

# Dead Ducks and Dirty Oil: Media Representations and Environmental Solutions

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*On April, 2008, over 1600 migrating ducks died after landing on a toxic tailings pond in the Oil Sands region of North-Eastern Alberta. The responsible company was found guilty and paid the largest environmental fine in Alberta's history. To assess the nature of this environmental focusing event we identified 747 newspaper articles that covered this event published between January 2008 and June 2011. Each article was coded based on date of publication, voices represented, and solutions proposed. The coverage was concentrated following the original and related events, creating a focusing event, and expressed mainly the voices of powerful actors in industry, government, and environmental groups. Most of the solutions proposed were short term and depicted a zero-sum trade-off between environmental and economic interests. We suggest that more sustained media attention with a greater diversity of voices and solutions could foster greater dialogue around environmental challenges like toxic tailings ponds.*

**Keywords** Canada, environmental solutions, focusing event, media analysis, oil sands, pollution accident

On April 28, 2008, approximately 1600 migratory waterfowl died after landing on a tailings pond produced by the oil sands industry in northern Alberta. This event shed a critical environmental light on Alberta's oil sands industry, which had experienced little, widespread

negative attention during its prior three decades of operation. An anonymous whistle-blower alerted a provincial regulator who recorded the event with photography that was subsequently shared with several media sources. This event made local, provincial, national and international headlines, sparking controversy around the practices involved in extracting bitumen from the oil sands and particularly on the creation, maintenance and monitoring of tailings ponds.

Media attention following the mortality event was focused on the tailings ponds, which contain residual bitumen, suspensions of clay and various toxic compounds such as phenols, benzene, cyanide and arsenic, the typical by-products of oil sands production (Nikiforuk 2010, p. 84). The hazardous compounds contained in these ponds require oil sands operators, via provincial and federal laws, to prevent birds from landing on them. Since the late 1970's this goal has been addressed by deploying both auditory and visual deterrents to scare birds away from landing on the ponds (Ronconi and St. Clair 2006), which may be as large as 10 km<sup>2</sup> (St. Clair et al. 2011).

Relative to the infrequent media attention dedicated to the tailings ponds in the past, the landing event of April 2008 appeared to create a sudden rise in newsprint coverage, potentially constituting an environmental focusing event. Such focusing events occur when a dramatic and harmful incident attracts increased attention to the possibility of greater social or environmental harms in the future (Birkland 1998). Focusing events have the potential to reshape public opinion on the costs and benefits of extractive and toxic industries, like oil sands mining, and to stimulate a broader consideration of potential solutions. Critical analyses of the greater social and environmental impacts of oil production and distribution practices followed other environmental focusing events such as the grounding of the Exxon Valdez (Dyer, Gill and Picou 1992) and the blow-out of the Deepwater Horizon (Birkland and DeYoung 2011). The tailings ponds produced by the oil sands industry constitute a particularly intractable environmental problem for several reasons: there are currently no technologies available to extract bitumen without tailings (Simieritsch et al. 2009); tailings ponds cannot be restored to a pre-disturbance state (Foote 2012); tailings ponds already comprise approximately 60 km<sup>2</sup> in the oil sands region (St. Clair et al. 2011); and both the number of ponds and their areas continue to expand as production levels increase (Government of Alberta 2009). Evaluating the social and environmental dimensions of oil sands production is made more difficult by the high, but variable, royalties paid by the industry. Oil sands production is Alberta's top source of non-renewable resource revenue providing \$4.51 billion (Cdn.) in royalties for the province in 2011 and \$3.56 billion (Cdn.) in 2012 (Government of Alberta 2013). Employment statistics tend to be aggregated across the energy industry with provincial figures suggesting one in fourteen jobs is directly related to energy (Government of Alberta 2011). This ratio is conservative since it does not include jobs indirectly related to the energy industry.

This paper focuses on the aforementioned bird mortality event in northern Alberta that highlighted the environmental consequences of the tailings ponds. First, our analysis examined 700 articles over a three-year period to examine to determine if the landing event in 2008 comprised an environmental focusing event. Secondly, we quantified the prevalence of different voices who spoke to the risk posed by tailings ponds, and third we described the solutions for mitigating the tailings pond problem. Our next sections address the social construction of risk by the media and the more specific context of oil sands tailings ponds' risks posed for birds.

## Social Theory of Risk, Focusing Events and Media Construction

Debates surrounding environmental issues are often polarized emphasizing either the economic benefits or the environmental and social costs. Conflicting actors typically legitimize their position by defining the conflict in one of two key ways: either using a "differential knowledge view" or a values-laden viewpoint (Dietz, Stern and Rycroft 1989, pp. 48-50). A knowledge-based view assumes that experts are needed to identify the specific causes of environmental problems, and that the public does not understand the technical solutions and evaluations of risk. Alternatively, a value-based view promotes the fair allocation of the risks and rewards of resource extraction to industry and society. Similarly, a rationalist view holds that the risks of any technological innovation can be calculated and managed, while subjectivists argue that all risky behaviour takes place within a social context and is necessarily guided by subjective value judgements (Hornig 1993). These contrasting world views tend to polarize environmental debates.

Many environmental conflicts in the petrochemical industry involve corporate actors and government officials positioned above and looking down at lay critics who are often "portrayed as non-rational and unable to evaluate the contribution of 'experts' to environmental policy" (Berger et al. 2001, p. 63). An alternative view is that the experts, not the public, are naïve for assuming that all risks can be adequately managed with information and technology (Hornig 1993). Furthermore, when environmental debates are defined in economic, rationalistic terms, the "free-market" obscures the sociohistoric costs of pollution, since industry actors keep the majority share of profits while externalizing the environmental costs of production to the workers, local residents and a broader public (Dietz, Stern and Rycroft 1989; Bridge 2001). Industry and government actors typically benefit from defining environmental debates in economic terms because it allows them to engage in "diversionary reframing," a process by which actors may divert attention away from the primary issue and reframe the debate in a way that discredits their opponents (Freudenburg 2005). In such cases, critics are often accused of "trying to shut down the... economy" while the significance of the original catalyst for debate -- the pollution, social injustice, or technological failure -- is downplayed (Freudenburg 2005, p. 104).

An inevitable problem with too much reliance on economic framing and technological arguments is that they fail to recognize the embeddedness of all environmental debates in the political fabric of a society. As Žižek (2009) explained, "confronting ecological problems requires making choices and decisions – about what to produce, what to consume, on what energy to rely... as such, they are not only not technical, but are eminently political in the most radical sense of involving fundamental social choices" (p. 25). While discussion about the division between the technical and public spheres of argumentation is not new (Goodnight 1982), the technical sphere is increasingly influenced by private interests, raising concerns about the "contamination" of scientific research (Paliewicz 2012). In turn, the technological interpretations tend to obscure the sociological and ecological interpretations of environmental problems.

Framing is a technique used by journalists to establish how an environmental debate will be portrayed to the public. Following an environmental focusing event, journalists decide which actors to interview and which to exclude, thereby allowing certain actors to describe the event and to interpret the extent to which it poses a risk to the public. In making these decisions, journalists attempt to frame complex stories in ways that are accessible to the general public (Scheufele and Tewksbury 2007). By tapping into the prior existing cognitive schemas of their

readers, reporters can bolster the "effect" of their story proportionately to its degree of "cultural resonance" with the audience (Van Gorp 2007; Gamson and Modigliani 1989). Privileged voices with ready access to the media can provide reporters with easily-labeled 'pegs' on which to hang their stories, in turn promoting broader, pre-existing agendas, including future courses of action (Gans 1979; Entman 2007). For example, these 'pegs' often highlight the failures of technical systems and human operators, rather than the underlying organizational, institutional and societal conditions that contributed to a disaster (Tierney 1999). Privileged voices, including government officials, industry representatives and prominent environmental non-governmental organizations (ENGOS), can access media outlets more easily because they maintain routine relationships with journalists and are deemed to be the responsible spokespersons for either side of an environmental debate (Gamson and Modigliani 1989; Molotch and Lester 1975; Anderson 2002; Widener and Gunter 2007). Although these various strategies are employed to describe and interpret an environmental event, the actual media "effects" of framing rely on the assumption that "how an issue is characterized in news reports can have an influence on how it is understood by audiences" (Scheufele and Tewksbury 2007).

Focusing events can change the power dynamics among groups of actors making it possible to convey views that oppose the status quo to a much wider audience than can be reached in the absence of such events (Birkland 1998). Voices that are typically suppressed by more powerful, dominant groups can use focusing events to attract public attention to their environmental concerns and arguments for policy change (Birkland 1998; Stallings 1990). These "pro-change groups" often capitalize on the emotional stories from an event to mobilize a larger audience, while "status-quo groups" attempt to suppress or discount the same narratives to countermobilize the public (Birkland 1998). However, over time the power differentials tend to be reestablished as more powerful government or industry voices tend to dominate the headlines and influence how media sets the agenda of public concerns (Molotch and Lester 1975; Hornig 1993). An authority-order bias in shaping the ongoing story toward the more powerful actors often occurs because media outlets readily accept the underlying assumptions of prepared statements from government and industry representatives and use those accounts as the starting point for further discussion (Gamson and Modigliani 1989; Boykoff and Boykoff 2007). The alternative accounts then bear the burden of proof to offer a compelling counter-argument to the official accounts (Gamson and Modigliani 1989). In turn, attempts to counteract the implicit assumptions of prepared statements often results in defensive downplaying of the event by the creators of the prepared statements (Birkland 1998).

The favour media appears to provide to these privileged voices does not require collusion among media, industry, and government. Rather, it can unintentionally stem from the organizational structure of media companies where journalistic practices "become so ingrained that they become reified as 'professional norms' or 'good journalism,' thus reinforcing interpretations of focusing events that maintain the status quo (Molotch and Lester 1975, p. 255; Anderson 2002, p. 8; Boykoff and Boykoff 2007). We now turn to the context in which the 2008 duck mortality event in Alberta was constructed by media.

### **Context for bird protection in the Alberta Oil Sands**

The theory that media constructs the social context of risk following environmental focusing events has some important implications for the 2008 mortality event in the oil sands region of northern Alberta. Concerns regarding the accumulation of tailings resulting from the

production of bitumen and the risk these posed to migratory birds were identified by industry and government biologists as early as 1977 (Ronconi and St. Clair 2006; Nikiforuk 2010). These concerns were reiterated periodically over the following decades, but little effort was made to limit the creation or size of new tailings ponds (Nikiforuk 2010). Even their name underestimates the problem because many of the so-called ponds, including the one where the landing event in 2008 occurred, are several square kilometers in size (R. v. Syncrude Canada Ltd. 2010). The oil sands production region is also located just 200 km south of the Peace-Athabasca Delta, which is one of the largest freshwater deltas in the world and the only place in North America where waterfowl from all four continental flyways are known to congregate (Prowse and Conly 2000). In response, industry representatives, government officials, and academic researchers have long recognized the potential negative effects of tailings ponds on wildlife. This risk has been mitigated for the past three decades primarily with the use of metal scarecrows (as visual deterrents) and acoustic cannons (Ronconi and St. Clair 2006). The mortality event in 2008, however, occurred at a tailings pond where deterrents had not yet been placed for the summer season.

The initial reporting of the event estimated that a few hundred birds had died; that number approximately trebled to 1606 waterfowl in the ensuing months of investigation. The operating company, Syncrude Canada Ltd., was charged with contravening the provincial Environmental Protection and Enforcement Act and the federal Migratory Birds Convention Act. In the spring of 2010, a trial of nine weeks occurred and resulted in convictions on both counts. The subsequent hearing produced a sentence that included a fine that amounted to the largest monetary punishment for an environmental offence in provincial history (\$2.45 M. Cnd.) (Court Order for R. v. Syncrude Canada Ltd. 2010). Just four days after the court order, 457 more birds died at another tailings pond operated by the same company. The trial, conviction, sentence and second landing event each attracted media attention, but each event was invariably referenced back to the original 2008 landing event to amplify its effect as a focusing event worthy of detailed media analysis.

## Methods

In a primary electronic search, we used the online database *Factiva* to identify articles published between January 1, 2008 and June 30, 2011, in six newspapers (*The Edmonton Journal*, *The Calgary Herald*, *The Globe and Mail*, *The National Post/Financial Post*, *The New York Times*, and *The Wall Street Journal*) and two newswires (*The Canadian Press*, and *Canwest News Service*). Subsequently, we carried out a secondary search of publications from other major Canadian cities, major American cities, and English-speaking European cities. To account for the many ways of expressing the key concepts involved, we used the following boolean search strategy for both searches:

(tailings ponds or tailing ponds or tar ponds or settling ponds or settling basins or tailings pond or tailing pond or tar pond or settling pond or settling basin) and (oil sands or Syncrude or tar sands).

After executing the search, all duplicate or irrelevant articles were removed manually, resulting in a total of 747 articles (598 from daily newspapers, and 144 from newswires) for which we examined content in relation to two underlying themes: voices and solutions.

To analyze each article, a coding framework was created using the online tool, *Survey Monkey*, including two key categories of interest for this article: the voices heard and the

solutions proposed for dealing with tailings ponds in the articles. To test the coding consistency of the framework three of the four authors coded 20 random articles with the pre-test instrument and discussed the inconsistencies and ambiguities in their coding experience. The coding framework was clarified and then the first author coded all 747 articles included in the study.

In creating the coding frame, care was taken to distinguish minute but distinct differences between category codes, particularly under the solutions category (see Table 2). For instance, solutions that referred to litigation and fining oil sands operators for violating environmental regulations differed from solutions that referred to other punitive measures, such as revoking permits or shutting down operations. Also, many different forms of mitigation were discussed in the articles including: reducing the amount of liquid (fluid tailings) that is produced during the bitumen extraction process, forcing companies to eliminate the existing tailings ponds, and encouraging companies to speed up the process of restoring the land where tailings ponds currently exist to an ecologically productive state. Various alternative measures were also discussed in the articles ranging from slowing down the speed at which new oil sands projects are being approved, to implementing a moratorium on all new oil sands projects until a sustainable solution is found for the tailings ponds, to completely shutting down all oil sands production in the region.

At the time of our survey, the *Factiva* database did not include *Sun Media* publications, the more politically conservative media corporation in Canada. *Sun Media* is the publisher of two large Albertan newspapers, *The Edmonton Sun*, and *The Calgary Sun*, which have the third and fourth largest subscription rates in the province, behind *The Edmonton Journal* and *The Calgary Herald*. We suspect that by excluding *Sun Media* publications, which tend to emphasize right wing views, our findings are conservative in regards to the polarized representations we found in the remaining newspapers. Similar to Foote et al.'s (2009) study, we chose newspapers with the highest subscription rates for Alberta and newspapers well known for national coverage in Canada and the US. Because the electronic versions of newsprint articles from the *Factiva* database did not include images, we restricted our analysis to text, for which *Factiva* is known as a reputable and stable database (Phillips 2011).

## Results and Key Findings

Changes in media attention to the environmental problems associated with tailings ponds clearly define the dead duck incident of April 2008 as a focusing event (Figure 1). In contrast to the 14 articles that addressed the environmental effects of tailings ponds in the oil sands region in the first quarter of 2008, 68 articles appeared in May alone, the month immediately after the event on April 28. Over the subsequent two years, the frequency of articles dropped to an average of 13 per month with only 274 articles published between June 2008 and February 2010. Media attention again spiked with the start of the Syncrude trial in March 2010 (62 articles in each of March and April, 2010), and rose only slightly with the guilty conviction in June 2008 (44 articles). A sharp increase in media attention occurred October 22, 2010, following the announcement of the court imposed sentence and a second landing event (October 25; 63 articles). Article frequency precipitously dropped off following the second landing event, however, as only 57 articles in our survey were published between November 2010 and June 2011. There were rapid declines in temporal coverage following the original focusing event and each subsequent development. Additionally, among the 747 articles we reviewed, 36.1% (270) were published in Alberta-based newspapers, 34.7% (259) appeared in national (Canadian)

circulation, and 24.8% (185) were printed in local newspapers based in other Canadian cities outside of Alberta. By contrast, 23 articles were published in the United States and 10 articles in Europe, which together account for only 4.4% of the total survey.

Having established that the landing event of 2008 focused media attention on the environmental effects of tailings ponds, we then examined how the media portrayed opinions about these effects. First, we investigated the emphasis given by the media to different actors by identifying the voices directly or indirectly expressed in relation to both the number of articles (n=747) and the total number of statements contained in them (n=1785; Table 1). The most prominent voice belonged to the management and spokespeople for oil and gas companies, which was expressed in over half of all articles (Table 1). Next, ENGOs were represented in about a third of the articles (n=252; Table 1). Although prominent international organizations such as the Sierra Club and national environmental groups such as the Canadian Parks and Wilderness Society received notable press, almost half of those articles consulted only one ENGO, Greenpeace (121 out of 252 articles). The voices of provincial politicians appeared in a quarter of the articles. Together, these three groups accounted for almost half of the total number of coded statements under voices heard in the articles (46.4%). Inclusion of similar voices from other industry representatives, such as the Canadian Association of Petroleum Producers (CAPP; 104 articles) and federal politicians (85 articles) meant that these three privileged groups - industry management, politicians, and ENGOs, represented 57% of all coded statements in the Voices Heard category (Table 1).

Various groups of “experts” also had a prevalent voice in our survey. Relative to the privileged individuals and groups, however, approximately half as many statements (31%) were attributed to experts (Table 1). More of the expert voices belonged to government ministries and agencies (44.4% of articles; 18.5% of statements) than to the combination of academics, independent scientists and think tank employees (30.4% of articles; 12.7% of statements). Public and community groups, Aboriginal communities and oil sands workers were each cited in less than 5% of the articles and the public comprised only 4% of the total number of statements (n=1785; Table 1).

Next we explored how the newspaper media presented solutions for the environmental problems associated with tailings ponds. The most documented solution was to use technological innovations to improve industry practices. Some form of this solution appeared in almost a third of the articles (30.5%) and represented almost 17% of the total statements about solutions (n=1350; Table 2). These technological innovations along with other forms of mitigation such as reducing tailings (6.8%), reclaiming tailings ponds (6.1%), eliminating tailings ponds (3.3%) and forcing operators to clean-up tailings ponds (3.0%) comprised 36% of the total number of solutions documented in these articles. Two forms of regulation - tighter enforcement and litigation - were each mentioned in about a quarter of the articles. All together, regulatory solutions represented nearly 40% of the statements about solutions cited and were discussed in 70% of the articles in the survey (Table 2). Our results are likely skewed towards regulatory solutions, however, because the amount of media coverage given to the Syncrude trial (Figure 1) placed greater emphasis on litigation against companies as a prominent solution for tackling the tailings pond issue. In contrast to mitigation and regulatory solutions, alternatives to the current reliance on energy from oil sands, such as reducing oil production, placing a moratorium on expansion, or shutting down the oil sands altogether were each referenced in less than 5% of the articles.

## Discussion

There is no question that the landing event of April 2008 was a focusing event for the environmental issues associated with tailings ponds in the oil sands region of Alberta. The media attention following this incident was sudden, prolonged, and dramatic, and primarily concentrated in Alberta, with less media coverage across the country and significantly less outside of Canada. This increased attention by the newsprint media, following this wildlife event, is demonstrated by the trajectory of media attention since the original development of the Alberta oil sands in the late 1960's. During the 30 years prior to 2008, the Factiva database we searched retrieved only 96 articles from mainstream news media related to the issue of tailings ponds in Alberta's oil sands production. In contrast, we found 747 articles in the following 3.5 years, which equates to a 67-fold increase in annual averages. Monthly averages increased by at least 10 times after the event, relative to the four months prior to it, but this coverage tended to spike with related legal developments. Media coverage was almost equally split between local (Alberta) and national sources, with little international coverage. In combination, these temporal and spatial patterns of coverage suggest that the media perceived the landing event to be relevant to both provincial and national interests, but sustained attention was typically dependent on the development of a related issue.

We examined both voices and solutions to describe how this focusing event was constructed by the media as a source of pertinent public information. Other authors have shown that the prevalence of certain voices (Trumbo 1996) and the legitimacy given to those voices (Hanson 2000) affect how an environmental event is constructed by the media. For this event, three groups of privileged voices – politicians, industry spokespeople, and ENGOs – provided almost 60% of the statements found in our media survey. Experts of any type were given voice only half as often and only 40% of those statements were by experts who were not employed by government. In contrast, opinions expressed by any member of the public amounted to only 4% of the statements made. Others have also found that the public voice is largely omitted from media coverage (Grabner 2003), and have suggested that such disparities in representation can limit the flow of information and stifle open dialogue about environmental issues (Boykoff and Boykoff 2007).

Unequal representation in the frequency and legitimacy of voices can bias media's construction of environmental debates, particularly if the voices it represents favour depictions of negative environmental events simplistically as the inevitable consequence of economic gains. An example of the simplistic framing of this mortality event was provided by former Alberta Premier Ed Stelmach who said, "The markets will demand energy... Nobody's going to tell Asia, China, India, 'Sorry, this is the end of energy supply, you will have to live without new sources of oil'... It just won't happen" (Audette 2010, p. A1). The former Premier was implicitly rebutting demands by others to shut down the entire industry, but that extreme solution was named in less than 1% of the statements we coded. Diversionary reframing was also apparent in the words of Ted Morton, a provincial government minister, when the ducks landed and died. He commented that Alberta's oil production, "obviously has an impact on the environment... but if you compare our record to... the middle East or the U.S., we look pretty darn good," (MacDonald 2008). Despite their privileged access to the media, oil sands company management tended to adopt a more nuanced tone. For instance, Rick George, the CEO of Suncor Energy was quoted as saying, "I'm a free market kind of guy, so I would say the market will sort this out, and it already has. You see a number of projects that have already been

delayed” (Healing and Polczer 2008, p. D4). These official responses to the incident clearly do not address the key issue of concern: the dangers of the tailings ponds to wildlife and others.

Many articles employed the traditional media technique for conveying objectivity and balance by soliciting opposing views. Statements by politicians and industry sympathizers that warned of economic costs were often presented in the same articles that contained statements from environmental groups who suspect the practice of clientelism between government and the energy industry and, more specifically, the inadequacy of monitoring, enforcement and mitigative requirements imposed by government on industry (e.g., MacDonald 2008; Fong, McLean and Brooymans 2008). The actual balance in reporting was compromised by the disproportionate reliance of the media on just one ENGO, Greenpeace, for environmental opinions. In contrast to other ENGOs including The Sierra Club and The Canadian Parks and Wilderness Society, all of which are active in Alberta on the subject of oil sands mining, the media's reliance on Greenpeace likely increased the polarization of opinions in its reports on this environmental issue. Greenpeace is well known for its ability to amplify risk to engage public interest (Bakir 2005). In turn, that tendency might increase the reactive tendency of financially conservative individuals and governments to dismiss environmental concerns altogether.

A more striking lack of balance of voices in media reporting was apparent in the scant attention paid by the media to public interest groups, including Aboriginal communities and employees of the oil sands companies. For example, in terms of coverage by employees of the oil sands companies there was little representation of the employees who volunteered their time to try and rescue the struggling ducks. More remarkably, there was little representation of the voices of those whom live in the nine Aboriginal communities that surround, and sometimes overlap, with the oil sand production areas. Some First Nations communities have previously expressed widespread concerns about ecosystem degradation, contamination of the Athabasca River by leaking tailings ponds, and the deleterious effects of associated pollutants on human health. The lack of media coverage of these voices limited the expression of these larger, systemic environmental concerns and the solutions they require. Lionel Lepine (Athabasca Chipewyan First Nation) expressed the frustration many First Nations community residents felt when he stated to *The Edmonton Journal*, “Some ducks died and it’s nationwide news... in the meantime, we’re dying up here and it’s not being recognized by the world” (Henton 2008, p. A3). For this and other environmental focusing events, the disproportionate attribution of voices in newspaper media coverage to actors in positions of power and legitimacy appears to limit broader public debates about systemic and wicked environmental problems.

In our media analysis, support for the status quo by particular voices was amplified by the emphasis on new technologies for addressing the environmental problems associated with tailings ponds. Because technological innovations typically require specialized knowledge and proprietary information, they implicitly exclude most voices from the discussions about them. Reference to regulation was also prevalent in our survey, which likely stemmed from the important precedent-setting trial and conviction that followed the 2008 landing event (Fluker 2011). The Alberta government increased the dual emphasis on technological solutions and regulatory oversight with the announcement of Directive 074 in February 2009, which obliges oil sands operators to reduce fine tailings in their production practices (Anderson and Pachner 2010; Healing 2010; Krugel 2010; ERCB 2009). Almost five years later, however, none of the operators have come even close to meeting the requirements that companies were supposed to achieve. The media gave scant attention to the importance of testing new technologies to mitigate the negative effects of the tailings ponds before putting them into place, or to the

prohibitive expense to restore tailings ponds. For instance, Suncor's proposed TRO (tailings reduction operations) technology dredges mature tailings from the bottom of ponds, adds a polymer flocculent to bind them into clumps, and then spreads the mixture on the denuded earthen areas that surround the ponds (Anderson and Pachner 2010). Although the technology is undeniably innovative, it brings to the surface heavy metals and other toxins that were otherwise buried under water. For now, there appear to be no easy technological solutions for eliminating the toxins in tailings ponds. Furthermore, full reclamation of the mining areas is extremely expensive (estimated from \$10K to \$250K per ha) and current technology is incapable of reconstructing the complex wetland ecosystems that once predominated in the region (Foote 2012).

## **Conclusion**

In sum, we have shown that the focusing event of waterfowl mortality that occurred in April 2008 resulted in a dramatic increase in media attention to the environmental issues associated with oil sands tailings ponds. However, the media coverage was sporadic in time, dependent on the occurrence of novel associated events, and expressed mainly in local and national media outlets. Our examination of voices and solutions revealed that privileged voices were twice as prevalent as other voices. Lesser voice was given to other recognized experts or the public, including residents of the surrounding communities. By giving preference to certain voices, the documentation of particular solutions for tailings ponds emphasized as-yet-unknown technological solutions and tighter regulations without much consideration for alternatives to the current use of tailings ponds.

A few conclusions are apparent from our analysis. This focusing event made a huge splash initially in the Canadian print media, but it did not appear to foster critical, deep, or lasting inquiry into the systemic environmental problems associated with oil sands tailings ponds or the wider environmental issues associated with bitumen production. The absence of that effort may stem partly from lacking diversity in the voices depicted, and hence legitimized, by the media. In this and other problems of waste-stream management there is a tendency to rely too heavily on technological solutions, which may serve as both a cause and consequence of the lack of sustained interest by the public. Both tendencies limit the discussion of solutions to lawyers, industry insiders, politicians, and, to some extent, scientific and technological experts. Meanwhile, local residents, employees and other members of the public who are most impacted by the environmental effects of industry are typically excluded from the media debate over industrial activities.

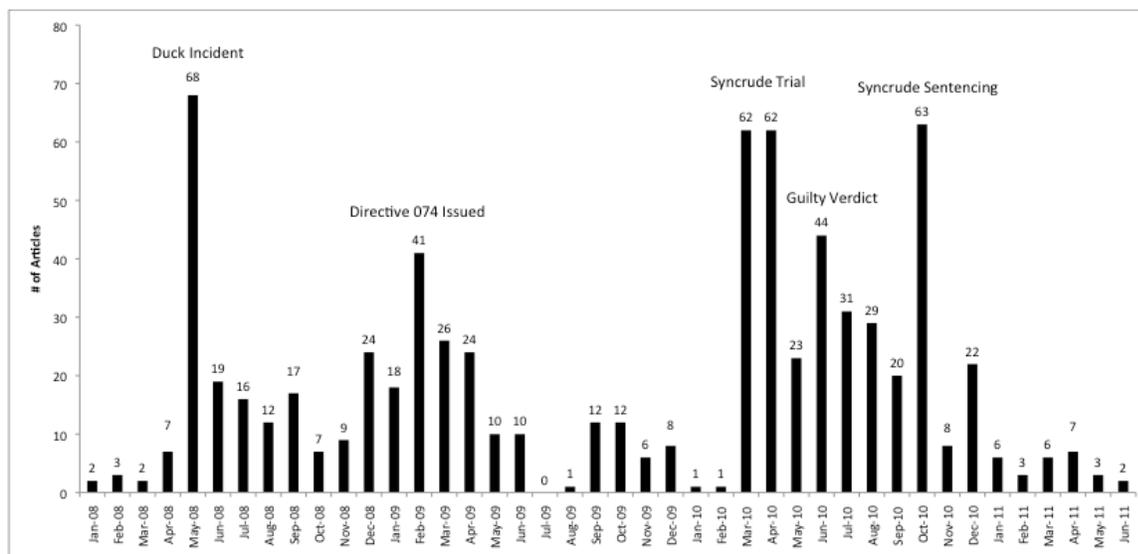
The tendency for journalistic reporting to pit economies against environments in the context of energy development begs several important questions for further research: Does this experience sensitize the public to cling more strongly to pre-existing views, thus further polarizing public opinion? Does the public habituate to the exaggerated and simplistic claims of interest groups to express greater apathy or a more homogenized opinion? What is the most effective way, especially in the context of burgeoning social media, to foster public dialogue about finding optimal long-term solutions for environmental problems that are endemic to resource extraction activities such as bitumen production? Understanding the impacts of traditional media constructions for environmental focusing events, while broadening the dialogue to include a greater diversity of voices and solutions over longer periods of time, may increase the success with which future societies integrate economic, environmental and social interests.

We support the assertion of Savacool (2008:357-358) that media coverage must support an “integrated and enhanced understanding of the various facets...of environmental science among the public.” In particular, coverage must avoid simplistic dichotomies of environmental focusing events that promote reliance on technological solutions and expert voices and, instead, support broad public dialogue about comprehensive, balanced, and lasting solutions for complex environmental problems.

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**Figure 1.** Number of newspaper articles published per month illustrating key events related to tailings ponds in Alberta that occurred between January 2008 and June 2011.

**Table 1.** Number of articles expressing each of the voices categorized into three types: privileged access, expert, and public. Relative representation of each voice is calculated as the percentage of articles (n=747) and the percentage of the total number of coded statements contained in those articles (n=1785).

	# of Articles	% of Articles	Percent of Statements
<b>Privileged Access</b>			
Oil & gas company management	383	51.3%	21.5%
Environmental organization	252	33.7%	14.1%
Provincial politician	192	25.7%	10.8%
Federal politician	85	11.4%	4.8%
CAPP <sup>1</sup>	72	9.6%	4.0%
Other petroleum industry orgs.	32	4.3%	1.8%
<i>Total Privileged Access</i>	<i>1016</i>		<i>57.0%</i>
<b>Experts</b>			
Academics and scientists	121	16.2%	6.8%
Think-tanks	106	14.2%	5.9%
Alberta Environment	88	11.8%	4.9%
Alberta Justice / Provincial Court	83	11.2%	4.6%
Federal government agencies	61	8.2%	3.4%
Alberta ERCB <sup>2</sup>	51	6.8%	2.9%
Other Provincial gov't agencies	48	6.4%	2.7%
<i>Total Experts</i>	<i>558</i>		<i>31.2%</i>
<b>Public</b>			
Other oil & gas company employees	25	3.3%	1.4%
Aboriginal communities	25	3.3%	1.4%
Community groups / citizens	16	2.1%	0.9%
<i>Total Public</i>	<i>66</i>		<i>3.7%</i>
Other categories*	145		8.1%
<b>Total voices</b>	<b>1785</b>		

*Note:* \* The other categories include peripheral groups like non-oilsands related private companies, financial institutions, foreign politicians or those that did not fit into any of the categories above. 39 of these articles were coded as "not specified" (2.2%).

<sup>1</sup> Canadian Association of Petroleum Producers

<sup>2</sup> Energy Resource Conservation Board

**Table 2.** Number of articles representing various solutions for tailings ponds. Relative representation of each solution is calculated as the percentage of articles (n=747) and the percentage of the total number of coded solutions contained in those articles (n=1350).

	# of Articles	% of Articles	Percent of Solutions Suggested
<b>Mitigation</b>			
Technological innovation	228	30.5%	16.9%
Reduce fluid tailings	92	12.3%	6.8%
Reclamation of tailings ponds	83	11.1%	6.1%
Eliminate tailings ponds	44	5.9%	3.3%
Force clean-up of tailings	41	5.5%	3.0%
<b>Regulation</b>			
Litigation	204	27.3%	15.1%
Monitor and enforce regulations	176	23.6%	13.0%
Apply stricter regulations	60	8.0%	4.4%
Impose sanctions for violations	49	6.6%	3.6%
Increase fines	37	5.0%	2.7%
<b>Alternative Measures</b>			
Moratorium on development	32	4.3%	2.4%
Slow pace of development	23	3.1%	1.7%
Reduce dependency on oil	10	1.3%	0.7%
Shut down the oil sands	8	1.1%	0.6%
<b>Other Solutions*</b>	<b>263</b>	<b>35.2%</b>	<b>19.5%</b>

*Note:* \* The other solutions category includes proposals like increasing the public's involvement, independent monitoring, increased research into deterrents, or other specific measures that did not fit into any of the above categories. 74 of these articles were coded as "not specified" (5.5%)