains how in practice morality/ethics frames (drawing from Wilson, 2006) have thrust political and ideological opponents together to express their mutual commitment to combatting a “shared moral challenge” (2010, p. 57). These frames present antitheses to the commonly used divisive frames, and so are used to operationalize unification and engagement.

The “public health” frame (Nisbet, 2010b, citing Frumkin et al, 2008) may translate an abstract, global problem like climate change into a concrete, personal one. Previously uninterested groups may pay more attention to the issue when presented with

information about climate change's health impacts. Hart and Feldman (2014), Maibach and colleagues (2010), and Weathers and Kendall (2016) have argued this as well.

Table 2

Climate change frame concept operationalization

Frames that “reinforce perceptual divides”	Frames that “break perceptual gridlock”
Concepts: Polarization, disengagement	Concepts: Unification, engagement
<ul style="list-style-type: none"> ● “Scientific/technical uncertainty” ● “Conflict/strategy” ● “Economic competitiveness” ● “Pandora’s Box/Frankenstein’s monster” ● “Public accountability/governance” 	<ul style="list-style-type: none"> ● “Economic development” ● “Morality/ethics” ● “Public health”

Note: Frames from Nisbet, 2009, pp. 18, 20; 2010b, pp. 52, 58

Codebook development

Despite the ubiquity of framing studies in mass communications research, there is little consensus on its methodological procedures (Chong & Druckman, 2011; Scheufele & Tewksbury, 2007). Scholars have used manually-coded qualitative, inductive

approaches to identify frames from the texts being studied (e.g. Kojola, 2017), deductive approaches using either coding schemes to directly measure the presence or absence of frames (e.g. Chong & Druckman, 2011) or statistical methods like factor analysis or cluster analysis to identify indicators and resulting frames (e.g. Semetko & Valkenburg, 2000; Matthes & Kohring, 2008). Computer-assisted linguistic searches are also used (e.g. Lawler & Gravelle, 2018). Critiques of these various approaches similarly abound. Nisbet (2010b) and Cacciatore and colleagues (2016) each admonished inductive framing scholars for generating their own frames without considering existing frames. Nisbet (2010b) argued that this practice clouds how issues are measured and understood. Cacciatore and colleagues (2016) questioned this practice for its inability to account for frames' "resonance" with audiences or potential to produce effects (Cacciatore et al., 2016, p. 14). These critiques inform this study's approach to selecting frames for analysis.

As such, following Chong & Druckman (2011) and Tankard (2001), this study will use existing literature on oil pipeline media coverage and hydraulic fracturing to identify a set of frames that would apply to news coverage of Enbridge Line 3. Following Nisbet (2010b), this study also will use a set of existing frames to further examine incidences of climate change within this coverage. Both frame analysis components will be deductive. The processes for establishing each set of frames, however, will be slightly different.

Overview of method for identifying and defining issue-specific frames

As noted in the literature review, the extant studies on oil pipeline framing in newspaper coverage use a variety of analytical approaches. Despite their common use of

framing, their complementary theories and research paradigms differ, ranging from critical theory (Kojola, 2017) to energy deployment theories (Dusyk et al., 2018), from qualitative analyses (Moore, 2019) to computer-assisted approaches (Lawlor & Gravelle, 2018). The result is a small body of literature that examines similar but not identical sets of frames. These discrepancies present a challenge to conducting an analysis using frames derived from literature per Chong & Druckman (2011): How can a researcher distill these similar-but-different sets of frames into a manageable list with definitions and indicators?

Consistent with Chong & Druckman (2011), previous literature was used to identify potential frames. Although they indicate that selecting frames from previous literature is an inductive process, in the absence of precise guidelines for how to select frames the researcher determined that frames should appear in at least two of the oil pipeline, oil sands, or hydraulic fracturing studies reviewed here to be included, an approach similar to Dahinden (2002). Since the foundational research addressed multiple pipelines in varying geographic regions that may have produced endemic frames, the researcher surmised that frames appearing in multiple studies may be more likely to appear in a new context. After listing out frames, their names and definitions were compared to assess their similarity. Frames were not required to have identical names and definitions in the foundational research to be counted as appearing in multiple studies. For example, some studies identified an “environmental risk” frame while others looked for an overall “environmental” frame. Frames with slightly different names and similar definitions (for example, national interest and energy security) were considered to be in

the same category for tallying purposes. Frames from studies on alternative or renewable energy sources like nuclear, wind, or solar power were not included in this process.

The foundational studies varied in the level of specificity with which they conceptualized their frames and definitions. For instance, some defined frames on a fairly detailed level: a frame could be designated as “environmental damage” or “spills” (Wood, 2019, p. 311), with each frame being categorized under a broader “environmental” theme or category. Others, however, identified the higher-level concept as the frame: “Environmental risk” (Kojola, 2017, p. 903) or “Economic” (Dusyk et al., 2018, p. 19), with more specific elements such as “climate change” (Dusyk et al., 2018, p. 19) or “job creation” (Kojola, 2017, p. 903) identified as sub-frames or codes. This study followed the latter approach and conceptualized frames at this higher level, which also aligned with the research questions pertaining to how the issue of the pipeline was broadly defined in coverage.

As Chong and Druckman (2011) noted, the framing literature does not dictate a single approach for establishing frame definitions or their constituent elements in inductive or deductive studies. A general strategy that informed this study’s approach was to use elements of framing definitions—either a frame’s functions or its textual devices and components—as the foundation for coding schemes. For example, studies have used elements of Entman’s (1993) or Gamson & Modigliani’s (1989) frame definitions to code content and provide bases for quantitative cluster analysis (Matthes & Kohring, 2008) or qualitative open coding schemes (Kojola, 2017; Moore, 2019). Pan & Kosicki (1993) demonstrated how tables could be used to parse and categorize framing devices such as “syntactical,” “script,” “thematic,” and “rhetorical” “structures” within a

text (p. 59). Tankard (2001) outlined similar guidelines for scholars to search “framing mechanisms” like headlines, leads, and quotes for frame indicators (p. 70), and Van Gorp (2010) similarly recommended developing matrices with indicators during an initial inductive open coding procedure, then deductively analyzing the full body of content. It is important to note that these examples applied the approaches directly to text being studied, rather than definitions and indicators described in related research literature. Dahinden’s (2002) proposed method to consolidate similar frame definitions from multiple studies differs. He took sets of frames from five different studies on general and science-specific news topics, and identified frames with similar definitions that appeared in at least two studies to use as the basis of consolidating frames (a criterion that this study also used). He acknowledged the complexity of the “semantic analysis” used to compile his resulting table of frames, but did not provide details on the steps taken (Dahinden, 2002, p. 191). While the present study did not duplicate any one of these methods exclusively, these studies provided background knowledge that inspired the approach taken. As in other studies (e.g. Nagler et al., 2016), Entman’s frame function categories were instrumental in the study design. Once frames appearing in multiple studies were identified, this study organized and translated those frames’ elements into Entman’s functions. Those translated elements were then analyzed to produce consolidated frames (see Appendix C for details).

Method for selecting and refining climate change frames

In addition to assessing how the Enbridge Line 3 pipeline is framed in newspaper coverage, this study also assesses whether and how climate change is framed within that coverage. Nisbet’s (2009, 2010a, 2010b) set of commonly-used frames in science news

and communication is the primary source for this study's climate change frames and definitions. These frames provide both a set of measures to assess the potential for news coverage to produce effects on public opinion and help to enhance continuity with previous research (Nisbet, 2010b). Similarly, searching for media frames that are tied to specific media effects helps to address the critique that too many content analyses fail to consider media objects with their production or reception contexts (Riffe et al., 2014). Researchers have used adaptations of Nisbet's frame set in content analyses of climate change media (Chetty et al., 2015; Feldman et al., 2017; Hart & Feldman, 2014; Shehata & Hopmann, 2012) and energy-related topics such as news on fracking (Hedding, 2017) and mountaintop removal coal mining (Hedding & Riffe, 2016), and tweets concerning the Standing Rock/Dakota Access Pipeline protests (Smith & van Ierland, 2018). However, the researcher is unaware of studies using Nisbet's frames to examine depictions of climate change within energy news coverage.

As previously discussed, Nisbet proposed that his typology's frames have the potential to either disengage the public and harden rifts in public opinion, or unify people's views and help them understand climate change's relevance in their personal lives. For instance, the conflict and strategy frame has been tied to political cynicism and disengagement (Cappella & Jamieson, 1997). One partisan group's use of the "Pandora's Box" frame may elicit strong support for the cause amongst its denizens but repel their opponents (Nisbet, 2009, 2010b). By contrast, frames that appeal to a common interest in combatting climate change ("morality/ethics") or people's own self-interest ("public health") may draw people together in addressing the issue (Nisbet, 2009, 2010b). Although the researcher is not aware of studies confirming the effects of Nisbet's frames,

Hart and Feldman (2014) have identified other research roughly confirming many of the frames' potential to engage/disengage or unify/polarize the public.

Pre-defined frames also give researchers a foundation from which to develop their codebooks. Some studies establish coding questionnaires for pre-defined frames with concrete measurement items that theoretically can be applied to any news content of the same genre (Semetko & Valkenburg, 2000). Nisbet did not offer such a concrete coding instrument, but he did provide formal definitions for the frames in his typology and examples of how they might show up in news content about different science-related topics from climate change (2009, 2010b) to nuclear energy to the teaching of evolution in public schools (2010a). This study uses Nisbet's frame definitions as the foundation of its codebook and uses his climate change-specific examples as frame indicators. It supplements these definitions and indicators with examples from a subsequent study that used Nisbet's frames.

Hart and Feldman's (2014) and Feldman and colleagues' (2017) content analyses of climate change in television and newspaper outlets drew upon Nisbet's (2009) study to assess how climate change "impacts" and "actions" were framed (2014, p. 335). Hart & Feldman's "conflict or power struggle" frame echoes Nisbet's conflict and strategy frame, but provided additional concrete examples such as "Democrats and Republicans battling over legislation" and "international disagreements over climate policy" (2014, p. 335). Their frames of climate change actions that could affect "the economy in a positive way" or "the economy in a negative way" (Hart & Feldman, 2014, p. 335) were similar to the positive and negative iterations of Nisbet's "economic development/competitiveness" frames and so were the source of indicators like greenhouse gas regulation's economic

impacts and “new green jobs” (p. 335). Hart and Feldman’s “public accountability” frame was aligned with Nisbet’s “Public accountability/governance” frame and provided an indicator explaining the relationship between research and policy and “serving interests” of stakeholders (p. 335). Finally, their “public health frame” supplied specific types of diseases and conditions that climate change could exacerbate (Feldman et al., 2017). Though these specific examples are not a part of Nisbet’s own definitions, they display a clear logical connection and provide them with greater depth. In cases where citing literature’s frame definitions and indicators were functionally equivalent to Nisbet’s, no additions were made.

Early iterations of the codebook attempted to draw indicators from other climate news studies that employed Nisbet’s frames (Chetty et al., 2015; Shehata & Hopmann, 2012). However, during the process it was difficult to determine whether indicators from adapted frames aligned with the originals, and for the sake of simplicity only indicators from Nisbet’s articles (2009, 2010b) and Hart and Feldman’s (2014) and Feldman et al.’s (2017) articles were included, with the exception of references to Lyme disease as an example of vector-borne diseases that could grow in changing climates, which came from previous knowledge (Minnesota Climate & Health Program Environmental Impacts Analysis Unit, 2015) and was mentioned in Weathers and Kendall (2016). Nor do the frames used here draw specific indicators from cited studies informing Nisbet’s typology (Nisbet, 2010a). Because these studies address a range of science topics other than climate change (for example, nuclear power, evolution, and biotechnology), the frame indicators they report would not be applicable to the content analyzed here (Nisbet, 2010a).

Codebook refinement process

Content analysis codebooks/coding instructions are typically developed in an “reiterative process” that is closely tied to the testing of their measures’ reliability (Neuendorf, 2017; Riffe et al., 2014, p. 105). Researchers establish variables and ways of measuring them in initial codebook drafts, apply them to content, revise them, and then repeat the process. Multiple coders may participate in testing codebooks. Under ideal circumstances, multiple pilot tests would be conducted in which at least two coders would use the coding instructions with a sufficiently large sample size to conduct formal preliminary intercoder reliability tests. Any insufficiently-reliable measures would be revised and retested until acceptable intercoder reliability levels could be achieved before conducting the formal study coding. While budgetary and time constraints prevented the present study from fully adhering to these recommendations as it had initially envisioned, the spirit of this iterative process informed its codebook refinement efforts. The coding instructions and corresponding code sheets that served as this study’s data collection instrument underwent multiple revision rounds over the span of approximately four months (October 2019–February 2020).

An initial round of test coding was performed by the researcher in November 2019 and was used primarily to assess the amount of time needed to code articles for use in a grant application. Articles were randomly drawn from informal sampling frames including articles from Minnesota Public Radio, the *St. Paul Pioneer Press* (search term *enbridge line 3* was used; nine articles from the *Pioneer Press* were inadvertently omitted from the sampling frame), and the *Cloquet Pine Journal* (final study search terms were used), which were retrieved from the Access World News database. These outlets were

the source for all subsequent test coding. PDFs of each article were downloaded individually and were read from a computer screen. Hard copies of the coding instructions and code sheets were used, and notes were taken on a separate sheet of paper. Fourteen articles were coded and coding time durations were recorded.

Some changes may have been made in the next version of the codebook as a result of these test codes, including the directive that government/politics frames may present the pipeline within a context of government and political processes. The first test coding sessions also raised issues to be resolved at a later point, including how to code for dominant frames when Enbridge Line 3 was not an article's main topic. Additional changes to the codebook between the first and second iterations included adding specifications of "economic markets" and "general financial success" to the economic frame definition; a clarification about Enbridge Line 3 being presented as a solution to problems identified in the National Interest frame; a caveat to explain how discussions of jobs did or did not fit into the National Interest frame; additional context for the key word "job killers" (Kojola, 2017, p. 908, from Solomon, 2011) in the conflict/strategy frame; a note about how to code references to economic impacts on Indigenous communities in the Indigenous frame; the addition of "trains and railways" to the indicators about oil product transportation safety in the safety frame; and a specification that foreign intervention frames could include references to both foreign and "outside" organizations. Instructions and criteria for climate change presence indicators were added, as well as instructions for how to code dominant frame attitudes and how to code for climate change frames. A brief example was added to clarify the definition of the Pandora's Box climate change frame. Some of these changes may have been made as a result of insights from

test codes. Additional changes were made to the codebook in response to colleague reviews, continued researcher test coding, practice coder training sessions with volunteer coders, and formal coder training sessions with hired undergraduate coders (see Appendix C for details on pipeline frame refinement, Appendix D for details on other variable refinement, and Appendix E for details on coder training).

General coding instructions and procedures

Coders were directed to read articles through at least three times to assess the variables in the coding instructions (Dusyk et al., 2018; O'Connor, A., personal communication). The coding instructions divided the variables into four sections in order to make the coding process more manageable. Coders were instructed to record identifying information, relevance, and basic article attributes (i.e. whether it was a news or opinion piece) on the first read.

In the second read, coders were directed to read through the article, focusing first on the headline and lead paragraph, and then paragraph by paragraph, to identify pipeline frames. Each frame's presence (or absence) and dominance in the article was coded with a 3, 2, 1, 0 coding scheme adapted from Nisbet & Huges (2006) and Hedding (2017). Dominant frames in articles with Enbridge Line 3 as the primary focus were designated with a "3" code and identified by reading the headline and lead paragraph. When the headline and lead paragraph indicated multiple frames, coders were directed to select the frame that best fit the article as a whole. Dominant frames in articles with Enbridge Line 3 as a tangential focus were designated with a "2" code and identified by reading the first paragraph in which Enbridge Line 3 was mentioned. Articles could not have multiple dominant frames (i.e. either two frames in an article being coded with a "3", two frames

being coded with a “2”, or two frames coded with both a “3” and a “2”). During training, coders questioned what to do if multiple frames appeared in the first paragraph that discussed Enbridge Line 3. Coders were instructed to select the dominant frame that best fit the section about Line 3 to maintain consistency with dominant frame selection procedures in Enbridge Line 3-focused articles. Coders read the remainder of the article paragraph by paragraph to identify the presence of secondary frames using a “1” code (while articles were designated the unit of analysis, paragraphs were designated the unit of observation, (Babbie, 2001)), of which there could be more than one. Coding discrepancies arose in coder training when coders used the context in preceding or subsequent paragraphs to inform frame identifications. In an effort to enhance reliability and remove a degree of subjectivity, and in consultation with the project’s advisor, the researcher specified in coding instructions that coders should not use external paragraphs as context to select frames. Frames that were not present in the article were assigned a “0” code. Coders were informed that it was possible for no frames, either dominant or secondary, to show up in articles.

The third pass through the article provided the opportunity for coders to indicate whether any of the study’s predefined frames appeared and record the dominant frame they found (if any). Upon recording the dominant frame, coders then assessed the dominant frame’s attitude toward Enbridge Line 3 using a nominal “-1” (anti-pipeline), “0” (neutral/balanced), “1” (pro-pipeline), “10” (no dominant frame for which to assess attitude) coding scheme and designations informed by Kim and colleagues (2014) and Lawlor & Gravelle (2018). Coders then identified the dominant actor associated with the dominant frame with directions adapted from Djerf-Pierre et al., (2016), and assessed the

presence of climate change with a “2” (present in headline or lead), “1” (present elsewhere in article), “0” (not present) coding scheme inspired by Nisbet & Huye (2006). See the study’s coding instructions (Appendix F) for complete listing of these variables’ categories and indicators. See Appendix D for details on these variables’ development processes.

If climate change was present in the article, coders were instructed to review the sections where it was discussed and code them for Nisbet’s (2009, 2010b) climate change frames. Each instance of climate change was to be considered for the presence of frames. For articles in which Enbridge Line 3 was not the primary focus, it was determined that only instances of climate change that appeared in paragraphs about Line 3 should be evaluated for frames. Coder training had yielded multiple types of articles in which Enbridge Line 3 was discussed but was not the article’s main focus such as round-ups of legislative decisions, articles about climate change activists or Indigenous groups in Minnesota that discussed Line 3 in part. Because part of the study’s aim was to understand how climate change was being discussed in the context of Line 3, and because these articles had the potential to discuss climate change elsewhere but not in the context of Line 3, it was decided that the review of climate change for frames should be restricted to paragraphs where Line 3 was mentioned. See Appendix D for details on these variables’ development processes.

Coders read the news articles in PDF form on computer or tablet screens and referred to hard copy coding instructions. Coding was initially performed with hard copy code sheets, but transitioned to a digital code sheet (using the Qualtrics survey platform) mid-way through the study due to Covid-19 precautions and social distancing practices

(see Appendix B for details). Coders were instructed to code at a rate of approximately 4–5 articles per hour. When the researcher coded her portion of the articles, she spent more time coding because of detailed note-taking.

Chapter 4: Results

Data analysis plan (original)

To analyze Research Question 1 and 1a, the researcher proposed to assess the frequency and proportion with which each article-level frame (later conceptualized as pipeline frame, when the study's design was adapted to account for the presence of articles in which Enbridge Line 3 was not the main topic) appeared in coverage, whether as a dominant frame or a secondary frame. For instance, the planned analysis would determine the number and proportion of articles that featured a dominant environmental frame and the number of articles that included environmental frames but featured other frames as dominant. The plan also proposed breaking down the frequencies and proportions by news outlet.

Although research questions were used instead of formal hypotheses to present the queries for the distribution of dominant pipeline frames, the researcher considered using the chi-squared goodness-of-fit hypothesis test to assess whether the distribution of cases represented a pattern that was not occurring by random chance or was significantly different from an expected distribution. The sample informal hypothesis test that the researcher had devised essentially assumed a null hypothesis of all dominant frames appearing in equal proportions. The alternative hypothesis would have been that dominant frames would have proportions greater or less than what would have appeared in an even distribution.

$$H_0: p_{\text{enviro}} = p_{\text{econ}} = p_{\text{national interest}} = p_{\text{conflict/strategy}} = p_{\text{gov't/politics}} = p_{\text{Indigenous}} = p_{\text{safety}} = p_{\text{foreign influence}} = p_{\text{enviro justice}} = p_{\text{no frame}} = 0.10$$

$$H_a: \text{some } p_i \neq 0.10$$

Note that this analysis was not conducted. Part of the researcher's interest in conducting this test was based on the misconception that it could assess whether the distribution of dominant frames in the sample represented the population; consultation with a statistics specialist confirmed that chi-squared tests do not perform this function along with other insights explained below (LATIS consultant, personal communication, October 24, 2020). Additionally, the null hypothesis that all frames would be represented equally in dominant positions (which was established in part based on the aforementioned misconceptions about the chi-squared test's functions) was faulty. In order to test a hypothesis in a chi-squared goodness-of-fit test, the null hypothesis should have established the distribution that the researcher expected to find in the data based on previous research. Conducting the test would have established how closely the actual data matched that expectation, and whether the variations present were likely to have been obtained in a situation where the null hypothesis were true; in the event that the p-value were sufficiently small, the null hypothesis of the expected distribution could be rejected and one could conclude that something different was happening in the data. With null hypotheses that assumed equal distribution of dominant frames, the p-value resulting from chi-squared tests for goodness-of-fit using the study's data may have been very small and would have been sufficient evidence to reject a null hypothesis that the distribution was equal. However, since previous research would have suggested that a different distribution was more likely, the p-value conducted on a test that assumed an equal distribution does not provide useful information. Nor does it provide information that would change or supplement conclusions drawn from the existing frequency and proportion descriptive statistics. Given the large numbers of dominant frames that did

appear in some categories, it was apparent based on the proportion and frequency analyses that the distribution was not equal, as the null hypothesis suggested and obtaining a p-value from the test may not have changed any of the conclusions (LATIS consultant, personal communication, October 21, 2020).

Furthermore, the researcher was concerned that the high number of cases coded as “none of these/other” and the difficulties in coding this variable (details below) would render the results of the chi-squared test meaningless—even if the resulting p-value indicated that the distribution of frames differed significantly from the null hypothesis, it would not be able to speak to the unidentified frames. Additionally, with the low reliability of the variable’s coding and the high number of “other” categories, it seemed like the statistic would be superfluous.

The analyses for Research Questions 1b and 1c utilized summary variables that were included in the coding instructions. After coding each individual frame’s presence, the coders were instructed to select the dominant frame in the form of a summary variable, along with that frame’s attitude toward the pipeline and the first actor associated with the dominant frame. To assess how dominant frames expressed attitudes, the researcher proposed to analyze the frequency and percentage of articles for each frame that fell into each attitude stance category. To assess which actors had the most visible power, the original data analysis plan proposed to count the frequency and proportion of each actor type’s appearance in the overall sample. Assessing the frequency of each actor’s appearance in relation to the dominant frames was not proposed as a main analysis, but was suggested as a potential supplement.

A chi-squared goodness of fit test was originally proposed for each question as well: analyzing the distribution of attitudes and actors, respectively. The test was attempted for the actor variable, but questions remain about its appropriateness for similar reasons as those described above; notably, for this variable there was a very high number of “unable to determine” cases in addition to the “none of these/other” cases. The initial informal null and alternative hypotheses were that if no interesting patterns were occurring, all actor types would be used with the same frequency in support of dominant frames. In the event that something interesting occurred in the data, some actors would be represented in greater or lesser proportion to the assumed proportion if all were equal:

$H_0: p_{\text{Gov't}} = p_{\text{Oil industry}} = p_{\text{Indigenous}} = p_{\text{ENGO}} = p_{\text{landowners}} = p_{\text{Business community}} = p_{\text{community residents}} = p_{\text{no actors}} = 0.125$ (In other words, H_0 : All actor types are used with the same frequency in support of dominant frames.)

H_a : some $p_i \neq 0.125$

Again, this assumption was problematic for a null hypothesis, given results from previous research (e.g. Tuchman, 1978; Wood, 2019).

Similarly for the attitude variable, during the data analysis phase the researcher believed that the large number of articles appearing in the “no dominant frame” category (which had not been included when the original data analysis plan was devised) would make such an analysis meaningless: if the object of the test is to determine whether the distribution of categories represents a pattern that diverges significantly from an assumed distribution, then the large number of cases whose attitudes could not be evaluated (because there was no dominant frame for which to assess an attitude) in retrospect seemed to make the resulting analysis a moot point.

The original analysis plan for Research Question 2 proposed presenting the frequency and proportion of articles that mentioned climate change, both across all outlets and broken down by outlet. When originally designed, the decision had not yet been made whether to code for climate change in a binary present/absent or trinary prominent/present/absent manner. The latter was eventually adopted to obtain a more detailed breakdown of climate change presence, and the two presence categories were subsequently collapsed to incorporate additional analyses (described below in results).

Research Question 3 planned to perform a chi-squared test of association to determine if a relationship existed between the dominant frame in an article and whether or not climate change was mentioned. This was one of the planned analyses that required a simplified climate present/absent variable. During the planning stage, the researcher was unsure of whether a chi-squared test would be feasible given the large number of variables, small sample size, and the potential for certain variables (such as climate change) to appear infrequently; it was doubtful that a minimum of five expected counts would appear in a dominant frame/climate change contingency table. Nonetheless, the analysis was included in the plan in the event that the minimum data distribution appeared. The null and alternative hypotheses were as follows:

H_0 : There is no association between the dominant frame used to define Enbridge L3 and the inclusion of climate change in the same article.

H_a : There is an association between the dominant frame used to define Enbridge L3 and the inclusion of climate change in the same article.

The initial data analysis plan considered the potential for collapsing categories if there were insufficient expected counts for the individual frames. However, in considering that

option during data analysis, it was unclear whether that would yield any meaningful analysis, as eliding the distinctions established during the codebook development phase would remove a level of detail that the researcher had deemed relevant.

Similar to the planned analyses for RQ1b and c, the planned analysis for Research Questions 4 and 5 involved a summary variable for coders to indicate whether an article included climate change frames that could promote disengagement and polarization, frames that could promote engagement and drawing together of opinion, both types of frames, or neither type of frame. The planned analysis for Research Question 4 called for an assessment of the frequency and proportion of articles that included only negative frames, only positive frames, a mix of the two, or neither. The analysis had also proposed to assess the frequency and proportion with which each individual climate change frame appeared in articles that mentioned climate change: for instance, to assess how many articles included the scientific/uncertainty frame, the public health frame, etc. To answer Research Question 5, the researcher proposed conducting a chi-squared test of association between the summary dominant pipeline frame variable and the summary climate change frame distribution variable. Again, during the planning stage it was unclear whether enough counts for each dominant frame and climate change frame combination would be present to run the analysis.

Intercoder reliability

Intercoder reliability tests were conducted July 21–23, 2020, using Deen Freelon's (2010, 2013) online tools ReCal3 and ReCalOIR. The data were cleaned prior to conducting tests (see Appendix G for details). The subsample quantity for testing the relevance variable's reliability (n=58) was higher than the subsample quantity for testing

the remaining variables' reliability (n=48) because the researcher added new articles to the intercoder reliability subsample each time a coder communicated one as being irrelevant. As a result, all coders coded the relevance variable for 58 articles (excluding the articles that were removed from the sample during data cleaning—see Appendix G). The researcher had planned to remove articles that were coded as irrelevant by one or more coders from the intercoder reliability subsample because coders were instructed to stop coding if they identified the article as irrelevant. As such, they would not have had the opportunity to code the articles for any subsequent variables; to include those articles in the remaining variables' reliability tests would have been inappropriate and would have skewed the reliability. Instead, reliability tests on remaining variables were only conducted on articles for which all three coders had coded the variables. Intercoder reliability tests were not run for variables that were uniformly coded as not present. V6 and V17 were calculated using ReCal OIR because they contained either missing data or data with negative numbers; only ReCal OIR is equipped to handle those data forms. The remaining variables were calculated using ReCal3. Reliability tests were not conducted for the Economic Development-positive, Morality/Ethics, or Public Health climate change frames because they were not coded as present in the intercoder reliability subsample. They did, however, appear in the coders' individually-coded subsamples. Results of the intercoder reliability tests appear in Appendix H, Table H25.

Variable adjustments in R Studio to assist in analysis

A handful of data manipulations were performed in R Studio in order to facilitate analysis. First, a new variable was created to identify whether Enbridge Line 3 was an article's primary focus or secondary focus; this was created by having R Studio

determine whether an article's dominant pipeline frame was coded with a "3" or a "2."

An additional new variable was created that identified each of the pipeline frames that had been coded as present in an article and compiled the names into a single text string. This variable's purpose was to assist the researcher in roughly evaluating which frames typically appeared together for an informal analysis (see Discussion, page 129). These two variables were created at the beginning of the data analysis procedure when the data was in numerical format. A statistics consultant from LATIS provided the code to create these variables (personal communication, July 29, 2020).

The researcher then used the `as.factor` function in R Studio to convert the data to factor format in order to perform the study's analyses (LATIS consultant, July 27 and 29, 2020). While the study's variables were all categorical, the coding scheme had used numerical values to represent the presence or absence of each variable, which R Studio by default interpreted as quantitative or numeric. The `as.factor` function adjusted this. Additional variables and data manipulations are described in the results below as they occurred in the data analysis sequence.

RQ1/1a

To answer Research Questions 1 and 1a ("How does local newspaper coverage define (i.e. frame) the Enbridge Line 3 pipeline replacement project?" and "What are the dominant definitions (i.e. frames) of Enbridge Line 3 in local newspaper articles/coverage?"), frequency and proportion tables were prepared for each individual pipeline frame variable in R Studio using the Mosaic data analysis package. Variables for which there were unrepresented categories required adjustments to properly display the data. The National Interest, Foreign Intervention, and Environmental Justice pipeline

frame variables each had frame presence categories that were not represented and so required adjustments using the “levels” function in R Studio to properly display the data.

Each article was coded for the presence of the nine predetermined pipeline variables with a “3”, “2”, “1”, “0” coding scheme. In this scheme, “3” indicated the frame was dominant when Enbridge Line 3 was the article’s main focus, “2” indicated the frame was dominant when Enbridge Line 3 was not the article’s main focus, “1” indicated the frame appeared as a secondary frame in any articles about Enbridge Line 3, regardless of whether it was the article’s main focus, and “0” indicated the frame was not present. The present analysis indicates the frequency with which each pipeline frame presence code appeared in the entire sample. Only one pipeline frame could be coded as dominant in each article, either as a “3” or a “2” depending on the article’s focus on Enbridge Line 3. Multiple pipeline frames could be coded as present in a secondary capacity. Frequencies for total dominant frame usage were calculated by adding the counts for articles coded with a “3” and a “2” for each pipeline frame-specific variable. Proportions for the total dominant frame usage in comparison to the total sample were calculated manually by dividing the total number of dominant frames by the sample size (n=209).

Two points about the designation of dominant frames are important to note to properly contextualize the following results. First, there were discrepancies in the frequency counts for articles that did not exhibit any of the study’s pipeline frames in a dominant position depending on which variables were used for the calculation. When the individual pipeline frame variables were used, the analysis showed that 39 articles were coded without dominant pipeline frames. When the dominant pipeline summary variable

was used, only 38 registered as not having a dominant pipeline frame. In the pipeline attitude summary, which was assigned based on the coders' designation of a dominant pipeline frame, only 37 articles were coded with an attitude position. Coder error explains these discrepancies: Coder 1 coded article GRHR1 with no dominant frame in the pipeline frame variables, but assigned it one with the summary variable, and coded article WPI31—which did not have a dominant frame selected in either the pipeline frame variables or the summary frame variables—as having an anti-pipeline dominant frame. Second, Coder 1 had identified a conflict/strategy dominant frame in the pipeline frame variables for BP29, but selected a government/politics frame as dominant in the summary variable.

Use of dominant frames, all outlets

The government/politics frame appeared as the dominant frame in 84 articles (56 where the pipeline was the article's primary focus, a proportion of 0.2679, and 28 where the pipeline was a secondary focus, a proportion of 0.1340) across the entire sample, making it the most frequently used dominant frame. It was also used in the highest proportion to the rest of the sample at a proportion of approximately 0.4019. Economic and environmental frames were used as dominant frames in the next highest frequency and proportion, appearing in 28 total articles (proportion of 0.1340; 18 articles where Line 3 was the primary focus, 10 where it was secondary) and 24 articles (proportion of 0.1148; nine primary focus, 15 secondary focus) respectively. 16 articles featured a dominant conflict/strategy frame (proportion of 0.0766 in relation to the total; 10 primary, 6 secondary). Indigenous and safety frames were used as dominant frames in similar quantities and proportions: nine articles with a proportion of 0.0431 (seven

primary focus, two secondary focus) and seven articles with a proportion of approximately 0.0335 (five primary focus, two secondary focus), respectively. National interest and environmental justice frames were dominant in only one article each with Line 3 as a primary focus (a proportion of 0.0048). No articles used foreign intervention frames in a dominant position. 38 articles in the sample (a proportion of 0.1818) did not exhibit any of the study's frames in a dominant position according to frequency and proportion calculations run on the dominant pipeline frame summary variable. See Appendix H, Tables H1 and H2 for data in table form. See Appendix H, Table H3, for data regarding articles where no frames were present.

Use of dominant frames by outlet

Two-way frequency and proportion tables were prepared in R Studio to compare each pipeline frame variable to the news outlet variable.

The government/politics frame was the most frequently used dominant frame in each separate outlet as well. The proportions with which this frame was used as dominant in each outlet ranged from approximately 0.1739 (*Bemidji Pioneer*; 0.0870 for primary and secondary articles; proportion calculated by dividing total number of government/politics frames in the paper by the total number of articles from that paper) to 0.4722 (*Walker Pilot-Independent*; 0.3611 for primary, 0.1111 for secondary; proportion calculated as above). Similar to their appearance across the entire sample, economic and environmental frames each occupied the second- and third-most frequently used dominant frame positions in the *Duluth News Tribune* (though environmental was tied for third with conflict/strategy), the *Walker Pilot-Independent*, and the *Crookston Daily Times*. The appearance of the economic and environmental frames did not follow this

pattern in the *Bemidji Pioneer* or the *Grand Rapids Herald Review*. The Indigenous frame was the *Pioneer*'s second most frequently used dominant frame, followed by the environmental frame and conflict/strategy. The economic frame was second most frequently used in the *Grand Rapids Herald Review*, and the conflict/strategy and environmental frames were used third most frequently. Specific frequencies and proportions with which each frame was used as dominant in each outlet are provided in Appendix H, Tables H4 and H5.

Use of secondary frames, all outlets

Note that the proportions provided for secondary frames do not compare their frequency in relationship to each other—the proportions cannot be added to 1 because multiple secondary frames could be identified as present in a single article. The proportions presented here should be interpreted as the percentage of all articles that included a given frame in a secondary position. Environmental frames appeared in the highest frequency (115 articles) and proportion (0.5502) across the entire sample. Government/politics (72 articles, 0.3445), safety (70 articles, 0.3349), and economic frames (69 articles, 0.3301) were used as secondary frames in similar frequencies and proportions. Conflict/strategy (15 articles, 0.0718), national interest (8 articles, 0.0383), environmental justice (7 articles, 0.0335) and foreign intervention (2 articles, 0.0096) frames were least frequently used as secondary frames when results for all outlets were pooled. See Appendix H, Tables H1 and H2 for data in table form.

Use of secondary frames by outlet

The environmental frame was the most frequently used secondary frame in each separate outlet with the exception of the *Crookston Daily Times*, where it was used in the

same frequency and proportion as the safety frame (each appeared as secondary in 5 articles, a proportion of 0.5000). The government/politics, safety, and economic frames appeared as the next most frequently used secondary frames in the *Duluth News Tribune* (along with the Indigenous frame, which was used in similar proportions), the *Bemidji Pioneer*, and the *Grand Rapids Herald Review*, but in varying orders of frequency and proportion. The Walker *Pilot-Independent's* and *Crookston Daily Times's* secondary frame usage differed slightly. In Walker, the government/politics (0.4444), economic (0.3611), and Indigenous (0.3056) frames were the next most frequently used, followed by safety (0.2500). In the *Crookston Daily Times*, the safety frames were used as secondary in equal proportion to environmental; the economics (0.4000), government/politics (0.3000), and Indigenous (0.2000) frames appeared as the next most frequent. Amongst the least-used secondary frames (national interest, conflict/strategy, foreign intervention, and environmental justice), the *Duluth News Tribune* included all in its coverage and the *Crookston Daily Times* used none. The *Grand Rapids Herald-Review* used conflict strategy (0.0833) and national interest (0.0556) frames, but not environmental justice or foreign intervention. In the Walker *Pilot-Independent*, national interest (0.0556) and environmental justice (0.0278) frames surfaced as secondary frames but not conflict/strategy or foreign intervention. The *Bemidji Pioneer* used the environmental justice frame as a secondary frame in small proportion (0.0481), but none of the others. See Appendix H, Tables H4 and H5 for all numbers.

Use of dominant frames in relation to story type, all outlets

An analysis of dominant frame usage as a function of story type was added to provide supplementary perspectives on dominant frame usage, even though it was not

included in the original data analysis plan. Two-way frequency tables and proportion tables were prepared in R Studio using variables in which coders had a) categorized stories as either news or opinion, and b) identified the article's dominant frame based on the way they had coded the individual pipeline frame variables.

Government/politics frames were used with the highest frequency in both news and opinion articles, though a higher percentage of news articles (61 out of 136 news articles, or 0.4485) featured government/politics frames than opinion articles (24 out of 73 opinion articles, or 0.3288). A higher percentage of news articles (0.2132) did not feature any of the study's frames as dominant than opinion articles (only 0.1233). News and opinion articles' next most common dominant frames were economic and environmental, with news articles featuring a slightly higher proportion of environmental dominant frames (13 out of 136, or 0.0956) and opinion articles a higher proportion of economic (16 out of 73 articles, or 0.2192). A higher proportion of opinion articles featured conflict/strategy (6 out of 73; 0.0822) and safety frames (5 out of 73; 0.0685) in dominant positions than in news articles (9 out of 136 for a proportion of 0.0662; 3 out of 136 for a proportion of 0.0221). News articles employed Indigenous frames as dominant in higher proportions than opinion (8 out of 136 news articles for a proportion of 0.0588 versus 1 out of 73 opinion articles, a proportion of 0.0137). Environmental justice, national interest, and foreign intervention frames were infrequently used as dominant in both news and opinion articles. See Appendix H, Table H6 for all numbers.

Use of dominant frames in relation to articles' degree of focus on Enbridge Line 3

This analysis was similarly added to provide supplementary perspectives on dominant frame usage. A variable was added to the data set in R Studio that determined

whether a “3” or a “2” had been used to code the dominant frame for a given article. Articles for which no individual pipeline frame had been designated as dominant were coded as “0”. Two-way frequency and relative frequency tables were prepared in R Studio to determine the frequency with which each frame appeared as dominant in articles whose primary focus was Enbridge Line 3 (i.e., articles coded with a 3) and articles for which Enbridge Line 3 was only a secondary focus (i.e. articles coded with a 2). Proportions were calculated by dividing the number of articles with a given dominant frame in articles with a given focus (e.g. the number of articles focused on Enbridge Line 3 that featured environmental frames) by the total number of articles with a given focus (e.g. the total number of articles that focused on Enbridge Line 3). It is important to note that the numbers here do not reflect all of the articles in the sample. Because the coding instructions permitted articles to not have a dominant frame, and the only mechanism by which to distinguish the article’s level of focus on Enbridge Line 3 was integrated into the mechanism to identify dominant frames, the articles that did not have dominant frames were not able to be coded for level of focus. 107 articles were coded with 3s and determined to focus primarily on Enbridge Line 3, 63 articles were coded with 2s and determined to have Enbridge Line 3 as a secondary focus. It was not possible to determine the level of pipeline focus in 39 articles.

Government/politics frames were the most frequently used dominant frames amongst articles where it was possible to determine whether Enbridge Line 3 was the article’s main focus (56 out of 107 articles, a proportion of 0.5234) or a secondary focus (29 out of 63 articles, a proportion of 0.4603). Economic, environmental, and conflict/strategy frames were the next most commonly used dominant frames for both

categories of articles, but their proportions differed slightly: in articles where Enbridge Line 3 was the main focus, economic frames (18; 0.1682) were used more frequently than either conflict/strategy (10; 0.0935) or environmental frames (9; 0.0841), whereas when the pipeline was an article's secondary focus, environmental frames (15/63; 0.2381) made up a higher proportion than both economic (10/63; 0.1587) and conflict/strategy (5/63; 0.0794) frames. Indigenous, safety, national interest, environmental justice, and foreign intervention frames were the least frequently used dominant frames in both categories of articles. Indigenous and safety frames were used in slightly higher quantities than national interest, environmental justice, and foreign intervention frames in articles where Enbridge Line 3 was the main focus. See Appendix H, Table H7 for all numbers. See Appendix H, Table H8 for the overall quantities of articles broken up by level of pipeline focus.

RQ1b

Research Question 1b asked: To what degree will articles' dominant definitions of Enbridge Line 3 support the project, oppose the project, or remain neutral? Frequencies and proportions/relative frequencies were calculated in R Studio using the dominant frame summary variable and the dominant frame attitude position variable. The two-way frequency table indicated the total number of articles that featured each type of attitude position; proportions of each attitude position being represented in relation to the sample were calculated manually by dividing the total number of articles with a given attitude position by the total number of articles in the sample. Similar to the pipeline frame variables, one category (Foreign Intervention) was not represented in the data, and a level function was performed to ensure the output displayed that category. Since not all articles

displayed dominant frames selected from the study's options, and the attitude position variable was determined based on the identified dominant frame, attitude positions for a portion of the articles could not be assessed. 39 (proportion of 0.1866) articles featured dominant frames that displayed anti-pipeline positions, 72 (proportion of 0.3445) articles featured dominant frames that were neutral toward the pipeline or presented a balance of pro- and anti- perspectives, and 61 (proportion of 0.2919) articles were characterized by dominant frames that presented favorable attitudes toward the pipeline. 37 (proportion of 0.1770) articles were coded as not having a dominant frame for which an attitude could be assessed; recall that one article that did not have a dominant frame was mis-coded as being anti-pipeline.

Proportions of dominant frame attitude positions in relation to dominant frame usage were calculated by dividing the number of articles with a given dominant frame and attitude position by the total number of articles with that dominant frame, with the goal of identifying what percentage of articles featuring a given dominant frame expressed a particular attitude position.

The environmental frame presented all of the possible attitude positions in similar proportions. Out of the 24 articles whose dominant frames were environmental, seven (0.2917) were pro-pipeline, nine (0.3750) were anti-pipeline, and eight (0.3333) were balanced/neutral.

Economic, national interest, and safety frames expressed higher proportions of pro-pipeline frames than the other two attitude positions. Note, however, that very few articles featured dominant safety or national interest frames. Economic frames tended to present favorable attitudes toward the Enbridge Line 3 project, with 24 out of 28 articles

presenting a pro-pipeline attitude (proportion of 0.8571) and four articles presenting neutral or balanced positions (proportion of 0.1429). The single article that featured a dominant national interest frame presented a pro-pipeline attitude. When used as dominant, safety frames were used primarily in support of the project (seven out of eight articles, a proportion of 0.8750), with a small portion taking no single position (one article, proportion of 0.1250).

When used as dominant frames, Indigenous and environmental justice frames presented anti-pipeline positions most frequently. Indigenous frames were rarely used solely in support of the pipeline project (one out of nine articles, a proportion of 0.1111). About half of the Indigenous frames expressed an oppositional stance (5 articles, proportion of 0.5556) and about one third (3 articles, proportion of 0.3333) presented either neutral or both pro-and anti-pipeline positions. The single article that used a dominant environmental justice frame presented an anti-pipeline attitude.

Government/politics and conflict/strategy frames presented neutral or balanced attitudes more frequently than pro- or anti-pipeline. Over half of government/politics dominant frames (49 out of 85, proportion of 0.5765) presented neutral or balanced attitudes. 17 of the remaining instances of dominant government/politics frames showed an anti-pipeline attitude (proportion of 0.2000) and 19 (proportion of 0.2235) displayed a pro-pipeline attitude. Seven out of 15 dominant conflict/strategy frames (proportion of 0.4667) presented balanced or neutral attitudes. Nearly as many presented anti-pipeline attitudes: six out of 15, with a proportion of 0.4000). Two conflict/strategy frames (a proportion of 0.1333) presented a pro-pipeline attitude. See Appendix H, Table H9 for numbers in table form.

Dominant frame attitude positions in relation to newspaper outlet

This analysis was conducted in addition to the originally-planned comparison of dominant frames and attitude positions. A two-way frequency table counting the number of articles from each newspaper outlet that displayed given dominant frame attitude positions was prepared in R Studio, along with a relative frequency table that presented the percentage of articles that expressed each attitude in each outlet.

Percentages/proportions were calculated by dividing the total number of articles with a given attitude in a given outlet by the total number of articles in that outlet.

Dominant frames with neutral or balanced pipeline attitudes appeared in the greatest proportion relative to the outlet's total number of articles in three out of five outlets. In the *Duluth News Tribune*, 38 out of 104 articles (proportion of 0.3654) used balanced/neutral dominant frames. Six out of 23 articles in the *Bemidji Pioneer* (proportion of 0.2609) similarly used balanced/neutral dominant frames. The *Walker Pilot-Independent* had the highest proportion of balanced/neutral dominant frames, with 15 out of 36 articles (proportion of 0.4167). Within those three outlets, however, the concentration of pro- and anti- pipeline dominant frames was inconsistent. The *Bemidji Pioneer* and *Walker Pilot-Independent* featured slightly greater quantities of anti-pipeline dominant frames (4 anti-pipeline versus 2 pro-pipeline dominant frames in the *Pioneer*; 9 anti-pipeline versus 8 pro-pipeline dominant frames in the *Walker* paper). By contrast, the *Duluth News Tribune* featured greater quantities of pro-pipeline dominant frames (29 out of 104, proportion of 0.2788) than anti-pipeline (21 articles, proportion of 0.2019).

The *Grand Rapids Herald Review* and the *Crookston Daily Times* each had higher proportions of pro-pipeline dominant frames than neutral/balanced or anti-pipeline

dominant frames. 16 out of 36 articles in the *Herald Review* (proportion of 0.4444) and 6 out of 10 articles in the *Crookston Daily Times* (proportion of 0.6000) used dominant frames with a pro-pipeline attitude. In both those outlets, dominant frames with neutral pipeline attitudes appeared in the next highest quantity (11 articles in the *Herald Review*, proportion of 0.3056; 2 articles in the *Daily Times*, proportion of 0.2000). Dominant frames with anti-pipeline attitudes appeared least frequently, with four in the *Herald Review* (proportion of 0.1111) and one in the *Daily Times* (0.1000).

Anti-pipeline dominant frames showed up in lowest frequencies and proportions when all outlets were pooled together, but only showed up in the least amounts in the *Duluth News Tribune*, the *Grand Rapids Herald Review*, and the *Crookston Daily Times*.

A portion of all of the outlets' articles did not feature any of the study's frames as dominant, so attitude positions could not be calculated for all articles. 16 out of the *Duluth News Tribune's* 104 articles (proportion of 0.1538) did not have a dominant frame for which to assess attitude. The *Bemidji Pioneer* had the highest number of articles without an identified dominant frame at 11 out of 23 (proportion of 0.4783). Five articles (proportion of 0.1230) in the *Grand Rapids Herald Review*, four articles in the *Walker Pilot-Independent* (proportion of 0.1111), and one article in the *Crookston Daily Times* (proportion of 0.1000) did not have a dominant frame for which to assess attitude positions. See Appendix H, Table H10 for table layout of numbers.

RQ1c

As with the previous research questions, assessments of frequency and proportion were used to answer the question, "What types of actors will have the greatest degree of visible power to define issues?" Single-variable frequency and proportion calculations

were first performed on Variable 18, which recorded the first-named actor used in association with the dominant frame identified for an article. Again, the level function was used to add the non-represented actor variable categories to the R Studio output. A chi-squared test for goodness of fit was proposed in the original data analysis plan to assess whether the data provided statistical evidence that some actors were used more frequently than others. The original proposed null and alternative hypotheses were:

$$H_0: p_{\text{Gov't}} = p_{\text{Oil industry}} = p_{\text{Tribal}} = p_{\text{ENGO}} = p_{\text{landowners}} = p_{\text{Business community}} = p_{\text{community residents}} = p_{\text{no actors}} = 0.125$$

In other words, H_0 : All actor types are used with the same frequency in support of dominant frames.

$$H_a: \text{some } p_i \neq 0.125$$

In other words, H_a : Some actor types will be used greater or less than 0.125 (12.5%).

As discussed in the data analysis plan, it was not clear whether the data fit the requirements for a chi-squared test to be appropriate. In order to run the test, the level function was used to ensure that the unrepresented category (landowners) appeared in the output, and a new object using the concatenate function was used to ensure the categories were represented in the proper order. Although a test was run, the results do not provide useful information. Unclear coding instructions and the presence of articles without dominant frames resulted in low intercoder reliability scores and a high number of

articles for which actors could not be determined. Further limitations for the actor variable and related analyses will be addressed in the discussion section.

Although a meaningful chi-squared test of association could not be performed, the frequency and proportions of actors provide highly tentative answers to the research question. Amongst the articles for which a dominant frame was identified and an actor could be identified based on the coding instructions, government actors were the most frequently used. These actors appeared in association with dominant frames in 71 articles out of the total 209-article sample, a proportion of 0.3397. Oil industry representatives followed, used in 20 articles (proportion of 0.0957), then Indigenous representatives and business community representatives, each used in 12 articles (a proportion of 0.0574 in relation to the entire sample). Community residents and combined environmental/Indigenous groups were represented as the first actor in 7 (proportion of 0.0335) and 6 articles (proportion of 0.0287), respectively. Environmental interest groups were represented as the first actor in association with articles' dominant frames only once (proportion of 0.0048). See Appendix H, Table H11, for data in table form.

An analysis of the frequency with which different actors appeared in association with dominant frames was added to the study after the first analyses were run. Although RQ1c did not ask which frames were associated with actors, the analysis provides an additional level of nuance. Proportions were also calculated to find the percentage of articles that featured a combination of actor and dominant frame out of all articles that used a given actor type, the assumption being that actors have the agency to promote different frames. The discussion section will address this assumption's limitations.

Out of all frames that government actors were associated with, the government/politics frame was used most frequently (54 out of 71 articles, proportion of 0.7606). Full results are presented in Appendix H, Tables H12 and H13.

RQ2

To answer Research Question 2 (“To what degree will local newspapers include climate change in its coverage of the Enbridge Line 3 pipeline?”), single-variable frequency and proportion tables were prepared in R Studio. Tables were prepared for the codebook’s original climate change presence variable, which used a “2” (present in the article’s headline or lead), “1” (present elsewhere in the article), “0” (not present) coding mechanism. Tables were also prepared for a simplified present/not present climate change variable that was created in R Studio. Climate change’s presence in articles was also broken down by news outlet with two-way frequency tables and relative frequency tables. Proportions were calculated by dividing the number of articles that mentioned climate change in an outlet by the total number of articles from the outlet.

Out of the 209-article sample, climate change was mentioned in 35 articles (proportion of 0.1675): four articles mentioned climate change in the headline or lead (proportion of 0.0191), and 31 elsewhere in the article (proportion of 0.1483). Based on this sample, articles about Enbridge Line 3 in the *Duluth News Tribune* mentioned climate change at a higher rate than the other four papers (24 out of the paper’s 104 articles, or a proportion of 0.2308). Three of those articles mentioned climate change in the headline or lead. This proportion was notably higher than the proportion of the total number of articles that mentioned climate change in relation to the sample. The remaining articles mentioned it elsewhere. Climate change appeared in four out of 36

articles in the *Grand Rapids Herald-Review* (a proportion of 0.1111); in three out of 23 articles in the *Bemidji Pioneer* (a proportion of 0.1304), in three out of the 36 articles in the *Walker Pilot-Independent* (proportion of 0.0833, with one appearing in the headline or lead), and one out of 10 articles in the *Crookston Times* (a proportion of 0.10). See Appendix H, Tables H14 and H15.

An analysis (not included in the original data analysis plan) that explored the relationship between an article's type (either news or opinion) and whether or not climate change was mentioned was also conducted. Two-way frequency and relative frequency tables were prepared in R Studio to calculate the proportion of articles that mentioned climate change in relation to each news story type. The two article types included climate change at a similar rate: 24 out of the 136 news articles (proportion of 0.1765) and 11 out of 73 opinion articles (proportion of 0.1507). See Appendix H, Table H16.

Although these results suggested that there was not a substantial distinction between the proportional mentions of climate change in news versus opinion articles, a chi-squared analysis was run to see if a different pattern might exist. An informal alternate hypothesis that there would be an association between the type of story and the mention of climate change was advanced. The null hypothesis for this test was that there was no association between the incidence of climate change and the type of story. The chi-squared test of association yielded a chi-squared statistic of 0.22654 with a p-value of 0.6341. This fails to provide evidence to reject the null hypothesis that there is no relationship between an article's designation as news or opinion and whether or not it discusses climate change. See Appendix H, Table H17.

RQ3

A chi-squared test of association was planned to answer Research Question 3 (“Is there a relationship between the use of a dominant pipeline frame and the mention of climate change in local newspaper articles about Enbridge Line 3?”). There were not enough instances of climate change appearing in articles with each dominant frame to meet the chi-squared test’s minimum data distribution requirements. As an alternative, a two-way frequency table and relative frequency table were prepared using the simplified climate change presence variable and the pipeline dominant frame summary variable to generate tentative insights into the framing contexts in which climate change was appearing.

Articles with dominant environmental frames mentioned climate change in the highest proportions, at 0.2500 (six out of the 24 articles). Conflict/strategy-dominant articles included climate change in the next highest proportion (three out of 15 articles, 0.2000). More government/politics-framed articles mentioned climate change (16 out of 85), but at a lower proportion (0.1882) than articles featuring the two preceding frames. Articles that featured dominant Indigenous frames and dominant safety frames each included climate change in only a single article (proportions of 0.1111 and 0.1250, respectively). Six out of the 38 articles in which none of the study’s frames were dominant included mentions of climate change, at a proportion of 0.1579. Climate change did not appear in the one article with a dominant national interest frame; foreign intervention frames were not used as dominant. See Appendix H, Table H18.

RQ4

Research Question 4 asks: Will local newspaper coverage of Enbridge Line 3 define (i.e. frame) climate change in a way that would promote public disengagement and

polarization? The researcher noticed during data coding and cleaning that very few climate change frames appeared in the sample. Analytical strategies were limited as a result. Frequency tables were prepared in R Studio for each climate change frame variable, and the climate change distribution variable that coders used to summarize whether an article contained negative climate change frames, positive climate change frames, a mix of the two, or none at all. Because there were so few climate change frames, the researcher did not calculate their proportion in relation to the total number of articles mentioning climate change. In order to better understand the context in which the few climate change frames appeared, two-way frequency tables were then prepared comparing each frame that appeared and the distribution variable to compare their incidence with the following variables: news outlet, story type, and dominant frame attitude position. (Note: Climate change frame incidence was compared to dominant frame type to answer Research Question 5, below.)

Very few articles about the Enbridge Line 3 pipeline project defined climate change in a way that would promote public disengagement and polarization. The only such climate change from Nisbet's typology that appeared was the Pandora's Box/Frankenstein's Monster/runaway science frame, which appeared twice in opinion articles from the *Duluth News Tribune* that featured anti-pipeline dominant frame attitudes. The scientific uncertainty, conflict/strategy (in reference to climate change), negative economic consequences, and public accountability/governance frames did not appear in the sample.

Frames with the potential to promote engagement and unification, per Nisbet's typology, appeared four times. The economic development (positive) frame appeared

once in an opinion article that featured an anti-pipeline dominant frame attitude from the *Duluth News Tribune*. The *Bemidji Pioneer* included one morality/ethics frame in a news article with a neutral/balanced dominant frame attitude. The public health frame was used twice: once in the *Duluth News Tribune* and once in the *Grand Rapids Herald Review*. Both were in opinion articles with a pro-pipeline dominant frame; the frame in the *Herald Review* may have been a coder error (see below). See Appendix H, Tables H19 through H23.

Based on the climate change frame distribution variable's coding, negative and positive climate change frames appeared in articles exclusively of each other; no articles included a mix of positive and negative frames. Note that a coding error may be present in this variable: based on the two-way tables comparing outlets and the public health frames, one public health frame (a positive frame) appeared in the *Grand Rapids Herald Review*. However, no "positive frames only" codes appeared for that paper in the climate change frame distribution summary variable. (Note: the researcher scanned this article after running data analyses and did not see any references to climate change or health impacts in the article. This was likely a coder error.)

To summarize: Only the *Duluth News Tribune* and the *Bemidji Pioneer* definitively included climate change frames. Neither the *Walker Pilot-Independent* nor the *Crookston Daily Times* used climate change frames; it is likely the *Grand Rapids Herald Review* did not, either. In the limited number of cases with climate change frames, they tended to appear in opinion articles (four) more than news (one). The climate change frames also surfaced in articles with anti-pipeline dominant frames (three) slightly more of than neutral- or pro-pipeline dominant frames (one and two, respectively). All of the

articles that featured only negative climate change frames were also articles that featured anti-pipeline dominant frames. Articles with positive climate change frames were distributed across articles expressing all attitude positions. See Appendix H, Tables H19–H23 for numbers pertaining to this section.

RQ5

Research Question 5 asked: “Is there a relationship between the way Enbridge Line 3 is defined (i.e. framed) in local news coverage and the inclusion of potentially polarizing/disengaging climate change frames?” As with Research Question 3, there were not enough incidences of climate change frames to warrant the planned chi-squared analysis test of association. Two-way frequency tables comparing the presence of each climate change frame to the article’s dominant pipeline frame provided a preliminary, superficial understanding of the distribution in the absence of sufficient data and a formal test.

The Pandora’s Box frame appeared once in a dominant-environmental-frame article and once in a conflict/strategy-dominant-frame article. The economic development (positive) frame and the morality/ethics frame each appeared in articles with the government/politics dominant frame. Public health climate change frames appeared once in a dominant-environmental-frame article and once in an economic-dominant-frame article. Articles that featured dominant national interest, Indigenous, safety, and environmental justice pipeline frames did not display climate change frames. See Appendix H, Table H24 for display of numbers.

Chapter 5: Discussion

How local newspapers define the Enbridge Line 3 pipeline project through framing

Research questions 1 and 1a asked how the Enbridge Line 3 pipeline project would be defined in local newspaper coverage, both in terms of dominant frame usage and overall framing. The newspapers in this study's sample presented familiar overall dominant frame usage patterns with some notable nuances. The top three dominant frames—government/politics, economic, and environmental—resemble findings from previous literature on oil pipeline newspaper coverage (e.g. Dusyk et al., 2018; Kojola, 2017; Wood, 2019). The low incidence of Indigenous and environmental justice frames also aligns with some findings from previous research (e.g. Lawlor & Gravelle, 2018; Moore, 2019). Other frames' low incidence levels—conflict/strategy, safety, and national interest—were surprising in the context of previous research and Enbridge Line 3's ongoing debate (Kojola, 2017; Lawlor & Gravelle, 2018; Raso & Neubauer, 2016).

The local papers' overall tendency to frame Enbridge Line 3 primarily as a government/politics issue, followed by the environment-versus-economy framing dichotomy, embodies a variation of common framing patterns in oil pipeline literature. Instead of foregrounding the environment/economy framing split (e.g. Dusyk et al., 2018; Wood, 2019), the coverage in these northern Minnesota papers appears to situate those understandings of the Enbridge Line 3 pipeline within the greater context of the state's permitting process. Kojola's (2017) critical analysis of national Keystone XL pipeline newspaper coverage provides the best complement to this pattern. His "political controversy" frame appears in the coverage in the greatest amount (88 articles out of 122 total, or 72% of coverage) with "creating jobs and economic growth" as second-most-

common, “promoting the national interest” as third, and “environmental risk” as fourth; he argues that each of these frames serves to reinforce perceptions of the Keystone XL as a “conflict” and “trade-off between the economy and the environment” (Kojola, 2017, p. 903). In other words, an overall political context provided a shell for the environment/economy dichotomy in a way that resembles the distribution of frames in the Enbridge Line 3 coverage. The undertones of conflict in Kojola’s most-frequently-appearing political controversy frame notably contrasts with the government/politics frame defined in this study; the conflict/strategy frame’s use in this study will be addressed further below.

The high percentage of government/politics dominant frames in the newspaper coverage studied here may be a result of both the way the study defined the frame and the pipeline’s progression through Minnesota’s permitting process, similar to Hedding (2017) and Kim and colleagues’ (2014) findings. Mentions of public meetings and hearings were included as indicators of a government/politics frame; notices and recaps of such meetings in the news coverage may have expanded the application of this frame (e.g. Duluth News Tribune, 2017; Johnson, 2017a; Swanson, 2017). Coverage of regulatory milestones or mentions of regulatory bodies such as recommendations from the Minnesota Department of Commerce (Lovrien, 2018b), an administrative law judge (Lovrien & Johnson, 2018a), or the Minnesota Public Utilities Commission (Forum News Service, 2019) may also have driven the frame usage. News articles may have placed their primary focus on the core facts of these processes (e.g., the various agencies’ procedures and decisions) and then elaborated on the arguments being made for and against the project. Indeed, one undergraduate coder observed that many of her assigned

articles dealt with “legality and regulatory aspects” (Coder 1 debrief). Insights from other examples of energy news coverage literature that similarly reported high volumes of government and policy frames support this interpretation. Hedding (2017) and Kim et al. (2014) each suggested that in different contexts legislative and political activity, whether engaged in debate or approval, may have explained in part the use of government administration, conflict/strategy, or policy frames. The popularity of the government/politics frame in each of the individual outlets examined here—in addition to being the most commonly used across the whole sample—is also noteworthy. However, some coder error may have resulted in designating dominant government/politics frames. For example, Coder 1 identified government/politics dominant frames in some articles, decisions that after a brief scan, the researcher may not have (Myers, 2016; Schoneberger, 2018; Swanson, 2018).

The economic and environmental frames’ prominence as the second- and third-most frequently used dominant frames is unsurprising given previous oil pipeline news coverage research that has identified a strong influence of economic factors as they relate to national well-being (Raso & Neubauer, 2016) or the presence of environment-versus-economy framing patterns (Dusyk et al., 2018; Kojola, 2017; Wood, 2019). The slightly higher proportion of economic to environmental dominant frames may suggest that the papers in this sample may have prioritized concerns about improving the region’s fiscal well-being, protecting it from the costs of potential protest activity, and assessing the state’s need for oil, as suggested by the coding instructions. However, since the sample and the difference in number was fairly small (28 dominant economic frames compared to 24 dominant environmental frames), the difference may not be significant.

The supplemental analyses of economic and environmental dominant frames indicate different contexts that may be more or less conducive to each frame's usage. News articles featured environmental dominant frames in slightly higher proportion than economic (about 9.6% compared to 8.8%). Opinion articles, by contrast, featured a higher proportion of economic dominant frames (about 21.9% of all opinion articles) than environmental (about 15.1%). Although the data collected here does not provide a definitive explanation for this finding, it could suggest that advocates for Enbridge Line 3's economic advantages had greater access to editorial, commentary, or reader's letters—or that they placed a higher priority on using those venues. It could also suggest that there are simply more pipeline advocates than opponents. A more in-depth study comparing news and opinion framing, along with the actors involved, would be interesting to pursue. Economic dominant frames appeared more frequently than environmental when Enbridge Line 3 was an article's primary focus (16.8% of primary-focus articles compared to 8.4%), and environmental dominant frames appeared more frequently when the pipeline was an article's secondary focus (23.8% of secondary-focus articles featured environmental compared to 15.9% featuring economic). Again, more research would be needed to explain this, especially given that the study was unable to determine an article's degree of focus on the Line 3 project for up to 38 articles with the existing coding instrument. (Additional comments will address this in the limitations section.)

Indigenous and environmental justice frames' infrequent use as dominant frames is also unsurprising given the broader context of oil pipeline newspaper coverage literature. Both Dusyk and colleagues (2018) and Lawlor and Gravelle (2018) appeared

to report low percentages of articles that featured Indigenous or First Nations frames (exact numbers were not reported, but the articles' figures suggested low numbers), suggesting that newspapers did not focus on defining the pipeline issue in terms of how it related to such groups. It should be noted that the use of Indigenous frames in secondary positions in the Enbridge Line 3 pipeline coverage does appear to exceed the usage reported in other studies, a point which will be elaborated upon below. The small number of environmental justice dominant frames echoes trends in Moore's (2019) study, which showed that it appeared very rarely in the *Bismarck Tribune's* regional coverage of the Standing Rock/Dakota Access Pipeline protests or in the very limited Canadian coverage studied (though it did appear more frequently in stories from the *New York Times* and the *Indian Country Media Network*).

More surprising findings involve the relatively low proportion of safety, conflict/strategy, national interest, and foreign intervention frames in dominant positions. Study design issues such as gaps in the coding instructions may account in part for their scant quantities. Distinctions made between similar frames during the codebook development process may have inadvertently weighted the potential for one frame to appear over another. For example, environmental frame indicators included references to environmental health concerns like water quality. Had references to water quality in the context of human consumption and health been categorized as safety concerns, similar to Dusyk and colleagues' (2018) work, and the environmental frame definition instead been restricted to discussions of natural land or water features and wildlife, more dominant safety frames may have appeared. Likewise, indicators for national interest frames were difficult to tease apart from economic frames (and as Kojola, 2017, indicated, could often

appear together in news coverage). The focus on language and specific content indicators in the conflict/strategy frame may account in part for its possible underrepresentation: while indicators like violent language and references to strategic actions are useful on a micro level, they fail to capture more macro-level indicators like story structure (e.g., alternating two sides of a conflict in a news story). Moore's (2019) distinction between conflict frames, which used "violent language," (to borrow a phrase from Kojola, 2017, p. 907) and professional journalism frames, which were characterized by a "balanced" story presentation, was a likely genesis for this decision. One of the study's undergraduate student coders identified the combative language requirement as a restrictive component as well, and noted that many articles featured a broader "versus-type feeling" that could have signaled a conflict/strategy frame. Furthermore, building from Cappella and Jamieson's (1997) assertion that "neutral language of agreement and disagreement" did not qualify as a strategy frame (p. 36) simple references to "opponents," "supporters," or "controversy" were judged to be not strong enough to indicate a conflict/strategy frame; if they had been incorporated into the definition, it may have appeared more frequently. Likewise, identifying what counted as "heated language" itself proved to be a subjective task (Appendix C for details).

For the national interest frame, the Enbridge Line 3 dispute's state-centric context may have magnified the coding instructions' potential to skew the results. Based on the researcher's coding notes and prior knowledge of the issue, much of the news coverage focused on Minnesota-specific permitting and review procedures. As a hypothetical example, it is possible that discussions and commentary surrounding the state Department of Commerce's assessment that there was not sufficient demand in the state for the oil the

new Line 3 would carry could have employed language highlighting Minnesota's energy needs (or lack thereof) instead of situating them in a broader national context. The coding instructions, however, omitted such frame indicators, even though they may have shared national interest undertones. One example of an opinion piece from Enbridge's John Swanson made references at various points to Minnesota's energy needs and Enbridge's "contribut[i]ons to Minnesota's economy by delivering North American energy safely and reliably" (Swanson, 2017, para. 7). The "North American energy" statement nearly rose to the level of a national interest frame, but the researcher determined it did not reference energy security or friendly nation business ties strongly enough. Both undergraduate coders similarly noted the content's focus on Minnesota and the surrounding region as a factor that made identifying national interest frames difficult, with one coder even suggesting that the frame's definition should be expanded to include those examples. It should be noted, however, that one example that discussed Minnesota's energy needs did also include the national interest frame keyword "energy security," thus warranting the frame (Roth, 2017), so Minnesota-centric energy discussions did not uniformly preclude the national interest frame.

The local Minnesota papers used in the sample, too, may explain the lack of dominant national interest frames. Kojola's (2017) analysis of Keystone XL newspaper coverage, which found national interest frames in 52% of articles, contrasts strongly with the results found here. However, Kojola examined national papers (the *New York Times*, the *Washington Post*, and the *Wall Street Journal*), whose broader audience and scope may have made a national interest frame more relevant or appealing. Kojola argued that the frame's use cast Keystone XL in a national light rather than characterizing it as a

regional matter. Indeed, the question of whether a newspaper's proximity to a pipeline project may impact its frame selection was a core concern in Lawlor and Gravelle's (2018) study. While the papers in this sample may have addressed national interest themes like energy security and the need for energy to maintain a certain way of life, they may have expressed them in Minnesota-centric terms.

The coding instructions, when interpreted too narrowly, may have explained under-coding of national interest frames in a more general sense as well. The researcher noted a reference to the United States being "too dependent on fossil fuels" (Burnes, 2017, para. 17) as a potential example, in that it suggested the national interest may be better served by not investing in pipelines, but determined that the codebook did not provide for it. A reference to an ongoing need for oil to manufacture goods was also close, but the researcher decided against it because the article did not express this idea in terms of how the goods would relate to a national way of life (Duluth News Tribune Editorial Board, 2018).

The relatively low level of dominant safety frames in the sample is somewhat surprising given its prominence in coverage of the Keystone XL pipeline (Kojola, 2017; Lawlor & Gravelle, 2018) and given Enbridge's frequent presentation of the Line 3 project as "safety and maintenance driven" (e.g. Lovrien, 2018d, para. 5) or other variations. Codebook specificities, again, may account for this: manifest indicators like "leak" and "spill" were categorized under an environmental frame, but the latent meaning behind these indicators could also have suggested safety concerns as well. Despite the safety frame's infrequent dominant status, however, it does appear as a secondary frame in fairly similar proportions as government/politics and economic frames.

While the Indigenous frame's rare appearance as dominant in articles was not surprising, its high rates (appearing in 26.8% of articles as a secondary frame and approximately 31.1% of articles as either a secondary or primary frame) in comparison to results from previous research were notable. Framing analyses of the Keystone XL and Northern Gateway pipelines appear to indicate (though figures are somewhat unclear) that Indigenous frames appeared in 25% of articles at the most at a given point in time (Lawlor & Gravelle, 2018), with lower rates being more common (Dusyk et al., 2017; Lawlor & Gravelle, 2018; Wood, 2019). The role that Minnesota tribal groups have played throughout the Enbridge Line 3 planning and review process may explain the higher percentage of Indigenous frames in this coverage. For example, an administrative law judge's approval of the replacement line on the condition that it would use the "existing trench" afforded the tribes decision-making power over the line, through whose land Line 3 now passes (Lovrien & Johnson, 2018a, para. 2). Indigenous interests, then, took a central role in this particular governmental action, and could account in part for the frame's presence in the sample. Likewise, individual negotiations or interactions between Enbridge and tribal groups—for example, approving new pipeline construction on the Fond du Lac Band of Lake Superior Chippewa's reservation (Lovrien, 2018c) or dictating old pipeline removal on the Leech Lake Band of Ojibwe's land (Bowen, 2018b)—may also have been deemed newsworthy events that would have introduced Indigenous frames into coverage.

Distribution of frames in secondary positions

The environmental frame's status as the most frequently used secondary frame stands out as confirmation of trends in other pipeline news research and may also speak

to the specific conditions in which the Enbridge Line 3 debate has occurred. From the secondary frame perspective, the greater presence of environmental over economic frames resembles results from Dusyk and colleagues (2018) and Wood (2019). The project's genesis could account for some of these environmental frames. Although Enbridge has often described it as a "safety and maintenance driven project," (e.g. Lovrien, 2018d, para. 5) descriptions of the old pipeline's risk for leaks and spills (e.g. Orenstein, 2018a) may also have spurred discussions of the environmental implications of foregoing replacement. (That these served as environmental frame indicators in this study's codebook and their potential overlap with a safety frame has been noted, but the observation remains relevant here.) The Line 3 project also comprised two related issues with environmental implications: whether and how to construct a new pipeline, and how to safely decommission the old line. Environmental and Indigenous opposition to a new line were mentioned in multiple articles (e.g. Johnson, 2017b; Pastoor, 2017b; Schneeweis, 2018). Water supply safety (e.g. Slater, 2017) and assigning responsibility for pipeline removal (e.g. Johnson, 2017a) were other examples of decommissioning debates. An informal, cursory analysis of the pipeline frame combinations demonstrated that environmental frames appeared in articles with all of the other frame choices at least once. Articles frequently featured an environmental and government/politics frame co-occurrence as well, whether they appeared with other frames or were the only two present. The importance of environmental impact statements and reviews in the permitting process may explain this frame combination, as discussions of the government action and its object (the environmental concern) were considered indicators of each separate frame. The wide distribution of environmental frames suggests, however, that

impacts on the natural world and on human health permeated a variety of Enbridge Line 3 news coverage.

Absence of frames

The absence of dominant frames in 38–39 articles also warrants further discussion. (Recall that due to coder error, the individual pipeline frame variables indicated 39 articles did not have a dominant frame, but the dominant frame summary variable indicated 38 did not. See pages 101–102 in Results section for details.) The study’s inability to add new frames throughout the codebook development and coder training processes likely accounts for some of the articles for which dominant frames could not be identified. During the study coding, the researcher identified potential frames that may have been relevant, including a responsibility frame (found in articles discussing the debated necessity of removing the old Line 3 after its decommission) and a landowners’ rights frame (which may overlap with the potential responsibility frame) (Johnson, 2017a); or an engagement frame (referring to either community residents’ participation in the public hearing process, or Enbridge’s efforts to encourage this participation) (Swanson, 2017). Coding instruction deficiencies may also explain the lack of dominant frames. While the instructions provided detailed procedures for how to identify dominant frames in articles where Enbridge Line 3 was the primary focus, their directions for identifying dominant frames in secondary-focus articles were unclear. Coders’ varying interpretations may have prompted some coders (likely the hired coders) to choose dominant frames for these articles and other coders (the researcher) to determine that no one frame took precedence over another.

Dominant frame attitudes in local newspaper coverage of Enbridge Line 3

Articles in local newspapers used dominant frames that expressed a neutral or balanced attitude toward the Enbridge Line 3 project most frequently, followed by pro-pipeline dominant frames. News articles' greater share in comparison to opinion articles in the sample may explain why neutral or balanced attitude frames appeared in the highest quantity. Although this study's data cannot provide causal explanations for why pro-pipeline dominant frames were used more frequently than anti-pipeline counterparts, frame-by-frame analyses—in combination with insights about frame distribution and frame actors—may furnish preliminary insights for future research. Note as well that the very low reliability coefficient for the attitude variable indicates that all of these insights are tentative at best.

Pro, anti, and neutral attitudes' fairly even distribution across dominant environmental frames in this pipeline coverage suggests that the communications context surrounding Enbridge Line 3 may differ from those surrounding other oil pipelines. Instead of presenting a case where “environmental risks” outnumber “environmental benefits” frames (Dusyk et al., 2018, p. 16) or where environmental arguments are broadly equated with anti-pipeline perspectives (Kojola, 2017), the local newspaper coverage of Enbridge Line 3 suggests a scenario where a key frame for understanding the issue may serve multiple perspectives (Chong & Druckman, 2011; Entman, 1993). This study's environmental frame distribution may instead align with Wood's (2019) finding that quotes from oil companies presented environmental frames in Keystone XL coverage, typically dismissing the threat of “ecological damage from pipeline spills” (p. 303). While this study does not tabulate all pro, anti, and neutral pipeline statements and attribute them to stakeholders, an interpretation of the data collected suggests that the

environmental frame was a compelling way to define the pipeline for supporters and opponents alike. A more focused analysis could further assess whether pro-pipeline environmental frames advocated for a new Line 3 to protect natural resources (e.g. Orr, 2018) or deflected specific accusations of environmental risk, as other studies found (Dusyk et al., 2018; Wood, 2019). It is interesting to note that one of the undergraduate coders perceived a general trend associating environmentally-framed articles with anti-pipeline sentiments (Coder 1 debrief), although a review of her coding revealed that she identified all three attitude positions in relation to dominant environmental frames. Whether the coder's perceptions reflected an internalization of the environment-versus-economy pattern that other researchers have identified as "taken-for-granted" in Kojola's (2017) labor-versus-environment context (p. 910) or whether the negative attitude was perceived in articles with secondary environmental frames (and thus were not reflected in the dominant frame-dependent attitude variable) would require further study as well.

The concentration of neutral/balanced and anti-pipeline attitudes in conflict/strategy frames suggests a potential variation in pipeline supporters' and opponents' communication approaches. As with the interpretations of conflict/strategy frames' frequency in coverage, this discussion must be considered with the caveat that the definitions and coding instructions for this frame may have shaped the findings. And similar to the interpretation of the environmental pro, anti, and neutral frame arguments, the data collected here do not account for relationships between all framing statements and stakeholders. With that said, the close proportions of neutral/balanced (46.7%) and anti-pipeline (40%) attitudes in comparison to pro-pipeline (13%) went against the researcher's expectations. The researcher had anticipated that the conflict/strategy

frame's typical presentation of multiple contending sides would by definition tend to express a balanced attitude toward the pipeline, even if the perspectives themselves were not neutral. The coding instructions' bias for identifying conflict/strategy frames based on heated language could explain the actual results. If pipeline opponents tended to use heated language more frequently than pipeline supporters, their attitudes may have been reflected in the conflict/strategy frame more frequently as well. Confirming these interpretations would require further study. If confirmed, it could suggest that Line 3's supporters opt for less inflammatory communication techniques (itself an interesting contrast to Kojola's (2017) finding that elite representatives of Keystone XL's union support base used "violent language and war symbolism" (p. 907)). Such findings could also comport with Zukas's (2017) expectations that conflict framing could play a key role in Wisconsin environmental organizations' wind power communications strategies. Wood's (2019) argument that Keystone XL supporters and opponents tended to express their own perspectives instead of actively addressing each other's critiques in a public forum seem to resonate with this hypothesis: Line 3 supporters may emphasize the pipeline's benefits and stay "on message" (Wood, 2019, p. 306) without responding directly to opposition or matching its tone. However, this must also be considered with the observation that actors were distributed fairly evenly across the articles that featured dominant conflict/strategy frames; indeed, the highest number of conflict/strategy frames were identified along with government officials (three), followed by business community representatives and combined Indigenous and environmental groups (two each). It is possible, then, that opponents may not have been the parties contributing the heated language. A more detailed analysis of which actors made which statements as other

researchers like Wood (2019) and Hedding (2017) have done, and larger sample size, would be required to make any stronger arguments.

The presence of pro- and anti- attitudes in government politics frames was also somewhat surprising, given the researcher's assumptions that much like the conflict/strategy frames, discussion of the government processes would be handled by news reporters in a neutral or balanced manner. One possible explanation for the pro- and anti- government/politics frame attitudes could be that coders were identifying those perspectives in reporting on government agencies' or actors' specific decisions—for instance, the Department of Commerce issuing a decision against moving forward with Enbridge's plans (Grand Rapids Herald-Review, 2017b). The researcher noted during coding the difficulty in deciding whether reports of these decisions should indicate a specific attitude if other indicators of government/politics frames expressed continued uncertainty about the project's approval. For instance, an article where the Minnesota Pollution Control Agency issued a statement about their preference for a given route adjustment but the Public Utilities Commission had not yet voted was coded as neutral (Lovrien, 2018a), but an article that detailed Republican legislators' favor for the Public Utilities Commission's approval yet also referred to potential appeals from the governor, was coded as pro-pipeline (Ferguson, 2019). In one case, a coder also indicated that a statement from Democratic legislators expressing interest in assessing the project in light of its job creating potential was a pro-pipeline government frame (Grand Rapids Herald-Review, 2017a).

Although safety and Indigenous frames were used as dominant frames in small numbers, the attitudes they expressed carry interesting implications. The dominant safety

frame's strong pro-pipeline orientation suggests that pipeline supporters were most aligned this perspective. This would align with analyses of the Keystone XL pipeline that note the association between pipeline-friendly interests and safety assertions (Kojola, 2017; Wood, 2019). It provides an interesting contrast to Moore's (2019) analysis of the *Bismarck Tribune's* Dakota Access pipeline coverage, which attributes the infrequent presence of a "pipelines are safe" frame to the paper's editorial department (pp. 95; 101–102). Moore ultimately interprets these statements as being used to "sympathetically" undercut the Standing Rock tribe's opposition to the pipeline, but her observation that they also indicate the paper's "trust" in the oil industry is relevant here in that it supports the connection between pipeline supporters and the frame (pp. 101–102). Indigenous dominant frames' close mix between anti- and neutral/balanced attitudes was not completely unexpected, given that Dusyk and colleagues' (2018) reported a fairly even number of statements framed with Indigenous risks and benefits (although the percentage of articles that include each of those is somewhat unclear). Moore's (2019) analysis did suggest that media outlets in her sample, particularly the *Indian Country Media Network*, expressed Indigenous perspectives, the Standing Rock tribe's voice, and opposition to the Dakota Access Pipeline at various points throughout the conflict. However, environmental justice and "empathy" (Moore, 2019, p. 108) frames carried this meaning as opposed to a discrete Indigenous frame.

The analysis also revealed several unsurprising results. The dominant economic and national interest frames' overwhelming pro-pipeline attitude alignment was to be expected, as was the single dominant environmental justice frame's anti-pipeline attitude. Results from an analysis comparing dominant frame attitude positions to newspapers

showed that outlets featured either neutral/balanced or pro-pipeline dominant attitudes in the greatest proportion, fitting roughly with the overall distribution of attitudes throughout the sample. The observation that two papers—the *Bemidji Pioneer* and the *Walker Pilot-Independent*—had more anti-pipeline dominant frames than pro-pipeline dominant frames is interesting, but the small difference between the two attitude types' appearance makes it difficult to determine if they are significant.

Actors used in support of dominant frames

Two significant caveats that limit this study's ability to answer research question 1c ("What types of actors will have the greatest degree of visible power to define issues?") must be discussed before examining the results. First, as with the dominant frame attitude position, the reliability coefficient for the actor identification variable was very low (Krippendorff's $\alpha = 0.32$). Second, the researcher determined during coding that instructions for how to identify and code actors were insufficiently detailed to accurately capture which actors were promoting a given frame (as opposed to being mentioned in association with it by another actor). In the example of letters to the editor, for instance, the instructions directed coders to identify the letter writer as the main actor with the assumption that the writer holds issue-defining power in that circumstance. However, the same logic was not applied to opinion or commentary articles; coders were not instructed to identify those articles' authors as actors. For example, an environmental critique of Enbridge's project from an article by Winona LaDuke was coded with "oil industry representative" as the actor instead of "combined environmental/Indigenous interest group (LaDuke, 2015b). Similarly, the actor for an opinion piece with a byline from Enbridge's John Swanson (2017) was coded as "no actors/unable to determine".

Additionally, some letter writers were not identified in the newspapers beyond their names (e.g. Grotting, 2018; Neises, 2017) making it impossible to categorize them as one of the specified actor types. In regular news items, the instructions are still somewhat unclear: they state that the actor should be identified as the first one, usually in the headline or lead, but not always. Furthermore, identifying the first-named actor in association with a dominant frame per the coding instructions could not guarantee that the actor was supporting that frame. Similar to the LaDuke example above, consider as a hypothetical example a quote criticizing Enbridge's proposed replacement route on environmental grounds. If the quote was presented before identifying its source, Enbridge would be the first-named actor in relation with an anti-pipeline environmental frame—a contradictory combination. The actor who supplied the quote—who would arguably hold more power than Enbridge in this example by virtue of their active inclusion in the news coverage—would be overlooked. Adding a detailed catalogue of specific named actors and groups would have improved this variable's reliability and validity. Nonetheless, the study's analyses reveal several interesting tentative findings that could spark additional research.

Government actors and oil industry representatives' ranking as the two most frequently identified groups reflects the longstanding observation that news sources privilege official and authoritative sources (Tuchman, 1978). Both undergraduate coders recalled government agencies as frequently-cited actors overall and one noted oil industry figures. The identification of government and energy industry actors as top-named players is prevalent in more recent energy news research as well (Djerf-Pierre et al., 2016; Hedding, 2017; Zukas, 2017). This study's results diverge slightly from Wood's

(2019) finding that environmental groups appeared as quoted sources in similar proportions to oil companies and “trade associations” in Canadian and U.S. coverage of the Keystone XL pipeline (p. 300). Differences in this study’s actor measure as compared to Wood’s source measure may account for this: Wood counted the “first five quoted sources” (p. 298) in every article whereas the present study only counted the first named actor. This study’s findings are noteworthy not because of their novelty, but because of their conventionality.

The dominant frames with which oil industry representatives appear in this sample tentatively point to Enbridge’s primary concerns with the Line 3 replacement project. Oil industry actors’ most frequent association with government/politics dominant frames in comparison to all possible frames makes sense given Enbridge’s active engagement with the permitting process. The equal number of associations with environmental and economic dominant frames, followed closely by safety frames, could suggest that Enbridge sought to define the Line 3 project in those terms. (In other words, out of all of the times oil industry representatives were named as the actor in support of a dominant frame, they appeared in the government/politics frame most frequently, followed by environmental, economic, and safety.) A more detailed qualitative analysis would be required to confirm these conjectures.

The infrequent appearance of environmental groups—whether environment-specific or combined environmental and Indigenous interest—is especially interesting in light of the finding that environmental frames were the third most commonly used dominant frame. Again, the study’s coding mechanism presents a major caveat for these findings. Since only the first-appearing actor was coded for each article, the relative lack

of these groups' appearances in the data should not be interpreted as an indicator that they were completely omitted from coverage. They also may have been edged out by government actors in coverage; given that references to environmental impact statements that were a part of the permitting process served as environmental frame indicators, it stands to reason that government actors may have been more likely to be mentioned along with them.

The presence of combined environmental and Indigenous groups in association with dominant frames (about 2.9% of the total sample) may also help explain the infrequent appearance of solely-environmental interest groups (less than 1%). Environmental/Indigenous groups appeared in tandem with a dominant environmental frame twice, whereas environmental-only groups did not at all. The combined environmental/Indigenous actor category also, notably, did not appear with dominant Indigenous frames in the sample. The caveat that only a very small number of cases are represented here must be considered along with the ones introduced at the beginning of this section. However, the observation does raise some interesting questions for further study. Could this indicate that the group represented in the combined environmental/Indigenous interest group (Honor the Earth) took a leadership role in presenting environmental arguments against Enbridge Line 3? Or were their strategic communication efforts simply more successful than other groups', such as Friends of the Headwaters or MN350? (As an aside, note that the researcher had completed a communications internship with MN350 in the summer of 2018, although the internship was not related to the organization's pipeline opposition activities.) Observations from both coders that Honor the Earth and Winona LaDuke stood out as frequently cited

sources (whether in connection to dominant frames or not) further suggests that the organization may have been more salient than others. It is important to note that the decision to create a combined environmental/Indigenous actor category was motivated by the researcher's inability to categorize Honor the Earth as one or the other; to do so seemed to not fully represent the organization's mission based on the way it presents itself on its website (Honor the Earth, n.d.). Stakeholder activity surrounding the Line 3 debate could be investigated with a more in-depth case study, in which either a more detailed content analysis or qualitative textual analysis could be combined with interest group member interviews or ethnographic methods. Such an approach would help clarify how the different interest groups define themselves in relation to their missions, the project, and perhaps each other.

Although there are very few cases to examine, the correspondence between Indigenous representatives and business community representatives and dominant frames seems to fit common-sense expectations. Indigenous representatives were most commonly found in relation to Indigenous dominant frames (eight articles), followed by environmental dominant frames (three articles). Business community representatives predictably were found with economic dominant frames in the greatest quantity (five articles), but were distributed across more dominant frames (i.e. environmental, government/politics, conflict/strategy, and safety) than the Indigenous representative actors.

Coding mechanism flaws again may account for landowners' noteworthy absence as an actor associated with dominant frames. These actors could possibly have factored into the category of letter writers or opinion/commentary authors whose affiliations could

not be assessed according to the coding instructions. Similarly, since a landowner or responsibility frames (likely ones where landowners would be the primary actors) were not included in the menu of pipeline frames, it is possible that landowners do appear in relation to dominant frames, but they were not counted.

Presence of climate change

Some limitations in the coding instructions' directives for identifying climate change should be noted to place these results into context. First, the coding instructions failed to provide clear guidelines for how to assess articles in which Enbridge Line 3 was a secondary—and not the primary—topic. The researcher had provided clear procedures for how to evaluate the presence of climate change frames in these cases, but not climate change itself. When coding, the researcher attempted to follow the instructions as literally as possible, given Riffe and colleagues' perspective that the definitions of variables' categories should “control assignment of content” (2014, p. 94); since no distinction was discerned between primary-focus and secondary-focus articles at the time, the researcher counted mentions of climate change in approximately four articles where Line 3 was a secondary topic that may not have been made in connection to the pipeline. It is not clear how the undergraduate coders interpreted these instructions. Second, some references to climate change may not have been counted because they were not included as specific indicators; this shortcoming has appeared in other research as well (Stephens et al., 2009). For example, a reference to “climate marches” was determined to not fall within the instructions' parameters (Grotting, 2018, para. 3). One undergraduate coder similarly noted a tendency for articles to “insinuate” climate change as an environmental facet of the project instead of discussing it directly (Coder 1 debrief). At the same time, some of

the codebook's indicators (e.g. emissions, carbon, methane), though they may have been counted accurately per the instructions, may not be strong indicators for all readers in a natural media consumption setting. Thus, the actual percentage of articles that included climate change may be somewhat higher or lower than what is presented here.

Climate change's infrequent appearance in coverage of the Enbridge Line 3 project was unsurprising when considered in the context of previous research on energy industry news. At 16.7%, its inclusion here fell within the 4.5%–28% range that other oil pipeline literature reported (Dusyk et al., 2018; Kojola, 2017) and the 12%–23% range in literature on oil sands (Firtova, 2017), hydraulic fracturing (Olive & Delshad, 2017), and wind power (Stephens et al., 2009). Though climate change appears here more frequently than in coverage of the Northern Gateway pipeline (the scant 4.5%), its presence is still low. As Dusyk and colleagues (2018) concluded in their assessment of that pipeline, local newspaper coverage in this study has not depicted the Enbridge Line 3 debate as an embodiment of the climate change challenge.

Although the data collected in this study can identify (with the caveats described above) the degree to which climate change appeared in Line 3 coverage, the study's design did not establish mechanisms to explain the quantities. Some of the study's data, however, and previous research can provide clues for possible explanations for the low rate of climate change inclusion.

The data collected here can imply which factors are not responsible for the lack of climate change mentions in coverage. It was not omitted for lack of environmental considerations; as noted previously, environmental frames were the third most common dominant frame, and second most common frame overall. Nor was it an outsized

concentration of opinion or news articles in the sample; analyses showed that climate change appeared in nearly equal proportions in both article types.

The size of the newspapers included in this sample may provide some insights. Climate change appeared in a higher percentage of articles from the *Duluth News Tribune* (about 23%) than all the other papers (ranging from 8–13%). The fact that the *Duluth News Tribune* formed the largest share of the total sample may explain why it featured the most climate change mentions. However, at 68.86%, the proportion of the *Duluth News Tribune*'s 24 climate change mentions in relation to the 35 found was larger than the proportion of its articles in relation to the whole sample (approximately 49.8%). One interpretation, then, is that the *Duluth News Tribune*'s higher circulation numbers compared to other papers in the sample may indicate that it has more resources at its disposal to discuss issues in greater depth; resources have been identified as important factors that shape journalistic practices in climate change news research (Gibson et al., 2016) and cited as factors affecting coverage in the foundations of many studies (e.g. Raso & Neubauer, 2016; Wood, 2019). A broader study with larger samples from smaller-circulation papers and the addition of larger-circulation papers could test this interpretation.

The undergraduate coder's observation that articles occasionally hinted at climate change without explicit discussion raises additional possible complementary explanations. As already mentioned, the coding instructions' limitations may have resulted in under-counting climate change references. This points to additional interesting questions: would reporters and other professional communicators intentionally avoid using the term climate change? During one coder training session, for instance, an oil

industry actor's use of "hydrocarbon fuel" prompted the question of whether or not it should be counted (Christoff, 2018, para. 4). Other articles referencing "fossil fuels" prompted the same question. Might these phrases carry enough latent meaning to signify climate change to readers without mentioning it? Or might they be used to strategically omit climate change from discussion? Oil industry actors may deliberately avoid the topic of climate change in pipeline coverage (Wood, 2019). Though a discussion of the oil industry's corporate social responsibility positions on climate change was not included in this study's initial rationale, Jaworska (2018) argued that these companies' CSR statements softened climate change's imminence and human origins through their adoption of the very term (i.e. "climate change") over global warming. More detailed research would be needed to assess these possibilities.

Previous research on energy topic news coverage offers a number of potential explanations as well, the confirmation of which in this context would require additional research. Climate change may be omitted as a topic in these contexts because it is seen as too complicated, or because journalists or anti-pipeline advocates have determined that other environmental concerns could resonate more effectively with audiences and locals (Dusyk et al., 2018; Olive & Delshad, 2017). Drawing from Good (2008), Dusyk and colleagues (2018) also suggested that papers may leave climate change out of coverage to avoid casting an important part of the Canadian industrial sector in a negative light, an insight that resonates with Moore's (2019) core premise that the oil industry's economic interests and power prevents critiques from mainstream news sources. This dynamic may be at play in the coverage here if the newspapers consider Enbridge or the oil industry in general to be beneficial to their communities' economic or overall well-being. Articles

about pipeline advocacy groups like Jobs for Minnesotans (e.g. DeBoer, 2017) or Minnesota legislators from the region (Layman, 2019) do assert Line 3's potential economic benefits, and the *Duluth News Tribune's* endorsement of a DFL legislative candidate who appeared to support Line 3 suggests at least a lack of opposition (Duluth News Tribune Editorial Board, 2018). A paper's ideological bias may also have a role (Dusyk et al., 2018), although that facet was not examined here. Stephens and colleagues (2009) proposed that climate change's growing status as a public issue aligned with the modest increases in climate change references in wind energy news coverage from Massachusetts, Minnesota, and Texas dating from 1990–2007. It is unclear whether this explanation would also hold for present study; its later time frame would suggest that climate change should appear more frequently here if growing awareness was a factor. That said, it could also be the case that renewable energy news coverage and fossil fuel-based energy news coverage may discuss climate change in different quantities as well; a formal comparison of these two types of energy news could produce worthwhile insights. Finally, Dusyk and colleagues (2018) conjectured that a lack of climate change discussions in Northern Gateway pipeline news coverage may have stemmed from the omission of “upstream greenhouse gas emissions from oil sands production” in the pipeline's review process (p. 19). An analysis of the Line 3 environmental impact statements and other regulatory documents would be necessary to confirm whether the same applies to this case, but it is interesting to note that the Line 3 review process did include input from the Youth Climate Intervenors (e.g. Dunbar, 2017). Whether or not this input accounted for the higher volume of climate change mentions in the Line 3

coverage in comparison with the Northern Gateway coverage cannot be determined with any certainty here, but it does provide an interesting counterpoint.

This study's findings and previous scholars' interpretations for the lack of climate change in energy news suggests limits to this study's premise that journalists working for papers with reduced resources may integrate climate change discussions into related news topics. While the premise's academic source indicated that journalists who formerly covered climate change or other science- and environment-related topics may still find ways to cover them in new beats (Gibson et al., 2016), this study failed to consider that reporters covering Enbridge Line 3 may not be in similar situations. Nonetheless, this limitation points to routes of more focused inquiry: future research could compare the incidence of articles devoted to climate change and those where climate change is incorporated as a tangential issue in local papers—perhaps across time periods—to identify whether a difference in volume appears. Similarly, future projects could compare the inclusion of climate change in related news topics across outlet size and type—for example, comparing a large regional paper like the *Star Tribune* to the *Duluth News Tribune* (a comparatively mid-sized paper), the *Bemidji Pioneer* (a comparatively smaller local paper), and perhaps even a digital alternative such as *MinnPost*. Interviews with journalists from outlets like these could directly address other researchers' proposals that they may deliberately avoid climate change in related coverage to avoid its communicative pitfalls (Dusyk et al., 2018; Olive & Delshad, 2017). Such research could provide useful nuance to Gibson and colleagues' interview work.

Dominant pipeline frames and climate change presence

Although the chi-squared test of association could not be performed to assess whether a relationship existed between dominant pipeline frames and climate change presence, the frequency analysis between the two variables presented a handful of points to consider. Government/politics-framed articles served as the most frequent host for climate change mentions (16), followed by articles with environment-dominant frames and articles with no identified dominant frames (six each). It is unclear from the data and the possible analyses whether the high volume of government/politics-dominant frame articles explains their high concentration of climate change mentions or whether climate change's appearance in these articles is greater than one would expect if there were no underlying patterns. That climate change is used more frequently in environmental-dominant framed articles than economic is interesting, given that economic dominant frames did appear slightly more frequently in the sample. This observation would provide some support for the possibility that a relationship may exist between climate change mentions and dominant frame, but the data is insufficient to test and make a formal claim. Note that Hart and Feldman (2014) similarly looked for relationships between different aspects of climate change's incidence in coverage (i.e. mentions of threat; actions to address it; efficacy discussions) and certain frames (i.e. environmental and conflict/strategy). Weathers & Kendall (2016) likewise investigated the incidence of public health aspects of climate change as they appeared in articles with various generic frames.

The rationale for posing Research Question 3—to better understand how climate change was being introduced in coverage and to see if it suggested use as a complement or counterpoint to an article's main frame—provides some context for formulating

tentative interpretations. This discussion suggested earlier that the high volume of government/politics dominant frames could be a result of a tendency for papers to present Enbridge Line 3 first in terms of its connection to the regulatory process, and then present different—often competing—facets of the issue. This could also explain the presence of climate change in government/politics-dominant articles: environmental frames with a climate change dimension may have been introduced to explain the pipeline's controversy.

The finding that 25% of environmental frame-dominant articles included climate change, but only 18.8% of government/politics-dominant articles did is worth mentioning. A possible explanation is that articles that focused on the environmental aspects of Enbridge Line 3 were more likely to explore a range of environmental impacts.

The concentration of climate change in articles where none of the study's frames were identified as dominant is also interesting. This may be partially due to coding instruction weaknesses that made it difficult to identify dominant frames when Line 3 was not an article's primary focus. Further studies with a wider range of dominant frame options could provide further explanation for these articles.

Limited use of climate change frames overall

Research question four asked whether climate change appearing in the Enbridge Line 3 local news coverage would be framed in ways that could potentially polarize or disengage audiences from the issue. Results showed that neither potentially damaging nor potentially helpful climate change frames appeared in large numbers. Thus, the answer to research question 4 is a qualified no. It is important to bear in mind the low intercoder reliability coefficients for the Pandora's Box frame, the inability to test reliability for the

other climate change frames, and the overall low number of climate change frames when interpreting these results. Since climate change frames appeared so infrequently, both during the coder training process and in the actual study coding, it is possible that coders may have either overlooked or misidentified frames due to lack of exposure and sufficiently detailed coding instructions. Wood's (2019) study reported difficulty in establishing reliability for infrequently-appearing variables, suggesting the challenges that can arise in properly coding these items.

Despite this caveat, the scarcity of potentially polarizing or disengaging climate change frames—particularly frames that would cast doubt on the existence of climate change or question the utility in combatting it—is cautiously encouraging. Readers encountering climate change in this news context may still respond negatively to some mentions depending on the source of the climate change mention; associations with figures that readers may not consider authoritative or trustworthy or in line with their existing beliefs could still affect how they process the messages (e.g. Chong & Druckman, 2007; Merkley & Stecula, 2018; Nisbet, 2009, 2010b). Nonetheless, it is interesting that coders identified a slightly larger number of potentially positive climate change frames than negative. Indeed, some of the positive climate change frames were even offered by pipeline advocates. One coder identified a public health frame in a pro-Line 3 Enbridge employee-penned article that acknowledged in the same breath the health benefits of lowered “air pollution” and the concurrent need to lower emissions and combat climate change (McLeod, 2019, para. 1). While the example cited here does not strictly conform to the definitions provided in the coding instructions, it still underscores the interesting notion that pipeline advocates may acknowledge the need to lower

emissions and the wider benefits of doing so. Expanding the range of political and ideological perspectives that advocate for the climate has been cited as a potential means by which to de-polarize public opinion in the U.S. (Bolsen & Shapiro, 2018); if a corporation in the oil industry speaks about the importance of climate, could that help depolarize as well? Or could it be a strategic way for the corporation to ensure its relevance in a gradually decarbonizing energy landscape (Schlichting, 2013)?

That so few climate change frames appeared in coverage poses an obvious question: why? This study can only offer tentative explanations without conducting more in-depth analyses, but a handful of ideas come to mind. The overall lack of climate change in the coverage suggests the first. If climate change is so rarely considered as a facet of the Enbridge Line 3 issue in news, it is not surprising that articles would not elaborate on the issue in the rare circumstances in which it was. Dusyk and colleagues (2018) observed that climate change tended to appear primarily in brief lists of environmental risks in Northern Gateway news coverage. Although this study was unable to execute a formal qualitative analysis of all climate change mentions in the sample, the researcher did perform a cursory review to gauge whether they could match Dusyk and colleagues' findings. Climate change was mentioned frequently within the context of pipeline critiques. The language "opponents argue the line contributes to climate change, violates indigenous rights and is ultimately unnecessary" appeared in six articles (Lovrien, 2018b, para. 9; Lovrien, 2018c, para. 14; Lovrien, 2018d, para. 16; Lovrien, 2018e, para.16; Lovrien & Ferguson, 2018, para. 27; Schneeweis, 2018, para. 11), some of which may have appeared in newswire reprints across multiple outlets. Other articles presented variations on this theme with more detail or colorful language (e.g. Lovrien &

Johnson, 2018b; Myers & Johnson, 2017a), making it difficult to say without further analysis whether the articles were attempting to express more complex ideas about climate change that simply did not conform to the climate change frames provided. Both undergraduate coders expressed surprise at the lack of these frames (Coder 1 and 2 debriefs). Coder 2's general impression was that articles' climate change discussions rarely moved past "basic mentions."

Deficiencies in the coding instructions could also explain the lack of climate change frames. The possibility of coders misidentifying or overlooking climate change frames has already been mentioned. Additionally, the directive to only consider paragraphs about Enbridge Line 3 where climate change was mentioned could have caused coders to miss climate change frames if the paragraph's topic was unclear. (This will be addressed further in the limitations section.) Restricting the coding of climate change frames to mentions of climate change may also have had this effect; if references to climate change were more latent in nature or did not conform to the specified climate change indicators, the presence of climate change frames in those instances may have been missed. For example, one article from the *Duluth News Tribune* included the quotes "Our dependence on fossil fuels is destroying the Earth as a livable planet" and "Let's create jobs by building renewable energy' not by importing more fossil fuel" (Myers, 2015, para. 8), which could each suggest a Pandora's Box frame and a Positive Economic Development frame, respectively. The coder did not identify them as such, though, and the coding instructions' explicit directions that references to fossil fuels on their own do not constitute climate change references may explain why.

Finally, to invoke Occam's razor, the simplest explanation might also be the most likely one. If most of the articles were about the pipeline issue itself, it may be reasonable to conclude that the authors preferred to focus their attention on its more immediate concerns instead of expanding the discussion to provide context about climate change.

Limitations

While the researcher endeavored to design and execute this study in the most rigorous way possible, a number of limitations are present. Budgetary and time constraints produced many of the limitations. Errors made during the learning process produced others.

Codebook limitations

A variety of coding instruction mechanics and variable definition issues presented themselves when the researcher coded her portion of the study sample. One overarching coding instruction mechanics issue related to the fact that the sample included both articles that focused primarily on Enbridge Line 3 and articles that discussed it as a secondary topic. The initial decision to include secondary-topic Line 3 articles was motivated by the concern that newspaper coverage of the topic would be limited and a resulting desire to cast a wide net and capture as much discussion as possible. The coding instructions were originally designed to be applied to articles in which Line 3 was the main focus; while they were modified throughout the codebook development and coder training process, the modifications failed to account for all situations that coders would encounter during the actual study coding. The approaches outlined in the following paragraphs reflect how the researcher approached the difficult coding decisions. The

other coders may have taken interpreted the instructions and determined the best course of action differently.

First, it was often difficult to determine based on the instructions whether an article should be coded as relevant or not. The coding instructions directed coders to include any article that devoted at least one full sentence to Enbridge Line 3. Although this parameter was clear in theory, in practice it was not. For example, two articles that the researcher encountered about protests made brief references to Line 3. One was a news brief that mentioned a march that disrupted “work at a construction site for the recently permitted Enbridge Line 3 pipeline replacement” (Doeden, 2018, para. 1). At the time, the researcher determined that it wasn’t sufficiently clear that the sentence was about Line 3; in retrospect, it is more clear that it was and should have been coded as relevant. (It is worth mentioning that this was a triple-coded intercoder reliability article that both of the undergraduate coders had identified as relevant.) Another article discussed a broader Indigenous peoples-led protest movement and mentioned the Line 3 protests briefly in the context of the Dakota Access pipeline demonstrations (Bowen, 2019). There, too, it was unclear whether the article should be considered relevant: the paragraph in which the Line 3 reference appeared was about pipeline protests (a criterion for inclusion), but seemed to be presented as a passing reference in a paragraph that addressed the Dakota Access pipeline more directly, and so was coded as irrelevant.

Difficulties in how to code articles where Enbridge Line 3 was not the primary focus surfaced in a number of cases—especially in articles that discussed other pipelines, whether specific ones or in general. These difficulties included determining how much of

the article to code for frames, how to distinguish between dominant and secondary frames, and how to code for the presence of climate change.

The first main issue—determining how much of the article to code for frames when Line 3 was not the main focus—was first encountered during coder training. Articles such as legislative decision roundups and collections of reader letters were easier to navigate: coders were verbally instructed to focus on the delineated sections that specifically discussed Line 3. When the researcher encountered legislative summaries and reader letters during study coding, she followed the procedures she had outlined during coder training.

Unfortunately, only directions for identifying climate change frames and choosing dominant pipeline frames in these circumstances were incorporated into the final coding instructions. The researcher attempted to maintain a consistent approach when coding other secondary-focus Line 3 articles by only coding paragraphs that specifically discussed that pipeline. This approach carried benefits: it aligned with the directions that articles should be read paragraph-by-paragraph to identify pipeline frames; it maintained consistency with the climate change frame identification directions; it helped to narrow the analytic focus on Line 3. There were disadvantages as well. It was possible for the analysis to miss frames that could have been intended to apply to Line 3. Articles that addressed the Sandpiper pipeline, which was frequently discussed with Line 3 in the sample's early articles, present a prime example. If paragraphs did not mention Line 3 by name, it was difficult to tell if the arguments being presented were intended to apply equally to both pipelines or only one (e.g. LaDuke, 2015a). Other researchers (Wood, 2019) have encountered this difficulty before, but took the opposite approach and

considered portions about pipelines even when the specific project could not be determined. Additionally, the code instructions and sheet did not provide a mechanism for recording how many paragraphs, the unit of observation, were analyzed for frames (Babbie, 2001, p. 311). Despite the disadvantages, the researcher decided that prioritizing consistency in the paragraph-by-paragraph division was more appropriate for the study's research goals.

The second issue—how to identify dominant versus secondary frames when Line 3 was not the article's main focus—also initially arose during coder training. Initial instructions had been to identify the first frame appearing in these articles as dominant. After discussing examples in which a paragraph on Line 3 contained two frames, the researcher determined that coders should follow a protocol similar to the one established for selecting a dominant frame when a main-focus Line 3 article featured multiple frames in the headline and lead: coders should consider which frame applied best to the section and choose that one as dominant. However, the researcher encountered examples during coding in which articles contained multiple seemingly equally-represented frames in a single paragraph about Line 3 and no other Line 3-specific paragraphs to provide context (Bibeau, 2014), or articles with multiple paragraphs about Line 3 but no clear frames present in the first one (or only vague suggestions that did not conform to the coding instructions, though they were indicated in subsequent paragraphs) (Duluth News Tribune, 2018a, 2018b). Since the researcher acknowledged the possibility that other frames beyond the ones specified in the study might exist, and she did not want to over-identify frames when indicators were unclear, she determined that it was important to not “force” any of the study frames into a dominant spot. Indeed, in an example where three

paragraphs about Line 3 appeared and the study's frames were only found in the third, it is possible that different frames might have been present in the first two (Pastoor, 2017a). As such, the researcher opted to not code any frames as dominant in these situations and instead indicated that any present frame was secondary. It is possible that this coding issue may be at the root of at least some of the low intercoder reliability coefficients.

Unclear or incomplete variable definitions were another source of limitations for the study. Gaps in the national interest and conflict/strategy frames and climate change presence variable have already been discussed. The Indigenous frame variable definition lacked indicators like specific groups' names and potential cultural signifiers like "tipi" and "burn[ing] tobacco" (Bowen, 2018a, paras. 2, 6), which could have carried latent meaning. Articles that contained these elements but no others from the coding instructions therefore may have included uncounted Indigenous frames, which may have resulted in that frame being underrepresented in the data collection. The directions to designate the object of a government action as a dominant frame when they appeared in a headline or lead paragraph were also problematic. Although they were not difficult to apply consistently, they may have inserted a bias into the coding, as so many of the articles dealt with government actions surrounding environmental concerns. (The larger share of dominant government frames suggests this may not have been the case; however, it is still important to mention.) Additionally, the definitions and indicators for Nisbet's (2009, 2010b) frames could have been more detailed; the researcher could have identified more content analyses that used Nisbet's frames and incorporated their indicators into the codebook (the researcher focused on finding articles that cited Nisbet's 2010 piece, but

did not search as widely for the 2009 piece), or could have tested them with more pipeline or even climate change articles to identify examples.

The limitations in variable definitions and indicators expressed here—and the ways in which they were interpreted by coders—point to a handful of content analysis pitfalls that also may help in explaining the low intercoder reliability scores. The first is the debate over how detailed codebook indicators should be and how generously or narrowly coders should apply them. Chong and Druckman (2011) noted that in content analyses, coders may identify variables in the content if they are similar enough to the definitions, even if they are not an exact match. Neuendorf (2017) pointed out that including “exemplars” of a variable in a codebook may guide coders to only recognize and code instances similar to the “exemplar” and disregard other valid ones (p. 156). In an attempt to rely on the letter of the instructions instead of previous knowledge, the researcher may have interpreted instructions more narrowly than the coders. Coder 1, for example, identified the presence of Indigenous frames via references to Ojibwe territory; the researcher declined to identify similar examples unless they were accompanied by keywords included in the coding instructions—an overly-strict application of the codebook. The second is the difficult issue of coding latent versus manifest content. As discussed in the example of the climate change indicators, following the explicit directions for variables may have caused coders to miss more subtle instances.

The designation of paragraphs as the unit of observation and articles as the unit of analysis also resulted in coding challenges. As previously mentioned, the coding mechanism failed to account for how many paragraphs did not include frames (Babbie, 2001, p. 311)—either because they did not include frames, or because they did not

discuss Line 3 in articles where the pipeline was not the main topic and were therefore not coded. So while the coding mechanism did allow us to understand how many articles included a given frame, they did not provide a detailed understanding of how much of the articles were not covered by study's frames. The researcher had tried to capture this information by allowing coders to say that no frames were either present or dominant in an article, but this proved to be a superficial device. Additionally, even though paragraphs were set as the unit of observation, multiple frames could be identified within a single paragraph or sentence. Setting the paragraph as a unit of analysis—so that each paragraph needed to be considered separately for each frame—likewise had its advantages and disadvantages. On one hand, it could provide a systematic way for the coders to process the material and as a result improve their reliability. On the other hand, it also limited the coders' ability to use an article's entire context to inform the frame identification, thus potentially limiting the study's validity.

Many of these issues could have been resolved with either a greater access to resources or a narrower scope. In an ideal world, a content analysis researcher could train coders and perform pilot tests and full intercoder reliability tests to achieve reliability before completing the study's coding (Neuendorf, 2017). The budget for this study, unfortunately, only had room for one full intercoder reliability test performed during the regular coding. More time could also have been spent developing the codebook using a wider range of examples. Coder 2 noted the difficulties in coding opinion articles and mentioned that her sample included many more opinion stories than had been encountered during coder training. The researcher agreed with this assessment. If the codebook development process had been expanded and the researcher had encountered a

greater diversity of content, some of the flaws (including how to code differently for primary-focus and secondary-focus articles, add frames that appeared in the content, etc.) described above could have been anticipated and avoided. Furthermore, having a more detailed understanding of the entire Enbridge Line 3 issue would have helped the researcher to provide clearer examples of how frames might have been present in coverage.

Based on coder debriefs, the undergraduate coders appeared to handle the interruption in the coding process and the transition to digital coding fairly well. Both coders noted that they were able to adapt to the digital coding format easily, although they used slightly different methods. Coder 2 did seem more concerned about verifying that options hadn't been mistakenly selected on the digital form. Coder 1 asserted that picking coding up after the coding interruption was fairly simple because of notes she had taken on the "most recent" version of her coding instructions. While it is unclear which notes she was referencing (she had taken notes on previous versions of her coding instructions as well during training sessions, but it was not clear if those notes were transferred to the last set that was given to her after the final training session), she did indicate that the notes were helpful. Coder 2 said that some aspects of the coding instructions were clearer to her after the interruption, such as changes made to climate change frame coding. This may have resulted in inconsistent coding over the course of the project; unfortunately there was not a mechanism to formally assess intracoder reliability.

The small sample size was also a limitation in the study. The margin of error of +/- 5% was not ideal. The codebook was admittedly fairly complex, with many variables

that did not appear frequently. As such, not all of the planned statistical analyses could be completed.

Finally, there are limits to the level of detail and nuance that a quantitative content analysis can reveal (Neuendorf, 2017). Although the study attempted to consider frames from a variety of angles, without coding for the presence or absence of more specific indicators in addition to the pipeline frames, the depth of analysis possible was limited. A more focused scope of inquiry could have permitted the researcher to extract more detailed data from a quantitative analysis. A complementary qualitative approach would have allowed a deeper analysis as well (Neuendorf, 2017).

In retrospect

Many of this study's design choices could have been improved upon. The preceding discussion of limitations outlines a number of individual issues encountered throughout the study. The researcher proposes here two general categories for improvements. First, narrowing the study's scope would have simplified the design and thereby would have (second) allowed more time to refine individual elements. For instance, the choice to examine the content for two different sets of frames—pipeline frames and climate change frames—was ambitious and proved to be time-consuming. A different approach would have been to search for the pipeline frames as originally planned but to choose a simpler mechanism for measuring the potential for climate change information to polarize or disengage readers. In line with research that highlights how issues can be politicized by virtue of association with political figures (Fowler & Gollust, 2015) or that the public figures who discuss climate change have the potential to sway people's opinions about the issue (e.g. Bolsen & Shapiro, 2018; Merkley & Stecula,

2018; Nisbet, 2010b), an early conceptualization of this study's design proposed to identify which actors discussed climate change in the Line 3 coverage. Using such a measure instead of adding eight climate change frames to the coding instructions would have both reduced the number of variables for the researcher to refine and would have reduced the cognitive effort required during coding and the level of subjectivity.

Had the study focused on only the pipeline frames, the researcher would have been able to spend more time testing and refining variables. Given the opportunity to conduct this study again, the researcher would have examined communications from different stakeholders, such as press releases or online materials, to identify indicators and add frames that were not included in the original set derived from the literature (Chong & Druckman, 2011). More time also would have been spent using the codebook on an array of content related to Line 3 that would not have been a part of the sample (Riffe et al., 2014).

Chapter 6: Conclusion

This study set out to investigate how local newspapers defined the Enbridge Line 3 pipeline project in affected communities and evaluate the coverage's inclusion of climate change and its potential to foster or impede shared concern about the issue among readers. Its findings about how Line 3 itself was framed suggests that the broad strokes conform to much of what researchers have found in other oil pipeline news contexts: governmental/political, economic, and environmental concerns were prevalent (Dusyk et al., 2018; Kojola, 2017; Wood, 2019). The details, especially concerning actors and attitudes associated with dominant frames, hint at divergences that would require more focused study to confirm. The strongest conclusion that can be drawn points to a body of oil pipeline project newspaper coverage whose climate change discussions broadly resemble those of its predecessors (Dusyk et al., 2018; Kojola, 2017; Stephens et al., 2009): infrequent and often brief. The near absence of potentially harmful climate change frames stands out as a thought-provoking finding. Whether these results signal a successful, failed, or simply missed opportunity for effective climate change communication cannot be determined from this study alone, but the quantitative trends and anecdotal examples from the coding process suggest additional facets to be explored. Despite low intercoder reliability scores and other research design flaws that prevent the researcher from drawing strong conclusions, the study's tentative results point to interesting directions of future research.

Climate change is most likely not a major consideration in local newspaper coverage of Enbridge Line 3. Although stories in the *Duluth News Tribune*, the *Bemidji Pioneer*, the *Grand Rapids Herald-Review*, the *Walker Pilot-Independent*, or the

Crookston Times may guide readers to understand the pipeline project within the context of environmental concerns like water quality and ecosystem health, it is unlikely that climate change would jump to the forefront as a result of reading this news coverage. An obvious next step for this research would be to test these questions with readers themselves in a survey or experimental study, an avenue for future research that other content analyses have proposed as well (Hart & Feldman, 2014). While testing the salience of climate change as a facet of the pipeline issue may edge further into the theoretical territory of agenda setting media effects research (Cacciatore et al., 2016), it could still be a worthwhile complement to this framing study, which accepts as a premise that agenda setting and framing effects may share a common bond (McCombs & Ghanem, 2001).

Note that there would still be theoretical issues to resolve. It is unclear where climate change would fall in an integrated framing and agenda setting media effects model per McCombs and Ghanem (2001): as a facet of the pipeline issue, would it need to be its own frame or “attribute”? Or could their model accommodate investigation of climate change as an attribute belonging to an environmental frame, that itself is an attribute of the pipeline? McCombs and Ghanem themselves noted the difficulties in establishing when an issue attribute constitutes an issue in its own right, especially when extending the challenge to identifying media frames. This question is particularly relevant given the friction between McCombs and Ghanem’s assertion that frames may still be best understood as “central themes” for a given article (pp. 55–56) and the present study’s adoption of Chong and Druckman’s (2011) perspective that articles may host more than a single frame. Would climate change represent one frame among many? Or

would it be a superfluous attribute in articles with a different, stronger theme?

Nonetheless, further media effects research would help understand the broader significance of relegating climate change to the metaphorical sidelines in this news coverage.

Observations about climate change's distribution across news outlets inform tentative interpretations for its general omission from coverage. Although outlet and media market size were not formally conceptualized as explanatory factors, the concentration of climate change mentions in the *Duluth News Tribune*—the largest paper in the sample—does point to a range of other possible contributing factors including budget and capacity. These factors provide an interesting counterpoint to Gibson and colleagues' (2016) findings, to be discussed further below.

Climate change references appear to be perfunctory as well as uncommon in the study's sample. Both the scarcity of climate change frames and coders' assessments suggest that climate change's primary function was to flesh out discussions of Line 3. This interpretation is subject to several caveats: low climate change frame reliability, the potential undercounting of climate change occurrences and frames, and the lack of a formal qualitative analysis of climate change mentions. However informal the coders' comments were that climate change was not generally elaborated upon, they lent weight to conclusions that could be drawn from the lack of recorded climate change frames. Though readers may be deprived of discussions that could enhance the issue's accessibility, they may also be spared frames that could engender discord and apathy (Nisbet, 2009; 2010b).

Articles containing two of the few identified climate change frames suggested the possibility that involved actors may employ the issue in surprising ways. The Enbridge employee who argued for a new pipeline and declared the need to reduce emissions for air quality, health, and climate change reasons alike (McLeod, 2019) is a notable, if potentially isolated, contrast to Wood's (2019) observation that figures from the oil industry seldom addressed their adversaries' climate or environment-based critiques. A "paid political letter" from a collection of "proud union members" decried the proposed pipeline on numerous grounds, including its possible climate impacts, and furthermore critiqued the assumed division between labor and environmental interests (Adams et al., 2019, headline, para. 1). This example complements Kojola's (2017) argument that national newspapers cast certain "union leaders" as pan-union pro-pipeline spokespeople in Keystone XL coverage, to the exclusion of individual members' and critical unions' dissenting opinions (p. 904). These individual examples, of course, may be exceptions to a stronger trend that only a more detailed analysis—qualitative or quantitative—could discern. Still, such a study could provide a richer understanding of how oil pipeline issues are hashed out at the local level.

The unexpected variation in actors discussing climate change demands that we consider the relative absence of climate change frames with more nuance. With a lack of problematic climate change frames, verbal presentation of the issue in this context may not itself further rend apart public opinion or drive people away (Nisbet 2009, 2010b). However, the individuals and organizations who introduce climate change may—or they may not (Nisbet, 2009, 2010b; Bolsen & Shapiro, 2018). Pandora's Box climate change frames, for example, have the potential to backfire in part because of their frequent

association with liberal political figures (Nisbet, 2009, 2010b); could simple mentions of climate change from these figures provoke negative reactions among some populations as well (Merkley & Stecula, 2018; Nisbet, 2009, 2010b)? Or could an Enbridge employee—working for a company that may bring valuable economic activity to a region—constitute a sympathetic figure whose assertions about the importance of reducing greenhouse gas emissions could connect with community members (Bolsen & Shapiro, 2018)?

Experimental or survey research analyzing people’s reactions to these situations would enrich our understanding of what is at stake. The researcher had considered conducting a more detailed analysis of the figures who tend to discuss climate change in oil pipeline news coverage in preliminary study design iterations; this would be a useful complement to any survey or experimental research.

That climate change would fail to surface in local newspapers’ Enbridge Line 3 stories in a substantial way points to flaws in this study’s initial premise: the environmental reporters represented in Gibson and colleagues’ (2016) research may not have had equivalent counterparts in these papers’ newsrooms, and so their reporters may not have had the same interest in integrating climate change into related news stories. The potential avenues for future research detailed in the discussion section—comparing articles about climate change itself to related topic mentions; comparing the complexity of climate change discussions in pipeline coverage across multiple news outlet sizes; interviewing journalists—could all prove to be useful complementary perspectives. They could indicate where information about climate change is concentrated in the local news environment, and if it is being discussed differently depending on the context.

The overall framing of Enbridge Line 3 itself as an issue broadly resembles previous researchers' analyses of oil pipeline news coverage: the high-level concerns of how a pipeline project relates to government, environmental, and economic matters are present here as elsewhere (Dusyk et al., 2018; Kojola, 2017; Raso & Neubauer, 2015; Wood, 2019). The findings make sense given that the sample's time frame was chosen to encompass the very beginnings of Enbridge's permit application period and ran through the permitting process's course; one can imagine that different frames may appear in coverage of an approved pipeline under construction or in regular use. With so few studies on the topic, the pipeline frame variables' low reliability, and the inconsistencies between this study's and its predecessors' definitions and measurements (despite efforts to reconcile them in the present study), it is difficult to tell whether the broad occurrences of frames in this study are significantly different from others. The prevalence of government figures as first-named actors in relation to dominant frames—predominantly government/politics frames—implies their issue-defining power and similarly aligns with previous research that shows officials and elites' strong presence in news (e.g. Tuchman, 1978, Wood, 2019; Zukas, 2017). A closer look at some of the finer—although less reliable—details from this study's analysis suggests that the Line 3 project's specific context introduces novel trends.

The discussion section suggested that the correspondence between oil industry actors and government/politics, environmental, economic, and safety frames potentially indicated Enbridge's primary issue-defining goals. While oil industry actors were not the most frequently used in association with dominant frames, this interpretation integrates with some of the study's other findings to highlight Enbridge Line 3's possibly unique

qualities as an object of news coverage. First, the difference between economic and environmental dominant frames in news versus opinion articles—in tandem with the notion that oil industry and government actors were associated with a fair number of dominant environmental frames—could suggest that environmental organizations were diminished in coverage. The split of attitudes across the environmental frames—with a not-insignificant proportion being associated with pro-pipeline attitudes—speaks to the potential for pipeline supporters to adopt those perspectives. That dominant safety frames were identified in association exclusively with government officials, oil industry representatives, and business representatives is also an interesting observation. Even though frames could technically be used in service of both advocates and opponents (Chong & Druckman, 2011; Entman, 1993), industry and business appear to claim this one in this context.

This split between safety frames and environmental frames' attitudes and proponents recalls the difficulties in distinguishing their respective definitions during codebook development. While some studies folded safety frames into a larger environmental category (Wood, 2019), others conceptualized them as distinct frames that nonetheless shared similar indicators (“oil spil*” and “clean water” for environment and “spill” or “leak” for safety) (Lawlor & Gravelle, 2018, p. 673). Moreover, Lawlor & Gravelle (2018) hypothesized that safety and environmental frames would appear in differing quantities based on whether newspapers served audiences close to a pipeline project site or widespread national ones. When developing the study's frames, the researcher determined that drawing distinctions between the two seemed to disregard the importance that pipeline site communities might set on clean water access. Future studies

could examine how people actually perceive the intersections and divisions between these frames to further refine how they are defined. Finally, what might it mean if pipeline advocates have staked claims to both environmental and safety frames, whether or not they are connected? It could suggest that they enjoy greater flexibility in developing their messages; it could also mean that in occupying these possibly related but seemingly distinct conceptual camps, they are better able to shape how the pipeline is understood in the public sphere.

Concluding thoughts and future research

What light, then, does this study shed on local news coverage's treatment of the Enbridge Line 3 pipeline project? As an additional case to the roster of oil pipeline controversies, it presents a variation on a theme: one that broadly resembles other studies' findings in its emphases on government, economic, and environmental framing of the pipeline itself and in the short supply of climate change connections, but one that may have introduced contradictions to the frequently-seen alignment of proponents' and opponents' concerns in the media. Parties that would normally be associated with one perspective—say, advancing a region's economic opportunities—may take on those of their adversaries—protecting the environment and even in isolated cases arguing for their project's climate change benefits. Additional research that delves into each camp's communication strategies, of course, would be necessary to confirm these very tentative observations.

Identifying this case's greater significance would require more extensive research as well. Could the industry-aligned climate discussions fall within the trend that Schlichting (2013) identified, wherein some representatives from sectors that had

previously been associated with climate change denial gradually positioned themselves and their “technological innovations” as necessary players in a climate change response (p. 505)? Could it represent an active attempt to deflate arguments against the pipeline by adopting them, vaguely reminiscent of Moore’s (2019) argument that regional newspaper coverage of the Dakota Access Pipeline protests recognized yet diminished the Standing Rock Tribe’s perspectives by presenting them in “balance” with pro-pipeline positions? The lack of climate change discussions overall, as the study’s most reliable finding, presents perhaps the strongest foundation for future research. The discussion chapter suggested a study comparing the incidence of climate change in a local paper’s pipeline coverage and in its general coverage; it could be a reasonable next step in understanding whether climate change depictions in related topic areas resemble or contrast its overall portrayal in local news outlets.

Enbridge Line 3, though its permits have now been granted, is still being opposed (Karnowski, 2020); other pipelines, whether for oil or other fuels, continue to make national news as cases are made for and against them (Tabuchi & Plumer, 2020). More research can show us how these trends develop as the issues progress. Understanding the connections of climate to these issues or lack thereof in news—either local, regional, or national—can help us understand the fuller range of information that the public receives about this urgent topic.

References

- 350.org. (n.d.) *350 celebrates a decade of action*. Retrieved July 1, 2020, from <https://350.org/10-years/>.
- Adams, R., Bernston, M. B., Birnbaum, L., Brandt, L., Fatiga, M., Fisk, A., Gardner, S., Gosh, K., Karsh, C., Kuitu, M., Lake, P., Martin, J., McEwen, J., McEwen, S., Moore, H., Nachbar, C., Peterson, K., Rhodes, W., Senski, V.,... Witte, J. (2019, April 21). Paid political letter. *Duluth News Tribune*, 33.
- Ashmoore, O., Evensen, D., Clarke, C., Krakower, J., & Simon, J. (2016). Regional newspaper coverage of shale gas development across Ohio, New York, and Pennsylvania: Similarities, differences, and lessons. *Energy Research & Social Science*, 11, 119–132. <https://doi.org/10.1016/j.erss.2015.09.005>
- Associated Press. (2018, June 2). Minnesota - Religious leaders oppose proposed Line 3 oil pipeline - 'Moral issue' cited in letter to PUC. *St. Paul Pioneer Press*, A2.
- Associated Press. (2019, June 4). Minnesota - State Court of Appeals: Line 3 pipeline needs more environmental review - Findings didn't address oil spill risk. *St. Paul Pioneer Press*, A4.
- Babbie, E. (2001). *The practice of social research* (9th ed.; instructor's ed.). Wadsworth.
- Baumgartner, F. R., & Jones, B. D. (2009). *Agendas and instability in American politics* (2nd ed.). University of Chicago Press.
- Bibeau, F. (2014, November 5). Signs of the future: Enbridge doubles-down on pipelines through northern lakes while the PUC considers additional routing concerns. *Pilot-Independent*.
- Bolsen, T. (2011). The construction of news: Energy crises, advocacy messages, and frames toward conservation. *International Journal of Press/Politics*, 16(2), 143–162. <https://doi.org/10.1177/1940161210392782>
- Bolsen, T., Druckman, J. N., & Cook, F. L. (2014). How frames can undermine support for scientific adaptations: Politicization and the status-quo bias. *Public Opinion Quarterly*, 78(1), 1–26. <https://doi.org/10.1093/poq/nft044>
- Bolsen, T., & Shapiro, M. A. (2018). The US news media, polarization on climate change, and pathways to effective communication. *Environmental Communication*, 12(2), 149–163. <https://doi.org/10.1080/17524032.2017.1397039>
- Bowen, J. (2018a, September 18). Updated: Line 3 protesters block Clearwater County roadwork. *Bemidji Pioneer*.
- Bowen, J. (2018b, December 14). Leech Lake, Enbridge reach agreement to remove existing Line 3 if new pipeline is built. *Bemidji Pioneer*.
- Bowen, J. (2019, January 15). 'These are human rights issues': Indigenous Peoples March highlights Native challenges locally, globally. *Bemidji Pioneer*.
- Boykoff, M. T., & Boykoff, J. M. (2004). Balance as bias: Global warming and the US prestige press. *Global Environmental Change*, 14(2), 125–136. <https://doi.org/10.1016/j.gloenvcha.2003.10.001>
- Boykoff, M. T., & Boykoff, J. M. (2007). Climate change and journalistic norms: A case-study of US mass-media coverage. *Geoforum*, 38(6), 1190–1204. <https://doi.org/10.1016/j.geoforum.2007.01.008>
- Brossard, D., Shanahan, J., & McComas, K. (2004). Are issue-cycles culturally constructed? A comparison of French and American coverage of global climate

- change. *Mass Communication and Society*, 7(3), 359–377.
https://doi.org/10.1207/s15327825mcs0703_6
- Burnes, J. (2017, October 11). Enbridge plan to replace aging pipeline draws strong support at Grand Rapids hearing. *Grand Rapids Herald-Review*.
- Cacciatore, M. A., Scheufele, D. A., & Iyengar, S. (2016). The end of framing as we know it...and the future of media effects. *Mass Communication and Society*, 19(1), 7–23. <https://doi.org/10.1080/15205436.2015.1068811>
- Cappella, J. N. & Jamieson, K. H. (1997). *Spiral of cynicism: The press and the public good*. Oxford University Press.
- Carlson, M. (2020). Fake news as an informational moral panic: The symbolic deviancy of social media during the 2016 US presidential election. *Information, Communication & Society*, 23(3), 374–388.
<https://doi.org/10.1080/1369118X.2018.1505934>
- Carvalho, A. (2007). Ideological cultures and media discourses on scientific knowledge: Re-reading news on climate change. *Public Understanding of Science*, 16(2), 223–243. <https://doi.org/10.1177/0963662506066775>
- Chetty, K., Devadas, V., & Fleming, J. S. (2015). The framing of climate change in New Zealand newspapers from June 2009 to June 2010. *Journal of the Royal Society of New Zealand*, 45(1), 1–20. <https://doi.org/10.1080/03036758.2014.996234>
- Chong, D., & Druckman, J. N. (2007). A theory of framing and opinion formation in competitive elite environments. *Journal of Communication*, 57(1), 99–118.
<https://doi.org/10.1111/j.1460-2466.2006.00331.x>
- Chong, D., & Druckman, J. N. (2011). Identifying frames in political news. In E. P. Bucy & R. L. Holbert (Eds.), *Sourcebook for political communication research: Methods, measures, and analytical techniques* (pp. 238–267). Routledge.
<https://doi.org/10.4324/9780203938669>
- Christoff, J. (2018, May 22). Letter: Approve Line 3 and preferred route. *Pine Journal*.
- Corbett, J. B., & Durfee, J. L. (2004). Testing public (un)certainty of science: Media representations of global warming. *Science Communication*, 26(2), 129–151.
<https://doi.org/10.1177/1075547004270234>
- Crow, D. A., & Lawlor, A. (2016). Media in the policy process: Using framing and narratives to understand policy influences. *Review of Policy Research*, 33(5), 472–491. <https://doi.org/10.1111/ropr.12187>
- Dahinden, U. (2002). Biotechnology in Switzerland: Frames in a heated debate. *Science Communication*, 24(2), 184–197. <https://doi.org/10.1177/107554702237844>
- Deboer, G. (2017, June 27). Jobs for Minnesotans supports Enbridge’s Line 3 replacement project. *Pilot-Independent*.
- Dirikx, A., & Gelders, D. (2010). To frame is to explain: A deductive frame-analysis of Dutch and French climate change coverage during the annual UN Conferences of the Parties. *Public Understanding of Science*, 19(6), 732–742.
<https://doi.org/10.1177/0963662509352044>
- Djerf-Pierre, M., Cokley, J., & Kuchel, L. J. (2016). Framing renewable energy: A comparative study of newspapers in Australia and Sweden. *Environmental Communication*, 10(5), 634–655. <https://doi.org/10.1080/17524032.2015.1056542>

- Doeden, D. (2018, September 18). Brief: Protesters block bridge over Mississippi River in Clearwater County. *Bemidji Pioneer*.
- DOT-111 tank car. (2020, April 1). In *Wikipedia*.
https://en.wikipedia.org/w/index.php?title=DOT-111_tank_car&oldid=948569460
- Druckman, J. N., & Bolsen, T. (2011). Framing, motivated reasoning, and opinions about emergent technologies. *Journal of Communication*, 61(4). 659–688.
<https://doi.org/10.1111/j.1460-2466.2011.01562.x>
- Duluth News Tribune. (2017, October 15). If you go. *Duluth News Tribune*, A1.
- Duluth News Tribune. (2018a, June 8). Northland briefs. *Duluth News Tribune*, A2.
- Duluth News Tribune. (2018b, December 21). Northland briefs. *Duluth News Tribune*, A2.
- Duluth News Tribune Editorial Board. (2018, August 1). Radinovich emerges even stronger OUR VIEW / ENDORSEMENT. *Duluth News Tribune*, A5.
- Dunbar, E. (2017, November 16). *Meet the young activists fighting Enbridge's Line 3 oil pipeline*. MPR News. Retrieved December 21, 2020, from
<https://www.mprnews.org/story/2017/11/16/young-activists-fighting-enbridge-line3-pipeline>
- Dunbar, E. (2018a, May 18). 8 things our environment reporters are watching at the Capitol. *Minnesota Public Radio: Web Edition Articles*.
- Dunbar, E. (2018b, June 13). PUC: Line 3 oil pipeline plan is necessary, safest option. *Minnesota Public Radio: Web Edition Articles*.
- Dunbar, E. (2019, January 10). Boosted by a Walz, teens press new governor on climate change. *Minnesota Public Radio: Web Edition Articles*.
- Dusyk, N., Axsen, J., & Dullemond, K. (2018). Who cares about climate change? The mass media and socio-political acceptance of Canada's oil sands and Northern Gateway Pipeline. *Energy Research & Social Science*, 37, 12–21.
<https://doi.org/10.1016/j.erss.2017.07.005>
- Elsasser, S. W., & Dunlap, R. E. (2013). Leading voices in the denier choir: Conservative columnists' dismissal of global warming and denigration of climate science. *American Behavioral Scientist*, 57(6), 754–776.
<https://doi.org/10.1177/0002764212469800>
- Enbridge. (n.d.-a). *Crude oil and liquids pipelines*. Retrieved June 13, 2019, from
<https://www.enbridge.com/About-Us/Liquids-Pipelines.aspx>
- Enbridge. (n.d.-b). *Line 3 replacement project: Project background*. Retrieved October 14, 2019. <https://www.enbridge.com/projects-and-infrastructure/public-awareness/minnesota-projects/line-3-replacement-project#projectdetails:project-background>
- Enbridge. (n.d.-c). *Line 3 replacement project: Project timeline*. Retrieved September 26, 2020 from <https://www.enbridge.com/projects-and-infrastructure/public-awareness/minnesota-projects/line-3-replacement-project#projectdetails:timeline>
- Enbridge. (n.d.-d). [Map showing existing and replacement Enbridge Line 3 routes through Canadian provinces]. Retrieved October 28, 2020.
https://www.enbridge.com/~/_media/Enb/Images/Projects/Maps/L3R%20Canada%20May%202014%20PDF.pdf?la=en

- Endres, D. E., Cozen, B., Barnett, J. T., O'Byrne, M., & Peterson, T. R. (2016). Communicating energy in a climate (of) crisis. *Annals of the International Communication Association*, 40(1), 419–447. <https://doi.org/10.1080/23808985.2015.11735267>
- Entman, R. M. (1993). Framing: Toward clarification of a fractured paradigm. *Journal of Communication*, 43(4), 51–58. <https://doi.org/10.1111/j.1460-2466.1993.tb01304.x>
- Feldman, L. & Hart, P. S. (2018). Broadening exposure to climate change news? How framing and political orientation interact to influence selective exposure. *Journal of Communication*, 68(3), 503–524. <https://doi.org/10.1093/joc/jqy011>
- Feldman, L., Hart, P. S., & Milosevic, T. (2017). Polarizing news? Representations of threat and efficacy in leading US newspapers' coverage of climate change. *Public Understanding of Science*, 26(4), 481–497. <https://doi.org/10.1177/0963662515595348>
- Feldman, L., Myers, T. A., Hmielowski, J. D., & Leiserowitz, A. (2014). The mutual reinforcement of media selectivity and effects: Testing the reinforcing spirals framework in the context of global warming. *Journal of Communication*, 64(4), 590–611. <https://doi.org/10.1111/jcom.12108>
- Ferguson, D. (2019, March 30). Gun control bills reemerge, spending targets leave \$2B gap. *Duluth News Tribune*, A4.
- Fiřtová, M. (2017). Oil sands in European media: Representations of the Canadian oil sands in European newspapers, 2008–2013. *Journal of Canadian Studies*, 51(1), 186–216. <https://doi.org/10.3138/jcs.51.1.186>
- Forum News Service. (2019, April 13). Governor appoints Means to PUC, names Commissioner Sieben as chair. *Duluth News Tribune (MN)*, A3.
- Fowler, E. F., & Gollust, S. E. (2015). The content and effect of politicized health controversies. *Annals of the American Academy of Political and Social Science*, 658(1), 155–171. <https://doi.org/10.1177/0002716214555505>
- Freelon, D. (2010). ReCal: Intercoder reliability calculation as a web service. *International Journal of Internet Science*, 5(1), 20–33. https://www.ijis.net/ijis5_1/ijis5_1_freelon.pdf
- Freelon, D. (2013). ReCal OIR: Ordinal, interval, and ratio intercoder reliability as a web service. *International Journal of Internet Science*, 8(1), 10–16. https://www.ijis.net/ijis8_1/ijis8_1_freelon_pre.html
- Friedman, L., & Davenport, C. (November 9, 2018). Judge blocks disputed Keystone XL pipeline in setback for Trump. *The New York Times*. <https://www.nytimes.com/2018/11/09/climate/judge-blocks-keystone-pipeline.html>. Retrieved November 9, 2018.
- Gamson, W. A., & Modigliani, A. (1989). Media discourse and public opinion on nuclear power: A constructionist approach. *American Journal of Sociology*, 95(1), 1–37. <https://www.jstor.org/stable/2780405>
- Gibson, T. A., Craig, R. T., Harper, A. C., & Alpert, J. M. (2016). Covering global warming in dubious times: Environmental reporters in the new media ecosystem. *Journalism: Theory, Practice & Criticism*, 17 (4), 417–434. <https://doi.org/10.1177/1464884914564845>

- Gollust, S. E., Barry, C. L., & Niederdeppe, J. (2017). Partisan responses to public health messages: Motivated reasoning and sugary drink taxes. *Journal of Health Politics, Policy, and Law*, 42(6), 1005–1037. <https://doi.org/10.1215/03616878-4193606>
- Grand Rapids Herald-Review. (2017a, September 30). Statement from Reps. Metsa and Ecklund on Enbridge's line replacement project. *Grand Rapids Herald-Review*.
- Grand Rapids Herald-Review. (2017b, December 31). 2017 year in review. *Grand Rapids Herald-Review*.
- Grotting, C. (2018, November 1). Readers' views. *Duluth News Tribune*, A5.
- Haahr, M. (n.d.) RANDOM.ORG: True random number service. Retrieved February 19, 2020; February 20, 2020; April 10, 2020; April 27, 2020; May 24, 2020; June 12, 2020; & June 18, 2020, from <https://www.random.org>.
- Haigh, M. M. (2010). Newspapers use three frames to cover alternative energy. *Newspaper Research Journal*, 31(2), 47–62. <https://doi.org/10.1177/073953291003100205>
- Hart, P. S. (2011). One or many? The influence of episodic and thematic climate change frames on policy preferences and individual behavior change. *Science Communication*, 33(1), 28–51. <https://doi.org/10.1177/1075547010366400>
- Hart, P. S., & Feldman, L. (2014). Threat without efficacy? Climate change on U.S. network news. *Science Communication*, 36(3), 325–351. <https://doi.org/10.1177/1075547013520239>
- Hart, P. S., & Nisbet, E. C. (2012). Boomerang effects in science communication: How motivated reasoning and identity cues amplify opinion polarization about climate mitigation policies. *Communication Research*, 39(6), 701–723. <https://doi.org/10.1177/0093650211416646>
- Hedding, K. J. (2017). Sources and framing of fracking: A content analysis of newspaper coverage in North Carolina, New York, and Pennsylvania. *Environmental Communication*, 11(3), 370–385. <https://doi.org/10.1080/17524032.2016.1269819>
- Hedding, K. J., & Riffe, D. (2016). Local papers use community way of life frames more often in coal mining stories. *Newspaper Research Journal*, 37(4), 377–392. <https://doi.org/10.1177/0739532916677047>
- Hiles, S. S., & Hinnant, A. (2014). Climate change in the newsroom: Journalists' evolving standards of objectivity when covering global warming. *Science Communication*, 36(4), 428–453. <https://doi.org/10.1177/1075547014534077>
- Hmielowski, J. D., & Nisbet, E. C. (2016). “Maybe yes, maybe no?”: Testing the indirect relationship of news use through ambivalence and strength of policy position on public engagement with climate change. *Mass Communication and Society*, 19(5), 650–670. <https://doi.org/10.1080/15205436.2016.1183029>
- Honor the Earth. (n.d.) *About us*. <http://www.honorearth.org/about>
- IPCC. (2014a). *Climate Change 2014: Mitigation of climate change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. O. Edenhofer, R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel, & J. C. Minx (Eds.). Cambridge University Press. https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_full.pdf

- IPCC. (2014b). *Climate change 2014: Synthesis report. Contribution of working groups I, II, and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Core Writing Team, R. K. Pachauri, & L. A. Meyer (Eds.). IPCC.
https://www.ipcc.ch/site/assets/uploads/2018/02/SYR_AR5_FINAL_full.pdf
- Iyengar, S. (1991). *Is anyone responsible? How television frames political issues*. The University of Chicago Press.
- Jaworska, S. (2018). Change but no climate change: Discourses of climate change in corporate social responsibility reporting in the oil industry. *International Journal of Business Communication*, 55(2), 194–219.
<https://doi.org/10.1177/2329488417753951>
- Johnson, B. (2017a, June 9). Floodwood hosts debate on Enbridge pipeline. *Duluth News Tribune*, A7.
- Johnson, B. (2017b, October 19). Two hearings, two distinct messages. *Duluth News Tribune*, A1.
- Kaczke, L. (2017, December 9). Line 3 will impact Native Americans, review says. *Pine Journal*.
- Karnowski, S. (2017, October 21). Minnesota - Wild rice rule irks industry and environmentalists alike - Public hearings begin on Monday. *St. Paul Pioneer Press*, A3.
- Karnowski, S. (2018a, June 19). Minnesota - PUC hears final arguments over Line 3 - Decision on approval due next week. *St. Paul Pioneer Press*, A4.
- Karnowski, S. (2018b, December 14). Minnesota - Pipeline protesters looking past PUC - State regulators reaffirms project. *St. Paul Pioneer Press*, A6.
- Karnowski, S. (2020, November 30). *Minnesota gives final green light to disputed oil pipeline*. Associated Press, MPR News. Retrieved December 15, 2020, from <https://www.mprnews.org/story/2020/11/30/minnesota-gives-final-green-light-to-disputed-oil-pipeline>
- Kim, S.-H., Besley, J. C., Oh, S.-H., & Kim, S. Y. (2014). Talking about bio-fuel in the news: Newspaper framing of ethanol stories in the United States. *Journalism Studies*, 15(2), 218–234. <https://doi.org/10.1080/1461670X.2013.809193>
- Kingdon, J. W. (2003). *Agendas, alternatives, and public policies* (2nd ed.). Longman.
- Kojola, E. (2017). (Re)constructing the pipeline: Workers, environmentalists and ideology in media coverage of the Keystone XL pipeline. *Critical Sociology*, 43(6), 893–917. <https://doi.org/10.1177/0896920515598564>
- Kraker, D. (2017a, September 28). At Line 3 pipeline hearing, it's environment vs. jobs. *Minnesota Public Radio: Web Edition Articles*.
- Kraker, D. (2017b, October 13). Tribes launch review of controversial MN pipeline project. *Minnesota Public Radio: Web Edition Articles*.
- Kraker, D. (2018a, March 12). Clean up your old oil pipeline, Minnesotans tell Enbridge. *Minnesota Public Radio: Web Edition Articles*.
- Kraker, D. (2018b, May 9). Enbridge, Leech Lake Band rip Judge's Line 3 report. *Minnesota Public Radio: Web Edition Articles*.
- Kraker, D. (2019a, February 12). Walz's Commerce Dept. to renew Line 3 appeal. *Minnesota Public Radio: Web Edition Articles*.

- Kraker, D. (2019b, June 3). MN court says PUC didn't weigh oil spill impact in Line 3 pipeline decision. *Minnesota Public Radio: Web Edition Articles*.
- Kraker, D. (2020a, June 4). *State officials agree to give Line 3 permits additional scrutiny*. MPR News. Retrieved June 18, 2020, from <https://www.mprnews.org/story/2020/06/03/state-officials-agree-to-give-line-3-permits-additional-scrutiny>.
- Kraker, D. (2020b, August 20). *Another Line 3 appeal: Four things to know*. MPR News. Retrieved September 26, 2020, from <https://www.mprnews.org/story/2020/08/20/another-line-3-appeal-4-things-to-know>.
- LaDuke, W. (2015a, January 5). Large corporations will minimize their costs by seeking to offload risk onto the rest of us. *Crookston Times*, 5.
- LaDuke, W. (2015b, August 15). Enbridge Line 3 abandonment: Bad idea. *Grand Rapids Herald-Review*.
- Lawlor, A., & Gravelle, T. B. (2018) Framing trans-border energy transportation: The case of Keystone XL. *Environmental Politics*, 27(4), 666–685. <https://doi.org/10.1080/09644016.2018.1425106>
- Layman, S. (2019, March 16). Advocating for broadband, Line 3 and roads. *Grand Rapids Herald-Review*.
- Leiserowitz, A., Maibach, E., Rosenthal, S., Kotcher, J., Bergquist, P., Ballew, M., Goldberg, M., & Gustafson, A. (2019). *Climate change in the American mind: November, 2019*. Yale University and George Mason University. Yale Program on Climate Change Communication. https://climatecommunication.yale.edu/wp-content/uploads/2019/12/Climate_Change_American_Mind_November_2019b.pdf
- Littau, J. (2016). Participatory news websites feature more opinion pieces. *Newspaper Research Journal*, 37(1), 70–81. <https://doi.org/10.1177/0739532916634645>
- Liu, X., Vedlitz, A., Alston, L. (2008). Regional news portrayals of global warming and climate change. *Environmental Science & Policy*, 11(5), 379–393. <https://doi.org/10.1016/j.envsci.2008.01.002>
- Lovrien, J. (2018a, June 28). PUC continues to examine Line 3 routes - Enbridge offers alternative options for pipeline route. *Duluth News Tribune*, A7.
- Lovrien, J. (2018b, July 24). Department of Commerce says Enbridge filing needs work. *Duluth News Tribune*, A2.
- Lovrien, J. (2018c, September 1). Line 3 pipeline replacement to pass through reservation. *Duluth News Tribune*, A1.
- Lovrien, J. (2018d, September 27). Commerce Department wants Line 3 reconsidered. *Duluth News Tribune*, A9.
- Lovrien, J. (2018e, September 28). Department of Commerce wants Line 3 approval reconsidered. *Grand Rapids Herald-Review*.
- Lovrien, J., & Ferguson, D. (2018, November 20). PUC moves Line 3 forward - Pipeline opponents make case to Minnesota governor-elect. *Duluth News Tribune*, A1.
- Lovrien, J. & Johnson, B. (2018a, April 24). Judge: Line 3 should use current route - PUC to decide whether to follow recommendation for Enbridge pipeline. *Duluth News Tribune*, A1.

- Lovrien, J. & Johnson, B. (2018b, June 2). Enbridge CEO rallies with Line 3 supporters in Duluth. *Duluth News Tribune*, A1.
- Lund, J. (2017, November 18). Board hears Enbridge concerns, approves transfer rate hikes. *The Pine Journal*.
- Maibach, E. W., Nisbet, M., Baldwin, P., Akerlof, K., & Diao, G. (2010) Reframing climate change as a public health issue: An exploratory study of public reactions. *BMC Public Health*, 10(299), 1–11. <https://doi.org/10.1186/1471-2458-10-299>
- Matthes, J., & Kohring, M. (2008). The content analysis of media frames: Toward improving reliability and validity. *Journal of Communication*, 58(2), 258–279. <https://doi.org/10.1111/j.1460-2466.2008.00384.x>
- McCombs, M., & Ghanem, S. I. (2001) The convergence of agenda setting and framing. In S.D. Reese, A.E. Grant, & O.H. Gandy Jr. (Eds.), *Framing public life: Perspectives on media and our understanding of the social world* (pp. 67–82 [print]; pp. 51–59 [ebook]). Lawrence Erlbaum Associates, Inc. <https://doi.org/10.4324/9781410605689>
- McCright, A. M., & Dunlap, R. E. (2003). Defeating Kyoto: The conservative movement's impact on U.S. climate change policy. *Social Problems*, 50(3), 348–373. <https://doi.org/10.1525/sp.2003.50.3.348>
- McLeod, T. (2019, May 3). Replacing Line 3 will reduce its carbon footprint [Local view]. *Duluth News Tribune*, A5.
- Merkley, E., & Stecula, D. A. (2018). Party elites of manufactured doubt? The informational context of climate change polarization. *Science Communication*, 40(2), 258–274. <https://doi.org/10.1177/1075547018760334>
- Minnesota Climate & Health Program, Environmental Impacts Analysis Unit. (2015). *Minnesota climate and health profile report 2015: An assessment of climate change impacts on the health & well-being of Minnesotans*. Minnesota Department of Health. <https://www.leg.mn.gov/docs/2015/other/150285.pdf>
- Minnesota Newspaper Association (2020). *Minnesota Newspaper Association 2020 Newspaper Directory*. <http://mna.org/assets/2020-MNA-Directory.pdf>
- Minnesota Public Radio. (2015, April 25). Enbridge files application to replace Minnesota pipeline, would create largest capacity line. *Minnesota Public Radio: Web Edition Articles*.
- Minnesota Public Utilities Commission. (n.d.). *Project summary: Enbridge Line 3 pipeline replacement project*. <https://mn.gov/puc/line3/summary/>
- MN350.org. (n.d.). *Stop Line 3*. Retrieved September 26, 2020, from <https://mn350.org/campaigns/stop-line-3-pipeline/>
- Moore, E. (2019). *Journalism, politics, and the Dakota Access pipeline: Standing Rock and the framing of injustice*. Routledge.
- Myers, J. (2015, August 27). Supporters, critics attend pipeline meetings New Enbridge line would bring more Canadian crude into US. *Duluth News Tribune*, A7.
- Myers, J. (2016, January 26). Anti-pipeline protest held in Superior No arrests as groups continue opposition. *Duluth News Tribune*, A7.
- Myers, J. & Johnson, B. (2017a, May 16). Line 3 review ready for comment. *Duluth News Tribune*, A1.

- Myers, J. & Johnson, B. (2017b, May 23). Enbridge Line 3 review released for public comment. *The Pine Journal*.
- Nagler, R. H., Bigman, C. A., Ramanadhan, S., Ramamurthi, D., Viswanath, K. (2016). Prevalence and framing of health disparities in local print news: Implications for multilevel interventions to address cancer inequalities. *Cancer Epidemiology, Biomarkers & Prevention* 25(4), 603–612. <https://doi.org/10.1158/1055-9965.EPI-15-1247>
- Neises, K. (2017, April 29). Letter to the editor: A leader or a partisan pawn? *Pilot-Independent*.
- Neuendorf, K. A. (2017). *The content analysis guidebook* (2nd ed.). SAGE Publications Inc.
- Nisbet, M. C. (2009). Communicating climate change: Why frames matter for public engagement. *Environment: Science and Policy for Sustainable Development*, 51(2), 12–23. <https://doi.org/10.3200/ENVT.51.2.12-23>
- Nisbet, M. C. (2010a). Framing science: A new paradigm in public engagement. In L. Kahlor & P. A. Stout (Eds.), *Communicating science: New agendas in communication* (pp. 40–67). Routledge.
- Nisbet, M. C. (2010b). Knowledge into action: Framing the debates over climate change and poverty. In P. D'Angelo & J. A. Kuypers (Eds.), *Doing news framing analysis: Empirical and theoretical perspectives* (pp. 43–83 [ebook]). Routledge.
- Nisbet, M. C., & Hume, M. (2006). Attention cycles and frames in the plant biotechnology debate: Managing power and participation through the press/policy connection. *The Harvard International Journal of Press/Politics*, 11(2), 3–40. <https://doi.org/10.1177/1081180X06286701>
- Olausson, U. (2009). Global warming—global responsibility? Media frames of collective action and scientific certainty. *Public Understanding of Science*, 18(4), 421–436. <https://doi.org/10.1177/0963662507081242>
- Olive, A., & Delshad, A. B. (2017) Fracking and framing: A comparative analysis of media coverage of hydraulic fracturing in Canadian and US newspapers. *Environmental Communication*, 11(6), 784–799. <https://doi.org/10.1080/17524032.2016.1275734>
- Orenstein, W. (2018a, December 10). *Where the Enbridge Line 3 pipeline project stands, and where it goes from here*. MinnPost. Retrieved February 9, 2019, from <https://www.minnpost.com/environment/2018/12/where-the-enbridge-line-3-pipeline-project-stands-and-where-it-goes-from-here/>.
- Orenstein, W. (2018b, December 17). *Could pipeline politics affect Walz's choice for next public utilities commissioner?* MinnPost. Retrieved February 9, 2019, from <https://www.minnpost.com/environment/2018/12/could-pipeline-politics-affect-walzs-choice-for-next-public-utilities-commissioner/>
- Oreskes, N., & Conway, E. M. (2010). *Merchants of doubt: How a handful of scientists obscured the truth on issues from tobacco smoke to global warming*. Bloomsbury Press.
- Orr, I. (2018, May 26). Guest column: Love water and oil? New Line 3 will help us do both. *Pilot-Independent*.

- Pacala, S., & Socolow, R. (2004). Stabilization wedges: Solving the climate problem for the next 50 years with current technologies. *Science*, 305(5686), 968–972. <https://doi.org/10.1126/science.1100103>
- Painter, J., & Ashe, T. (2012). Cross-national comparison of the presence of climate scepticism in the print media in six countries, 2007–10. *Environmental Research Letters*, 7(4), 1–8. <https://doi.org/10.1088/1748-9326/7/4/044005>
- Painter, J., & Gavin, N. T. (2016). Climate skepticism in British newspapers, 2007–2011. *Environmental Communication*, 10(4), 432–452. <https://doi.org/10.1080/17524032.2014.995193>
- Pan, Z., & Kosicki, G. M. (1993). Framing analysis: An approach to news discourse. *Political Communication*, 10(1), 55–75. <https://doi.org/10.1080/10584609.1993.9962963>
- Pastoor, G. (2017a, April 10). Taking a closer look: Activists gather to inspect Enbridge pipelines in Cass Lake. *Bemidji Pioneer*.
- Pastoor, G. (2017b, August 18). Twin Cities teens paddle against pipelines. *Bemidji Pioneer*.
- Pine Journal. (2017, September 30). New round of Line 3 public hearings begins. *The Pine Journal*.
- Price, V. & Tewksbury, D. (1997). News values and public opinion: A theoretical account of media priming and framing. In G. Barnett & F.J. Boster (Eds.), *Progress in the Communication Sciences*, 13 (pp. 173–212). Ablex Publishing Corporation.
- Price, V., Tewksbury, D., & Powers, E. (1997). Switching trains of thought: The impact of news frames on readers' cognitive responses. *Communication Research*, 24(5), 481–506. <https://doi.org/10.1177/009365097024005002>
- Raso, K., & Neubauer, R. J. (2016). Managing dissent: Energy pipelines and “New Right” politics in Canada. *Canadian Journal of Communication*, 41(1), 115–133. <https://doi.org/10.22230/cjc.2016v41n1a2777>
- Riffe, D., Lacy, S., & Fico, F. (2014). *Analyzing media messages: Using quantitative content analysis in research* (3rd ed.). Routledge.
- Rochefort, D. A., & Cobb, R. W. (1994). Problem definition: An emerging perspective. In D.A. Rochefort & R.W. Cobb (Eds.), *The politics of problem definition: Shaping the policy agenda* (pp. 1–31). University of Kansas Press.
- Roth, E. (2017, October 11). Line 3 will be a state-of-the-art pipeline with multiple layers of safety monitoring. *Grand Rapids Herald-Review*.
- Salisbury, B. (2018, November 1). Vote 2018 - 2nd Congressional District - Craig, incumbent Lewis in a rematch - Where the candidates stand on key issues. *St. Paul Pioneer Press*, A13.
- Scheufele, D. A. (1999). Framing as a theory of media effects. *Journal of Communication*, 49(1), 103–122. <https://doi.org/10.1111/j.1460-2466.1999.tb02784.x>
- Scheufele, D. A. (2000). Agenda-setting, priming, and framing revisited: Another look at cognitive effects of political communication. *Mass Communication and Society*, 3(2–3), 297–316. https://doi.org/10.1207/S15327825MCS0323_07

- Scheufele, D. A., & Tewksbury, D. (2007). Framing, agenda setting, and priming: the evolution of three media effects models. *Journal of Communication*, 57(1), 9–20. <https://doi.org/10.1111/j.0021-9916.2007.00326.x>
- Schlichting, I. (2013). Strategic framing of climate change by industry actors: A meta-analysis. *Environmental Communication*, 7(4), 493–511. <https://doi.org/10.1080/17524032.2013.812974>
- Schmid-Petri, H., Adam, S., Schmucki, I., & Häussler, T. (2017). A changing climate of skepticism: The factors shaping climate change coverage in the US press. *Public Understanding of Science*, 26(4), 498–513. <https://doi.org/10.1177/0963662515612276>
- Schneeweis, N. (2018, August 9). Groups challenge northern Minnesota pipeline environmental impact statement. *Grand Rapids Herald-Review*.
- Schneider, J. (2010). Making space for the “nuances of truth”: Communication and uncertainty at an environmental journalists’ workshop. *Science Communication*, 32(2), 171–201. <https://doi.org/10.1177/1075547009340344>
- Schoneberger, B. (2018, October 2). Who to fear: protesters or law enforcement? [Local view]. *Duluth News Tribune*, A5.
- Semetko, H. A., & Valkenburg, P. M. (2000). Framing European politics: A content analysis of press and television news. *Journal of Communication*, 50(2), 93–109. <https://doi.org/10.1111/j.1460-2466.2000.tb02843.x>
- Shah, D. V., McLeod, D. M., Gotlieb, M. R., & Lee, N.-J. (2009). Framing and agenda setting. In R. L. Nabi & M. B. Oliver (Eds.), *The SAGE handbook of media processes and effects* (pp. 83–98). SAGE Publications.
- Shehata, A., & Hopmann, D. N. (2012). Framing climate change: A study of US and Swedish press coverage of global warming. *Journalism Studies*, 13(2), 175–192. <https://doi.org/10.1080/1461670X.2011.646396>
- Shelton, R. C., Colgrove, J., Lee, G., Truong, M., & Wingood, G. M. (2017). Message framing in the context of the national menu-labelling policy: A comparison of public health and private industry interests. *Public Health Nutrition*, 20(5), 814–823. <https://doi.org/10.1017/S1368980016003025>
- Shih, T.-J., Wijaya, R., & Brossard, D. (2008). Media coverage of public health epidemics: Linking framing and issue attention cycle toward an integrated theory of print news coverage of epidemics. *Mass Communication and Society*, 11(2), 141–160. <https://doi.org/10.1080/15205430701668121>
- Shoemaker, P. J., & Reese, S. D. (2014). *Mediating the message in the 21st century: A media sociology perspective* (3rd ed.). Routledge. <https://doi.org/10.4324/9780203930434>
- Shonkoff, S. B., Morello-Frosch, R., Pastor, M., & Sadd, J. (2011). The climate gap: Environmental health and equity implications of climate change and mitigation policies in California—a review of the literature. *Climatic Change*, 109(Suppl. 1), S485–S503. <https://doi.org/10.1007/s10584-011-0310-7>
- Slater, B. (2017, December 29). Grand Rapids serves as ground zero for Enbridge Line 3. *Grand Rapids Herald-Review*.
- Smith, J. M., & van Ierland, T. (2018). Framing controversy on social media: #NoDAPL and the debate about the Dakota Access Pipeline on Twitter. *IEEE Transactions*

- on *Professional Communication*, 61(3), 226–241.
<https://doi.org/10.1109/TPC.2018.2833753>
- Stephens, J. C., Rand, G. M., & Melnick, L. L. (2009). Wind energy in US media: A comparative state-level analysis of a critical climate change mitigation technology. *Environmental Communication*, 3(2), 168–190.
<https://doi.org/10.1080/17524030902916640>
- SurveyMonkey. (n.d.) *Margin of error calculator*. Retrieved January 2, 2020, from <https://www.surveymonkey.com/mp/margin-of-error-calculator/>
- Swanson, J. (2016, May 2). Public input encouraged on proposed pipeline projects. *The Pine Journal*.
- Swanson, J. (2017, October 25). Public hearings provide opportunity to be heard on Line 3 Replacement. *Grand Rapids Herald-Review*.
- Swanson, J. (2018, September 5). Line 3 Replacement realities far from 'pipe dreams' [In response]. *Duluth News Tribune*, A5.
- Tabuchi, H., & Plumer, B. (2020, July 8). Is this the end of new pipelines? *The New York Times*. <https://www.nytimes.com/2020/07/08/climate/dakota-access-keystone-atlantic-pipelines.html?searchResultPosition=8>
- Takahashi, B., Huang, K., Fico, F., & Poulson, D. (2017). Climate change reporting in Great Lakes region newspapers: A comparative study of the use of expert sources. *Environmental Communication*, 11(1), 106–121.
<https://doi.org/10.1080/17524032.2016.1220967>
- Takahashi, B., & Meisner, M. (2013). Climate change in Peruvian newspapers: The role of foreign voices in a context of vulnerability. *Public Understanding of Science*, 22(4), 427–442. <https://doi.org/10.1177/0963662511431204>
- Tankard, J. W., Jr. (2001). The empirical approach to the study of media framing. In S. D. Reese, A. E. Grant, & O. H. Gandy, Jr. (Eds.), *Framing public life: Perspectives on media and our understanding of the social world* (pp. 95–105 [print]; pp. 67–73 [ebook]). Lawrence Erlbaum Associates, Inc.
- Taylor, C. E., Lee, J.-S., & Davie, W. R. (2000). Local press coverage of environmental conflict. *Journalism and Mass Communication Quarterly*, 77(1), 175–192.
<https://doi.org/10.1177/107769900007700113>
- Trumbo, C. (1996). Constructing climate change: Claims and frames in US news coverage of an environmental issue. *Public Understanding of Science*, 5(3), 269–283. <https://doi.org/10.1088/0963-6625/5/3/006>
- Tuchman, G. (1978). *Making news: A study in the construction of reality*. The Free Press.
- Van der Linden, S., Maibach, E., & Leiserowitz, A. (2015) Improving public engagement with climate change: Five “best practice” insights from psychological science. *Perspectives on Psychological Science*, 10(6), 758–763.
<https://doi.org/10.1177/1745691615598516>
- Van Gorp, B. (2007). The constructionist approach to framing: Bringing culture back in. *Journal of Communication*, 57(1), 60–78.
- Van Gorp, B. (2010). Strategies to take subjectivity out of framing analysis. In P. D’Angelo & J. A. Kuypers (Eds.), *Doing news framing analysis: Empirical and theoretical perspectives* (pp. 84–109 [ebook]). Routledge.

- Wareham, B. (2019, June 4). *Daily digest: Setback for Line 3*. MPR News. Retrieved June 18, 2020 from <https://www.mprnews.org/story/2019/06/04/daily-digest-setback-for-line-3>.
- Weathers, M. R., & Kendall, B. E. (2016). Developments in the framing of climate change as a public health issue in US newspapers. *Environmental Communication, 10*(5), 593–611. <https://doi.org/10.1080/17524032.2015.1050436>
- Wood, T. (2019). The many voices of business: Framing the Keystone pipeline in US and Canadian news. *Journalism, 20*(2), 292–312. <https://doi.org/10.1177/1464884917717536>
- Wozniak, A., Wessler, H., & Lück, J. (2017). Who prevails in the visual framing contest about the United Nations climate change conferences? *Journalism Studies, 18*(11), 1433–1452. <https://doi.org/10.1080/1461670X.2015.1131129>
- Zehr, S. C. (2000). Public representations of scientific uncertainty about global climate change. *Public Understanding of Science, 9*(2), 85–103. <https://doi.org/10.1088/0963-6625/9/2/301>
- Zukas, K. J. (2017). Framing wind energy: Strategic communication influences on journalistic coverage. *Mass Communication and Society, 20*(3), 427–449. <https://doi.org/10.1080/15205436.2016.1266660>

Appendix A: Sampling Background and Details

Sampling frame: Outlets omitted from study

The original conception for this project also included the Cloquet *Pine Journal* and Minneapolis *Star Tribune* in the study sample. The *Pine Journal* was originally selected due to Cloquet's location in a county affected by the proposed Enbridge Line 3 replacement route and its availability in University-accessible databases; the *Star Tribune* was originally selected to represent Minnesota's newspaper of record. These papers were eliminated from the sample when search results in all papers yielded a greater quantity of articles than the study was able to accommodate. The Cloquet *Pine Journal* was eliminated because it was the only northern Minnesota paper that was not located in a county seat. The *Star Tribune* was eliminated because the study's main point of interest was how local newspapers covered the issue. The Cloquet *Pine Journal* was instead used as a source for testing the study's coding instructions.

Sampling frame: Article collection details

The search term used for the study ("line 3" AND enbridge) requested results from all of the newspapers originally identified for inclusion in the study. This search yielded 785 total results; the total number of articles was reduced with the removal of the Cloquet *Pine Journal* and the *Star Tribune* (details to follow). Using the Access World News database presented challenges in downloading search results: when users wish to download multiple articles, the database compiles results into PDFs containing 20 articles each instead of separating the PDFs into individual files. Since separate files were needed in order to distribute articles to coders, the university librarian ran the search in the

database, downloaded the articles in PDF form, and used a Python program to extract the text and save each article as an individual text file.

Sampling frame: Search term development

The final search terms to be used were established after trying a few iterations. The researcher's preliminary search for content to assess availability in October, 2018, suggested a small body of articles on the topic. (No data was analyzed at that time; only a count of number of articles in the Access World News database and individual news outlets' sites were assessed.) The search terms used at the time included "*enbridge line 3*," "*enbridge line three*," or combinations of the two connected by the Boolean operator OR. In one case searching the database for the *Superior Telegram*, *enbridge line 3*, without quotes, was used as a search term and revealed many more results than the search terms in quotes. These preliminary searches were conducted with a variety of database filters, including filtering by state (North Dakota, Minnesota, and Wisconsin) and filtering by outlet (e.g. the *Grand Forks Herald*, the *Bismarck Tribune*, the *Superior Telegram*, the *Duluth News Tribune*, the *Wisconsin State Journal*, the *Star Tribune*, etc.). In some cases, websites for papers were searched when they did not appear in the Access World News database but were still being considered for inclusion at the time (including the *Cavalier Chronicle* in North Dakota and the *Brainerd Dispatch*).

In May 2019, the researcher consulted with the university librarian to discuss data collection options. The librarian suggested using the search terms *enbridge AND "line 3"* at this time. "*line three*" had been tried during this consultation but did not yield many results. The researcher recalls observing that the pipeline was not always referred to as "Enbridge Line 3" in database search results' content previews, but was sometimes

referred to simply as “line 3”; this may have informed the recommendation for the *enbridge AND “line 3”* search term.

Search terms were finalized in October, 2019, after testing additional iterations in the Access World News and the ProQuest Global Newsstream databases (both for outlets with the potential to be included in the test code sample and the study sample). The researcher compared the volume and potential relevance of search results for both “*enbridge line 3*” and *enbridge line 3* by scanning the search results’ headlines. The search terms without quotes yielded a higher volume of articles that appeared relevant in these initial reviews, so they were used to search for articles in the outlets selected for the actual study sample. When searching for *enbridge line 3 OR enbridge line three* (with date ranges of 1/1/2013-7/31/2013) in the actual study sample outlets, the search results (headlines, bylines, and article previews) were scanned again for relevance; some articles appeared to be irrelevant at first glance, but were not formally identified as such. The total number of articles amounted to 894. At this point, the researcher recalled the librarian’s suggested *enbridge AND “line 3”* search term and tested it. The search term reduced the number of articles from 894 to 786. The differences in results for each outlet ranged from 6 (in the *Bemidji Pioneer* and *Walker Pilot-Independent*) to 27 (in the *Star Tribune*). The search term with “line 3” in quotes selected because it was assumed to be more precise and would be more effective in filtering out irrelevant pieces.

Sampling frame: Relevance criteria development details

Previous knowledge about the Enbridge Line 3 issue and previous research were considered in establishing article relevance criteria. The researcher’s general knowledge of protests related to Enbridge Line 3 and its governmental review process informed early

drafts of inclusion criteria. Reviews of search results conducted in order to select search terms and identify duplicate articles (both within outlets and across outlets) may also have informed these standards. Research articles suggested keeping articles with at least one paragraph about the topic of research (Kojola, 2017) or at least one sentence about the topic of research (Hart & Feldman, 2014). Others noted eliminated articles that included only “passing” references to the topic (Dusyk et al., 2018, p. 15). This study adopted Hart and Feldman’s criterion of having at least one sentence about Enbridge Line 3. The decision to cast a wide net for content inclusion was intended to address both the study’s research questions and practical concerns. Part of the study’s goals was to evaluate how Enbridge Line 3 was framed and defined in news coverage; it was conceivable that a single sentence about the pipeline could present it within a frame. Including a larger range of articles for consideration would also facilitate completion of the study within its time and budgetary constraints. Less additional time would be needed in order to re-draw a sample and incorporate it into the coders’ assignments if more articles were considered to be relevant for the study. Note that after completing the coding, the researcher acknowledged that the single-sentence criterion was not as clear or effective as had been hoped. This is addressed in the discussion and limitations sections.

Random sampling procedure details: Initial sample

Search results were copied into separate spreadsheet tabs for each outlet, where the spreadsheet row in which articles appeared became part of their respective IDs. Article IDs were assigned as follows: the acronym for the news outlet followed by the number of the spreadsheet row in which the article appeared.

Articles were selected using a random number generator on February 19, 2020 (Haahr, n.d.) in a manner similar to Riffe and colleagues' (2014) recommendations. Numbers were generated one at a time and translated to corresponding article IDs—for example, if the number “49” were randomly generated when preparing the sample for the Duluth News Tribune, the number “49” would be translated to the article ID “DNT49.” The corresponding article IDs were then recorded in a spreadsheet one at a time in order to best approximate a sampling-with-replacement scenario, so that all articles would have an equal chance of being selected (Neuendorf, 2017). The sampling with replacement scenario was modified slightly: when a randomly-generated number was duplicated, the researcher recorded it, marked it with a strike-through and indicated it was a duplicate, and then randomly selected another number to take its place. While this did alter the desired sampling with replacement strategy, it was done in order to avoid having duplicate articles in the sample and to achieve a full sample of unique articles. This process was completed for each outlet until the requisite number of articles was selected. Randomly selected articles were highlighted in the sampling frame spreadsheet to assist in record-keeping and to help verify that the correct articles were being drawn and re-titled with the correct IDs from the Access World News database output. (Articles that were drawn from the search term and parsed into separate text files by the university librarian were labeled with generic serial numbers. Each text file that corresponded to a randomly-selected article ID needed to be located and compared to the data in the sampling frame spreadsheet to ensure that it was the right one.)

Random sampling procedure details: Intercoder reliability subsample

A list was made of the initial sample by copying the selected article IDs into a new spreadsheet. The article IDs were copied into the new list as they were randomly drawn (i.e., organized outlet-by-outlet, but not sorted numerically). A column was created next to the column of article IDs to assign an Intercoder Reliability Draw ID number corresponding to the row in which the article ID was listed. Random numbers from 1 to 50 were generated via random.org using the generation procedure outlined above on February 20, 2020 (Haahr, n.d.). The article IDs that corresponded to the Intercoder Reliability Draw ID numbers were then recorded in order in a spreadsheet and highlighted in the full sample list. The intercoder reliability subsample selection process differed from the regular sample selection in that it was not deliberately stratified into separate lists or chosen proportionally to the full sample. During the coding process, coders identified 12 intercoder reliability subsample articles that were not relevant for the study. Replacement articles were drawn from the overall sampling frame (not the initially-drawn study sample) on April 10, 2020, and April 27, 2020, and added to each coder's assignment in order to return the fully-coded reliability subsample to 50. That number was reduced to 48 due to errors in assigning new articles and the researcher's removal of two irrelevant articles that had not also been identified by the coders. Those two irrelevant articles were not able to be replaced because the coders' employment term had finished. All coders coded the intercoder reliability sub-sample, including the researcher. See data analysis plan in Chapter 4 (Results) for additional details.

Appendix B: Data Collection Disruption and Transition

Data collection procedures were interrupted and altered in response to the Covid-19 pandemic. Coders were originally directed to use paper coding sheets to code articles and record data. Paper coding sheets were provided to each coder in batches for this task. Coding was disrupted approximately two to three weeks into the data collection process due to social distancing measures necessitated by the Covid-19 pandemic. When Covid-19 social distancing measures eliminated the potential for in-person meetings, the researcher investigated other options for continuing data collection, including mailing paper code sheets and developing an online data collection form. Although moving the data collection from a paper to an online form presented potential consistency challenges, using such a form presented advantages as well: it was more cost-effective and efficient than shipping hard copy forms to and from coders; and it was a more secure way to store the data (by avoiding the need to mail the only copy of completed data forms).

A new digital code form was developed using the Qualtrics survey platform. The digital code form's presentation of variables matched those in the original paper code sheet, with a few exceptions. Instead of providing spaces for coders to record their codes, the new coding sheet presented each variable as a survey-style question, with coders selecting the appropriate code by clicking on the corresponding answer choice. The climate change frame definitions from Nisbet (2010b) were not included on the digital code form out an abundance of caution for complying with copyright permissions restrictions; instead, the digital code form directed coders to refer to their coding instructions for the definitions. A section for notes was added to the final page of the survey that was not present on the paper form (the coders had been directed to take notes

on the paper coding forms, but no space was provided). A section summarizing the coders' responses was also added to the final page of the survey to facilitate coders' review of their responses. Coders would have previously been able to review the paper sheets quickly. On an online coding form they would have had to click back and forth through multiple pages; including an automatic summary of their responses at the end was designed to streamline that process. The researcher consulted with the University of Minnesota Liberal Arts Technologies and Innovation Services to learn about Qualtrics functionality and test drafts of the form.

Coders were trained via a Zoom meeting on how to use the Qualtrics form for data collection upon its completion. Coders had previously used Qualtrics and were familiar with its functionality. The researcher explained to coders how to access the form, how it was organized, and its new features. The researcher and coders discussed options for how coders could take notes while coding with the digital form in lieu of writing notes directly on code sheet; coders suggested that the most efficient means for them would be to take notes on PDF copies of the articles via digital tablet or highlighting. Coders were allowed to use the method that worked best for them. Goal times for completing coding for each article were revised when the researcher tested the Qualtrics form; it was estimated that coding each article could take up to 20 minutes instead of the originally-estimated 10-15. The researcher explained to coders that when using digital code sheet they should aim to code approximately 3-4 articles per hour instead of the original 4. When researcher the coded her share of the articles, coding took more time because of extensive note-taking on paper and then transferring notes to digital form. Before re-starting the coding of new articles, coders were instructed to use the Qualtrics

form to enter data from their already-completed paper code sheets. Coder 1 entered approximately 50 sheets; Coder 2 entered 28 sheets. This allowed coders to familiarize themselves with using the form before coding new articles.

When re-starting the coding process, the coders were provided with a document containing a link to the Qualtrics form, instructions for how to conduct the first coding session back (including taking 30 minutes to re-read coding instructions in depth and devoting at least 1.5 hours to the coding session in order to use the codebook with multiple articles). The document also provided notes on how to conduct subsequent sessions, including specifications for the coder ID to use with Qualtrics, the approximate amount of time to spend coding each article, and reminders to refer to the coding instructions for clarification during the coding process and to find definitions of climate change frames. The researcher referred to these instructions as well when beginning her section of the coding (although as previously mentioned she spent more time coding each article and taking notes).

Due to delays in coder training, the necessity for Qualtrics training, and limits in the coder grant budget, coders were unable to code all articles in the sample. The researcher as a result coded the remainder of the articles, along with the assigned intercoder reliability sub-sample.

Appendix C: Pipeline Frame Selection, Development, and Refinement Procedure

Details

Frame selection process

Pipeline frames

After identifying which frames appeared in multiple studies, the definitions and indicators for each variation were analyzed and consolidated into a single representative frame for each category. For instance, environmental frame elements from across all studies were examined to find commonalities and establish an environmental frame to be used in the present study. Definitions and indicators for each frame had been compiled in a spreadsheet during the tallying process. The frame definitions' level of detail ranged from simple frame names and keywords to full names, codes, and specific illustrated examples. The defining elements for each study were considered regardless of the variation in detail.

Entman's (1993) definition of framing provided the basis for organizing and recording frame elements and functions during comparison and compilation, an approach that others have used in various forms as well (e.g. Nagler et al., 2016). The elements included keywords and stock phrases. Functions included "problem definition," "causal interpretation," "moral evaluation," and "treatment recommendation" (Entman, 1993, p. 52). A spreadsheet was created that included these elements as separate columns. When analyzing the literature's definitions and indicators, commonalities between studies were recorded here and sorted by the function they performed according to the researcher. Some of Entman's framing devices were not included, such as stereotyped images, sources of information, and "sentences that provide thematically reinforcing clusters of

facts or judgements” (p. 52). Stereotyped images were not included because of the focus on textual rather than visual material. Sources of information were considered elsewhere in the study. Examples of the final framing device were not uniformly provided in research articles. When they were, they were typically presented as examples of frames. They were not treated as their own device, but rather used as either a source for typical keywords or as a way to inform the researcher’s understanding of the problem definition that the frame offered.

Frames from each study were grouped into similar categories (e.g., all environmentally-related frames, all economic-related frames). Their definitions and indicators were then examined and translated into the appropriate Entman frame device or function category. Most frame definitions fell into the “problem definition” or “treatment recommendation” categories. For example, one environmental frame definition could present the oil pipeline as contributing to climate change; another one could define the oil pipeline in terms of its potential to cause leaks or spills—both were interpreted as problem definitions. By contrast, an economic frame could emphasize a pipeline project’s ability to create jobs—those frames definitions were interpreted as “treatment recommendations” in that they could be suggesting the pipeline as a remedy to the (possibly unnamed) problem of a lack of jobs in a community.

To construct the definitions and select indicators for this study’s frames, indicators, problem definitions, and treatment recommendations were compared for each frame category. Components that appeared in multiple studies were included in the study definitions. Those that appeared in only one study were assessed to determine whether they could logically also contribute to or be indicators of the frame; if they could, then

they were included as potential indicators of that frame. For instance, Wood (2019) identified the potential for an oil pipeline to damage “aquifers” or “farmland” (p. 303). While these specific indicators were not highlighted in other stories, they were deemed to be sufficiently logically similar to other frame indicators such as “terrestrial ecosystem” impacts (Dusyk et al., 2018, p. 16) and “impact on rivers, streams, and watersheds” (compiled from Dusyk et al., 2018; Firtova, 2017; Kojola, 2017) to be included in the final environmental frame. Additional considerations were taken into account when frame definitions and identifiers demonstrated more variation and inconsistencies (explained below). The complete set of frames and indicators derived from this process and their subsequent revisions, can be found in the coding instructions (Appendix F).

Issue-specific pipeline frame development details

Environmental frame

The environmental frame was a clear choice for analysis, as nine studies included frames for environmental concerns and related issues (environmental justice). Likewise, multiple studies showed that it was a primary frame in news coverage on pipelines (Dusyk et al., 2018; Kojola, 2017). Indicators from studies on oil pipelines and Canadian oil sands were considered for the frame definition. Indicators for the studies on hydraulic fracturing (Hedding, 2017; Olive & Delshad, 2017) were excluded because while the two different energy sources and extraction technologies share some potential environmental impacts (e.g. threats to water quality), other potential impacts diverge and are unique to one source (e.g. threat of earthquakes and hydraulic fracturing).

The resulting definition for the *environmental frame* is one that *discusses the pipeline project in terms of the impacts it could have on the environment and the human*

and natural beings that depend upon it, whether in terms of climate change/global warming, human health, ecosystems, or spills and leaks. Indicators like climate change and the pipeline project's potential impacts on natural water systems and/or clean water supplies were derived from the work of Dusyk et al. (2018), Firtova (2017), Kojola (2017), Lawlor & Gravelle (2018), and Wood (2019), all of which mentioned these factors in some form. In addition to the pipeline's potential effects on water systems, its potential impacts on the land were also common, whether as references to "farmland" (Wood, 2019, p. 303), wildlife "habitats" (Kojola, 2017, p. 909), the general local environment or "terrestrial ecosystems" (Dusyk et al., 2018, p. 16; Lawlor & Gravelle, 2018). Many works included the pipeline's potential to either increase or decrease the likelihood of oil leaks or spills as a potential environmental frame indicator (Dusyk et al., 2018; Kojola, 2017; Lawlor & Gravelle, 2018; Wood, 2019). Although one study listed "spill" as an indicator of both an environmental and a safety frame (Lawlor & Gravelle, 2018, p. 673), it was assigned to an environmental frame here due to its inclusion in environmental frames in so many other studies.

Some indicators were more difficult to assess. The literature did not uniformly align impacts on human health and safety as indicators of an environmental frame, with some studies designating separate health and/or safety frames (e.g. Dusyk et al., 2018; Lawlor & Gravelle, 2018). Nonetheless, per Kojola's (2017) and Wood's (2019) examples, health and safety were folded into broader environmental frames or frame categories, given that the hypothetical threats to human health and safety could be linked to environmental contamination from pipeline failures. References to protests and activism were found as environmental indicators in some studies (Kojola, 2017; Lawlor

& Gravelle, 2018) but were excluded from the environmental frames because of their potential to signal conflict and strategy frames (to be discussed later).

Economic frame

Economic frames appeared in all studies reviewed for this frame construction. Like the environmental frame, the literature demonstrates that news coverage commonly defined oil pipelines in economic terms (Dusyk et al., 2018; Kojola, 2017). This study defines an *economic frame* as one that *discusses the pipeline project in terms of the way it relates to economic concerns such as markets, employment/jobs, business development and success, and financial success or failure.*

Examples of economic frame definitions and indicators in the literature were generally consistent or similar across studies, with one major exception. Lawlor and Gravelle (2018) established “employment” and “trade” (p. 673) as two separate frames of interest, both of which relate to economic issues. Since jobs and employment are used in multiple studies to indicate an economic frame (Dusyk et al., 2018; Kojola, 2017; Wood, 2019), Lawlor and Gravelle’s frame indicators for “employment” were similarly absorbed into the overall economic frame. Although their indicators for “trade” do not have exact matches in other studies’ frames, they do logically indicate economic aspects of trade issues: “import,” “export,” “trade.” Their other trade indicators (“bilateral,” “multilateral,” “NAFTA”, 2018, p. 673) are somewhat more ambiguous, potentially being used to describe either diplomatic and political elements, or trade agreements and economic relationships. As such, the trade frame was also folded into the economic frame.

Many aspects of economic frames centered around a pipeline project's potential benefits—designated as being analogous to Entman's (1993) treatment recommendation frame function. Discussions of the pipeline's "job creation" potential were among the most common economic frame indicators (Crow & Lawlor, 2016; Dusyk et al., 2018; Kojola, 2017, p. 903; Lawlor & Gravelle, 2018; Wood, 2019). Highlighting a pipeline project's ability to improve local or national economies was also common (Dusyk et al., 2018; Kojola, 2017; Moore, 2019; Wood, 2019).

The "development" (Firtova, 2017, throughout) of the oil sands industry and the impacts on oil companies also appeared as frequent frame signals (Dusyk et al., 2018; Firtova, 2017; Wood, 2019). Some researchers identified discussions of the cost of fuel and energy extraction and use, including "gas prices" and heating costs (Firtova, 2017; Kojola, 2017; Wood, 2019, p. 311).

Some studies highlighted potential economic problems related to the pipeline: a failure to build the pipeline would yield negative economic consequences (Dusyk, 2017; Kojola, 2017; Moore, 2019), or in one locally-focused example, protests against a pipeline (Dakota Access) would be financially detrimental to taxpayers and local businesses (Moore, 2019).

A number of catch phrases and specific keywords were highlighted in Lawlor & Gravelle (2018) and Moore (2019). They are included as potential economic frame indicators here as well (see coding instructions in Appendix F).

National Interest

Frames that defined oil pipeline projects in terms of their impact on the host country's overall wellbeing (outside of an economic point of view) were also frequently

used, appearing in four of the studies considered here. The names and definitions for these frames varied more across studies than did the environmental and economic frames. Two common elements did, however, appear in different iterations across those frames: the need for either the United States or Canada (depending on the origin of the news in the samples) to maintain a reliable energy supply and the countries' respective needs to make decisions in their own interest. Moore (2019), drawing from Gamson & Modigliani (1989), identified an emphasis on the United States' need to provide for its own energy needs, and identified the frame as "energy independence" (p. 81). Kojola (2017) defined a similar frame as "promoting the national interest" (p. 903). This frame incorporated elements of energy security, the advantages of building infrastructure that would enable the U.S. to exploit Canadian energy resources, and the pipeline's safety. Raso & Neubauer (2016) designated two similar frames: "national interest" and "pipelines as a critical component of Canada's energy security" (p. 127). Wood (2019) categorized "energy dependency" and "national security" frames, along with "terrorism," under the broader category of "security" (p. 311).

This study follows Kojola's example and conceptualizes these interrelated concerns as an attempt to define issues of oil pipeline projects as broadly serving the national interest. It casts energy independence as being valuable for countries in that they require dependable energy sources to function successfully. It also incorporates the idea that energy independence enhances a country's economic health and its national security, in that it provides a path away from relying upon politically compromised countries for energy supply. "National interest" captures the broader context for why the concepts of

energy security, energy independence, and national security would provide attractive means to depict an oil pipeline.

The resulting frame is thus *national interest*, which *defines the issue of the Enbridge Line 3 pipeline as being part of a larger conversation about how the United States' reliance on different kinds of energy resources affects its security and prosperity.*

The United States' and its overreliance on other countries for energy resources is one way that this frame could define the broader problem into which the pipeline fits (Kojola, 2017; Moore, 2019; Wood, 2019). Similarly, the arguments that oil pipelines could help the United States better exploit energy supplies from stable political entities, whether its own (Moore, 2019) or an amicable ally like Canada (Kojola, 2019) and in doing so extricate itself from the potential to enter armed conflicts in politically precarious but "oil-rich" regions (Kojola, 2017, p. 908; Wood, 2019) represents a treatment recommendation for this frame. Additionally, problem definitions and treatment recommendations pertaining to the role that sufficient energy supplies play in maintaining economic prosperity contribute to the national interest frame (Kojola, 2017). Specific keywords taken from Moore and Kojola appear in the coding instructions in Appendix F.

It is important to note that Wood's (2019) "terrorism" frame has been omitted from the broader "national interest" frame (p. 311). It will be incorporated into the "safety" frame, to be discussed below.

Conflict/strategy

The next two common frames, *government and politics* and *conflict and strategy* were somewhat challenging to define, as both sets of frames incorporated political elements and frame descriptors in a handful of studies were ambiguous.

Elements of the conflict/strategy frame were most easily identifiable across studies. Some labeled frames explicitly as “conflict” (Moore, 2019, p. 87) or “conflict/strategy” (Hedding, 2017, p. 374) and developed definitions that were rooted in existing conceptualizations from the literature. These frames highlighted disputes between opposing groups or actors, tracking “winn[ers]” and “lose[rs]” (Hedding, 2017, p. 374) and using combative word choices like “boiling over” and “standoff” (Moore, 2019, p. 88). In other studies, frame names like “political controversy” (Kojola, 2017, p. 903) and “political gamesmanship” (Wood, 2019, p. 311) reflected the elements of discord and strategizing that the conflict/strategy frame typically exhibits (e.g. Cappella & Jamieson, 1997). Kojola’s frame indicators align with conflict/strategy frames as well. Much like Moore, he identifies “violent language and war symbolism” as indicators of a political controversy frame (Kojola, 2017, p. 907).

Though Kojola’s and Wood’s frame examples differed slightly from the traditional conflict/strategy frame, they cohered with its overall meaning. Kojola (2017) emphasized the role of a political arbiter (U.S. President Barack Obama) at the center of the Keystone XL pipeline conflict and how adversaries competed for his political weight to achieve their preferred outcomes. When portrayed as the political gatekeeper that would advance or impede each stakeholder group’s objectives, the focus on a central figure enhances rather than detracts from the strategic frame construction (Kojola, 2017). The frames Wood (2019) identifies as representing “political gamesmanship” are not

characterized with the heated language of a conflict frame (p. 311). They do, however, emphasize the role that an oil pipeline might play in political strategy, whether on the international or domestic stage. His “diplomacy” frame defines an oil pipeline as having the potential to shift the balance of power between two countries (apparently the United States and Canada) and a “national image” frame that emphasizes a pipeline’s potential to “bolster” a nation’s “international reputation or stature” (Wood, 2019, p. 311).

Domestically, Wood’s “problems for politicians” underlines how politicians’ positions on the Keystone XL pipeline can affect their “relative popularity, electability, or image” (2019, p. 311). The component of this frame that focuses on achieving political favor exemplifies the strategic side of the conflict/strategy frame, and as a result both are incorporated into this study’s conflict/strategy frame definition.

The *conflict/strategy frame* is hereby defined as one that *portrays the pipeline issue primarily as a conflict between opposing sides, each vying to win*. Translated into a problem definition, this frame portrays the issue as being one where two (or more) opposing sides have conflicting perspectives about the pipeline and are working to promote their own respective goals (Hedding, 2017; Kojola, 2017; Moore, 2019; Olive & Delshad, 2017). Drawing from Wood (2019) and Kojola (2017), indicators of this frame can highlight how the actions of political entities like states, politicians, interest groups, or political groups are being used to influence the outcome of the issue, shift balances of power, and shift public perceptions. A focus on a single political figure or decision maker can signify the conflict/strategy frame, if the focus is on that actor needing to choose between sides and those sides’ attempts to influence the decision (Kojola, 2017). Portrayals of conflict, including conflicts between worker/middle class concerns and

“radical” or “wealthy liberal” concerns also signal this frame (Kojola, 2017, p. 906) as do combative language choices—see coding instructions in Appendix F (Kojola, 2017; Moore, 2019).

Government/Politics

A *government and politics frame*, by contrast, does not emphasize conflict, competition, or political schemes. Instead, it *highlights the relationship between the issue of the pipeline and the functioning of government and political processes*. Frames from the literature that highlighted regulations and government processes (Hedding, 2017; Wood, 2019) form the foundation of this frame. Hedding’s (2017) definition from her study on hydraulic fracturing suggests a broad, procedural frame, one that is “focused on how bills or regulations are being administered” (p. 374). Wood’s (2019) “regulation and government processes” category, however, include more precisely defined frames (p. 312). “Harsh” or “weak regulation” frames could by turns define the issue as one where burdensome or strict regulatory processes hamper pipeline construction, or one where such oversight has come up short (Wood, 2019, p. 312). His “political gridlock” frame offers a problem definition where politicians fail to make or enact policy decisions surrounding a pipeline because they are too busy engaging in partisan disputes or they avoid the issue altogether because of its conflicted nature (Wood, 2019, p. 312). (Note that the focus here is on the lack of policy progress, not on the conflict that causes it.) These indicators are reflected in more generically named “political” (Dusyk et al., 2018, p. 20) and “political perspective” (Moore, 2019, pp. 106 and 109) frames from other studies, although those frames cover more conceptual ground and thus are somewhat more difficult to integrate with the two from Hedding and Wood.

Potential elements of both the government/political processes frame and the conflict/strategy frame appeared in Dusyk and colleagues' (2018, p. 20) "political" frame and Olive & Delshad's (2017) "politics" frame and were thus more difficult to assign. Dusyk et al. (2018) identified three main political sub-frames: political "participation and democracy," "political other," and "regulatory streamlining" (p. 20). The regulatory streamlining sub-frame demonstrated clear thematic ties to Hedding's (2017) and Wood's (2019) respective administrative and regulatory processes frames. The "participation and democracy" (Dusyk et al., 2018, p. 20) sub-frame was not elaborated upon, but was interpreted as relating to risks and benefits to democracy from a political participation standpoint, and therefore categorized as a broad political process. Dusyk and colleagues' (2018) main politically-framed risk was "backlash" against Northern Gateway pipeline-favoring politicians (p. 16)—an example that resembled both indicators for Wood's (2019) "political gridlock" frame (p. 312) and his "problems for politicians" (p. 311) frame (absorbed into the *government and politics* and *conflict/strategy* frames, respectively). Since Dusyk et al. (2018) did not elaborate on the political consequences (e.g. electability) of recoiling opinion, their frame indicator was included in the more general government and politics frame.

The codes that denote a politics frames in Olive & Delshad's study on hydraulic fracturing (2017) represent the widest range, including regulation strength or absence, "energy independence," fracking "moratorium," "corruption," and the assertion that "fracking is safe" (p. 792). Since energy independence and safety are both addressed in other studies as separate frames, they will not be included in the political frame here. Moratoria on fracking as a concept was judged to not apply to the topic of the Line 3 oil

pipeline product source, so it is excluded. The indicators regarding regulation strength and absence match Wood's (2019), and so are included. Corruption is included as a general aspect of political processes.

The collective problem definitions that signal the presence of a government and politics frame therefore include: Whether or not government regulations and processes concerning the pipeline project may be too strict (and therefore hinder progress) or too lenient (Olive & Delshad, 2017; Wood, 2019). General discussions of how regulations are implemented or altered similarly indicate the government and politics frame (Dusyk et al., 2018; Hedding, 2017). The frame may be indicated by discussions of partisan conflict and its impact on either the procedural aspect of policymaking or general “backlash” against politicians (Dusyk et al., 2018, p. 16; Wood, 2019). Finally general discussions of other miscellaneous political issues: participation (Dusyk et al., 2018), corruption (Olive & Delshad, 2017), or politicians' stances on a pipeline, without highlighting conflict or combative words (Moore, 2019).

Indigenous

Frames that focus on pipelines' impacts on Indigenous or First Nations groups appeared in three studies reviewed here. (Moore's (2019) “environmental justice” frame also addresses impacts on Indigenous groups, but with a narrower focus to be described elsewhere.) The connection between pipeline projects, Indigenous groups, and land rights appears in Wood's (2019) “Native land” frame, asserting the potential of the Keystone XL pipeline to threaten native communities and “lifestyles” and its construction as a “violat[ion]” of the land rights (p, 311). Note that the other frames included in Wood's Land Rights category—“eminent domain” and “state and provincial rights” are not

included in this analysis, as they are not reflected in the other literature reviewed here (p. 311). Dusyk et al. (2018) analyzed broadly for whether First Nations references were modified with “risk,” “benefit,” and “no harm” frames (p. 20), and identified First Nations’ land rights as potential risks to the Northern Gateway pipeline project. It is important to note that the dissonance between Wood’s (2019) and Dusyk and colleagues’ (2018) frames do not necessarily indicate that they are different frames. Following Entman (1993) and Chong & Druckman (2011), frames are not synonymous with policy stances or opinions. An Indigenous frame, like an environmental, economic, or any other frame, has the potential to present either support or opposition for the pipeline.

With this caveat in mind, this study defines an *Indigenous frame* as one that *emphasizes the impacts that the pipeline project may have on First Nations/Indigenous/Native groups and vice-versa. Impacts could be positive or negative. Frame could also emphasize neutral associations between the pipeline project and First Nations/Indigenous/Native groups.* Translated to a problem definition, the literature’s indicators suggest the following: First Nations/Indigenous/Native groups’ land rights and the pipeline project’s land use needs are in conflict (Dusyk et al., 2018; Wood, 2019). To draw from Wood (2019) and provide an example of a risk to First Nations/Indigenous/Native groups as suggested in Dusyk et al. (2018), this frame could also define the pipeline construction as being detrimental to those groups. A pro-pipeline Indigenous frame could take the form of a treatment recommendation stating the pipeline project’s potential to benefit First Nations/Indigenous/Native groups by creating jobs and revenue (though this specific example was not provided in the foundational literature).

Keywords from Lawlor & Gravelle (2018) appear in the coding instructions in Appendix F.

Safety

Frames that specifically addressed safety concerns appeared in four pipeline studies and one fracking study (Crow & Lawlor, 2016; Dusyk et al., 2018; Lawlor & Gravelle, 2018; Moore, 2019; Olive & Delshad, 2017). Safety was also addressed as sub-categories or as indicators for other frames: environment (Wood, 2019), “promoting the national interest,” (Kojola, 2017, p. 903) and “devil’s bargain” (Moore, 2019, p. 82–83). Definitions and indicators for environmental, safety, security, and national interest frames demonstrated a degree of overlap. To determine which indicators should belong to which eventual frames, the overlapping indicators for each frame were identified, listed and sorted into frame categories, and then compared. For instance, references to oil spills and leaks were indicators in both environmental frames (Dusyk et al., 2018; Kojola, 2017; Lawlor & Gravelle, 2018; Wood, 2019) and safety frames (Lawlor & Gravelle, 2018). Likewise, environmental frames included references to pipelines as a threat to human health and safety (Kojola, 2017; Wood, 2019). Dusyk et al. (2018) assessed a combined “health and safety” category (p. 20). As mentioned above, health and human safety indicators were assigned to the environmental frame. Since the potential for leaks and spills was also more consistently used in environmental frames as opposed to safety frames, those indicators were included there as well.

Remaining definitions that highlighted simply the aspect of a pipeline’s safety in comparison to other transportation modes appeared in Wood’s (2019) environmental frame. These indicators were grouped with indicators from specifically designated safety

and security frames. Moore's (2019) "pipelines are safe" frame included indicators that highlighted the oil industry's integrity in ensuring safety, and the pipelines' various safety features and the advanced technology used to develop them (p. 101). Lawlor & Gravelle (2018) listed keywords relating to safety, explosions, derailments, "border security," railway oil tankers ("DOT 111") (DOT-111 tank car, 2020), and terrorism (p. 673). Interestingly, Wood (2019) also referenced the potential for pipelines to become sites of terrorist activity in his "security" frame (p. 311). Note that Kojola's (2017) "safe pipeline" indicator from the "promoting national interest" frame has been omitted from consideration, as it was not described in detail (p. 903).

Because these frames and indicators do not highlight potential environmental or human impacts of safety issues, they were used to develop a separate *safety frame*, which was defined as *placing emphasis on safety of the pipeline, but without drawing connections between human and environmental health*. Specific indicators or problem definitions that would indicate a safety frame would be that pipelines could become objects of terrorist activity (Lawlor & Gravelle, 2018; Wood, 2019) or that pipelines are either more or less safe than other methods for moving oil (Wood, 2019). Potential treatment recommendations that could be offered in a safety frame would be that the oil industry is "trustworthy" and has developed safety features like "monitoring and shutoff systems" technology, "thicker" construction materials, extra precautions in ecologically sensitive areas, installation site depths, and "inspection" routines (Moore, 2019, p. 101–102). Additional keywords appear in the coding instructions in Appendix F.

Foreign Intervention

Iterations of the *foreign intervention frame* were found in two studies. Wood's (2019) "foreign intervention" frame highlighted the perspective that external actors with stakes in the Keystone XL oil pipeline tried to influence its standing on the "domestic political agenda" (p. 312). Raso & Neubauer (2016) identified a similar pro-pipeline frame in their analysis of Canada's Northern Gateway pipeline that asserted foreign entities were funding anti-pipeline actors. Few other indicators were provided, but the frames' presence in multiple studies suggests a level of generalizability and is so included here. The working definition for this frame is: *pipeline issue is portrayed as a target for foreign organizations, institutions, and actors (including "governments, companies, individuals, or NGOs", per Wood, 2019, p. 312) to influence. Actors may use financial support or other methods as a means to influence progress of the issue.*

Environmental Justice

The final frame is an *environmental justice* frame. The inclusion of this frame diverges from the others' (i.e. that they must be included in multiple studies). It has been included due to the author's personal knowledge of perspectives that activists involved with protesting the Enbridge Line 3 have promoted (MN350). The *environmental justice* frame *highlights the power imbalances and historically-informed marginalization of racial and ethnic groups within an environmental impacts context.* Derived from Walker (2011), Moore (2019, pp. 85–87) used it to describe how newspaper coverage of the Dakota Access Pipeline and Standing Rock protests defined that pipeline as an environmental issue that exposed "power imbalances" between entities like oil companies and the government and Indigenous groups (p. 87). Power differentials can be revealed in terms of which groups of people might face more exposure to environmental

contamination risks than others, which groups have the stronger ability to participate in deciding outcomes, and which groups might be excluded from deciding outcomes (Moore, 2019). Moore's examples highlight the threat to the Standing Rock tribe's water supplies and the overall enhanced risks that Indigenous groups face in comparison to non-Indigenous groups. Moore's environmental justice frame furthermore juxtaposes the financial advantages that powerful groups might enjoy as a result of the pipeline's construction with the disregarding of tribal rights, needs, and treaties.

Frame and variable changes in detail

Pipeline frame definitions

Pipeline frame and other variable definitions were adjusted throughout the process of test coding and coder training.

The environmental pipeline frame definition was updated to clarify its distinctions from the safety frame and clarify coding procedures when indicators for other frames appeared in close proximity to it. The general "safety" indicator was removed from the environmental frame to distinguish it from the safety frame. The environmental frame's human safety indicators were restricted to human safety in an environmental health capacity, in contrast to the threats to human safety that may occur in the event of a terrorist attack or explosion—indicators that were included in the safety frame.

References to "wild rice" and "wild rice waters" were incorporated as environmental frame indicators in response to questions raised in coder training (e.g. Karnowski, 2017, headline). References to these on their own were considered an example of a general environmental factor or water systems; pairing with mentions of Native American groups could indicate simultaneous presence of an Indigenous frame. Descriptions of Enbridge's

extensive planning efforts to avoid environmental issues encountered in coder training were also incorporated as indicators of this frame (Swanson, 2016). It was decided that environmental groups must be presented as such in order to indicate the presence of an environmental frame. Referring to an environmental group by name without providing additional context may not resonate with readers who are unfamiliar with the group or its concerns.

The safety pipeline frame was also revised to distinguish it from the environmental frame. The frame definition excluded environmental impacts from the potential safety considerations of the pipeline. The phrase “cracking and corrosion” as used to describe the state of the existing Line 3 was incorporated into the safety frame as well. “Corrosion and cracking” was used both with and without additional environmental indicators in test code material (AP, 2018, para. 5; AP, 2019, para. 3); since their combined use wasn’t universal and the phrase was occasionally used with references to maintenance concerns, it was determined that it fit into the safety frame. Instructions were added to the environmental frame definition to specify that when safety and environmental concerns appeared simultaneously in a paragraph, both frames may be coded as present if the safety concerns were not identifiable as environmental health concerns.

The coder training process revealed points of confusion between the economic and national interest pipeline frames indicators that required additional consultation with the literature and subsequent frame revision. Early definitions of the national interest frame, adapted from Kojola (2017), Wood (2019), and Moore (2019), included a consideration of U.S. economic growth and job creation as an indicator. Further review of

the literature revealed that Wood's previously-unused "supply" (2019, p. 312) frame included indicators that aligned with the current study's economic and national interest frames, and with examples encountered in coder training. A review of Kojola's work also clarified an initial misconception: instead of conflating references to jobs and benefits to the American economy with a national interest frame, Kojola actually specified that frames that emphasized oil pipelines' benefits to the U.S. national interest frequently appeared with economic growth frames that touted the virtues of adding American jobs. As such, the definitions for each frame were revised: Wood's indicators regarding supply and the need to move oil products to market or to meet demand were incorporated into the economic frame. Wood's indicators about stabilizing supply and reserve were seen as aligning with Kojola's national interest frame and Moore's energy independence frame, emphasizing the importance of fostering the U.S.'s ability to focus on its own energy production activities and resources, and were thus incorporated into the national interest frame. In response to Kojola's insights about the co-occurrence of national interest and economic growth frames, the definitions of the frames in this study were revised to confirm that they were separate, but the instructions were also revised to direct coders to indicate the presence of both when both ideas were invoked in the same sentence, following recommendations from Chong and Druckman (2011).

Additional economic frame indicators such as references to increased tax income and business and labor leaders expressing support for the project were incorporated during test coding and coder training. Examples of concerns over the potential influx of outside workers creating social problems in the host communities were presented as an exception to the economic frame—although workers and jobs were discussed in these

examples, they were being used to discuss social problems like crime instead of economic problems or solutions (Lund, 2017). In line with the changes described above, the national interest pipeline frame definition was updated to include references to the American “way of life” and “energy security.”

The government/politics and conflict/strategy frames were also occasionally difficult for coders to distinguish, as conflict/strategy frames can be used to describe governmental or political figures’ actions (e.g. Cappella & Jamieson, 1997). Explanations of the need for heated language or examples of actions being explained in the context of strategy were incorporated into the conflict/strategy definition to clarify.

On its own, the government/politics frame required additional clarifications. Headlines and leads were occasionally found in which government actions referenced items that would indicate other frames as well, such as environmental impact statements, making it difficult to determine which frame should be coded as dominant (e.g. AP, 2019; Kraker, 2019b). The researcher created a rule in response to dictate that the object of the government action should be considered the dominant frame, but that the government frame could also be coded as present. When the object of the government action was the pipeline itself, then the government frame could be considered dominant. The inclusion of public hearings and consultations (*Pine Journal*, 2017) as a government frame indicator was confirmed by reviewing the literature: Dusyk et al. (2018) discussed it as an example of political activity in their study, and specified a “political participation risk/benefit” (p. 20) frame as one of their measures. Questions from coders prompted the exclusion of references to Native American tribal government actions and reports on the pipeline—the “Anishinaabeg Cumulative Impact Assessment” (Kaczke, 2017)—from the

government frame, as they were determined to be references to the Indigenous or environmental justice frames instead.

Questions that arose in the coder training sessions prompted clarifications to the conflict/strategy frame. One volunteer training session generated the insight that articles with a dominant conflict/strategy frame could include secondary frames as sides of the conflict, which was added to the codebook. In formal training sessions, coders occasionally over-applied the criteria of aggressive or heated language or strategic actions to content: the mention of “stakeholders” (AP, 2018, para. 6) was interpreted as automatically applying to deliberate efforts to sway opinion, and dramatic language like “thousands of pages” (Christoff, 2018, para. 3) was interpreted as aggressive. The researcher determined that neither example constituted a conflict/strategy frame, and added caveats to the definition accordingly.

Coders’ misunderstandings of what constituted an outsider necessitated clarifications to the foreign intervention frame. References to activist groups, tribal nations, and the U.S. Army Corps of Engineers were interpreted as indicators of a foreign intervention frame, largely because the coders did not understand how these groups fit into the Enbridge Line 3 issue (Kraker, 2017b; Kraker, 2019b). “Religious leaders” (AP, 2018, para. 1) were also interpreted as outsiders in an article about their opposition to Line 3 because they were assumed to not belong to communities affected by the pipeline, as were workers from outside the pipeline communities who might have been hired to work on the project (Lund, 2017). The coding instructions were thus updated to explain that an article’s text must present a group as an outsider through use of language, and must emphasize that the group was trying to influence the decision on the pipeline. An

explanation of intervenors' (for example, the Youth Climate Intervenors, (Dunbar, 2017)) official status in supplying input on the pipeline was also added to prevent further misunderstanding if any intervenors were mentioned. A single example of Enbridge being discussed as an outsider was included from the researcher's volunteer training/test code phase (Myers & Johnson, 2017b).

Similarities between the Indigenous and environmental justice frames in test code materials and in the codebook prompted revisions. After considering questions about the differences between the two frames during the volunteer training process, the researcher added the distinction should lie in whether references to "historical injustices" or treaty issues were discussed in the context of environmental vulnerabilities or not (Moore, 2019, p. 85). Coder training sessions raised questions as well, and modifications were added to the environmental justice frame definition to emphasize how historical conditions like structural inequalities might exacerbate certain groups' exposure to environmental risks. Verbal examples of how groups with lower socio-economic status may be more likely to live near highways and thus be exposed to more exhaust (Shonkoff, Morello-Frosch, Pastor, & Sadd, 2011), and that Indigenous communities' needs may not be considered as carefully as white communities' needs. The researcher considered further modifications including collapsing the two frames (e.g. Tankard, 2001) and adding additional indicators as difficult-to-distinguish examples arose during coder training. The frames were not collapsed in an effort to maintain analytical nuance, as it could be possible for an article to discuss Enbridge Line 3 in terms of the impacts it would have on Indigenous communities without discussing disproportionate exposure to environmental risks. References to Indigenous groups' rights to self-determination were

added to the environmental justice frame indicators after consulting Moore (2019), as were references to “historical trauma” (Kaczke, 2017, para. 2). Some key words from test code articles like “cultural resources” (AP, 2019, para. 7) and “sovereignty” (Kraker, 2018b, para. 13) were considered for addition but not added to either frame. It should be noted that coders were unfamiliar with specific names for Indigenous nations and groups in Minnesota. While the researcher had intended to compile a list, this was not completed.

Appendix D: Codebook Refinement Details—General Processes and Non-pipeline

Frame Variables

Codebook refinement details: Process

Other changes were made to the codebook between the first and second drafts in response to insights generated when developing the study’s data analysis plan and in order to provide clearer instructions for the coders. When constructing hypothetical coding results to verify that the coding instructions would yield data in a suitable format for analysis, the researcher ascertained that additional means were needed to account for the possibility that none of the prescribed frames may appear in articles. The option to select “No dominant frames/none of these” was added to the dominant frame summary variable. Later versions of the codebook also included a variable where coders could indicate that no frames were present at all. The study’s goals were removed from the second draft of the coding instructions in order to “blind” the coders to the project’s purpose and attempt to maintain a level of neutrality (Riffe et al., 2014, p. 113). The second draft of coding instructions was also updated to include a conceptual definition of media frames and to align frame definitions and indicators with the frame functions that they represented (e.g., problem definitions, problem solutions).

A colleague reviewed the second draft of coding instructions to provide additional feedback. Recommendations included clarifying instructions for how to determine article relevance, how to determine article type, how to assign frame codes, and adding examples to frame and other variable definitions and indicators.

A second phase of codebook development and refinement occurred in January of 2020 as the researcher incorporated suggestions from colleague reviews, revised pipeline

frame coding schemes to distinguish between articles in which Enbridge Line 3 was or was not the main focus, and conducted additional test coding—both with volunteers and individually.

The researcher conducted practice coder training sessions with three separate sets of volunteers in order to develop familiarity with the training process and identify aspects of the codebook that required clarification. Volunteers for practice training sessions were asked to read through the coding instructions (either during the practice session or prior to attending the practice session; either all at once or in portions). The researcher then asked volunteers to explain their understanding of each variable and the coding instructions and encouraged them to ask questions when instructions were unclear. Volunteers were then directed to code five articles independently in approximately one hour. Articles that had been used for the researcher's first test code were used in the first volunteer session; new articles were randomly selected from the test code sampling frame for the second and third volunteer sessions. Agreements and discrepancies in coding decisions were discussed, and volunteers' codes and examples from the text that prompted the volunteers' decisions were recorded in tables.

Notes from the volunteer sessions were incorporated into the coding instructions. Some instructions were clarified or added after the first volunteer session. Feedback from all three volunteer sessions was compiled for each frame. When the researcher and the volunteer coders agreed on text examples of indicators, the strongest ones were selected, incorporated into the coding instructions, and subsequently paraphrased. Informal, back-of-the-envelope style percentage agreements were calculated to estimate variables' reliability from the various coding sessions. It should be noted that these were very

informal and conducted on small sample sizes; as such, they were not the strongest indicators of reliability.

A third phase of codebook development and refinement occurred from January through February, 2020, during coder training. Coder training was conducted in a similar method to the volunteer practice training sessions described above; see Appendix E for further details on the process. Coder training sessions were also used to identify unclear variable definitions and coding instructions and prompt discussion. Disagreements that were resolved or clarified within the coding session were noted and added to the next draft of the coding instructions. Disagreements or questions that could not be resolved immediately were noted and then considered further in consultation with the literature used to develop the frames. Resulting changes were incorporated into subsequent coding instruction drafts. Preliminary reliability levels on a small set of content were checked mid-way through training using ReCal2 and ReCal3 on January 25, 2020 (Freelon, 2010, 2013). The levels were not uniformly acceptable, so training continued.

New variables and frames were not added during the test coding and coder training processes. Although adding new frames during testing is an advantageous and desirable practice (Chong & Druckman, 2011), the researcher declined to do so out of concerns that the already-complex coding instrument would become too complicated. The inclusion of the “none of these” category in the dominant frame selection variable and the inclusion of a “presence of any frame” variable was intended to provide an indicator of articles where the researcher’s predefined frames were not applicable to the content.

Pipeline frame summary variables—Initial development and subsequent refinement

Drawing from framing scholars' assertions that specific elite stakeholders may influence what frames appear in media coverage (Entman, 1993; Gamson & Modigliani, 1989), this study used an assessment of actors associated with the dominant pipeline frame as an operationalization of issue defining power. Djerf-Pierre and colleagues' (2016) actor identification operationalization, "Individuals or organizations that are described as doing or saying something in an article" was adapted for this study's codebook (although it should be noted that their instructions for how many actors to code and where differed) (p. 644). Other conceptualizations and operationalizations were considered, including identifying quoted or paraphrased sources (Takahashi & Meisner, 2013), but were dismissed under the consideration that actors appearing in an article's headline or lead (the initial criteria for establishing a dominant frame) could potentially identify groups or individuals without quoting them directly. Categories for potential actor types were compiled and adapted from previous knowledge and cross-referenced with literature: Government officials (originally split into Republican and Democrat politicians and nonpartisan or unelected officials, then combined during coder training to simplify variables) (Djerf-Pierre et al., 2016; Firtova, 2017; Hedding, 2017; Raso & Neubauer, 2016; Takahashi & Meisner, 2013; Taylor et al., 2000; Wood, 2019; Wozniak et al., 2017); oil industry representatives (Firtova, 2017; Hedding, 2017; Raso & Neubauer, 2016; Taylor et al., 2000; Wood, 2019); tribal/Indigenous representatives (Firtova, 2017; also selected due to relevance in this particular case); Environmental interest groups (Djerf-Pierre et al., 2016; Firtova, 2017, Hedding, 2017; Takahashi & Meisner, 2013; Wood, 2019); Landowners; business community representatives (Wozniak et al., 2017); and community residents (Djerf-Pierre et al., 2016; Hedding,

2017; Taylor et al., 2000). Scientist and experts were also considered for the list, but were omitted.

The instructions for where to identify these actors were modified to accommodate the inclusion of reader letters in the sampling frame and in response to coder training. The researcher determined that authors of reader letters were themselves granted a level of power and should be considered the dominant actor in those cases. The instructions initially directed coders to identify the dominant actors in the headline or lead in accordance with the initial procedure for identifying dominant frames; this was revised to “usually in the article’s headline or lead paragraph” to accommodate articles where Enbridge Line 3 was not the main focus and where dominant frames would be located later in the articles. This instruction was difficult to interpret when coding several months after the initial codebook development. In retrospect, the instructions should have clarified exactly how to identify the dominant actor in each situation. The interest group Honor the Earth appeared in test coding and was difficult to sort into a single category, given its combined commitments to environmental and Indigenous concerns (Honor the Earth, n.d.). As such, a separate category was created to accommodate it. It should be noted that the instructions for this variable were insufficiently detailed: criteria for identifying whether the mention of an unnamed group of people (such as “protestors” or “people”) should constitute an actor should have been established, instructions for how to identify actors in opinion pieces (given that their authors are typically interested stakeholders and their authorship could be considered a marker of their power in the way a reader letter’s authorship might display power); and more extensive lists of groups involved in the issue should have been included in instructions.

Chong and Druckman's (2011) work on identifying frames in political communication along with Entman (1993) and Gamson and Modigliani's (1989) observations that frames are ambivalent provided the theoretical foundation for the dominant frame attitude position variable. The researcher's knowledge that environmental arguments were made to both support and oppose the Enbridge Line 3 project undergirded the decision and was hoped to add nuance to the measurement of dominant frames in the news coverage. "Pro," "anti," and "neutral" attitudes toward the Enbridge Line 3 project were selected (Chong & Druckman, 2011). Lawlor & Gravelle's (2018) computer-assisted methods for assessing article tones provided inspiration for this study's nominal coding scheme of -1 (anti-pipeline), 0 (neutral), and 1 (pro-pipeline). While their methods were not used in this study (they evaluated the valence of framed statements based on the presence of surrounding positive or negative words), their use of a -1-1 tone range was adopted. Additional verbiage was added to explain the positions between the first and second draft of the codebook, after the researcher's first test code. The variable was not changed during the subsequent coder training process.

Climate change presence indicators

The researcher compiled potential synonyms and indicators that would signal the presence of climate change in an article based on knowledge of the issue. Verbatim use of "climate change" was a clear indicator; "global climate change," "global warming" and references to greenhouse gases, the greenhouse effect, carbon dioxide emissions, or methane emissions were also selected. "Global warming," greenhouse gases, and the greenhouse effect were assumed to be recognizable vernacular synonyms for climate change. Carbon dioxide emissions and methane emissions were added because of their

status as greenhouse gases. Versions of these terms have appeared as environmental frame indicators in other studies, including “global warming,” “greenhouse,” “emission*,” and “carbon” (e.g. Lawlor & Gravelle, 2018, p. 673). New indicators and exceptions were added in response to coder training: “climate action” was considered an indicator of climate change (Dunbar, 2018b, para. 8). “Hydrocarbon fuel” (Christoff, 2018, para. 4) and “fossil fuels” were encountered during coder training but were determined likely to be too unfamiliar or vague to signal climate change to readers: hydrocarbon fuel might not be immediately connected to greenhouse gas emissions, and fossil fuels could signify general pollution and air quality concerns. Note: In retrospect, “emissions” and “carbon” and “methane” could also have been considered to be too vague to signal climate change to readers.

Climate change frame definitions and indicators

The verbatim definitions for climate change frames cited from Nisbet (2010b) were not changed during the codebook development process in order to preserve continuity with the source work. The definition of the public health frame was paraphrased from Nisbet (2010b) but was not substantively changed. The climate change frame indicators were similarly substantively unchanged during the coder training process. One specific example was incorporated into the scientific/technical uncertainty frame. Reminders that these frames were to be considered for discussions of climate change were added when volunteers and coders mistakenly identified them in discussions of Enbridge Line 3.

Appendix E: Coder Training Procedures

Two undergraduate coders were hired in December of 2019 and trained in late January and early February 2020, coding 20 articles over the course of five training sessions. Coders were paid for training in addition to the study's coding work. The first session included an introduction of the project, a detailed orientation to the coding instructions (which coders had been instructed to read prior to the session) and code sheets, individual practical application of the codebook to content, and subsequent comparison and discussion of practice coding results. The undergraduates coded articles outside of training prior to the second and fourth sessions, and coded articles during the third and fifth. The researcher and coders compared and discussed their respective results in each session. Coding discrepancies were either resolved in session or were considered in greater detail between sessions. The researcher revised the coding instructions in response to these issues and highlighted revisions in subsequent sessions. There were, however, some oversights and not all verbal clarifications and examples were formally incorporated into the revised coding instruction documents. A handful of issues were unresolved after the fifth and final training session, which the researcher resolved later. The researcher informed coders of the changes when distributing the final study materials.

Appendix F: Coding Instructions

Introduction and purpose of study

This study will examine local newspaper coverage of the Enbridge Line 3 oil pipeline replacement project, which is slated for construction across northern Minnesota.

Coding procedures

At the beginning of every coding session, scan through the coding instructions. Reviewing the coding instructions—even if they have already been read for a previous coding session—will enhance coding consistency and reliability for the entire sample (Riffe et al., 2014).

There are four parts to the coding instructions.

Part 1 collects identifying information about the article, such as its pre-assigned ID, relevance to the study, publication date, news outlet of origin, and whether it is a news or opinion article. Read the article through once to code for these variables.

Part 2 collects information about the pipeline frames presented in the article. Nine frames are listed and described. You will read through the article a second time **paragraph by paragraph** to assess whether these listed frames are present and which one (if any) is dominant in the coverage. See Part 2 for additional instructions.

Part 3 collects additional information about the dominant frame you identified in the article (if any) and summarizes what you found. It will also allow you to assess the presence of climate change in the article. You will read the portions relevant to the dominant frame an additional time, and scan the article for the presence of climate change.

Part 4 collects information about the way climate change is framed. If climate change appears in the article, you will read the article a fourth time to identify whether the frames listed in Part 4 appear in the article. (Dusyk et al., 2018; A. O'Connor, personal communication)

Do not use outside research when coding the articles. Use the instructions provided in this codebook to code the articles. **Work independently.** Do not collaborate with other coders.

PART 1: IDENTIFYING INFORMATION

Variable 1: Item ID (Assigned)

Look at the article's file name. The item ID will be the first part of the file name: the acronym indicating the news outlet in which the article appeared and a serial number (appearing after the date. For example, **CPJ1** would be the ID for an article with the file name:

CPJ1_2019-04-24_CarltonCountyConcernedAboutEnbridgeAccessToChubLake.pdf

Record this in the space provided.

Variable 2: Relevance and Inclusion in analysis

Confirming appropriateness of content and preparing for analysis

This study will only examine newspaper pieces about the Enbridge Line 3 pipeline replacement project. To confirm that the piece is appropriate to include in the study, read through it in its entirety and consider the following guidelines:

The story **WOULD** be about the Enbridge Line 3 pipeline if any of the following criteria are met. Note: the story does not have to meet all criteria below.

- The piece is specifically about the Enbridge Line 3 pipeline.
- The piece is about pipelines in general, and discusses Enbridge Line 3 pipeline along with other oil pipeline projects.
- The piece is about government procedures and events (for example, public hearings or report releases) concerning Enbridge Line 3.
- The piece is about civic demonstrations or protests concerning Enbridge Line 3.
- The article does not focus primarily on the Enbridge Line 3 pipeline, but devotes at least one full sentence to the pipeline (e.g. Hart & Feldman, 2014).

The story **WOULD NOT** be about the Enbridge Line 3 pipeline if:

- A different pipeline is discussed (e.g. Enbridge Line 5 in Michigan; Dakota Access pipeline, Keystone XL, Sandpiper) but Enbridge Line 3 is not discussed at all.
- The Enbridge Line 3 pipeline is mentioned, but only as a “passing” reference (Dusyk et al., 2018, p. 15). (For example, if an article is broadly about current issues affecting northern Minnesota, and the Enbridge Line 3 pipeline is listed as one of many without providing any context to help the reader understand its significance.)

Indicate the article’s relevance on the coding sheet as follows:

- 1 = *Relevant. Include in analysis.*
- 0 = *Irrelevant. Do not include in analysis.*

If article is coded as 0, then stop coding the article and skip the rest of the coding sheet. Notify researcher by email [address removed] immediately upon end of coding session that the article was coded as 0. Provide the item ID.

Variable 3: Item Date: Year/Month/Day → e.g. 2011/12/31

Variable 4: Newspaper outlet

Select the news outlet that the article appeared in, even if article was provided by a wire service (e.g. AP, Forum, etc.).

- 1=Duluth News Tribune
- 2=Bemidji Pioneer

- 3=Grand Rapids Herald Review
- 4=Walker Pilot-Independent
- 5=Crookston Daily Times

Variable 5: Type of story

- 1 = News story:
 - Facts and “objective reporting” provide the article’s foundation, to the best of the reporter’s ability. Reporter does not emphasize their own “assertions or opinions.” (Littau, 2016, p. 75)
 - News stories can include features, traditional news stories, or news briefs.
- 2 = Opinion story:
 - The writer’s opinions, personal perspective, or argument provide the articles foundation. Writer may include facts to support their positions. (Littau, 2016)
 - Opinion stories can include editorials, commentaries, or letters to the editor.

PART 2: PIPELINE/ARTICLE FRAME IDENTIFICATION

Conceptual definition: what is a frame, and what does it mean for this study?

This study will analyze how local and regional newspaper coverage **defines the issue** of the Enbridge Line 3 oil pipeline replacement project (“Enbridge L3”) through **media frames**. The formal academic definition of “media frame” that this study will use comes from Robert Entman (1993, p. 52): “To frame is to select some aspects of a perceived reality and make them more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation for the item described.”

A good way to think about the concept of frames is to consider the following questions: “How does this article want me to understand what the Enbridge L3 project is about and why it is important? What aspects of the project does the article highlight when describing it? How do those highlighted aspects create an impression of what the Enbridge Line 3 project is about?” News articles may highlight different aspects of an issue by using certain “**stock phrases**” or “**keywords**,” referencing **general indicators**, presenting the issue as a specific type of **problem**, or presenting the issue as a “**solution**” **to a problem** (Entman, 1993, p. 52).

Evaluate whether each frame described below appears in the article and how prominently it appears. You will have the option to indicate whether a frame is the **dominant** one used to describe the pipeline, or a **secondary** one.

- **Dominant** frames will typically be identified by reading the article’s headline and lead paragraph (Hedding, 2017).

- If an article's headline and lead each present different frames (i.e., the headline presents one frame and the lead presents another), you will choose the frame that is most dominant throughout the article. Code that frame as a "3" (adapted from Nisbet & Huges, 2006).
- If Enbridge L3 is not the main focus of the article, you still have the option to select a dominant frame.
 - Identify the first frame used to present Enbridge L3, and select that as the dominant frame.
 - If a dominant frame is not clear in the first paragraph that presents Enbridge L3 (e.g. if there are multiple frames in the first paragraph), select the one that best fits the section about Enbridge L3.
 - Code the dominant frame as a "2."
- An individual article cannot include frames that are coded as a 3 and as a 2.
- Dominant frames may appear throughout the article in addition to the headline or lead paragraph. That is, if you code a frame as being dominant, subsequent indicators of the frame that appear in the body of the article are considered part of that dominant frame. They are not considered secondary frames.
- If neither the headline nor the lead include one of the frames listed here, then do not code any of the frames as dominant. You may still code for secondary frames.
- **Secondary** frames are ones that appear elsewhere in the article, but generally do not appear in the headline or lead paragraph (adapted from Nisbet & Huges, 2006).
 - In the event that a headline and a lead paragraph include multiple frames (e.g. there are two frames in the headline, or there are two frames in the lead), select the frame that most closely aligns with the article as a whole as dominant. Select the other frames appearing in headline or lead as secondary (adapted from Nisbet & Huges, 2006).
 - Read the remainder of the article paragraph by paragraph. Consider each paragraph individually to determine whether frames are present or not. Do not use the context provided in preceding or subsequent paragraphs to inform your identification of frames in a given paragraph.
- Multiple frames may appear in an article (Chong & Druckman, 2011; Nisbet & Huges, 2006).
- A single sentence may invoke multiple frames (Chong & Druckman, 2011).
- It is possible for none of the frames listed below to appear in an article.

Variable 6: Environmental

Description: Discusses the pipeline project in terms of the impacts it could have on the environment and the human and natural beings that depend upon it, whether in terms of climate change/global warming, human health in the context of environmental health, ecosystems, or spills and leaks (adapted from Dusyk et al., 2018; Firtova, 2017; Kojola, 2017; Lawlor & Gravelle, 2018; and Wood, 2019).

Stock phrases that indicate this frame include use of “tar sands,” “dirty oil” (Wood, 2019, p. 311) and “Big Oil” (Kojola, 2017, p. 910) to describe the product that the pipeline transports.

Examples of **problem definitions** that indicate an environmental frame include:

- Construction of the pipeline could have an impact on carbon, greenhouse gas emissions, and climate change (Dusyk et al., 2018; Firtova, 2017; Kojola, 2017; Lawlor & Gravelle, 2018; and Wood, 2019).
 - *Example: Passages explaining how some people are against the pipeline because its primary product (tar sands oil) would make climate change worse (Kraker, 2018b).*
- Pipeline project could affect water systems like aquifers, rivers, streams, or watersheds; coastal regions, or otherwise threaten or pollute clean water supplies (Dusyk et al., 2018; Firtova, 2017; Kojola, 2017; Lawlor & Gravelle, 2018; and Wood, 2019).
- Pipeline project could affect farm or agricultural land, wildlife habitats, or the general local/regional environment (Kojola, 2017; Wood, 2019).
 - *Example: Concerns from community residents that pipeline construction activities could harm area farmers or water resources (Lund, 2017).*
- Pipeline project could threaten humans in an environmental/public health capacity (Kojola, 2017; Wood, 2019).
- The pipeline project could either **cause or increase** the likelihood of oil leaks or spills (Dusyk et al., 2018; Kojola, 2017; Lawlor & Gravelle, 2018; and Wood, 2019).
 - *Example: Statements from environmental advocacy groups that express concerns about potential spills due to the increased amounts of oil that the pipeline would accommodate (Minnesota Public Radio, 2015).*

Examples of **problem solutions** that indicate an environmental frame include:

- The pipeline project could **reduce** likelihood of oil leaks or spills (and as a result benefit the environment) (adapted from Kojola, 2017; Wood, 2019, with insights from Chong & Druckman, 2011).
- Enbridge has conducted extensive planning to avoid negative environmental effects.

- *Example: References to how the company's engineering efforts, environmental surveys, and route planning were designed to reduce potential negative outcomes for people and the environment (Swanson, 2016).*

Special notes and exceptions:

- If a sentence references environmental concerns along with safety concerns, the sentence would count as invoking both an environmental frame and a safety frame.
 - For example, if references are made to both environmental impacts and safety, and it can't be determined that the safety references indicate environmental health concerns, then both environmental and safety frames are present.
- If references to environmental concerns and safety concerns are separated into different paragraphs (i.e., one paragraph includes environmental indicators and the preceding or following paragraph includes safety indicators, code the article as including both environmental and safety frames.
- References to environmental organizations (e.g. MN350, Sierra Club, Friends of the Headwaters) on their own are not sufficient to invoke the presence of an environmental frame. Article must provide additional context for why the groups are involved in the Line 3 issue: they must be identified as an environmental group, or their environmental concerns must be mentioned to warrant an environmental frame.
- References to wild rice and wild rice waters signal an environmental frame. If they are presented in conjunction with references to Indigenous groups, then the sentence or paragraph can signal both an environmental frame and an Indigenous frame or environmental justice frame (whichever is indicated.)

Indicate this frame's appearance in the article on the coding sheet as follows:

- 3 = Dominant frame when Enbridge L3 **is** the article's main focus.
- 2 = Dominant frame when Enbridge L3 **is not** the article's main focus, but is still relevant for analysis.
- 1 = Secondary frame. Use to identify when a frame appears as secondary in **all relevant articles**, whether Enbridge L3 is main focus or not.
- 0 = not present

Variable 7: Economic

Description: Discusses the pipeline project in terms of the way it relates to economic concerns such as economic markets, employment/jobs, business development and success, general financial success or failure, or the necessity (or lack thereof) of delivering oil products to destinations where they can be refined or sold (adapted from

Crow & Lawlor, 2016; Dusyk et al., 2018; Firtova, 2017; Kojola, 2017; Lawlor & Gravelle, 2018; Moore, 2019; and Wood, 2019).

Keywords and stock phrases that indicate this frame include: “Jobs,” “employment” (or variations), “workforce,” “labor market” (Lawlor & Gravelle, 2018, p. 673), “strike it rich,” “flowing profits” (Moore, 2019, p. 82).

General indicators of this frame include:

- Discussion of fuel and energy costs, including gas prices, heating costs, and fuel costs, and industrial extraction expenses and market prices (Firtova, 2017; Kojola, 2017; Wood, 2019).
- Discussion of economic growth of country or local region, either general or specific, such as benefitting local business proprietors or bringing in tax dollars (Dusyk et al., 2018; Kojola, 2017; Moore, 2019).
 - *Example: Passages explaining how the pipeline would afford the affected counties opportunities to earn money through property taxes (Kraker, 2019a).*
 - *Example: Passages explaining how local businesses like hotels, stores, and restaurants would benefit from incoming construction workers’ patronage (Kraker, 2019a).*
- Discussion of oil sands industry “development” (Firtova, 2017, throughout) and potential economic outcomes (Dusyk et al., 2018; Firtova, 2017; Wood, 2019).
- Impacts on industries and companies like oil producers (Dusyk et al., 2018; Firtova, 2017; Wood, 2019).
- References to business leaders or labor unions issuing statements or writing letters in regards to the pipeline (Dunbar, 2019).

This frame may define the pipeline as an issue of “economic consequences” (e.g. Wood, 2019, p. 297). Examples of **problem definitions** include:

- Not building the pipeline would yield negative economic consequences (Dusyk et al., 2018; Kojola, 2017; Moore, 2019).
- Pipeline protests would harm taxpayers and businesses in the areas affected by protests (Moore, 2019).

This frame may define the pipeline as a **solution to economic problems** in the following ways:

- Emphasizes the jobs that the pipeline project has created or could create; could be general discussion of job creation potential or specific job number estimates (Crow & Lawlor, 2016; Dusyk et al., 2018; Kojola, 2017; Lawlor & Gravelle, 2018; and Wood, 2019).

- *Example: Statements from people in favor of pipeline that highlight potential for “good paying, middle class jobs” from its construction (Kraker, 2017a, para. 20).*
- Emphasizes that pipelines facilitate the delivery of oil products, either in the context of selling the product or in the context of fulfilling demand for the product (Wood, 2019).
 - *Example: This could include references to Line 3’s capacity or Enbridge’s desire to relieve “congest[ion]” in their pipeline network (Kraker, 2017b, para. 6).*

Special notes and exceptions:

- Passages that mention jobs related to the pipeline in the context of social or safety problems that they might create do NOT indicate the presence of an economic frame if the passage does not also discuss those jobs’ impacts on the economy or people’s financial well-being.
 - *Example: Local residents might express worry about excessive hiring of external workers, whose housing needs could create “man camps” and in turn attract crime to the region (Lund, 2017, para. 9).*
- Sentences and passages that discuss both economic benefits to the region or country AND discuss how they are advantageous to the country’s overall well-being and interests can be coded as exhibiting both an ECONOMIC frame and a NATIONAL INTEREST frame (see Variable 8) (Chong & Druckman, 2011; Kojola, 2017; Moore, 2019).

Indicate this frame’s appearance in the article on the coding sheet as follows:

- 3 = Dominant frame when Enbridge L3 **is** the article’s main focus.
- 2 = Dominant frame when Enbridge L3 **is not** the article’s main focus, but is still relevant for analysis.
- 1 = Secondary frame. Use to identify when a frame appears as secondary in **all relevant articles**, whether Enbridge L3 is main focus or not.
- 0=not present

Variable 8: National Interest

Description: The U.S.’s reliance on various kinds of energy resources affects its security, prosperity, and way of life (adapted from Kojola, 2017; Moore, 2019; Wood, 2019).

Keywords that indicate this frame include “success,” “self-sufficiency,” “secure,” (Moore, 2019, p. 81), “energy security,” “friendly nation,” use of patriotic language, emphasis on “the country” and “we” (in the sense of “we as a nation”) (Kojola, 2017, pp. 903, 908, 909).

Presenting the pipeline in relation to the following **problems** indicates this frame:

- The United States relies too heavily upon other countries—especially politically “unstable” (Kojola, 2017, p. 908) or otherwise compromised ones—for energy resources and trade (Kojola, 2017; Moore, 2019; Wood, 2019).
- U.S. dependence on problematic political entities for energy undermines its national security (Kojola, 2017; Wood, 2019).
- U.S. well-being depends on having sufficient energy supplies (Kojola, 2017).

This frame may offer the pipeline as a **solution to problems** in the following ways:

- U.S. can build oil pipelines to better exploit domestic energy production or energy resources from “friendly” “ally” nations like Canada (Kojola, 2017, p. 908). Doing this will help U.S. extricate itself from its dependence on politically-unstable countries for energy resources and reduce the potential for entering armed conflicts in those regions to protect those energy resources (Kojola, 2017; Moore, 2019; Wood, 2019).
- The country will be better able to maintain or expand their energy resources (i.e. “supply or reserves”) with the construction of the Enbridge Line 3 pipeline; to better take advantage of what is available domestically (Wood, 2019, p. 312).
- Building pipelines (like Enbridge Line 3) will ensure delivery of energy sources and keep the country and society running smoothly.
 - *Example: Statements arguing that people in Minnesota and the rest of the country need energy resources to be transported efficiently and safely in order for society to function, and the pipeline will fulfill those needs (Christoff, 2018).*

Notes and Exceptions

- NATIONAL INTEREST frames may appear in relation to ECONOMIC frames. If a sentence explains that the Enbridge Line 3 pipeline will benefit the national economy AND shore up domestic energy resources, then both economic and national interest frames should be considered present.

The following example does NOT indicate a national interest frame:

- General discussion of jobs without connections to the United States’ broader national interest as described above.

Indicate this frame’s appearance in the article on the coding sheet as follows:

- 3 = Dominant frame when Enbridge L3 **is** the article’s main focus.
- 2 = Dominant frame when Enbridge L3 **is not** the article’s main focus, but is still relevant for analysis.
- 1 = Secondary frame. Use to identify when a frame appears as secondary in **all**

relevant articles, whether Enbridge L3 is main focus or not.

- 0=not present

Variable 9: Government and politics

Description: Highlights the relationship between the issue of the pipeline and the functioning of government and political processes. Presents the pipeline within the context of governmental and political processes. Note that this frame **does not** emphasize specific conflicts or controversies related to politics (adapted from Dusyk et al., 2018; Hedding, 2017; Moore, 2019; Olive & Delshad, 2017; Wood, 2019).

General **indicators** for this frame include:

- General discussions of pipeline permitting and construction regulations—how they’re implemented, altered (Dusyk et al., 2018; Hedding, 2017)
 - *Example: Passages that describe Enbridge’s application submissions with the Minnesota Public Utilities Commission (Minnesota Public Radio, 2015).*
 - *Example: Passages discussing legislative process and bills related to old pipeline removal (Kraker, 2018a).*
- Discussions of other miscellaneous political issues: direct participation, public hearings and consultations, corruption, politicians’ stances on a pipeline (without highlighting conflict with combative words) (Dusyk et al., 2018; Moore, 2019; Olive & Delshad, 2017).
 - *Examples: Passages that describe launch of state-wide public hearing processes to help regulators consider Enbridge’s proposed construction project (Kraker, 2017a).*

Potentially defines the pipeline issue as indicating the following kinds of problems:

- Government regulations and processes concerning the pipeline project being either too “strict” (Olive & Delshad, 2017, p. 791) (and therefore hindering progress) or too lenient (Olive & Delshad, 2017; Wood, 2019).
- Partisan conflict surrounding the pipeline **slows down the policy-making process**, because the potential for conflict and criticism deters politicians from engaging with the issue at all, or because engaging in partisan disputes delays decision-making. Politicians might face criticism for their views about the pipeline, whether supportive or oppositional (Wood, 2019).

Special notes and exceptions:

- In instances where a headline and/or lead paragraph display indicators for the GOVERNMENT/POLITICS frame and another frame, consider what the object of the government or political action is in order to determine which frame is dominant.

- For example, if a headline and lead discuss an Environmental Impact Statement, the dominant frame would be ENVIRONMENTAL, because that is the concern in the government action being discussed.
- If the headline and lead discuss government or political actions solely in relation to Enbridge Line 3 (such as explaining that Enbridge has applied for a permit to build it), then the GOVERNMENT/POLITICS frame would be dominant, because it is defining Enbridge Line 3 in terms of a government process without providing additional considerations.
- Tribal government actions should not be coded as government/politics frame.
- The Anishinabe-centric impact statement (“Anishinaabeg Cumulative Impact Assessment,” (Kaczke, 2017, para. 2)) is different from the state’s environmental impact statement, and does not count as a government/politics frame.

Indicate this frame’s appearance in the article on the coding sheet as follows:

- 3 = Dominant frame when Enbridge L3 **is** the article’s main focus.
- 2 = Dominant frame when Enbridge L3 **is not** the article’s main focus, but is still relevant for analysis.
- 1 = Secondary frame. Use to identify when a frame appears as secondary in **all relevant articles**, whether Enbridge L3 is main focus or not.
- 0=not present

Variable 10: Conflict/strategy

Description: Portrays the pipeline issue primarily as a conflict between opposing sides, each vying to win (adapted from Hedding, 2017; Kojola, 2017; Moore, 2019; Olive & Delshad, 2017). The use of language is important here: heated, violent language that reinforces the idea of two or more parties being at odds with each other must be present to signal conflict. To signal the strategic side of the frame, different parties’ actions would be described in a way that highlights their calculated efforts to come out ahead.

Keywords that indicate this frame include “standoff” (Moore, 2019, p. 88); “winning,” “losing,” (Hedding, 2017, p. 374); “Influential donors” (when used in context of trying to persuade a decision-maker), “Fork in the road” (when used in context of trying to persuade a decision-maker) (Kojola, 2017, p. 909, citing Eilperen, 2011); “Anti-working class” (Kojola, 2017, p. 906) or “job-killers,” (when used to describe pipeline opponents) “fatal” outcomes, (Kojola, 2017, p. 906, citing Solomon, 2011); “boiling over,” “riot gear” (Moore, 2019, p. 88).

General indicators of this frame include:

- Highlighting how the actions of political entities like states, politicians, interest groups, or political groups are being used to influence the outcome of the issue, shift balances of power, and influence public “perceptions” (Kojola, 2017; Wood, 2019).

- *Example: Descriptions of a political party's proposed bill as being largely for show or political theater instead of a realistic effort to pass legislation (Dunbar, 2018a).*
- *Example: Descriptions of different parties redirecting their efforts after not achieving a goal in order to continue to advance their agenda (Karnowski, 2018b).*
- Focus can be on a single political figure or decision maker, if the focus is on that actor needing to choose between two of the opposing sides and those sides' attempts to influence the decision (Kojola, 2017).
- Combative, “violent language” and “war symbolism” (Kojola, 2017, p. 907; Moore, 2019)
 - *Example: “firing back” (Kraker, 2018b, para. 1)*
 - *Example: Use of “versus” to juxtapose two sides' positions (Kraker, 2017b, headline).*
- Portrayals of workers/middle class concerns versus “radical” and “wealthy liberal” concerns (Kojola, 2017, p. 906).

Special notes and exceptions:

- When the conflict/strategy frame is dominant in an article, other frames on this list may appear in the article as different sides of the conflict. For example, the dominant frame in an article might be conflict/strategy, and then two sides in the conflict may offer opposing environmental and economic frames. Those environmental and economic frames would be coded as secondary frames.
- The presence of dramatic language that doesn't emphasize violence, combat, or adversaries squaring off is not enough to signal a conflict/strategy frame. For example, the phrase “Passions ran high” would not qualify as conflict/strategy on its own (Karnowski, 2018a, para. 1).
- Use of “stakeholders” (Associated Press, 2018, para. 6) as a term on its own or being spoken by a representative of a company or interest group (oil industry, environmental, tribal, etc.) does not indicate strategic or conflict framing. Language surrounding the use of the term must supply the context that these actors are exerting influence, whether financially or otherwise.

Indicate this frame's appearance in the article on the coding sheet as follows:

- *3 = Dominant frame when Enbridge L3 is the article's main focus.*
- *2 = Dominant frame when Enbridge L3 is **not** the article's main focus, but is still relevant for analysis.*
- *1 = Secondary frame. Use to identify when a frame appears as secondary in **all relevant articles**, whether Enbridge L3 is main focus or not.*
- *0=not present*

Variable 11: Indigenous

Description: Emphasizes the impacts that the pipeline project may have on First Nations/Indigenous/Native groups and vice-versa. Impacts could be positive or negative. Could also emphasize neutral associations between the pipeline project and First Nations/Indigenous/Native groups (adapted from Dusyk et al., 2017; Lawlor & Gravelle, 2018; Wood, 2019).

Keywords that indicate this frame include “aboriginal,” “First Nations,” “Indian,” “band,” (Lawlor & Gravelle, 2018, p. 673), “tribe.”

Defines the pipeline issue as a **problem** of:

- One where First Nations/Indigenous/Native groups’ land rights and the pipeline project’s land use needs do not align (Dusyk et al., 2017; Wood, 2019).
- One where construction of pipeline could be detrimental to First Nations/Indigenous/Native “communities” “rights” or “lifestyles” (Dusyk et al., 2017, p. 16; Wood, 2019, p. 311).

Could also present the pipeline as the following kind of **problem solution**:

- Pipeline project could be beneficial to First Nations/Indigenous/Native groups (in terms of bringing community jobs, creating revenue). Note: In cases like this where the pipeline’s benefits to Native groups are presented as economic, the Native aspect supersedes the economic aspect, and results in an Indigenous frame instead of an economic frame (adapted from Dusyk et al., 2017; Wood, 2019, following Chong & Druckman, 2011).

NOTE: References to First Nations/Indigenous/Native groups, rights, treaty issues, historical injustices, or other similar attributes that situate the discussion within context of potential environmental risks or detrimental impacts should be coded as Environmental Justice frames instead of Indigenous frames (see definition for Variable 14).

Indicate this frame’s appearance in the article on the coding sheet as follows:

- 3 = Dominant frame when Enbridge L3 **is** the article’s main focus.
- 2 = Dominant frame when Enbridge L3 **is not** the article’s main focus, but is still relevant for analysis.
- 1 = Secondary frame. Use to identify when a frame appears as secondary in **all relevant articles**, whether Enbridge L3 is main focus or not.
- 0 = not present

Variable 12: Safety

Description: Emphasis on safety of the pipeline, but without drawing connections between human/environmental health and environmental impacts (adapted from Lawlor & Gravelle, 2018; Moore, 2019; Wood, 2019).

Keywords or stock phrases that indicate this frame include “safe,” “explosion,” “explode,” “derail,” “border security” (Lawlor & Gravelle, 2018, p. 673), “state-of-the-art technology” (Moore, 2019, p. 101).

This frame defines the pipeline issue as one where:

- Pipelines could become targets for terrorist activity (Lawlor & Gravelle, 2018; Wood, 2019). (Note: human safety in connection to terrorist activity **differs** from human safety in connection to environmental hazards.)
- Pipelines are **less safe** than other methods for moving oil, such as trains and railways (Wood, 2019).
- Pipelines are **safer** than other methods for moving oil, such as trains and railways (Wood, 2019).
 - *Example: Passages describing a local resident’s preference for oil pipelines over trains because of their safety advantages (Kraker, 2018a).*
- As an issue where safety as a general concept is presented, but NOT in connection to the environment or human health and safety.

This frame could offer the following **problem solutions**

- Oil industry is “trustworthy” and has developed safety features for pipelines like “monitoring and shutoff systems” technology, “thicker” construction materials, extra precautions in ecologically sensitive areas, installation site depths, and “inspection” routines (Moore, 2019, pp. 101–102).

Additional indicators of a safety frame can include:

- References to “cracking” and “corrosion” (Associated Press, 2019, para. 5)
 - NOTE: If a sentence refers to both cracking and corrosion AND environmental concerns, then this would signify BOTH a safety and an environmental frame.

Safety frames do not have to specify whose safety is at stake in the Enbridge L3 project.

Indicate this frame’s appearance in the article on the coding sheet as follows:

- 3 = Dominant frame when Enbridge L3 **is** the article’s main focus.
- 2 = Dominant frame when Enbridge L3 **is not** the article’s main focus, but is still relevant for analysis.
- 1 = Secondary frame. Use to identify when a frame appears as secondary in **all relevant articles**, whether Enbridge L3 is main focus or not.
- 0 = not present

Variable 13: Foreign intervention

Pipeline issue is portrayed as a target for foreign or outside organizations, institutions, and actors (including “governments, companies, individuals, or NGOs”, per Wood, p. 312) to influence. Actors may use financial support or other methods as a means to

influence progress of the issue. Foreign intervention influence could be either in favor of or opposed to the pipeline (adapted from Raso & Neubauer, 2016; Wood, 2019). To clarify: the text of the article needs to provide state or imply that organizations, institutions, or actors are being thought of or presented as outsiders. Naming a specific interest group who is participating in the issue is not enough to constitute a foreign intervention frame on its own; instead, that group or actor's status as an outsider must be emphasized.

Additionally, note that groups that are designated as official intervenors would not count as outsiders (unless they are referred to as such). For example, the Youth Climate Intervenors were granted official status to provide input in the project's approval proceedings (Dunbar, 2017).

- *Example: Statements from pipeline-opposing landowners who emphasize Enbridge's status as a foreign company as one of the reasons they disapprove of the project and Enbridge's means of doing business (Myers & Johnson, 2017b).*

Special notes and exceptions:

- References to non-local groups who may enter a community in order to work on the Enbridge Line 3 project (Lund, 2017) do not constitute the presence of the Foreign Intervention frame. To be an example of the Foreign Intervention frame, the group must be discussed in the context of wanting to sway the outcome of the Enbridge Line 3 decision, and be discussed as an outsider.
- In order for the foreign intervention frame to be identified, the text must provide some indication that a group is being thought of or presented as an outsider.
 - Example: if a headline and lead indicate that a religious group opposes the pipeline without providing additional context (Associated Press, 2018), it would not count as a foreign intervention frame. If the article suggested that local community members were upset about this group's involvement because they aren't part of the community, it would.

Indicate this frame's appearance in the article on the coding sheet as follows:

- 3 = Dominant frame when Enbridge L3 **is** the article's main focus.
- 2 = Dominant frame when Enbridge L3 **is not** the article's main focus, but is still relevant for analysis.
- 1 = Secondary frame. Use to identify when a frame appears as secondary in **all relevant articles**, whether Enbridge L3 is main focus or not.
- 0 = not present

Variable 14: Environmental justice

Highlights the power "imbalances" and historically-informed marginalization of racial and ethnic groups within an environmental impacts context (Moore, 2019, p. 87).

Indicators of this frame may include emphasizing a marginalized group's disproportionate exposure to environmental risks as a result of structural inequalities, or a marginalized group's exclusion from decision-making processes and need for "self-determination" (Moore, 2019, p. 107, citing the *Indian Country Media Network*).

Indicators may also include references to Indigenous groups' "historical trauma" (Kaczke, 2017, para. 2).

Indicate this frame's appearance in the article on the coding sheet as follows:

- 3 = Dominant frame when Enbridge L3 **is** the article's main focus.
- 2 = Dominant frame when Enbridge L3 **is not** the article's main focus, but is still relevant for analysis.
- 1 = Secondary frame. Use to identify when a frame appears as secondary in **all relevant articles**, whether Enbridge L3 is main focus or not.
- 0 = not present

PART 3: PIPELINE FRAME SUMMARY AND ADDITIONAL DETAILS

Variable 15: Presence of any frame

Review the coding for Variables 6–14. Assess whether the article contains any frame listed above or not.

Indicate the presence of frames on the coding sheet as follows:

- 1 = One or more of the frames is present in the article.
- 0 = None of the frames are present in the article.

Variable 16: Dominant frame

Review the coding for Variables 6–14.

- Identify the variable that received a "3" (frame appearing in headline or lead) or a "2" code (the first pipeline frame in articles where the pipeline is not the main focus). Only one frame per article should receive either a "3" or a "2" code (Hedding, 2017; Nisbet & Huge, 2006).
- If none of the frames were coded as a "3" or a "2," (i.e., if none of the frames listed in Section 2 appeared as dominant), then indicate that by selecting "10" from the choices below.
- Select that frame from the list below and record the corresponding number.
 - 1 = Environmental
 - 2 = Economic
 - 3 = National interest
 - 4 = Government/politics
 - 5 = Conflict/strategy
 - 6 = Indigenous
 - 7 = Safety
 - 8 = Foreign intervention
 - 9 = Environmental justice

- 10 = None of these/other

Variable 17: Dominant frame attitude position

- Assess whether the dominant frame reflects support for the Enbridge Line 3 replacement project (i.e. supports replacing it and its continued use overall) or if it reflects opposition to the Enbridge Line 3 replacement project (i.e. is against replacing the line and is against continued use of the old line) (drawing from Chong & Druckman, 2011).
 - Identify the dominant frame based on previously assigned codes.
 - Based on reading of entire article, determine whether that frame is being used to:
 - Support the approval and completion of the Enbridge Line 3 replacement project.
 - Oppose the approval and completion of the Enbridge Line 3 replacement project.
 - Does not take a single position, or presents arguments both for and against the approval and completion of the Enbridge Line 3 replacement project.

Indicate this attitude position as follows (Kim et al., 2014; Lawlor & Gravelle, 2018):

- *-1 = Anti-pipeline*
- *0 = Neutral/balanced*
- *1 = Pro-pipeline*
- *10 = No dominant frame for which to assess attitude*

Variable 18: Actors (people or organizations) associated with dominant frame

Identify actors and/or quoted sources that are used in support of the dominant frame (categories for actors adapted from Djerf-Pierre et al., 2016; Hedding, 2017; Firtova, 2017; Raso & Neubauer, 2016; Taylor et al., 2000; Takahashi & Meisner, 2013; Wood, 2019; Wozniak et al., 2017).

- In a news story, identify the first person or organization that is mentioned along with the dominant frame, usually in the article's headline or lead paragraph.
- If the article is a letter to the editor, identify the letter writer and determine which category listed below s/he falls into.
- Select the type of actor from the list below
 - 1=Government official (includes Republican and Democrat politicians; appointed officials, non-partisan officials, regulators, judges, law enforcement)
 - 2=Oil industry representative (e.g. Enbridge spokesperson, petroleum interest group spokesperson, etc.)
 - 3=Indigenous representatives (e.g. tribal government, leaders, members)

- 4=Environmental interest groups (e.g. Friends of the Headwaters, MN350, Sierra Club)
- 5=Landowners (other than Indigenous)
- 6=Business community representatives
- 7=Community residents (i.e. people who live in communities that are affected by Enbridge Line 3 project–current route or proposed routes)
- 8=Combined environmental and Indigenous interest group (e.g. Honor the Earth)
- 10=None of these/Other
- 11=No actors/unable to determine

Variable 19: Does the article include references to climate change?

Mentions of climate change could include verbatim references to “climate change.” An article may also discuss climate change in terms of “global climate change” or “global warming,” or by referring to greenhouse gases, the greenhouse effect, CO₂ (carbon dioxide) emissions, methane emissions, or climate action.

Note: Mentions of “hydrocarbon fuel” (Christoff, 2018, para. 4) or “fossil fuels” on their own are not enough to indicate a reference to climate change. In order for these word choices to indicate a reference to climate change, the article would need to explain how their use is related to climate change or global warming.

- 2= appears in headline or lead
- 1= secondary/appears elsewhere in article
- 0= not present

PART 4: CLIMATE CHANGE FRAMES (per Nisbet, 2009; Nisbet 2010b)

[Note: Verbatim text for climate change frame definitions appeared in coders’ personal copies of instructions but were removed from final submission copy of thesis. Citations to the original verbatim text are provided.]

Instructions:

Review the article again to identify instances where **climate change** is mentioned. Examine each instance to determine whether any of the following frames are used to **present the issue of climate change**.

- When Enbridge L3 **is** the primary topic of the article, examine all instances of climate change for the following frames.
- When Enbridge L3 is **not** the primary topic of the article and is only discussed in a portion of the article, examine **only the instances of climate change that appear in paragraphs about Enbridge L3** for the following frames.

Articles may include:

- multiple climate change frames

- a single climate change frame
- no climate change frames

Note: You are considering whether these frames apply to the issue of climate change specifically, NOT Enbridge L3.

Variable 20: “Scientific/technical uncertainty”

[See Nisbet, 2010b, p. 52 for verbatim definition.]

Indicators of this frame include:

- Presenting perspectives of scientists who are climate skeptics as evidence against its reality (Nisbet, 2009).
- Instances that suggest that climate change's causes are unknown or could be natural/non-human (Nisbet, 2009).
 - *Example: A politician expressing his/her belief in the veracity that the Earth’s climate is changing, but doubts that greenhouse gas emissions like CO2 are the cause (Salisbury, 2018).*
- Instances that suggest that impacts of climate change might not be that bad or as dire as they have been claimed to be (Nisbet, 2009, 2010b).

Note: The object of uncertainty in this frame is climate change, NOT Enbridge Line 3.

Indicate the presence of this frame as follows:

- *1=present*
- *0=not present*
- *Note: if climate change is not mentioned at all in article, the code for this variable should be 0.*

Variable 21: “Conflict/strategy”

[See Nisbet, 2010b, p. 52 for verbatim definition.]

Indicators of this frame include:

- Portrayal of the issue as one that needs to be won, or which two different sides are competing over, or focuses on the strategic aspect (Nisbet, 2009, 2010b).
- Depicting political groups’ conflicts over climate change-related legislation (Hart & Feldman, 2014).
 - For example, if Republicans and Democrats were arguing over carbon taxes.
- Depicting conflict in the international community about how to address climate change (Hart & Feldman, 2014).

Indicate the presence of this frame as follows:

- *1=present*
- *0=not present*

- *Note: if climate change is not mentioned at all in article, the code for this variable should be 0.*

Variable 22: “Economic development/competitiveness” (negative)

[See Nisbet, 2010b, p. 52 for verbatim definition.] In other words, think about this frame as suggesting that efforts taken to combat climate change will harm the economy. Note: the focus here is on actions related to climate change (not Enbridge Line 3) and their impact on the economy.

Indicators of this frame include:

- Expressing that the U.S. is being asked to do too much to reduce emissions in comparison to other countries (Nisbet, 2010b).
- Depictions of fighting climate change as being a misuse of economic resources (Nisbet, 2009, 2010b).
- Discussion of how the government or industrial sector will suffer financially or economically if greenhouse gases are regulated (Hart & Feldman, 2014).

Indicate the presence of this frame as follows:

- *1=present*
- *0=not present*
- *Note: if climate change is not mentioned at all in article, the code for this variable should be 0.*

Variable 23: “Pandora’s Box/Frankenstein’s monster/runaway science”

[See Nisbet, 2010b, p. 52 for verbatim definition.] In other words, think about this frame as suggesting that the impacts of climate change will be disastrous.

Indicators of this frame include:

- The phrase “climate crisis” (Nisbet, 2010, p. 55).
- Calling attention to dramatic or drastic climate change impacts or images of such impacts, such as destruction caused by extreme storms, or imagery of animals put at risk by climate change, extreme drought, wildfires, dramatic flooding of recognizable urban landscapes (Nisbet, 2009, 2010b).
- Presence of Democratic-aligned politicians or environmental advocacy groups making these statements (Nisbet, 2010b).

Indicate the presence of this frame as follows:

- *1=present*
- *0=not present*
- *Note: if climate change is not mentioned at all in article, the code for this variable should be 0.*

Variable 24: “Public accountability/governance”

[See Nisbet, 2010b, p. 52 for verbatim definition.] In other words, this frame emphasizes the government’s role in the way that climate change research is produced and/or used (or

if it is not).

Indicators of this frame include:

- Use of the phrase “war on science” (Nisbet, 2010b, p. 55).
- Highlighting government's obligations to use scientific research for the public good and not for political gain. As a part of that highlighting government's obligations to promote research, not misrepresent or bury scientific research for political reasons (Nisbet, 2010b).
- Is research being discussed in terms of how it is used to “serve” the “public interest” or “special interests” (Hart & Feldman, 2014, p. 335).

Indicate the presence of this frame as follows:

- *1=present*
- *0=not present*
- *Note: if climate change is not mentioned at all in article, the code for this variable should be 0.*

Variable 25: “Economic development/competitiveness” (positive)

[See Nisbet, 2010b, p. 52 for verbatim definition.]

Indicators of this frame include:

- Calling attention to the notion that combatting climate change yields “opportunities” for economic growth (Nisbet, 2010b).
- Stock phrases like “innovative energy technology,” “sustainable economic prosperity,” “creating green jobs” (Nisbet, 2010b, p. 57), “New green jobs” (Hart & Feldman, 2014, p. 335).

Indicate the presence of this frame as follows:

- *1=present*
- *0=not present*
- *Note: if climate change is not mentioned at all in article, the code for this variable should be 0.*

Variable 26: “Morality/ethics”

[See Nisbet, 2010b, p. 52 for verbatim definition.]

Indicators of this frame include:

- References to obligation to “be stewards of God's creation” (Nisbet, 2010, p. 57)
- Appeals to need to come together across divides to solve a “shared moral challenge” (Nisbet, 2009, p. 21).
- Comparisons of combatting climate change to other shared national struggles (Nisbet, 2009).
- Images or depictions of traditional political opponents agreeing on a shared concern about issue (Nisbet, 2009).

Indicate the presence of this frame as follows:

- *1=present*
- *0=not present*

- *Note: if climate change is not mentioned at all in article, the code for this variable should be 0.*

Variable 27: “Public health”

Emphasizes that rates of certain diseases and illnesses could rise as a result of climate change (Nisbet, 2010b, p. 58).

Indicators of this frame include:

- Diseases and illnesses include “asthma,” “allergies,” “vector-borne diseases” like Lyme disease (Minnesota Climate & Health Program, Environmental Impacts Analysis Unit, 2015; Weathers & Kendall, 2016), or “heat stroke.” Certain populations like “children” or the “elderly” are particularly susceptible. (Hart & Feldman, 2014; Nisbet, 2010b, p. 58).
- Depictions or discussions of these impacts on people in/close to the community (Nisbet, 2010b).

Indicate the presence of this frame as follows:

- *1=present*
- *0=not present*
- *Note: if climate change is not mentioned at all in article, the code for this variable should be 0.*

Variable 28: Distribution of climate change frame groups

Review the codes for the climate change frames. Assess whether climate change frames from different groups appear in the article according to the following designations:

- Group 1: Variables 20, 21, 22, 23, 24
- Group 2: Variables 25, 26, 27

Code the article as follows:

- 0 = Article does not include climate change frames
- 1 = Article includes frames exclusively from Group 1
- 2 = Article includes frames from both Group 1 and Group 2
- 3 = Article includes frames exclusively from Group 2

Appendix G: Data Cleaning Procedures

The raw data files were downloaded from Qualtrics in CSV and Excel formats. The researcher inspected the data file to ensure that coder IDs were entered properly and compared the number of articles associated with each coder to the researcher's article assignment tracking spreadsheets. One more article appeared for Coder 1 than was assigned. All assigned articles for Coders 2 and 3 were present in the data set.

The researcher compared each article's Item ID in the Qualtrics data to the original assignment tracking spreadsheets to verify that each ID had been entered correctly, that there were no unintended duplicate entries, and to determine the source of Coder 1's discrepancies. For Coder 1, three IDs appeared twice, four IDs did not match the assignment list, and one ID was missing. For Coder 2, three IDs did not match the assignment list. To identify the appropriate Item ID and/or determine which duplicate items to keep, the researcher compared the incorrect coder-entered Item IDs and article publication dates to the original article PDFs that had been assigned to each coder. The table below indicates the changes made.

Table G1*Article ID entry errors and resolutions*

Coder	Article ID	Problem	Resolution
1	DNT27	Entered twice. Item ID for second iteration was a typo (DNT27 entered instead of DNT257)	Kept both items. Corrected Item ID for DNT257. (Date entered for that article matched DNT257 PDF.)
1	GRHR68	Incorrectly entered as GRH68.	Corrected Item ID. (Date entered in Qualtrics matched article's PDF.)
1	WPI76	Incorrectly entered as WPI176.	Corrected Item ID. (Date entered in Qualtrics matched article's PDF.)
1	WPI76	Duplicate entry (second entry for article)	Kept first item entry with this ID. Removed second item.
1	DNT111	Incorrectly entered as DNT11.	Corrected Item ID. (Date entered in Qualtrics matched article's PDF.)
1	WPI5	Incorrectly entered as WP15.	Corrected Item ID. (Date entered in Qualtrics did not match article's PDF exactly, but was close enough to warrant making change.)
1	BP29	Entered twice.	Kept first item entry with this ID. Removed second item.
1	DNT266	Missing	Did not replace.
2	WPI76	Incorrectly entered as WP176.	Corrected Item ID. (Date entered in Qualtrics did not match article's PDF exactly, but was close enough to warrant making change.)
2	WPI81	Incorrectly entered as WP181	Corrected Item ID. (Date entered in Qualtrics matched article's PDF.)
2	DNT275	Incorrectly entered as DNT725.	Corrected Item ID. Date entered in Qualtrics matched date for DNT275 PDF.

The researcher examined all remaining variables (with the exception of the Item Date) in the data set column by column to identify any missing or out-of-range values.

Errors appeared in the following variables: V4: Outlet (one article, GRHR72, was mistakenly coded as a “1” for the Duluth News Tribune instead of “3” for the Grand Rapids Herald Review); V2: Relevance (details below); V6: Environmental Frame (missing values for Coder 2’s BP8 and DNT251 entries); V7: Economic Frame (missing values for Coder 2’s BP8 entry); V15: Presence of Any Frame (Coder 1 marked BP35 as 0/no frames present when individual frame variables had been coded as present); V16: Dominant Pipeline Frame (Coder 1’s entries do not match the codes indicating dominance in frame variables for BP29 and GRHR1); V27: Public Health frame (in GRHR58, Coder 2 identified a Public Health frame when climate change was not identified as present and when the distribution of climate change frames was coded as none being present in the article). Per the ReCal guidelines, pound signs (#) were entered for the missing data in order to facilitate intercoder reliability testing. Some articles were deleted to account for errors in relevance coding (see below). No other errors were fixed.

The researcher also reviewed the coding for each article’s pipeline frames row-by-row to ensure that no more than one frame had been coded as dominant. No articles were coded with multiple dominant pipeline frames. This suggests that the coders followed basic procedural coding instructions well overall, though there was disagreement in applying the codes.

During data entry and data cleaning, the researcher discovered that discrepancies existed between the way Coders 1 and 2 had coded four articles’ relevance and what they had communicated to the researcher during the coding process. (The researcher had directed coders to notify her if any articles were identified as irrelevant during the coding process in order to track how many articles would need to be replaced.) The researcher

decided to remove those four articles (DNT37, DNT67, DNT 256, WPI21) from the sample. These four articles were a part of the intercoder reliability subsample, and had already been replaced in the overall sample because at least one coder had reliably marked it as irrelevant. As a result, their removal did not affect the total sample size. It did, however, affect the sample size for the intercoder reliability tests for the relevance variable (described in the intercoder reliability test section in Chapter 4: Results).

After conducting the intercoder reliability tests, the researcher's (Coder 3) intercoder reliability data subsample was selected for incorporation into the final cleaned data set as it contained the most detailed notes for coding decisions.

Appendix H: Results Tables

Table H1

Pipeline frame frequency: All outlets

Pipeline Frame	Frame presence			
	Not present (0)	Present– secondary (1)	Dominant– EL3 not main focus (2)	Dominant– EL3 main focus (3)
Environmental (1)	70	115	15	9
Economic (2)	112	69	10	18
National Interest (3)	200	8	0	1
Government/Politics (4)	53	72	28	56
Conflict/Strategy (5)	178	15	6	10
Indigenous (6)	144	56	2	7
Safety (7)	132	70	2	5
Foreign Intervention (8)	207	2	0	0
Environmental Justice (9)	201	7	0	1

Note: Counts from all outlets, prepared from single-frame variable frequency tables

Table H2

Pipeline frame proportions

Pipeline Frame	Frame presence			
	Not present (0)	Present– secondary (1)	Dominant–EL3 not main focus (2)	Dominant– EL3 main focus (3)
Environmental (1)	0.3349	0.5502	0.0718	0.0431
Economic (2)	0.5359	0.3301	0.0478	0.0861
National Interest (3)	0.9569	0.0383	0	0.0048
Government/Politics (4)	0.2536	0.3445	0.134	0.2679
Conflict/Strategy (5)	0.8517	0.0718	0.0287	0.0478
Indigenous (6)	0.689	0.2679	0.0096	0.0335
Safety (7)	0.6316	0.3349	0.0096	0.0239
Foreign Intervention (8)	0.9904	0.0096	0	0
Environmental Justice (9)	0.9617	0.0335	0	0.0048

Note: Proportion of frame codes, all outlets, compiled from single-variable frequency tables prepared in R (rounded to ten thousandths place)

Table H3*Presence of any frame*

	No frames		At least one frame		Total
	n	\hat{p}	n	\hat{p}	
Articles	10	0.04784689	199	0.95215311	209

Table H4*Frame appearance frequency by outlet*

Frame	Newspaper Outlet					
		Duluth News Tribune	Bemidji Pioneer	Grand Rapids Herald- Review	Walker Pilot- Independent	Crookston Times
Environmental	0	37	10	13	7	3
	1	57	11	21	21	5
	2	5	2	1	5	2
	3	5	0	1	3	0
Economic	0	57	18	13	20	4
	1	33	4	15	13	4
	2	5	0	4	1	0
	3	9	1	4	2	2
National interest	0	100	23	34	34	9
	1	4	0	2	2	0
	2	0	0	0	0	0
	3	0	0	0	0	1
Government/ politics	0	28	13	5	3	4
	1	34	6	13	16	3
	2	15	2	6	4	1
	3	27	2	12	13	2
Conflict/ strategy	0	82	21	31	35	9
	1	12	0	3	0	0
	2	3	2	1	0	0
	3	7	0	1	1	1
Indigenous	0	66	18	28	24	8
	1	33	2	8	11	2
	2	1	0	0	1	0
	3	4	3	0	0	0
Safety	0	68	17	16	26	5
	1	30	6	20	9	5
	2	2	0	0	0	0
	3	4	0	0	1	0
Foreign Intervention	0	102	23	36	36	10
	1	2	0	0	0	0
	2	0	0	0	0	0
	3	0	0	0	0	0
Environmental Justice	0	98	22	36	35	10
	1	5	1	0	1	0
	2	0	0	0	0	0
	3	1	0	0	0	0

Note: Frequency of frame codes, broken out by outlet, compiled from single frame/outlet relative frequency tables prepared in R. 0 = not present; 1 = secondary; 2 = dominant when Line 3 is article's secondary focus; 3 = dominant when Line 3 is article's primary focus

Table H5*Frame appearance proportion, by outlet*

Frame		Newspaper Outlet				
		Duluth News Tribune	Bemidji Pioneer	Grand Rapids Herald Review	Walker Pilot-Independent	Crookston Times
Environmental	0	0.3558	0.4348	0.3611	0.1944	0.3000
	1	0.5481	0.4783	0.5833	0.5833	0.5000
	2	0.0481	0.0870	0.0278	0.1389	0.2000
	3	0.0481	0.0000	0.0278	0.0833	0.0000
Economic	0	0.5481	0.7826	0.3611	0.5556	0.4000
	1	0.3173	0.1739	0.4167	0.3611	0.4000
	2	0.0481	0.0000	0.1111	0.0278	0.0000
	3	0.0865	0.0435	0.1111	0.0556	0.2000
National interest	0	0.9615	1.0000	0.9444	0.9444	0.9000
	1	0.0385	0.0000	0.0556	0.0556	0.0000
	3	0.0000	0.0000	0.0000	0.0000	0.1000
	2	0.0000	0.0000	0.0000	0.0000	0.0000
Government/politics	0	0.2692	0.5652	0.1389	0.0833	0.4000
	1	0.3269	0.2609	0.3611	0.4444	0.3000
	2	0.1442	0.0870	0.1667	0.1111	0.1000
	3	0.2596	0.0870	0.3333	0.3611	0.2000
Conflict/strategy	0	0.7885	0.9130	0.8611	0.9722	0.9000
	1	0.1154	0.0000	0.0833	0.0000	0.0000
	2	0.0288	0.0870	0.0278	0.0000	0.0000
	3	0.0673	0.0000	0.0278	0.0278	0.1000
Indigenous	0	0.6346	0.7826	0.7778	0.6667	0.8000
	1	0.3173	0.0870	0.2222	0.3056	0.2000
	2	0.0096	0.0000	0.0000	0.0278	0.0000
	3	0.0385	0.1304	0.0000	0.0000	0.0000
Safety	0	0.6538	0.7391	0.4444	0.7222	0.5000
	1	0.2885	0.2609	0.5556	0.2500	0.5000
	2	0.0192	0.0000	0.0000	0.0000	0.0000
	3	0.0385	0.0000	0.0000	0.0278	0.0000
Foreign Intervention	0	0.9808	1.0000	1.0000	1.0000	1.0000
	1	0.0192	0.0000	0.0000	0.0000	0.0000
	2	0.0000	0.0000	0.0000	0.0000	0.0000
	3	0.0000	0.0000	0.0000	0.0000	0.0000
Environmental Justice	0	0.9423	0.9565	1.0000	0.9722	1.0000
	1	0.0481	0.0435	0.0000	0.0278	0.0000
	2	0.0000	0.0000	0.0000	0.0000	0.0000
	3	0.0096	0.0000	0.0000	0.0000	0.0000

Note (Table H5, continued from page 255): Proportion of frame codes, broken out by outlet, compiled from single frame/outlet relative frequency tables prepared in R. 0 = not present; 1 = secondary; 2 = dominant when Line 3 is article's secondary focus; 3 = dominant when Line 3 is article's primary focus

Table H6*Dominant frame frequency and proportion, by story type*

Dominant frame	Story type				Total
	News		Opinion		
	n	\hat{p}	n	\hat{p}	
Environmental	13	0.09558824	11	0.15068493	24
Economic	12	0.08823529	16	0.21917808	28
National Interest	0	0	1	0.01369863	1
Government Politics	61	0.44852941	24	0.32876712	85
Conflict Strategy	9	0.06617647	6	0.08219178	15
Indigenous	8	0.05882353	1	0.01369863	9
Safety	3	0.02205882	5	0.06849315	8
Foreign Intervention	0	0	0	0	0
Environmental Justice	1	0.00735294	0	0	1
None of these/other	29	0.21323529	9	0.12328767	38
Total	136		73		209

Note: Foreign Intervention frame was not present as a dominant frame, so was not included in original R output. Added to table manually. Dominant frame summary variable used for calculations.

Table H7*Dominant frame frequency and proportion, by Enbridge Line 3 focus level*

Dominant Frame	Pipeline Focus in Story						Total
	Unable to determine		Secondary focus		Main focus		
	n	\hat{p}	n	\hat{p}	n	\hat{p}	
Environmental	0	0	15	0.238095	9	0.08411	24
Economic	0	0	10	0.158730	18	0.16822	28
National interest	0	0	0	0	1	0.00934	1
Government politics	0	0	29	0.460317	56	0.52336	85
Conflict strategy	0	0	5	0.079365	10	0.09345	15
Indigenous	0	0	2	0.031746	7	0.06542	9
Safety	1	0.025641	2	0.031746	5	0.04672	8
Foreign Intervention	0	0	0	0	0	0	0
Environmental Justice	0	0	0	0	1	0.00934	1
None of these/Other	38	0.974358	0	0	0	0	38
Total	39		63		107		209

Note: Foreign Intervention frame was not present as a dominant frame, so was not included in original R output. Added to table manually.

Table H8*Frequency of articles by Enbridge Line 3 focus level*

	Unable to determine	Pipeline secondary focus	Pipeline main focus	Total
Articles	39	63	107	209

Table H9*Dominant pipeline frame attitude frequency and proportion*

Dominant frame	Dominant frame attitude position								Total
	Anti-pipeline		Neutral/ balanced		Pro-pipeline		No dominant frame for which to assess attitude		
	n	\hat{p}	n	\hat{p}	n	\hat{p}	n	\hat{p}	
Environmental	9	0.375	8	0.3333 3333	7	0.2916 6667	0	0	24
Economic	0	0	4	0.1428 5714	24	0.8571 4286	0	0	28
National Interest	0	0	0	0	1	1	0	0	1
Government Politics	17	0.2	49	0.5764 7059	19	0.2235 2941	0	0	85
Conflict Strategy	6	0.4	7	0.4666 6667	2	0.1333 3333	0	0	15
Indigenous	5	0.5555 5556	3	0.3333 3333	1	0.1111 1111	0	0	9
Safety	0	0	1	0.125	7	0.875	0	0	8
Foreign Intervention	0	n/a	0	n/a	0	n/a	0	n/a	0
Environmental Justice	1	1	0	0	0	0	0	0	1
None of these/other	1	0.0263 1579	0	0	0	0	37	0.973 68421	38
Total	39		72		61		37		209

Note: Dominant frame summary variable used for frequency counts and proportion calculations.

Table H10*Dominant pipeline frame attitude frequency and proportion, by news outlet*

News Outlet	Dominant frame attitude position								Total
	Anti-pipeline		Neutral/ balanced		Pro-pipeline		No dominant frame		
	n	\hat{p}	n	\hat{p}	n	\hat{p}	n	\hat{p}	
Duluth News Tribune	21	0.201 92308	38	0.365 38462	29	0.278 84615	16	0.153 84615	104
Bemidji Pioneer	4	0.173 91304	6	0.260 86957	2	0.086 95652	11	0.478 26087	23
Grand Rapids Herald-Review	4	0.111 11111	11	0.305 55556	16	0.444 44444	5	0.138 88889	36
Walker Pilot- Independent	9	0.25	15	0.416 66667	8	0.222 22222	4	0.111 11111	36
Crookston Times	1	0.1	2	0.2	6	0.6	1	0.1	10
Total	39		72		61		37		209

Table H11*Actor type frequency and proportion, across sample*

Actor type	n	\hat{p}
Government official	71	0.33971292
Oil industry representative	20	0.09569378
Indigenous representative	12	0.05741627
Environmental Interest Groups	1	0.00478469
Landowners	0	0
Business community representatives	12	0.05741627
Community residents	7	0.03349282
Combined environmental and Indigenous interest group	6	0.02870813
None of these/other	19	0.09090909
No actors/unable to determine	61	0.29186603
Total	209	1

Table H12*Actor type frequency in relation to dominant pipeline frames*

Dominant Frame	Actor										Total
	Gov't official	Oil industry reps.	Indig. Reps.	Enviro. Interest Groups	Land-owners	Business community reps	Community residents	Comb. Enviro. Indig. interest group	None of these/ other	No actors/ unable to determine	
Enviro.	7	4	3	0	0	1	2	2	2	3	24
Econ.	6	4	0	0	0	5	4	0	6	3	28
National Interest	0	0	0	0	0	0	0	0	1	0	1
Gov't/ Politics	54	7	0	0	0	3	0	2	9	10	85
Conflict Strategy	3	1	1	1	0	2	1	2	0	4	15
Indigenous	0	1	8	0	0	0	0	0	0	0	9
Safety	1	3	0	0	0	1	0	0	0	3	8
Foreign Intervent.	0	0	0	0	0	0	0	0	0	0	0
Enviro. Justice	0	0	0	0	0	0	0	0	1	0	1
None/other	0	0	0	0	0	0	0	0	0	38	38
Total	71	20	12	1	0	12	7	6	19	61	209

Table H13

Proportion of articles featuring a combination of actor and dominant frame out of all articles with a given actor type

Dominant Frame	Actor									
	Gov't official	Oil industry reps	Indig. Reps.	Enviro. Interest Groups	Land-owners	Business community reps	Community residents	Comb. Enviro. Indig. interest group	None of these/ other	No actors/ unable to determine
Enviro.	0.098591 55	0.2	0.25	0		0.0833333 3	0.28571429	0.333333 33	0.1052631 6	0.0491803 3
Econ.	0.084507 04	0.2	0	0		0.4166666 7	0.57142857	0	0.3157894 7	0.0491803 3
National Interest	0	0	0	0		0	0	0	0.0526315 8	0
Gov't/ Politics	0.760563 38	0.35	0	0		0.25	0	0.333333 33	0.4736842 1	0.1639344 3
Conflict/ Strategy	0.042253 52	0.05	0.0833333 3	1		0.1666666 7	0.14285714	0.333333 33	0	0.0655737 7
Indigenous	0	0.05	0.6666666 7	0		0	0	0	0	0
Safety	0.014084 51	0.15	0	0		0.0833333 3	0	0	0	0.0491803 3
Foreign Intervent.	0	0	0	0		0	0	0	0	0
Enviro. Justice	0	0	0	0		0	0	0	0.0526315 8	0
None of these/other	0	0	0	0		0	0	0	0	0.6229508 2

Table H14*Climate change presence, across sample*

Climate change presence	n	\hat{p}
Not present	174	0.83253589
Present but not in headline or lead	31	0.14832536
Appears in headline or lead	4	0.01913876
Total	209	1

Table H15*Climate change presence, divided by outlet*

Outlet	Climate Change Presence						Total
	Not present		Present but not in headline or lead		Appears in headline or lead		
	n	\hat{p}	n	\hat{p}	n	\hat{p}	
Duluth News Tribune	80	0.76923 077	21	0.20192 308	3	0.02884 615	104
Bemidji Pioneer	20	0.86956 522	3	0.13043 478	0	0	23
Grand Rapids Herald Review	32	0.88888 889	4	0.11111 111	0	0	36
Walker Pilot-Independent	33	0.91666 667	2	0.05555 556	1	0.02777 778	36
Crookston Times	9	0.9	1	0.1	0	0	10
Total	174		31		4		209

Table H16*Climate change presence, divided by story type*

Climate change presence	Story Type				Total
	News		Opinion		
	N	\hat{p}	n	\hat{p}	
Not present	112	0.8235294	62	0.8493151	174
Present	24	0.1764706	11	0.1506849	35
Total	136		73		209

Table H17*Pearson's Chi-squared test of association for story type and climate change presence*

data: x
 X-squared = 0.22654, df = 1, p-value = 0.6341

Climate change presence	Story type	
	News (1)	Opinion (2)
Not present (0)	112 (113.22) [0.013] <-0.12>	62 (60.78) [0.025] < 0.16>
Present (1)	24 (22.78) [0.066] < 0.26>	11 (12.22) [0.123] <-0.35>

key:
 observed
 (expected)
 [contribution to X-squared]
 <Pearson residual>

Table H18*Climate change presence in relation to dominant pipeline frames*

Dominant frame	Climate change presence				Total
	Not present		Present		
	n	\hat{p}	n	\hat{p}	
Environmental	18	0.75	6	0.25	24
Economic	26	0.928571	2	0.071428	28
		43		57	
National Interest	1	1	0	0	1
Government/Politics	69	0.811764	16	0.188235	85
		71		29	
Conflict Strategy	12	0.8	3	0.2	15
Indigenous	8	0.888888	1	0.111111	9
		89		11	
Safety	7	0.875	1	0.125	8
Foreign Intervention	0	0	0	0	0
Environmental Justice	1	1	0	0	1
None of these/other	32	0.842105	6	0.157894	38
		26		74	
Total	174		35		209

Table H19*Climate change frame frequency, broken out by story type*

	Story type	
	News	Opinion
Scientific/technical uncertainty	0	0
Conflict/strategy	0	0
Economic consequences (negative)	0	0
Pandora's Box	0	2
Public accountability/governance	0	0
Economic development (positive)	0	1
Morality/ethics	1	0
Public health	0	2

Note: Numbers of articles without climate change frames not included

Table H20*Climate change frame types, broken out by story type*

	Story type		
	News	Opinion	Total
No climate change frames present	135	69	204
Negative climate change frames only	0	2	2
Negative and positive climate change frames	n/a	n/a	n/a
Positive climate change frames only	1	2	3
Total	136	73	209

Table H21*Climate change frame frequency, broken out by dominant frame attitude position*

Climate change frame	Attitude position				Total
	Anti-pipeline	Neutral/balanced	Pro-pipeline	Unable to determine	
Scientific/technical uncertainty	0	0	0	0	0
Conflict/strategy	0	0	0	0	0
Economic consequences (negative)	0	0	0	0	0
Pandora's Box	2	0	0	0	2
Public accountability/governance	0	0	0	0	0
Economic development (positive)	1	0	0	0	1
Morality/ethics	0	1	0	0	1
Public health	0	0	2	0	2

Note: Numbers of articles without climate change frames not included

Table H22*Climate change frame frequency, broken out by outlet*

Climate change frame	News outlet				
	Duluth News Tribune	Bemidji Pioneer	Grand Rapids Herald-Review	Walker Pilot-Independent	Crookston Times
Scientific/technical uncertainty	0	0	0	0	0
Conflict/strategy (CC)	0	0	0	0	0
Economic consequences (negative)	0	0	0	0	0
Pandora's Box	2	0	0	0	0
Public accountability/governance	0	0	0	0	0
Economic development (positive)	1	0	0	0	0
Morality/ethics	0	1	0	0	0
Public health	1	0	1	0	0

Note: Numbers of articles without climate change frames not included

Table H23*Climate change frame types, broken out by outlet*

Distribution of Climate Change Frames	News outlet				
	Duluth News Tribune	Bemidji Pioneer	Grand Rapids Herald Review	Walker Pilot- Independent	Crookston Times
No climate change frames present	100	22	36	36	10
Negative climate change frames only	2	0	0	0	0
Negative and positive climate change frames	n/a	n/a	n/a	n/a	n/a
Positive climate change frames only	2	1	0	0	0
Total	104	23	36	36	10

Table H24*Climate change frame frequency, broken out by dominant pipeline frames*

Pipeline frame	Climate change frame							
	Scientific/ technical uncertainty	Conflict/ strategy	Economic consequences (negative)	Pandora's Box	Public accountability / governance	Economic development (positive)	Morality/ ethics	Public health
Environmental	0	0	0	1	0	0	0	1
Economic	0	0	0	0	0	0	0	1
National Interest	0	0	0	0	0	0	0	0
Government Politics	0	0	0	0	0	1	1	0
Conflict Strategy	0	0	0	1	0	0	0	0
Indigenous	0	0	0	0	0	0	0	0
Safety	0	0	0	0	0	0	0	0
Foreign Intervention	0	0	0	0	0	0	0	0
Environmental Justice	0	0	0	0	0	0	0	0
None of these/other	0	0	0	0	0	0	0	0

Note: Numbers of articles without climate change frames not included

Table H25*Intercoder reliability results*

Variable	Pairwise % agreement				Krippendorff's alpha
	Average (all coders)	Coders 1 & 3	Coders 1 & 2	Coders 2 & 3	
V02: Relevance And Inclusion (n=58)	89.655	91.379	87.931	89.655	0.347
V04: Newspaper Outlet (n=48)	98.61	100	97.917	97.917	0.9787360594 8
V05: Type Of Story (n=48)	97.222	97.917	95.833	97.917	0.944
V06: Environmental Frame Pipeline (n=48)	(not available ReCal OIR)	n/a	n/a	n/a	0.543
V07: Economic Frame Pipeline (n=48)	76.389	87.5	70.833	70.833	0.596
V08: National Interest Frame Pipeline (n=48)	94.444	95.833	91.667	95.833	0.478
V09: Government Politics Frame Pipeline (n=48)	68.75	68.75	68.75	68.75	0.581
V10: Conflict Strategy Frame Pipeline (n=48)	79.167	83.33	81.25	72.917	0.293
V11: Indigenous Frame Pipeline (n=48)	84.722	83.333	85.417	85.417	0.601
V12: Safety Frame Pipeline (n=48)	85.417	83.333	81.25	91.667	0.721
V13: Foreign Intervention Frame Pipeline (n=48)	95.833	100	93.75	93.75	0.234
V14: Environmental Justice Frame Pipeline (n=48)	92.361	91.667	93.75	91.667	0.363
V15: Presence Of Any Frame (n=48)	93.056	95.833	91.667	91.667	0.63
V16: Dominant Frame Pipeline (n=48)	57.639	56.25	68.75	47.917	0.445
V17: Dominant Frame Attitude Position Pipeline (n=48)	(not available ReCal OIR)	n/a	n/a	n/a	0.299
V18: Actors Associated With Dominant Frame (n=48)	47.222	45.833	54.167	41.667	0.32
V19: Climate Change Reference Presence (n=48)	97.222	95.833	97.917	97.917	0.874
V23: Pandoras Box Frame CC (n=48)	95.833	100	93.75	93.75	-0.014
V28: Distribution Climate Change Frames (n=48)	95.833	100	93.75	93.75	-0.014