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'Scientists don't care about truth anymore': the climate crisis and rejection of science in Canada's oil country

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ABSTRACT

Recent research in the area of science and technology studies focuses on climate change denial, the spread of misinformation, and public distrust in climate scientists; these beliefs are held especially by those dependent on fossil fuel extraction for their livelihoods. Many of the same individuals who deny the scientific consensus on climate change are nevertheless directly impacted by the climate crisis and environmental disasters. In fossil fuel dependent locations, do people continue to deny the scientific consensus on climate change and distrust climate scientists even after themselves experiencing a catastrophic flood? This paper investigates this question through interviews with 40 people affected by the 2013 Southern Alberta Flood, the costliest flood in Canadian history, who also live in the City of Calgary, the economic hub for Canada's tar sands. Results indicate the participants rejected the scientific consensus on climate change, voiced a distrust in the motivations of climate scientists, though hoped they would one day discover the 'truth', and worked discursively to protect the oil industry. The findings reveal the complexity of post-disaster environmental views and trust in science, as well as how fossil fuel dependence shapes these views.

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Introduction

Risks are endemic in North American cities – places vulnerable to hurricanes, floods, tornadoes, and a litany of more mundane hazards, generating renewed scholarly interest in the urban hazardscape (Khan, Crozier, and Kennedy 2012). Most of these risks are being exacerbated and intensified by climate change and the current climate crisis. On this matter, there is a scientific consensus: The earth's climate is changing, humans are primarily responsible for it via our carbon emissions (IPCC 2018, 2015), and that change is intensifying disaster risks worldwide (UNISDR 2019). On that latter point, there is largely even agreement between scientists (Cook et al. 2016), NGO's (Red Cross 2020), and the private sector (Swiss Re Institute 2019).

Despite the scientific consensus, public opinion lags somewhat behind in both Canada and the United States, though is gaining ground in the USA. In Canada, the province with the highest proportion of climate change skeptics and deniers is Alberta which, not coincidentally, is home of the tar sands – the third largest petroleum deposit in the world. In Alberta, production and growth in the tar sands means jobs and very high incomes and, as we might expect, Albertans rally to protect their oil industry when they feel it is threatened (Davidson and Gismondi 2011).

But how do those dependent on oil production for their livelihoods make sense of the climate crisis and the scientific consensus on it after themselves experiencing

an environmental disaster? How do they express trust or mistrust in scientists and the empirical questions that scientists understand as being quite settled? And, in what ways do defensiveness about the oil and gas industry help us understand their views of climate change and the attendant science?

To answer these questions, the present study mobilizes qualitative interview data drawn from 40 residents of Calgary, Alberta in the neighborhoods immediately adjacent to the city's major rivers, the Bow and Elbow. As the rivers attract many of the city's wealthiest denizens, nearby land houses many who work in the oil and gas industry or in white-collar industries that support or depend upon it. At the same time, the city's two rivers catastrophically flooded in 2013 (Pomeroy, Stewart, and Whitfield 2016), an event that became the costliest disaster in Canadian history, and indeed, nearly all participants in the study flooded. How did these flood-affected but oil-dependent residents express agreement/disagreement with the scientific consensus, explain their trust or mistrust of science and scientists, and understand actions that might be taken to limit carbon emissions? Answering these question will help us to learn more about the complex, nuanced ways that people view scientific work on climate change, particularly in communities highly dependent on fossil fuels.

As I demonstrate below, participants in this interview study, when questioned about their environmental views, engaged in four main discursive strategies: A)

They expressed disbelief in the scientific consensus on climate change; B) They expressed a distrust in scientists, though some did trust scientists to one day prove that climate change is not caused by humans; C) They defend the oil and gas industry while blaming other nations and other fuel sources (i.e., not oil) for climatic changes, and D) They suggest solutions for the climate crisis that are both at odds with scientific positions and, most importantly, are less of a threat to the profitability of Alberta's oil and gas industry.

Literature review

Research on public understandings of climate change most often focuses on the demographics of populations who accept or deny anthropogenic climate change (i.e., McCright and Dunlap 2011a; Spence, Poortinga, and Pidgeon 2012; Smiley 2017; McCright 2010; Hamilton, Hartter, and Bell 2019). Recently, an interesting line of work has focused on the role of emotions (Norgaard 2011), on silence and avoidance (Zerubavel 2006), and on how people work to spin worrying information in a positive light (Cerulo 2006). Less often has research looked at how people discursively frame their ideas of climate change, and how those framings stem from their ultimate trust or distrust of the work of scientists. At the same time, a body of existing literature demonstrates how dependence on fossil fuels affects beliefs about climate change. First, however, I will briefly outline the scientific consensus on climate change.

The scientific consensus

As most readers will be aware, the scientific consensus is that the Earth's climate is changing and becoming more volatile, and that human activity is primarily responsible for it. Recent research demonstrates that about 97 or 98% of climate scientists subscribe to views consistent with this anthropogenic climate change (Anderegg et al. 2010; Cook et al. 2016). According to the Intergovernmental Panel on Climate Change (IPCC 2018) 'human influence has become a principal agent of change on the planet, shifting the world out of the relatively stable Holocene period into a new geological era, often termed the Anthropocene' (p. 53). This consensus is that 'human activities are estimated to have caused approximately 1.0°C of global warming above pre-industrial levels Likely to reach 1.5°C between 2030 and 2050' (p. 4). Along with the changes to the climate, disasters and catastrophes are becoming more common and damages from them are increasing (UNISDR 2019). Even 15 years ago, no major scientific organization took the position that humans are not changing the earth's climate (Oreskes 2004), a view that remains the consensus today (NASA 2021). The world's scientists

have argued we have a worsening climate emergency in need of drastic and immediate action (reductions in emissions), citing their own moral obligation to speak out (Ripple et al. 2020).

Despite these urgent matters of fact, there remains public skepticism and outright denial. In the United States research indicates that as of 2015, just over half the population acknowledged that climate change is occurring and is caused mainly by human activity, while 30 to 40% conceded that the climate is changing but believe its causes are mainly natural (Hamilton et al. 2015). The percentage accepting the scientific consensus rose by about 10 points between 2010 and 2016, however (Hamilton 2016), and indeed 81% of Americans now attribute climate change at least somewhat to human activity (Goldberg et al. 2020) while a full two-thirds of Americans now think the US government should take action to address climate change (Tyson and Kennedy 2020). These findings generally track patterns in climate change denial from other wealthy countries/regions like Australia (Tranter 2017), New Zealand (Milfont, Wilson, and Sibley 2017) and Europe (Poortinga et al. 2019). In this body of work, different views of climate change are often aligned with political views, with conservatives/Republicans more likely to reject the consensus (Hamilton, Hartter, and Bell 2019; McCright and Dunlap 2011a, McCright and Dunlap 2011b). In Canada, the vast majority of people (83%) believe that the earth is getting warmer, and 60% acknowledge that it is warming mostly or partly because of human activity, however these numbers are precipitously lower in Alberta, where only 70% believe the earth is warming and 42% believe that warming is caused by humans (Mildenberger et al. 2016). In other words, fewer than half of Albertans subscribe to the scientific consensus on anthropogenic climate change. Along similar lines, only 34% of Albertans believe that climate change will harm them personally, and only 56% believe that their province has already felt the effects of climate change. Alberta, the site of the current study, leads the nation in climate change denial. Why might that be? As the follow section teaches us, communities reliant on fossil fuel extraction are particularly prone to this sort of denial. First, however, it is also important to note that disasters also play a role in shifting climate change beliefs and environmental concern, as first-hand experience of disaster and/or extreme weather events has been found to alter such views, often in the direction of greater acceptance of the scientific consensus and greater environmental concern (Sarithchandra and Haltinner 2020; Hamilton, Safford, and Ulrich 2012; Cutler 2016; Tanner and Árvai 2018; Tidball 2012; Kato, Passidomo, and Harvey 2014). This debate is far from settled, however, and it should be noted that this is not the case during and after all crises (Hamilton et al. 2016), and that these perspectival

changes do not necessarily translate into actions or pro-environmental behaviors (Dessai and Sims 2010), owing to a disconnect between actions undertaken and severe impacts of climate change, which may happen far away from the highest-contributing communities (Zahran et al. 2008).

Fossil fuel communities and climate change beliefs

A body of work in sociology and related fields shows us how fossil fuel extraction communities are shaped politically, socially, and culturally by their economic dependence on those resources (Bell 2016; Malin 2015; Bell and York 2010; Truong, Davidson, and Parkins 2019; Eaton and Kinchy 2016). Residents of communities dependent on fossil fuel extraction harbor environmental views at odds with scientific evidence and may police one another's views, public speech, and activism. But a particularly useful body of work shows us how these beliefs and views change, particularly during and after environmental crises.

For instance, Bishop (2014) finds that after the Deepwater Horizon Oil Spill, residence in counties highly dependent upon offshore drilling was predictive of pro-drilling attitudes after the disaster, even more so than before the disaster. In other words, the disaster prompted people in these dependent counties to circle the wagons to protect their economic interests after an event that Bishop calls a 'focusing event.' These events can give rise to such protective behaviors out of concern that the industry might be threatened (for instance, by a moratorium on offshore drilling). Along similar lines, Hamilton, Safford, and Ulrich (2012) find that following the same event, those in states dependent on tourism (Florida) were more likely to support restrictions on offshore drilling, and more likely to embrace environmentalism, than those in states more dependent on oil (Louisiana). In both cases, residents' views were shaped by their economic interests and whether oil threatened their largest industry (Florida) or *was* their largest industry (Louisiana).

In many fossil fuel dependent communities, of course, a substantial share of the population works directly in the industry. How does that work exert an influence on their environmental views and their position on climate change? Lefsrud and Meyer (2012) conducted a survey of more than 1,000 engineers and geoscientists in Alberta, and they find that a substantial portion of these educated professionals (24%) believe that 'changes to the climate are natural, normal cycles of the earth,' sometimes even viewing these changes as wholly positive. Another 10% felt that the 'real' cause of climate change is yet unknown, and in doing so, they pointed out the economic harm they felt would be done through emissions reductions. Another group, comprising 17%, felt fatalistically

about it, and did not believe actions would have any effect anyway. In all, about half of the professional engineers and geologists, in some way or another, doubted the scientific consensus on climate change. In doing so, they frequently referred to their own shrewd abilities as experts to sort out truth from falsehoods, maintaining confidence in their judgement. Even more worrisome, those higher up in their organizations' hierarchies, thus wielding more decision-making power, were the least likely to voice views supportive of the scientific consensus and to support regulation.

In these fossil fuel dependent communities, it can be difficult to speak about the environment and about climate change. Residents fear ostracization and exclusion (Evans and Garvin 2009; Davidson 2018) as the larger fossil-fuel dependent community refuses to tolerate dissent or opposing views, though speaking out against the hegemony of fossil fuels is often undertaken by women (Bell 2013; Bell and Braun 2010) and by children (McDonald-Harker, Bassi, and Haney 2021), those most negatively affected by the industry and with fewer direct economic ties to the industry.

There's a nascent body of work from Alberta looking at how fossil fuel dependence shapes post-disaster environmental views, as well. Haney and McDonald-Harker (2017) show how flood-affected adults began to think about and care about environmental change and risks since the 2013 flood. At the same time, Milnes and Haney (2017) show how fossil fuel dependence explains men's post-disaster environmental complacency, and they find that women are more likely to embrace environmentalism after disaster. The ways dependence manifests in environmental views is made evident by McDonald-Harker, Bassi, and Haney (2021), who studied disaster-affected children in Alberta. Despite living in a community where many people are dependent on fossil fuels, children (even many whose parents worked in oil) spoke emotionally and persuasively about the climate crisis and the need to mitigate it. This literature highlights how many living in Southern Alberta following the 2013 flood did indeed adapt their environmental views and practices, as a direct result of their experiences in the flood (Haney 2021), though we understand less about their post-disaster views on science, scientists, and the consensus on climate change.

Distrust of science

Scholars have recently noted that public distrust of science is becoming a prevalent and more alarming phenomenon (Gauchat 2012). Research indicates that the public is more trusting of scientists who are publicly, not privately, funded (Critchley 2008) and that members of the public trust scientists more when they consume less conservative media (Hmielowski

et al. 2014). Quantitatively, other important predictors of trust are geographic location, religious identification (Krause et al. 2019), maintaining an interest in science over the life-course (Motta 2018), and subscribing to left-wing or progressive politics (Leiserowitz et al. 2013). Among conservatives, these feelings of trust are particularly complicated, with people placing trust in science, but distrusting the scientists themselves, who they see as having an ideological agenda (Mann and Schleifer 2020). Even when scientists warn residents of hazards and their attendant risks, the public frequently rejects official and scientific narratives about those environmental risks (Messer, Shriver, and Adams 2017). Messer et al. (2017) find that people often challenge the science and data, voicing suspicion of the motivations of scientists and government officials. This suspicion was heightened by the 2009 'climategate' scandal, in which emails from climate scientists purportedly admitted to concealing a decline in global temperatures, gained significant media coverage (Leiserowitz et al. 2013; Raman and Pearce 2020).

Given existing distrust in science, discussed above, it might be tempting to argue that reason and 'truth' do not matter to the public anymore. Yet as Jasanoff and Simmet (2017) contend, debates about facts are ultimately debates infused with social meanings and subjectively experienced, but also rooted in material realities. According to them, assuming that we are in a post-truth age is naïve because it 'overlooks people's manifest respect for evidence that matters to *their* condition' (p. 752); respect in scientific knowledge, in other words, is socially patterned and depends upon both who created it and how accepting it might affect people's material well-being. Similarly, Boulianne and Belland (2019) show that even in Alberta, scientists are the most trusted source of information about climate, more so than the media. Nevertheless, they conclude that 'scientists' messages about climate change are clouded by high levels of distrust in the news media, the primary venue through which their messages are conveyed.' One disconnect occurs because the media do not normally connect locally-experienced disasters, like wildfires, to climate change, thereby impeding Albertans from connecting locally-experienced events to climate change (Davidson, Fisher, and Blue 2019). At the same time, Albertan and Canadian media outlets in have discursively framed the environment/energy debate as consisting of two delimited and mutually exclusive camps, contributing to polarization of the Alberta public (Davidsen 2016).

Distrust of science and scientists in Canada, like in the United States, is fueled by a network of corporate-funded right-wing think tanks which work to influence public beliefs and opinion (Dunlap and Jacques 2013; Gutstein 2018; Bonds 2016). These think tanks are also deeply embedded within the state in ways that shape

public policy. Taft (2017) calls this 'oil's deep state,' and demonstrates how these parties have worked to influence governments, to the extent that both right-wing and left-wing politicians in Alberta are consistently pro-oil, leaving little room in the public sphere for dissent. Messaging from think tanks feeds into widespread belief in conspiracy theories in Alberta – a strain of thought originating in right-wing populist political movements dating back to the 1930's which situated Albertans as victims of various federal and global conspiracies (Shamchuk 2012). In the United States, those believing in a global climate conspiracy make up a sizable minority of climate change deniers, and this group is disproportionately composed of higher-earning, right-wing, religious, educated older men (Sarithchandra and Haltinner 2020). As Lewandowsky, Oberauer, and Gignac (2013) find, conspiratorial beliefs tend to coalesce as those who believe in one conspiracy theory also tend to believe in others. Further, they find that endorsement of free-market economics (a common position in Alberta, as I discuss below) is predictive of climate change denial. Though scientists are not normally the main party implicated in such conspiracy theory beliefs, those who hold such beliefs nevertheless do hold a measurable distrust in science (Drummond and Fischhoff 2017; Lewandowsky, Gignac, and Oberauer 2013), even relative to other types of climate deniers (Sarithchandra and Haltinner 2020).

Potentially most concerning is that despite scientists' dire warnings about climate change, and the need to drastically reduce carbon emissions, many Albertans do not see it that way. As Oreskes (2019) points out, though scientists may separate empirical truths from their implications, the public does not; to many members of the public, scientific findings with inconvenient implications are to be resisted. Results from the province-wide Alberta Climate Dialogues reveal that Albertans approach climate change as mostly a tame problem 'that can be solved by technological solutions or market-based mechanisms that keep broader political and economic systems in place' (Blue 2018, p. 138). Thus, Albertans see climate change not as a crisis and not as a risk requiring urgent mitigative action.

Setting

Alberta is the fourth most populous province in Canada, with a population of 4.37 million residents (Government of Alberta 2021). Approximately one-third of Albertans live in the City of Calgary (population 1.54 million), one-third in the City of Edmonton (population 1.47 million), and the balance (1.36 million) in the remainder of the province, often in smaller cities and towns (Statistics Canada 2021). Politically speaking, the City of Edmonton is known as being slightly

more progressive (though the term 'liberal' is rarely used in Alberta politics) than the rest of the province, and the rural population is decidedly more conservative, leaving the City of Calgary somewhere in the middle (Ward 2019; Cournoyer 2020), though still quite far right-leaning by Canadian political standards (see Bratt et al. 2019).

Given those political dimensions, Calgary, and Alberta more broadly, presents a useful setting for the exploration of the rejection of scientific knowledge. Although skepticism about climate change in Alberta has been well documented (see above), it should also be noted that Alberta has some of the worst routine vaccination coverage numbers in Canada (Busby and Chesterley 2015), and the highest hesitancy among Canadians for the COVID-19 vaccine (CBC News 2021). As a result, Alberta has dealt with outbreaks of preventable diseases such as pertussis and measles, and today 43% of two-year-olds in Alberta are unimmunized (Vandenberg and Kulig 2015). One of the drivers of both climate denial and vaccine rejection in Alberta is the education system, whereby matters of health and values are barred from schools and taught by parents in the home (French 2016). Alberta also has the lowest rate of post-secondary (college and university) attendance and completion in the country (COPPA 2019), rendering many disconnected from scientific knowledge.

A key driver of skepticism is the public's tendency to believe conspiracy theories, a tendency that has been quantitatively linked to refusal to follow public health guidelines and to refuse vaccines (Teovanović et al. 2020). A variety of polls suggest that Albertans are more likely than other Canadians to be skeptical of climate change, they believe that the federal government dedicates too much attention to climate change, and believe Canada is already doing more than the rest of the world to deal with climate change (Salomons and Parkins 2018, p. 90). At the same time, the region is highly disaster-prone, with 12 of the 20 costliest disasters in Canadian history occurring in Alberta, including six of them in the City of Calgary alone – nearly all of them in the past decade (Sauchyn, Davidson, and Johnston 2020). This region is ground zero for a changing and more chaotic climate, but stubbornly questions the attendant science.

Alberta also maintains a political-economic zeitgeist that makes it particularly prone to the rejection of science and empirical evidence about environmental change. Alberta is known as the most conservative of Canadian provinces, and its history celebrates the rugged individualism embodied by iconic self-made oil-men, cowboys, and ranchers – a history still celebrated annually at the city's Calgary Stampede, the largest rodeo on earth (Williams 2021). This history makes Alberta particularly prone to right-wing populism (Davidson 2019; Sayers and Stewart 2019).

At the same time, Alberta is home to the tar sands, the third largest oil deposit in the world. Despite its size, most of the oil is contained as a tarry substance called bitumen, which must be mined, then upgraded (which is both energy and water-intensive), then piped more than 1,000 miles to refineries on the US Gulf Coast or Midwest. The polluted water produced as a by-product is often stored in large tailings ponds. Though oil companies boast about reclaiming and re-naturing mined areas, only about 10% of mined tar-sands land has undergone this process (Kent 2017). The rest remains scars upon the landscape. At the same time, toxins from the tar sands contaminate the ground and soil, potentially sickening both nearby indigenous communities (Alberta Cancer Board 2009) and most certainly contaminating wildlife (Cruz-Martinez et al. 2015) and water (Kelly et al. 2010). In short, the environmental impact of the tar stands is substantial. Yet Alberta and Canada both depend upon those resources economically, with the energy sector currently comprising 23% of Alberta's GDP and over 75% of its exports (Salomons and Parkins 2018).

As evidenced in the empirical work discussed above (Haney 2021; Haney and McDonald-Harker 2017; McDonald-Harker, Bassi, and Haney 2021), the 2013 Southern Alberta Flood left many people wondering what they did not know about environmental problems and climate change – a finding consistent with research in other geographic contexts demonstrating how first-hand experience of negative environmental events decreases things like conspiracy ideation among climate change skeptics (Sarathchandra and Haltinner 2020). The flood exposed gaps in their knowledge and changed their views. This is particularly relevant given the misinformation campaigns aimed at Albertans, often undertaken by industry-supported think tanks such as 'Friends of Science' who boast on Calgary billboards that 'The sun is the main driver of climate change. Not you. Not CO₂,' as well as 'Global warming stopped naturally 16+ years ago.' Discourses like these have come to dominate in Alberta, much like how the coal industry actively works to shape public opinion about the environmental impact of their industry (Bell 2016; Mix and Waldo 2015). This came to a head in 2015 when Ecojustice filed a complaint with the federal Competition Bureau asking it to investigate false and misleading claims by a number of right-wing organizations including Friends of Science, the International Climate Science Coalition, and the Heartland Institute (Hanson and Kahane 2018, p. 11). The emergent denial and misinformation trickle down from government, as well; during the catastrophic flooding in Calgary and the surrounding areas, the Premier of Alberta, Allison Redford, 'promised to report to party members the following week on her recent successful trip to New York City to promote the Keystone XL pipeline,' suggesting that 'her

government did not see any obvious link between growing greenhouse gas emissions and the growing intensity of extreme weather events that ultimately caused the very catastrophe she was commenting upon' (Sandford and Freek 2014, p. 48). Given the ubiquitous and repetitive pro-oil messaging Albertans are exposed to, it creates an economic and social context whereby those who oppose oil and gas infrastructure are dubbed 'radicals' with an 'ideological agenda' (Salomons and Parkins 2018). As one might expect, Salomons and Parkins (2018) conclude that 'this political culture does not lend itself to significant action on climate change, especially if such action would potentially threaten the oil sands as the economic engine of the province' (p. 89). Yet outside of activities that the state has declared 'radical' activism, Carter (2020) argues that options for public consultation and feedback into oil-related environmental issues is almost entirely absent.

Data & methods

The analyses that follow are based upon data derived from 40 in-depth interviews with residents of Calgary who were affected by the 2013 flood. Interviews took place in the Fall of 2015, two years after the flood. Recruitment of these 40 participants occurred through the community associations in the city's 26 flood-affected neighborhoods. Like many Canadian cities, Calgary maintains a very civically active network of community associations, which correspond to the city's many neighborhoods (City of Calgary 2018). This recruitment followed a 2014 survey of several hundred residents in these neighborhoods in which community associations were key partners. Our parameters included only that the participants be 'flood affected,' though we left that up to their interpretation. In the end, however, 39 out of the 40 participants had residences that flooded during the 2013 Southern Alberta Flood. In many ways, this recruitment is ideal as those who recently experienced an environmental disaster have been shown to exhibit changing environmental views (Haney 2021; Hamilton, Safford, and Ulrich 2012; Haney and McDonald-Harker 2017), and disaster-affected people might potentially be increasingly likely to accept the scientific consensus on climate change, having just gone through such an event. Twenty of these interviews were with participants who identified as being men, and 20 identified as women. Thirty-five of the 40 participants provided their age (i.e., five missing), resulting in a mean age of 52, and a median of 55.5, which is slightly higher than, but in the same ballpark as, systematic surveys from Calgary's flood affected neighborhoods (i.e., Haney 2019 who found a mean of 48). About one-third of participants (n=13) currently worked in the oil and gas industry, in roles such as engineering, risk management, finance,

or geology. Another third (n=14) did not work directly in the oil industry but mentioned a close family member (usually a spouse) who did or reported being retired from the oil industry. And, finally the remaining third (n=13) worked in non-oil occupations such as teachers, plumbers, technology entrepreneurs, professors, hairstylists, or were retired from these non-oil occupations.

The interviews lasted between one hour and three hours, with an average of 1.5 hours, and normally took place at a coffee shop or café in the participant's neighborhood, or in a dedicated space at the university. To thank participants, we offered them a \$50 gift card to RONA, a Canadian home improvement store. Interview recordings were then transcribed verbatim by a third-party transcriptionist, based in Calgary.

We did not ask questions specifically about participants' views on science or scientists. Instead, we asked broadly about their environmental views, and we asked about what actions should be taken to mitigate or adapt to climatic changes (taking anthropogenic climate change itself as a given). Nevertheless, many participants spoke at length about these issues, and the topic of this paper arose in a grounded theory fashion, from the data themselves. First, the author open-coded the data to determine relevant themes. Then, both the author and a research assistant independently coded the data in NVivo to ensure inter-coder reliability (see Warren and Karner 2010). The study was approved by the Human Research Ethics Board at Mount Royal University. All participant names are changed to pseudonyms to ensure confidentiality.

Findings

As discussed above, climate scientists almost uniformly contend that the earth's climate is changing and that this change is primarily caused by human activity (IPCC 2018), while recently making calls about the urgency of addressing the climate emergency (Ripple et al. 2020) and the risks of facing an increasingly volatile climate and ever-more climate disasters (UNISDR 2019). Did flood-affected participants living in the financial hub of Canada's tar sands subscribe to these same beliefs? In short, no. Findings from the study indicate that some flood-affected participants from Calgary admitted to lacking knowledge about climate change and the environment. More often, though, they gave voice to positions that are at odds with the scientific consensus on climate change. Does distrust of science and scientists explain these views that depart from the scientific consensus? Yes, although the answer is nuanced. Participants espoused a distrust of scientists and their motivations to reveal and communicate 'truth' about climate change, though to add a layer of complexity, I also find that many participants trusted

science insofar as they hoped scientists would one day discover the ‘truth’ that climate change either is not occurring or is not anthropogenic. Because they viewed the science as yet largely unsettled, or because they flatly denied the salience of human contributions to climate change, many participants discussed their reluctance to act too quickly on climate change, and only wished to make incremental cuts to emissions, so as to not disturb economic growth, demonstrating some of the connections between scientific mistrust and defensiveness about oil and gas. The sections that follow unpack and examine these major themes.

Denial of the scientific consensus

When asked about climate change and the environment, a few of the participants admitted freely that they lacked knowledge on the topic – including participants who work in the oil and gas industry themselves. Several others contended that the science was still unsettled, and felt scientists were working on the issue. William tells us ‘There appears to be an increase in natural disasters, and whether that is just because the media is doing that or if there is a greater number of them happening, you know, a lot of times it is hard to tell. It appears that there are more and more major environmental disasters happening weather-wise and I guess whether it is climate change that is doing that or is just part of an overall pattern is for the scientists to try and figure it out, I guess.’ Though this comment by William implies trust in scientists, it also conveys that the truth about climate change is yet to be discovered.

Much more often than admitting to knowledge gaps, however, participants in the study confidently espoused theories about anthropogenic climate change and its drivers, many of which are not consistent with the scientific consensus on climate change reviewed above. Participants took four discursive approaches for explaining their views on climate, which collectively demonstrate they disagreed with the scientific consensus on climate change.

First, participants expressed doubt that the Earth’s climate is changing. According to Frank, scientific thought on whether the earth is cooling or warming has ‘flip flopped over the years.’ He posits ‘how much of it is our fault and how much of it is just the earth going through cycles is kind of a crap shoot ... We definitely have put a lot of pollution in the air but not as much as a mega-volcano probably.’ Jackie, who works directly in the oil and gas industry, discusses disasters, saying

“sometimes I wonder if they are more common, but not necessarily Calgary but sort of worldwide, but I think, like many things in life are cyclical ... I think Mother Nature has ... the earth has a balance when it

comes to the climate, and so I think it is almost sort of a finite resource ... I don’t think they are necessarily more common, but I think we are hearing about them more often because of social media now.”

She later concludes, ‘The majority is just a natural process The dinosaurs didn’t drive cars and all that kind of stuff and they still went extinct!’ The participants were especially careful about how they discussed responsibility for climate change. We asked them directly what they thought the main drivers of climate change were, and many like Caleb, answered ‘Well global warming [is] due to the greenhouse gases. I mean that is what we are hearing so that is what I would have to agree with, I guess.’ But he then backtracks and says that much of it is due to ‘natural cycles.’ Some, in fact, had trouble even discussing climate change without shifting the topic (see also Norgaard 2011). Graham, when asked about climate change, immediately shifted (as did many participants) to the issue of ‘pollution’ but then took this one step further, insisting ‘Pollution is a human problem – any pollution – and so I think there is verbal pollution, you know, somebody starts in here and starts ranting with foul language – that is pollution. All sorts of things. You could wear perfume that could pollute my air.’ Graham, like many participants, reduced carbon emissions to the notion of ‘pollution,’ and in doing so, avoided discussing human contributions to climate change via fossil fuel use.

Second, participants in the study gave information about the causes and drivers of climate change at odds with the consensus position of scientists, and only very rarely attributed climate change to humans’ carbon emissions. In doing so, they echoed positions consistent with industry messaging and with Alberta’s climate change-denying think tanks (Heald 2017; McCartney and Gray 2018; Plait 2014). When asked about the role of carbon emissions directly, they often expressed skepticism. Kristopher says, ‘in terms [of], is it caused by CO₂? Maybe, but the data is very – I mean that gets very complicated very quickly and very messy and I’ll tell you it’s not at all clear to me that [CO₂] is a direct cause.’ And even those Calgarians who accept that climate change is anthropogenic nevertheless shift blame away from fossil fuels onto other sources. Rachel, when asked about leading drivers of climate change said she didn’t know, but ‘I guess it’s CO₂.’ When prompted about fossil fuels she said ‘Does that include cow farts? (laughing) ‘Cause I think cow farts are bad too I don’t know. I’m honestly not educated. It doesn’t really matter. Whatever the truth is. Whatever the scientific truth is. I’ll go with that. I don’t want to sit here and go ‘No, it’s Jesus! like what do I know?’ In her discussion, she both admits to ignorance, but also mentions ‘cow

farts' (methane from animal agriculture – which is certainly a source of carbon pollution), not discussing the role of fossil fuels.

Many of the participants instead felt that climate change is a natural and incorrigible process. As Derek tells us, 'climate change is a mostly natural process that we have very little control over.' Upon further prompting, he said that he believes the sun and solar radiation are the largest drivers of climate change, a message consistent with the Calgary climate-change-denying think tank named 'Friends of Science' who contends on billboards that 'The sun is the main driver of climate change. Not you, not CO₂' (Plait 2014). Many others echoed these feelings that control of our climate comes from outside our atmosphere. Bradley adds, 'I think there's a natural phenomenon happening. There's something – a major cycle that we go through. I mean the earth changes on its axis. . . . We can't forecast the weather from any more than three days ahead And so I don't think we know enough yet.' Inherent in that statement, of course, is the notion that climate change scientists cannot be sure yet because more must be learned. Feelings like this were overwhelmingly common in the data (particularly, but not exclusively, from men). Derek, an oil and gas geologist says 'Climate [is] always changing. So I'd say probably the sun. Radiation's the biggest change to climate. Sunspot activity.' Later in the interview, when asked about what needs to be done to prevent climate change, he adds 'Nothing.' And says 'we have very little control over [it]. I don't think carbon dioxide is a driving force of climate change,' a position he shares with many of Alberta's geoscientists (Lefsrud and Meyer 2012). Again, when asked about programs that could be adopted to mitigate climate change, he only laughed and did not respond. He finished the environmental section of the interview by saying 'You're going to think I'm a nutbar' – perhaps recognizing that his position runs counter to the scientific consensus. Dave, a 62-year-old man from the flooded Douglasdale area of Calgary, who works in risk management for an oil and gas company, when asked about the drivers of climate change, said that 'Forest fires is probably one of the biggest ones. A lot of it is natural.' Later in the interview, he discusses volcanic eruptions as a major driver of climate change, as well.

Along those same lines, some participants felt that the Earth was actually *cooling*, not warming. Jackie feels this way, telling us 'I don't think we have time to stop it in a hundred years, but these are longer cycles with the Earth. Maybe even in a couple of thousand years will it change? We will have an ice age in a thousand years, or maybe we will be living in a Sahara Desert type place – I don't know. I think it will. We will cycle through.' Despite scientific evidence for the increasing rapidity of climatic shifts (Brito-Morales et al. 2020), Jackie argues

that these are 'longer term cycles.' Wayne felt that climate change comes from tectonic shifts, what he calls 'continents moving' and 'the cracks filling up with water,' but also potentially 'the poles have moved a little bit' since 'Texas is getting a little bit of snow now' (implying cooling, not warming). Frank attributes change to volcanic activity, not carbon emissions, adding 'Like I say, one big volcano is going to make far more climate change difference than we would produce in a year or two years.'

To shift the blame from oil and gas, and carbon emissions more generally, several participants engaged in discursive work to revise history. Gary is an example of this revisionist history, as he says 'I think 90% of it – 98% of it – is the natural earth changing. Right here [Calgary] there used to be 3,000 feet of ice – right here – but it has been going away for thousands of years in different areas. Greenland used to be green! Really! That is why it is called Greenland!' Though historians do not concur with that account (Nuttall 2009), this appeal to the historical record gives insight into how people construct internally consistent explanatory frameworks for their denial of scientific evidence.

Third, a very consistent finding in the data is that humans do not and cannot have enough power to influence these larger climate and cosmic patterns at play. Commonly, they call it 'arrogant' to believe that humans are capable of that. One example is Nancy, who works in the oil industry and believes climate change is a 'natural processes. Why do you think we have oil here? Well because we've been though some form of climatic climate change that happened however many billions of years ago It's all a cycle So I think that we are far too *arrogant* with our "Oh! We're causing all of this – we're causing all of this!"' She later adds 'I don't think we have as much control of the environment as we think we do. Us *arrogant* human beings. Things change, and it's not necessarily cause of what we are doing.' She was not alone in her attribution of arrogance, with Graham adding 'I don't think we are going to get control of this world I think that is *arrogant*. Do I believe humans can greatly harm and therefore having created the harm, then reverse it and cause good? Yeah absolutely.' This attribution of arrogance by climate scientists (and the members of the public who accept the consensus) is consistent with messaging from 'Friends of Science,' who wrote as recently as March 2021 that 'Model-based predictions of global warming continue to be wrong, only proving an overabundance of *arrogant* confidence by their proponents' (emphasis added) (Friends of Science 2021).

Graham also responds in an exasperated fashion when asked how climate change may affect him personally, exclaiming 'I have no idea! I don't know! This is too much . . . So if I was to criticize this, there is too

much work! So if a person said exhaust from gas burning cars is not good for us, I get that. To say it is climate change is too big for me But to lump it all together and say climate change, that is the flag we are going to wave? Well I just think that is ranting. It is not . . . it is not problem solving I think the whole concept is a red herring.' Bradley agrees that humans have little control, arguing that climate is a much larger geologic phenomenon, 'When it comes to the environmental impact, we're not gonna change the axis that we rotate on. We're not gonna change when the sun comes up and when it goes down Bottom line is I don't think we can do anything to change the actual happenings. I think we just have to adapt.'

Fourth, participants shifted blame about who is most responsible for climate change, either onto other fuel sources than oil or onto other countries than Canada. Peter, a 39-year-old man from Sunnyside, when asked what he considers the most important driver of climate change responded with a one-word answer: 'China.' Upon prompting, he said 'Because of big contributors like China and India, until you get those things under control it's gonna keep happening, it's going to keep going like it's going' although he does also add that 'You know I don't know enough about it to, to make an inform I just sound like an idiot on your . . . I guess I'm not informed enough, I guess, to make a statement on it.'

Dave, the 60-year-old risk management officer for an oil and gas company, though he felt that climate change was 'mostly natural,' only minutes later shifted the blame to countries with emerging economies. According to him 'I find that the environmentalists attack people that are doing the best job. You know, I mean our power plants here in Canada are probably some of the most efficient ones around. You go to China and I mean . . . they're building one coal-fired power plant a day in China, right?' During this part of the interview, he acknowledges that humans are 'probably a good part of it [driving climate change],' but does not believe it is Canadians nor Americans – despite the fact that North Americans have some of the largest per capita carbon footprints on Earth (Solarin 2019). The interviews were replete with instances of blaming China, India, and Russia, in particular. Gary argues that 'if another flood happens, that's just the way nature is. It is not caused by Fort McMurray' (epicenter of the tar sands). He continues by blaming China, saying 'Fort McMurray, pollution-wise puts out, in a year, what China puts out in 23 hours. They are still building coal fired plants in China, they just finished a whole bunch of big coal fired plants in Poland, you know? They can't adapt; they have to keep going, people need jobs and they don't seem to understand that here If they got a problem, they got to get China straightened out.' As Naomi Klein tells us, however, 'This argument is made as if we in the

West are mere spectators to this reckless and dirty model of economic growth. As if it was not our governments and our multinationals that pushed a model of export-led development that made all this possible. It is said as if it were not our own corporations who, with single-minded determination turned the Pearl River Delta into their carbon-spewing special economic zone' (Klein 2014, p. 82). Rachel likewise believes that Albertans are doing all of the emissions cutting work, but getting none of the due credit, saying 'It's bigger than Canada even. Like you can't have that CO₂ coming out of China while we're doing all the work.'

A number of other participants discursively shift the blame from oil (on which they depend) to coal (on which they do not), arguing that coal is the real problem. When asked about what approach Alberta should take to climate change, Allan immediately speaks of coal, saying 'I mean get off coal is number one, right? But then you know there are 500 new coal plants coming online in China, so our twenty or whatever it is [are inconsequential].' Then, when asked about whether we should continue producing oil from the tar sands, he contradicts himself, saying 'I don't think we should continue, but I don't think I don't think we could phase it out.' Graham adds 'The number I heard the other day was 50% of Alberta's electricity was produced from coal. So where did that come from? I didn't think they used coal anymore? Can society do better and find other things? Sure. But show me a person that doesn't use anything and that has actually reduced their quality of life for saving the planet – there are not many of them.' Tasha feels the same, pointing to the environmental devastation in Appalachia: 'They are really after the oil sands, but you could go to any country in the world, and even the United States and Appalachian Mountains, and see what devastation they have done with coal mining and that. So it is easy to lay the blame, but all of the communities really need to be involved in this.' Though she is not wrong about the impact of coal mining, especially mountain-top removal methods, her interview, like many of the interviews, works to shift the blame from oil and onto other types of fossil fuels on which they are not economically dependent. Other participants shifted blame to clear-cut logging in British Columbia ('BC is certainly not the good guys' says Frank), to celebrities such as Neil Young who visit or speak about the tar sands ('They are hypocrites' says Gary) and to any number of other parties. Graham adds that 'I have never met an environmentalist who is truly living a pure life. They are not. They do their best, and I think at their worst they are radical, but it is not fair to point at government and say "we want you to serve the expectations of radicals."'

Trust in scientists

Previous research shows that residents of Alberta, like many places, maintain great trust in scientists – more so than in politicians or the news media (Boulianne and Belland 2019). Data from this project demonstrate that this was true for some, in particular and very nuanced ways, but for a sizable number of participants, skepticism prevailed.

On the one hand, many participants implied that the science on anthropogenic climate change is yet undecided, but that they also trust scientists to figure out it. In her interview, Mary-Jean says that climate scientists are being muzzled and made to toe the party line by government. She says ‘I also think that the scientists should be free to express their knowledge and opinions without being shut down by the government because people need to know and make informed decisions, not just what the government thinks we need to hear.’ She states that she believes more scientists would dissent if they were not ‘shut down’ in doing so. Kristopher similarly adds: ‘Well, you know as I said, a vote of scientists is not the same as scientific proof,’ meaning that although there may be a scientific consensus on the matter, definitive ‘proof’ still eludes science.

A number of other participants placed unwavering trust in scientists to discover this truth, but stated that they believed these scientists would eventually discover that climate change is not in fact anthropogenic. When asked if there is anything we can do to prevent climate change, Gary, who earlier said he believes that climate change is mostly or entirely a natural process, adds that ‘Everybody has got to get on the wagon and start stepping up. People know what to do. [Author] knows what to do. I know what to do. But they don’t listen to us. You know?’ He continues discussing the current project, saying ‘Doing study after study is just a waste of time. I hope you do something with this . . . This is the kind of study that needs to be done but people have to listen, and you have to get all the bullshit paperwork out of it. I realize this takes time and you guys are really good at doing what you are doing, but I hope our professor can take this and actually say “this is what needs to be done.” We don’t have to study this for the next 50 years – we don’t have time.’ Earlier in the interview Gary told us, however, that he does not feel climate change is driven by carbon emissions or human activity, revealing the complicated, nuanced, back-and-forth views that many participants maintain related to climate science. Participants likewise voiced skepticism about the motivations of scientists and researchers, including the author of this paper. When asked at the end if he had anything to add, he said ‘No, I don’t but I will keep an eye on this Tim Haney and if I see his name coming up in some radical movement against the oilsands then I will call!’

Several other participants worried that scientists were using flawed data or flawed studies to mobilize opposition to the oil sands, which Graham calls ‘radical.’ Nancy similarly says she distrusts scientists and instead wishes that energy industry lobby groups were more vocal about sharing ‘the truth’ with the public, as she believes they are being overshadowed by scientists with an anti-oil agenda. According to her,

“I think we should stand up for ourselves. I think for too long, we’ve been letting the rhetoric, and the politics and the scientist actors run the agenda. I think we shoulda had organizations like CAPP [Canadian Association of Petroleum Producers] and other people like that, and citizens’ organizations like that have their say. They’re smart people and they’re coming out with education now. I think it was too little too late, sadly. But do it. Just do it. Organizations like that have to come up and just give truth. Give truth. Give facts and get out there and do that. I think that’s the only option we have. ‘Cause if you heard the truth, if you were willing to hear the truth, you would look at differently . . . I think opinions would change if it was purely a fact-based thing.”

In this quotation, Nancy refers to an industry lobby group as a ‘citizens’ group,’ implying that it is grass-roots in nature. She says she believes that organizations like this, if they were more vocal, could ‘give truth’ and if people heard that truth they would ‘look at it differently.’ She also discusses scientists as ‘scientist actors,’ perhaps meaning to imply ‘activists,’ as a critique suggesting a lack of neutrality and objectivity. Indeed, recent scholarship points out that the perception of scientists as engaging in activism is one of the drivers of distrust among right-wing Americans (Cofnas, Carl, and Woodley Of Menie 2018). Nancy continues, arguing that the scientific consensus on warming has changed frequently, and questions the very credibility of scientists. Nancy says

“I think the problem is we’ve let it go too long and this whole climate change, global warming, oops global cooling, oops climate change whatever the hell you want it call it now be— you know to make all these scientists feel better— and they’re not really scientists. What’s happened is people have wrapped their entire lives around the you know whatever it is— they’re environmentalist— they’re this, they’re that . . . and they don’t care about truth anymore. Because if somebody gets through to them and they realize that things may not be as they were told—they lose everything. They lose their credibility, they lose their friends, they lose their social structure. They lose everything, because so many people have so much tied into their worldview now. That I think it’s—I don’t think it can change . . . I think it’s a really uphill battle by now. We waited too long.”

Nancy gives us an extended look into her view on scientists (‘they’re not really scientists’), and implies that scientists cannot tell the ‘truth’ because of all they have to lose by doing so. She is not alone in

these views. When asked about whether we should decrease carbon emissions because of the scientific consensus on climate change, Scott says ‘it seems like you can’t trust people [implying scientists], and I am getting more and more pessimistic and skeptical as I get older. I take my car in for repairs and, “Am I going to get ripped off here?” I know it is Toyota, but are they going to rip me off? Yeah, he did! Five hundred dollars and he just changed an air cleaner and stuff! He ripped me off!’ Scott’s quote implies that professionals (whether it be scientists or automotive technicians) cannot be fully trusted to perform their job duties ethically and in ways that are deserving of public trust.

Several participants spoke about the tendency for scientists and politicians to be alarmist or to intentionally provoke fear in the public, to achieve desired economic or social reforms. Jackie says she ‘sometimes had trouble knowing what is true and what isn’t true – separating fact from fiction – because I think there is a lot of fearmongering sometimes.’ She says that this ‘fearmongering’ is done by politicians and scientists with regard to the climate crisis, specifically. Such accounts imply that scientists are stoking public fear in order to gain something personally, implying at least some degree of conspiratorial thinking found in climate change research from other jurisdictions (Sarathchandra and Haltinner 2020; Haltinner and Sarathchandra 2020).

Lastly, Kristopher tells us that the consensus of scientists is not necessarily scientific truth, or even what the data really demonstrate. He says

“You know there are a lot of people asking questions like you’re asking. With easy answers. Oh yeah. And then it goes down as a vote. Science has voted. I talked to somebody in Sunnyside who voted that, yes, CO₂ is cause of climate [change]— I don’t know! So, but for me to say yes or no doesn’t matter. I don’t know. It’s not at all clear to me—at all— that CO₂ is connected to—well this obviously it’s correlation. But it’s not clear at all that’s causation . . . And the causation has never been made— you know there’s— you hear theories and you look at the data and you go ‘oh yeah except that you know what data doesn’t support theories so now what? Now what?’ And then you end up with theories that sort of like ‘That doesn’t make sense!’ So no.”

For Kristopher, a consensus among scientists is not enough to convince him of anthropogenic climate change. This statement implies, of course, that scientists are choosing to support (‘vote’ as he says) a causal link between human activity and a changing climate, even if that’s not what the objective data show. Dave similarly tells us that scientists pick arbitrary cut-off points in their data, and likely do so in order to bolster their arguments. He likens this to public authorities creating a limit for blood alcohol levels in impaired driving laws;

“Where did that come from? Like is it just pie in the sky, that’s enough trouble right? It needs so have some of [rationale] behind it, here’s why you know, you know if it’s above this or below that then it’s gonna do this damage and if it’s above that it’s gonna be really, really hard to achieve or whatever. But just to say this is what we want right like drinking .08, right? Are you drunk at .08? Maybe you might be maybe I won’t [be], right? Why did you pick .08? Why didn’t you pick .1 or why didn’t you pick .05? (laughing) Just that it’s a good number I’ll take it, that’s the trouble we have to have something that’s science that says this is where it should be. This is where we are going to get the most bang for our buck.”

Some participants did voice an unwavering trust in scientists, and in turn the consensus on climate change, but they were a minority. Pheobe, who has a Ph.D. in the natural sciences, tells us ‘The government at any level needs to really start to trust what the climate scientists are saying, I think, and then make decisions based on facts . . . In this case public opinion shouldn’t matter because . . . you can’t have an opinion about a fact.’ She later adds, ‘And so I think the government decisions should be weighed on facts that are presented by experts in their field – people who have been doing this their whole entire lives,’ implying a high degree of trust in scientists.

Fossil fuel dependence and the consensus on climate change

Many of the participants’ positions that contradict the scientific consensus on climate change (discussed in the first section) and much of their distrust of scientists (discussed in the second section) ultimately stems, I argue, from a desire to discursively protect Alberta’s oil industry, on which many of them depend either directly or indirectly. They also engage in these discursive strategies when asked about how we might ameliorate or mitigate the climate crisis, and they do so by suggesting ideas and solutions that attribute responsibility elsewhere or are slow and incremental in nature. These slow, incremental approaches are indeed directly at odds with recent warnings from scientists that drastic cuts to carbon emissions must occur immediately and should have occurred years ago (Ripple et al. 2020). Their defensiveness, I argue, taps into the sources of scientific distrust and climate change denial discussed above.

For instance, when asked about the largest or most significant action that should be taken to mitigate climate change, participants in the study normally cited small actions that would have only infinitesimally small impacts on Canada’s actual carbon footprint. These included: planting trees along riverbanks (Nicole), using less water in our households (Timothy), capturing CO₂ from chimneys and

sequestering it (Tasha), fixing oil pipeline leaks (Dave), and the ceasing of strip-mining practices (Angelina). Though all positive changes, of course, each would have a small or negligible impact on Canada's or on Alberta's actual carbon footprint. Rarely mentioned in their interviews, however, is the need to extract, manufacture, ship, consume, and discard fewer products derived from the environment, nor using fewer fossil fuels to do so.

Through these accounts, participants danced on a fine line between voicing a commitment to the environment and not stepping on the toes of the oil industry, in which many of them worked and on which all at least indirectly depended. In doing so, they used three main discursive strategies.

First, they pointed to what they saw as the absolute necessity and irreplaceability of oil and gas. Caleb reveals that his behaviors have not changed since the flood, however this is because 'it is a bit of a trap for all of us, there is really not much you can do since we rely on our vehicles.' According to him, because we live in cities constructed for transportation mainly by automobile, the ability to decrease one's carbon footprint is limited. His comment suggests that doing so would be a tremendous inconvenience, a sacrifice he is not willing to make.

Along similar lines, Timothy gestured to the interviewer's sweater, as a way of pointing out the ubiquity of oil and gas in our products and lives. He then says, 'take everything that has been touched by oil and gas out of your life and what do you have? You are living . . . under a tree naked, basically. You have no shelter, you have no heat in your house sort of things.' Likewise for Gary, it is nearly impossible to discuss the environment without the absolutely necessity of oil. When asked about the drivers of climate change, he says 'I think the environment is doing what it is naturally doing. Would it be a good idea to . . . [pause] . . . I mean we are still going to need oil, we still need natural gas, I mean you don't have any even . . . everything is oil.' Here Gary presumably begins to ask himself 'Would it be good to [decrease use of fossil fuels]?' but stops and redirects his answer rather than saying it.

Second, they pointed out that people who work in oil and gas are good, well-intentioned people and that blaming the industry, which they see many scientists and environmentalists doing, is disingenuous. Angelina tells us, 'it is too easy to blame oil and gas for climate change. That's too small a picture I think. And it is too easy to be afraid of being blamed and therefore say there is no problem 'cause otherwise . . . So we need to get past that. And that's what we should do – twenty years ago already. Again, so that one of the key things we need to do as Albertans. We could lead the way in getting past that divisive "us and them" which will not solve the problems.' Nancy similarly feels that the industry is already doing as much as it

can, but fails to get the deserved credit; 'Alberta companies have done a great job adjusting and emitting less. I think Alberta is a great example . . . If you think about what we were emitting and what we are doing and [what we are doing today] . . . There's no comparison. Every single year they do it with less water and less steam and less impact and less emissions.' Even Pheobe, who subscribes to the scientific consensus on climate change, dislikes the rhetoric of environmentalists, and is critical of

"all the negative comments from lots of places about all these people [who work] for dirty oil. Like there's some really intelligent, really caring people that work for an oil and gas company, and they're not stupid people, they believe in climate change—they just happen to work in a job where their skills are very useful, and they're paid very well. But they're not bad people for working at Shell or EnCana, or you know a little start-up oil and gas firm. And it's not that they don't care, it's just that, that's their job."

Later on in our interview, she remarks 'The oil and gas companies and their leadership as you know, people who want to rape earth like that's just – that's just rude . . . You're not gonna get the right answer from them or the right reaction when you're basically just insulting their intelligence.' Here she suggests – possibly quite rightly – that insults and accusations will not produce the needed reductions in carbon emissions. At the same time, a less sanguine view of this argument is that it serves as an attempt to delay and obfuscate meaningful climate action by blunting critique of the fossil fuel industry and those who work within it.

Finally, participants pointed out that the sudden, drastic emissions cuts called for by scientists (Ripple et al. 2020) are a bad idea and might carry dire economic consequences. They generally objected to sudden changes to the oil and gas economy on which they dependent, preferring small incremental changes. The appropriateness of only small, incremental changes to fossil fuel use was particularly pronounced when participants were asked if we should stop producing oil from the tar sands, given the scientific consensus on climate change. Matthew says, 'Stop it all together . . . Uhhh at a reasonable pace, I suppose. Yeah 'cause again you don't want to have a ton of people out of work, [and] you don't want to have everybody hating the government that's trying to do a good job. You don't want everybody having that, that backlash. I think there are lot of jobs involved. There's a lot of money involved. A lot of political will involved. And you have to kind of do it at the, at a smart rate. At the right pace, but yeah eventually.' Jackie calls these 'baby steps' and feels as though that is all Canada needs, unlike India and China which need a massive environmental overhaul, according to her. Similarly, when Bryan is discussing a carbon tax (which Alberta

had until 2019 and then rescinded) and its effect on gasoline prices, he says 'The cut off could be five cents [per liter] more tomorrow, I don't care. If it's fifty cents more tomorrow, we've got a problem. People will absorb all kinds of incremental changes. As long as they're incremental.' Timothy feels similarly about the carbon tax, saying 'You have to be careful with that, that is ... you have to consider the economics with that If you are going to do that, you should be taxing the individual as well, because we are the consumers, right? The companies are only providing the product for us to consume, and we are creating that demand. If you really want to stop climate change you tax us, right? Not the companies.' If you tax them, 'they just move somewhere else if it isn't economic here ... they move to the [United] States, they move to Argentina, they move to Europe, France, whatever. They don't care. It's global, right? We lose out. We are the ones that have no jobs if the companies leave, and the government loses too because they don't have that income anymore – the royalties and all that are shot down. The companies don't care, it's all economics.' When asked about increased corporate regulations for oil and gas producers, Peter perhaps sums up the feelings of participants best when he says, 'As long as it doesn't cost me anything.'

The reluctance to make environmental or economic changes too quickly, too drastically – or in some cases, at all – serves to tie together earlier findings about both participants' views on climate change that run counter to the consensus, as well as their varying degrees and types of trust in science and scientists. In short, I argue, the views of most participants in this study on climate science ultimately stem from a defensiveness of the oil and gas industry, one that has been found in other post-disaster work in fossil fuel-dependent communities (Bishop 2014; Hamilton, Safford, and Ulrich 2012). Ultimately, it reveals an anxiety about participants' economic well-being, and what that might entail in a post-oil Alberta economy. Participants therefore work discursively to cast doubt both on the empirical reality of climate change (first section, above) and upon those undertaking the work of climate science (second section). Hence, their defensiveness and support for a slow, incremental approach to phasing out fossil fuels is likely carefully considered and instrumental in nature – not solely a function of a lack of education or knowledge. Although it is not realistic to expect that individuals would flatly state that they do not believe in the consensus, or do not trust scientists, specifically *because* of their dependence on oil (thereby admitting that their beliefs about the validity of science stem from their economic concerns), this section helps us see some of the ways that beliefs about science might flow logically from a worldview consumed by the perceived ubiquity and necessity of oil.

Conclusion

The findings discussed above reveal how Albertans living in the economic hub of Canada's tar sands feel about the scientific consensus on climate change and about the attendant work of scientists. Though an emerging body of work suggests that flood-affected Albertans have shifted their environmental views somewhat since the 2013 flood (Haney 2021; Haney and McDonald-Harker 2017; McDonald-Harker, Bassi, and Haney 2021), prior research had not yet examined whether residents in this oil-producing region are accepting of the consensus and trusting of scientists after going through such an environmental disaster.

I find that even after experiencing an environmental disaster, participants did not generally echo a position consistent with the scientific consensus on climate change. Though a few expressed uncertainty about climate change and its key drivers, many more echoed positions inconsistent with the scientific consensus on climate change, arguing that the climate was not indeed occurring, that humans are not responsible for change, that oil is not to blame, and that if anyone is to blame, it is emerging economies like India and China, not Canada.

When discussing the role of scientists, their views took two directions. On the one hand, some participants voiced a faith in scientists to discover the 'truth,' which they usually implied would someday reveal that carbon emissions are not, in fact, driving climate change. They told us that if scientists were unmuzzled and could speak freely, they would arrive at this conclusion. So while they maintained faith in science, they did not believe the scientific consensus on climate change. In fact, several of the participants told us that they distrust scientists who they see as protecting their own economic self-interest, as ideological, as 'fear-mongers,' or as simply corrupt. They said that these scientists are 'not real scientists,' they are instead activists, and that they 'do not care about truth anymore.'

Lastly, participants were very careful to suggest solutions to the climate crisis (which they did not consider to be a crisis) that were small, incremental, and non-threatening to the economic and cultural hegemony of oil in Alberta. They worried that large policy shifts, away from fossil fuels, would mean job losses and economic disruption. To this end, they did not favor action commensurate with the challenges that the climate crisis confronts us with, nor the immediacy that scientists instruct us is required to address it.

Although some research flowing out of the Southern Alberta Flood sensitizes us to the changes in environmental views that took place for some residents (Haney and McDonald-Harker 2017; McDonald-Harker, Bassi, and Haney 2021), the findings of this article are more consistent with the theoretical framework and empirical findings of Bishop (2014) and

Hamilton, Safford, and Ulrich (2012) who contend that post-disaster environmental views are shaped by economic interests and dependence on fossil fuels. Bishop dubs these events 'focusing events,' as they reveal to residents that their preferred industry might come under attack as affected communities demand change (for instance, cuts in fossil fuel extraction and emissions). As a result, they rally around the industry to protect it. This strategy was evident in the interviews discussed herein, as participants generally defended the ubiquity and necessity of oil and gas by denying anthropogenic climate changing, blaming other drivers of climate change, or expressing mistrust in climate scientists. In doing so, they engage in discursive work to protect Canada's tar sands and what they view as their economic livelihoods.

A body of work on climate change denial helps us understand who believes the scientific consensus on climate change, and who does not, demographically speaking (Hamilton, Hartter, and Bell 2019; McCright and Dunlap 2011b, McCright and Dunlap 2011a; Smiley 2017). However, the present analysis sensitizes us to the ways in which denial or acceptance are not black-and-white matters, just as trust in scientists is not so discrete. Instead, this analysis shows us that while many people in this oil-dependent region do indeed doubt or reject the scientific consensus on climate change (as we might have expected), many nevertheless trust scientists to one day figure out the 'truth.' Similar to Mann and Schleifer (2020)'s work, many participants trusted science but distrusted the scientists themselves, however, the emergent story is even more complicated than that. This analysis adds a layer of complexity by showing how many residents actually *trusted* the scientists, but trusted them to eventually discover that climate change was indeed not occurring or not anthropogenic in nature, viewing scientific data as currently inconclusive. Many others accept *parts* of the scientific consensus; for instance, they believe that the earth's climate is changing, but that volcanic activity, sunspots, or other drivers are responsible – rarely mentioning our use of oil as a causal factor. To explore these nuanced views further, the final section of the analysis looked at what exactly participants thought should be done about climate change – to the extent that they felt anything should be done at all. In these cases, participants favored small, 'baby steps' approaches to eventually, one day, decreasing oil use. Despite the need to shift away from oil, and the immediate need for action given the current climate crisis, being widely accepted among scientists, participants from Calgary did not see it the same way. This work speaks to literature in environmental sociology looking at dichotomies of trust/mistrust in science, and belief/denial of anthropogenic climate change. The participants frequently echoed the talking points provided

by right-wing, industry-supported think tanks like 'Friends of Science,' suggesting that the discourse and rhetoric coming from such organizations (not to mention government and the private sector who also advance pro-oil messaging) have an impact and have made the beliefs of Calgarians more durable, even in the aftermath of environmental disaster.

Of course, we must remember that a sample of 40 participants from one city cannot be understood as representative of that entire city, nor should the findings be generalized to the larger provincial or national population. Still, the value of such a sample rests in its ability to provide deep understanding of how participants view a particular issue, uncovering key themes and mechanisms at play. Larger surveys of residents in fossil fuel-dependent communities should be undertaken, although as I find in this study, dichotomous measures of trust/distrust in scientists may miss important nuance – for instance, that participants trust scientists to one day discern that climate change is not caused by humans. Though this constitutes a form of trust, to be sure, it is not the type of trust in climate scientists normally operationalized and included on survey instruments.

It is clear that values, economic dependence on fossil fuels, and even recent disaster experience contribute to people's understandings of what is scientifically 'true.' As Hoffman (2018) argues, science and technology studies must continue to play an important role in this particular moment he says is defined by 'post-truth demagoguery.' Though it is tempting to argue that better public education is needed on the connection between fossil fuels and a changing climate, much existing work demonstrates that wealthy residents of the Global North are already aware of these facts (Norgaard 2011). But coming to terms with the empirical reality evokes deep emotions – fear, helplessness, guilt, and so on. For Albertans studied in this paper, the fear of job loss and economic insecurity seem prevalent. Hence, instead of simply arguing for more and better education, scholarly work and policy interventions should focus on quelling these concerns and offering residents in fossil fuel-dependent places viable economic alternatives that will allow them to find employment in greener industries. We may very well find that this action alone will increase public uptake of science, trust in climate scientists, and adherence to the scientific consensus on climate change.

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