Climate Change and Popular Culture: reframing climate change to incite action

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A Major Portfolio

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ABSTRACT

Anthropogenic, or human caused climate change is no longer a hypothetical, future risk. It is wreaking havoc on our landscapes and weather patterns, and the effects of it will only continue to increase in severity and frequency. There will be significant costs. Economic and social activity, as well as environmental and human health will experience many direct and indirect effects. It is thus imperative that we work towards finding ways to adequately address climate change.

In North America, more than 90 percent of the public is presently aware of climate change, however many still do not believe it is a result of human activity. People systematically misunderstand the issue, their role in it, and and the actions required for mitigation. Most consider it of low risk because they believe it will affect people and places that are geographically distant. What is needed is a way to convey the fact that this is an existential emergency, one that requires coordinated action on all fronts.

This portfolio seeks to explore ways in which communicators and educators can use popular forms of communication such as literature, photography and media to help disseminate information on climate change and incite action within the general population. This portfolio is informed by a wide body of popular and academic literature including non-fiction books, fiction, peer reviewed articles, and manifestos. A literature analysis was conducted to explore the scientific and cultural aspects of climate change as well as how media interprets and represents the many complexities relating to climate science and the ways these representations influence public understanding and engagement.

Meaningful visualizations depicting climate change are argued as a way to bridge the gap between what many see as an abstract concept not affecting them, and informed action with local and individual relevance. A photo essay depicting different aspects of climate change, a piece of creative non-fiction, and an annotated bibliography seek to bring the world of climate change down to earth. It is hoped this study will inform communicators and educators who will ultimately help the general population learn about climate change in ways they can understand, while creating a desire within them to participate in actions that will create lasting change.

FOREWORD

This Major Portfolio is the final submission to the Master in Environmental Studies program at York University. It is the culmination of over two years studying climate change and popular culture, focusing primarily on education and communication and the scientific, social, economic, political and cultural contexts surrounding the issue. My POS and Major Portfolio are closely related as both aim to help reimagine climate change in today's capitalist society from a problem on some people's mind to an existential threat against which all people mobilize. In keeping with my POS, my Major Portfolio aims to navigate different ways communicators and educators can facilitate this necessary paradigm shift. The scientific and cultural factors of climate change are studied. An examination of the relationship between media and climate change is presented.

My POS argues that the general population needs meaningful ways in which they can learn about the current climatic crisis and the ways in which they can make a difference. My Major Portfolio, through three different mediums - a Photo Essay, a piece of creative non-fiction, and an annotated bibliography - attempts to inform this goal. It explores how climate change is currently being framed in society, and what forms of communication are best suited to disseminate climate change information. Climate change education is an important step and I argue there must first be a deconstruction of scientific jargon concerning climate change in order to maximize society's capability to understand its impacts. Recommendations are made on how to best engage and incite action in the general population with respects to climate change. My Major Portfolio aims to show how communicators and educators can share climate change information with the public and educate them in ways that inspire mobilization, and in doing so, fulfilling the objectives of my MES program.

METHODOLOGY

The methodology for this Major Portfolio was predominantly traditional, quantitative design with a small focus on narrative inquiry. In order to gather and analyze data to respond to my research question, I relied heavily on document analysis. Like other analytical methods in qualitative research, document analysis required me to examine and interpret data in order to elicit meaning, gain understanding, and develop empirical knowledge (Bowen 2009). The main form of documents I used for evaluation in my study took the form of books (cultural studies, media studies, call to action, climate fiction), newspapers, institutional reports, photographs, and previous studies, in which I relied on the description and interpretation of data rather than having the raw data as a basis for my analysis. I had previously reviewed literature during my MES studies, and much of the information gathered throughout was included in this Portfolio.

My analytic procedure entailed finding, selecting, appraising, and synthesizing data contained in the various documents. Document collection and analysis yields data such as excerpts or quotations, that I organized into major themes, categories and case examples (Labuschagne 2003). This process combined elements of content and thematic analysis. (Bowen 2009). Through content analysis I organized the collected information into categories related to the central questions of my research, such as the science of climate change, the culture of climate change, and media and climate change. I followed this with thematic analysis, recognizing patterns through a careful, more focused re-reading and review of the data (ibid). Here, I saw patterns of things such as scientific consensus, public perceptions, and media representations.

The data I collected informed my research question and helped me to give justification for my claims, as document analysis can verify findings. When I saw convergence of information from different sources, as I often did, I was able to have a greater confidence in the findings. Additionally, documents can provide context as they bear witness to past events (Bowen 2009). Documents provided me background information as well as historical insight. Such information and insight helped me understand the historical roots of climate change and media, and indicated the conditions in which they influence each other. Further, documents provide a means of tracking change and development. Document analysis enabled me to see how climate change science has progressed through time, illustrating the development of further confirmation and consensus.

Document analysis was efficient as it required review and selection, instead of data collection. It was made easy due primarily to the internet and the fact that many documents are in the public domain. I was fortunately able to view those that are not in the public

domain for free because York University has access to many journals that otherwise would cost money to read. This made document analysis an attractive option for me as a researcher as it was less costly than other research methods. Additionally, documents are unaffected by the research process, making document analysis less subjected to the concern of reflexivity. However, I was still aware of two potential sources of bias, both the author's bias and my own source of bias, or how I read and drew conclusions from the documents. Further, I had to be careful that I selected a wide range of documents from various sources and across many disciplines in order to avoid biased selectivity, which is "an incomplete collection of documents" (Bowen 2009).

My main representation form of my portfolio is creative non-fiction, as modelled after Jack Hart and Lisbeth Berbary. I tried to represent my data in a meaningful way in order to convey what I learned. In presenting my research through a creative analytic practice, I attempted to manage the "crisis of representation" in qualitative research (Berbary 2015). Being self-conscious helped me to make sure that my work revealed upfront my own participation in the research, as I consistently used first person, and quoted myself. I attempted to place my creative representation first, and then offer my explicit interpretation of data after, in an attempt to "alter power relations among researcher / audience," as well as attempting to show rather than tell the reader what happened (ibid). In holding off on explicit interpretation, it allows for the reader to engage with the data and share in the interpretation prior to having my ideas imposed (ibid).

Throughout my research and Major Portfolio, I attempted to produce a creative representation of climate change. Richardson said, "creative arts is one sense through which to view the world; analytical/science is another. We see better with two lenses. We see best with both lenses focused and magnified" (2000). My Major Portfolio attempts to help better communicate climate change through being both "literary" and "scientific."

GLACIERS IN RETREAT AT MT EVEREST
John Novis

Artists Statement:

Activist Zhong Yu shows a scientific (public domain) 1968 photo of the Middle Rongbuk Glacier to the camera to illustrate the 2km retreat and deterioration of the Rongbuk glacier in just under 40 years. A Greenpeace team from Beijing visit Mount Everest to investigate the rapid melting glaciers. The Rongbuk Glaciers are one of the prime sources of water feeding into the major rivers of China and India. Glaciers in the Himalaya are receding faster than in any other part of the world as a result of climate change.

My Statement:

This photo illustrates retreating glaciers on Mt Everest. and is apart of the "established dominant visual language of climate change," which largely includes the splendour and destruction of glacial ice (Doyle 2007). In fact, in a study Leiserowitz discovered that melting glaciers and polar ice were the most salient images of global warming among the American public (2007).

Zhong Yu, through the use of a photo aid, makes visible the retreat of the glacier, which becomes a sign and visual testimony of the existence of climate change. This photo clearly illustrates the need for protection of nature from climate change, which, according to Doyle, is a "common discursive trop in environmental discourse (2007).

While being an example of "observational evidence of climate change," this picture can only offer a snapshot of one part of the world, at a particular moment in time (Manzo 2010). The issue of the visualization of time and place is one that must be grappled with, especially in depicting climate change. It is important to consider that photographs of glaciers such as this "represent temporally the already seen effects of climate change;" a unique problem when considered that my aim throughout this project is to help find ways to bring attention to this global problem before all its impacts can be seen

(Doyle 2007).

Attempting to visualize climate change through photography thus runs into the problem of trying to communicate environmental issues that are "both temporal (long term and developmental) and unseen (not always visible), through a media, that privileges the 'here and now' of the visual" (ibid). "Emphasis is placed on visible materiality at the expense of that which is latent, immanent and hidden from view," which makes communicating and validating climate change risks hard (Adam 1998).

Due to the fact that climate change operates "outside the capacity of unaided human perception," I have chosen to include a photograph of an "effect" of climate change in order to illustrate one of its real, but often invisible risks (Allan et al. 2000). Without visual aids, the negative impacts of climate change are difficult to represent as risks (ibid).

The lack of visual evidence related to the temporal aspect of climate change contributes to the lack of international engagement both at a personal and political level (Doyle 2007). As a result, the Arctic, and other icescapes, have become key sites in the "negotiation of global environmental politics" (Bloom and Glasberg 2010), which I argue is partly due to the fact that these sites are able to visually illustrate the risks of climate change via spectacular and culturally resonant images. This photo makes an aspect of climate change visible; the juxtaposition of the two glacial photos illustrates a manifestation of climate change that happens over time, the retreat of glacial ice.

The aesthetics of an image is "integral to the production and successful reception of the photographs as representative of an environment in need of protection" (Doyle 2007). The power of this photograph as evidence of climate change thus gains part of its legitimacy through an "aestheticization of the landscape," which renders glacial loss "all the more shocking" (ibid). However, in the context of climate change communication, this aestheticization and reliance on what is spectacular becomes problematic. This is because the shock inherent in this aesthetic framing of the glacier, or landscapes in general, corresponds to the "events-based tactics of the news media coverage of the environment," which does not enable the communication of "long term and accumulative (non-visibe) environmental problems (ibid).

Despite this, this photo is still useful because visual symbols, one of the more predominant ones being glacier retreat, can command public attention in environmental politics (Macnaughten and Urry 1998). Spectacular images can help mobilize support by bringing home the threat and reality of global climate change, as well as by positioning it, particularly for people in the west, as "the crisis of the global age" (Lester and Cottle 2009). Such images invite viewers to recognize and potentially respond to the increasing risks of climate change, be it at local, national, or global levels (ibid).

While spectacular images can help to create a powerful sense of threat and prove essential for the formation of public awareness and growing concern, spectacle is not sufficient enough for the basis of public mobilization and political responses (Lester and Cottle 2009). Such images cannot and will never be a substitute for crucial public elaboration and deliberation of environmental discourses and behaviours. However, they provide a starting point.

John Novis gave me permission to use this photo in my photo essay. Email communication attached.

SEASIDE HEIGHTS POST SANDY
New Jersey National Guard

Artists Statement:

Aerial views of the damage caused by Hurricane Sandy to the New Jersey coast taken during a search and rescue mission by 1-150 Assault Helicopter Battalion, New Jersey Army National Guard, Oct. 30, 2012. (U.S. Air Force photo by Master Sgt. Mark C. Olsen/Released)

My Statement:

On October 29, 2012, Hurricane Sandy struck the East Coast of the United States, causing unprecedented destruction as 80mph winds and record storm surges wreaked havoc and caused an estimated $20 billion worth of property damage. Here, an arial shot taken on October 30, 2010, during a search and rescue mission by New Jersey Army National Guard, shows the remains of the Casino Pier, part of the historic boardwalk of Seaside Heights, New Jersey, completely destroyed by the monster hurricane. Climate change is increasing the frequency and severity of extreme weather events such as Hurricane Sandy.

While the previous photo undoubtably provides an "important impetus to the politics of climate change," it simultaneously produces a distancing effect, relegating climate change impacts to an extremely isolated and inaccessible place, where "animals and habitats are affected rather than humans" (Doyle 2007). Additionally, unlike the previous photo, here the "visual aestheticization of nature" is minimally present: the photo displays an environment already wrecked by water and wind (ibid).

This photo, by focusing upon human impacts, seeks to bring home the risk and signify the future of climate change through a visible

authenticiation of its current effects in the United States. People are more touched by national and local imagery conveying climatic changes, as it has "more resonance than global imagery" because it is "easier to relate to and consequently more upsetting in some cases" (Nicholson-Cole 2005).

Some people feel that because they cannot directly see effects of climate change, they have little reason to react behaviourally; it is difficult to remain aware and consider one's daily actions when the threat of climate change is not an everyday concern (Nicholson-Cole 2005). Thus it is important to show examples of local manifestations of climate change as part of an attempt to educate and motivate people. This photo provides an answer to the question of what climate change could mean for residents of North America.

This photograph requires explanatory text to anchor its meaning as a sign of climate change, as some may not know that hurricanes and other extreme weather events are increasing in force and frequency as a result. Here, the "temporality of climate change as a long term, accumulative problem" is negotiated by referencing both present impacts, and future threats (Doyle 2007). By engaging with the past, present, and future of climate change through photographic and textual reference, this example addresses the "what is" and "what may" be of climate change (ibid).

The hurricane is a "potent denotation of climate change" because it is both a "fingerprint" and "harbinger" of global warming (Manzo 2010). Fingerprints are defined as "direct manifestations of a widespread and long-term trend toward warmer global temperatures. Harbingers are events that foreshadow the types of impacts likely to become more frequent and widespread with continued warming" (ibid). Hurricanes are a powerful symbol of climate change because they are capable of visualization (unlike greenhouse gases), but also because they can "live long in social memory" (Brönnimann 2002). This is because they provide graphic and catastrophic images, which are more likely to capture the public imagination as they are "vivid, dramatic, and easily understood" (Leiserowitz 2007).

It is important to note that presenting climate change, a complex issue who's effects are wide ranging and varied, as a graphic and catastrophic image can be damaging as it gives "precedence to the language of destruction over one of solution and hope" (Doyle 2007). Solely representing climate change using cataclysmic images can "render the viewer powerless in terms of agency" (ibid). This photo mirrors the dominant tones of contemporary climate change discourse, which are "fear, misery and doom" (Manzo 2010). However, climate change must hit home in order to move people to action (Nicholson-Cole 2005), and photos like these do just that.

Visuals that localize the global crisis of climate change are often "grounded in a particular place and hone in on loss of life, and in doing so, private loss is revealed, the threat becomes a domestic one, and viewers in their own homes are invited to care" (Lester and Cottle 2009). Extreme weather events happen every year, thus providing recurring "teachable moments" to explain the potential future of future climate change (Leiserowitz 2007). Educators and communicators should use these opportunities to highlight the connections between climate change, extreme weather events and human impacts, being sure to respect current levels of scientific understanding (ibid).

DOCTORS AGREE, THE EARTH IS SICK
Joe Brusky

Photo Caption:

On September 21, 2014, over 311,000 people took to the streets of New York City in the largest climate march in history, frustrated by international inaction on climate change. Described as "an invitation to change everything," the march was called by the environmental organization 350.org, and it was endorsed by many international and national unions, churches, schools and community and environmental justice organizations. Coursing through Midtown, the People's Climate March had a message of alarm for world leaders set to meet at the United Nations for a summit meeting on climate change on September 23 (Brodine 2014, Butters 2014).

My Statement:

The previous photo discussed the idea that in order to make climate change relevant to audiences, it must be made "local." Local threats are generally perceived as more salient and of greater urgency than global problems, which suggests that "efforts to describe the potential of national, regional, and local impacts of climate change and communicate these potential impacts to the public are crucial" (Leiserowitz 2007). This can be done by focusing directly on impacts that matter to people, or indirectly by focusing on the co-benefits of climate-friendly action (Moser and Dilling 2007).

In some instances, making global climate change local may

mean not talking about climate change at all. Leiserowitz argues that communicators should highlight climate change impacts that can be linked to people's "persistent concerns," such as human health (2007).

Health organizations now stress that climate change is not solely a threat to biological systems and the environment, but, as described by the World Health Organization, a "significant and emerging threat to public health" (DeBono et al. 2012). The perception that climate change may "change lives, cause disease, reduce the standard of living and worsen water shortages" may be the strongest driver behind support for

climate change action (DeBono et al. 2012). Research found that "focusing on climate change through a public health frame generated more hope and less anger," and that this frame usually "fit high on people's agendas and was more personal and salient" (Hoffman 2015). In this way, climate change is no longer "geographically, socially, and temporally distant, but localized, and the focus on the protection of the health of people we can relate to" (ibid).

Thus, it is recommended that in order to gain more public support, climate change communication campaigns should frame climate change as a "threat to health and well-being" (Hoffman 2015). In fact, a study conducted by DeBono et al. found a very strong relationship between the "perception of climate change as a threat to health and well-being, support for climate change mitigation policy, and a willingness to implement measures to address climate change" (2012). Framing climate change as a "moral concern pertaining to harm and care" relates well to audiences (Hoffman 2015). This engages people in a way that draws them towards an understanding they can embrace, as it is a threat that is personally salient.

This photo explicitly states that climate change is a health crisis, and places it in a local context. People need to know that climate change presents current and future risks to human health. They need to know enough about it to choose appropriate responses at personal, household, and community levels, and to support preferred government policies (Frumkin and McMichael 2008).

The health sector has an opportunity in the context of climate change to demonstrate leadership at the local and national level. There is a "tradition of health-sector leadership in confronting such large-scale challenges as nuclear war, poverty, environmental pollution, tobacco use, and community design" (ibid). The same opportunity and responsibility exists in the area of climate change (ibid). It is important that we identify and promote co-benefits so that measures that address climate change simultaneously promote health, environmental, economic and social benefits (ibid).

Effective communication has to achieve a "match between message content, framing, and the concerns and values with which audiences resonate" (Moser and Dilling 2007). An emphasis on the projected impacts on human health as a result of climate change is likely to raise concerns among the public, especially compared to the associations currently dominant in society, such as impacts on non-human nature (Leiserowitz 2007). Communicating the relevance of climate change to human health and associated health care costs in the context of a "comprehensive and respected assessment provides an opportunity for integrating high-profile issues" on the policy agenda (Harriss 2007). Re-framing climate change as a threat to human health can be the "principal catalyst" for people to change their behaviour and increase their support for climate change mitigation and adaptation policies (DeBono et al. 2012).

OIL BREEZWOOD
Edward Burtynsky

Artist Statement:

When I first started photographing industry it was out of a sense of awe at what we as a species were up to. Our achievements became a source of infinite possibilities. But time goes on, and that flush of wonder began to turn. The car that I drove cross-country began to represent not only freedom, but also something much more conflicted. I began to think about oil itself: as both the source of energy that makes everything possible, and as a source of dread, for its ongoing endangerment of our habitat.

I wanted to represent one of the most significant features of this century: the automobile. The automobile is the main basis for our modern industrial world, giving us a certain freedom and changing our world dramatically. The automobile was made possible because of the invention of the internal combustion engine and its utilization of both oil and gasoline. The raw material and the refining process contained both the idea and an interesting visual component for me.

My Statement:

In the early 1900s, Henry Ford produced a vehicle that became widely available to the average citizen. The combination of this with a plentiful fuel transformed turn of the century America, and ultimately locked us into a consumption cycle that's still evident a century later (Gramling and Freudenburg 2012). Oil is the most "valuable source of energy production that humans have yet discovered" (ibid). However, along with its benefits have come unanticipated consequences including "critical dependencies, geo-political struggles over oil resources, and negative effects such as air pollution and carbon dioxide (CO_2) emissions" (Dilling and Farhar

2007). We now know that CO_2 emissions, produced from the burning of oil, are one of the leading causes of climate change. Atmospheric CO_2 concentrations have increased by more than 40% since pre-industrial times, from approximately 280 parts per million by volume (ppmv) in the 18th century to over 400 ppmv in 2015 (IPCC 2013).

This photo beautifully illustrates how engrained oil is in our culture, and how we are directly implicated in the issue of climate change. Here, viewers are being asked to respond "via the personalization and domestication of a global issue" (Lester and Cottle 2009). The many gas stations and cars in the foreground and background act as an "unsubtle but also symbolic reminder" of the connection between a local place and the global threat (ibid). In this photo Burtynsky captures widely understood global symbols of climate change, and draws the viewers' attention to something they likely see daily. Through this photo, we come to face to face with an often overlooked and unquestioned aspect of our society: our dependence on oil. Here, causes of climate change that may seem abstract are depicted as everyday experiences, making clearer their local and individual relevance (Nicholson-Cole 2005). People can begin to interpret and see their present choices as apart of the global issue of climate change.

This photo, along with almost all of Burtynsky's work, also relies on the aestheticization and spectacularization of nature, though his work typically focuses on human-altered nature. Burtynsky's work has been criticized for invoking "fear and trepidation as they reveal our mistreatment of the earth" (Lindquist 2010). They are "beautiful images of a disaster, like the scene of an accident that you can't stop watching" (ibid). While fear tactics have a place in climate change communication, as discussed in the following section, they must be coupled with positive motivations, which when viewing an entire Burtynsky collection, are not present.

An additional issue with Burtynsky and some other high-profile artists, is that his photography practice is a lucrative industry. Burtynsky holds dozens of shows each year, with prints on sale for well over $20,000. Burtynsky is considered an environmentalist and philanthropist, but if this is the case one can't help but wonder whether the money should "go back from where it's extracted by donating to an oil spill clean up effort or the economies" of the places he shoots (Lindquist 2010). Further, while I had no difficulties obtaining copyrights for the other photos, I had to go through a lengthy process in order to get permission to include this.

This brings up a question about accessibility and the use of photography as an educational tool. How can we use images to communicate and persuade if they are not publicly availably; if Burtynsky is in fact an environmentalist, should there not be widespread and unhindered access to his photos in attempts to help educate? Shouldn't the quest for the widespread dissemination of environmental information take precedent over the drive for profit? This is a question that remains fundamental to the climate change conundrum; people want change but don't want to sacrifice their own livelihoods.

We need to re-imagine what it means to be free, powerful and happy, that see's living well not just about one's own individual material well-bring (Crow and Boykoff 2014). Above and beyond helping to articulate both the need for sacrifice and the rewards it might bring, the most important task is to "encourage all of us to reflect upon, discuss, and reevaluate the values, structures, and practices that are altering the planet's climate" (ibid). This photo prompts us to begin that conversation by explicitly illustrating many of those unquestioned values and practices.

Permission was granted to me to use this photo in my photo essay. Email communication attached.

BRINGING CLIMATE CHANGE DOWN TO EARTH
A piece of creative non-fiction

I arrived 20 minutes early, confident I would have enough time to get a good seat. But, as I walked up to the entrance of the TIFF Bell Lightbox theatre in downtown Toronto, I encountered an enormous line of people, snaking back and forth eight layers deep. When the doors finally opened, I found myself in a crowd of people, all eagerly waiting not for the latest Hollywood blockbuster, but a talk on climate change.

I have been worrying about climate change since grade nine science class. My teacher, a quiet yet stern disciplinarian, showed us Al Gore's *The Inconvenient Truth*. I found the issue popping up in my upper-year high school classes too: geography, and world issues. To understand climate change I needed science, but there was much more to the story. My interest never waned. I knew I had to study climate change in university too, so I earned my bachelor's degree in an interdisciplinary environmental studies program where I learned the hard and social science aspects of climate change. Based on those discussions with small classes of students, I imagined that I was part of only a small group of people interested in what likely is the most urgent problem facing our society today.

But now here I was, in a sold out crowd of 500, waiting to hear Canadian author and activist Naomi Klein speak about her new book, *This Changes Everything,* which addresses the issue of climate change in a whopping 566 pages. It suddenly dawned on me that maybe I'm not the only one who cares about climate change. This realization was empowering and gave me a renewed sense of hope. Adding to the sense of empowerment was Naomi herself and how she engaged each of us in the crowd. "Climate change is the ultimate collective crisis. It requires that we cooperate in an unprecedented way; it demands collective solutions" she said over the mic, to a rapt audience. "Where we are," she continued, "is a place where there are no non-radical options left on the table. If we stay on the road we're on, we face radical changes to our physical world." There was no way around it, we need to think entirely different for changes to be possible because right now, the "triumph of market logic, with its ethos of domination and fierce competition is undermining all serious efforts to tackle climate change." In her book, Klein details much of the science behind climate change, talks about the social and economic underpinnings, and the unquestioned ideology so many of us subscribe to that pits us against the climate.

For years the climate issue had left me rather numb and almost apathetic. The glimmer of hope that I had waited for finally came when Naomi said that it *is* possible to transform our society so that it is less resource intensive, and to do it in ways that are equitable. But it requires bold "long-term planning at every level of government, and needs to be as

decentralized as possible" (Klein 2014). The climate change conundrum was framed as an opportunity to heal the planet and shattered communities, as an opportunity to discard an economic model that is failing the "vast majority of the people on the planet on multiple fronts." Any attempts to rise to the climate challenge will be fruitless Klein argued, unless it is understood as part of a much broader battle of world views; we must fight capitalist exploitation and invasion and put forth an alternative worldview. "This is more than a change in strategy; it's a fundamental change in perspective and values."

Klein's book is replete with examples of what is currently being done around the world and what changes need to take place in order to achieve this lofty goal. Foremost, we need to choose the right early policy battles, "game changing ones that don't merely aim to change laws but change patterns of thought" (2014, 461). For instance, forming a "grand coalition to demand a guaranteed minimum income" makes it possible for workers to "say no to dirty energy jobs" (ibid). Additionally, the very process of "arguing for a universal social safety net opens up a space for a full throated debate about values… what it is that we collectively value more than economic growth and corporate profits" (ibid).

Listening to Naomi speak about these grand plans and usually unapproachable topics, I was relieved to see nodding heads, and hear frequent applause. When question period came around people weren't asking for clarification, rather they asked about her stance on "the BP oil spill," and other contentious topics. If a writer like Naomi could draw a big crowd and make this topic accessible, perhaps the issue of climate change inaction wasn't due to a lack of solutions, but rather an issue of communication. How could the effects of Klein's work, and people like her, be multiplied? And how could I contribute to that effort? I was convinced that climate change was *the* threat of our lifetime, and I increasingly came to realize that communicating it to the greatest number of people was the most urgent task.

Hundreds of Thousands of Years of Climate Change: Explained

The release of the Intergovernmental Panel on Climate Change (IPCC)'s fifth assessment report in 2013, provided even further evidence than the previous report, that the impacts of *human caused* climate change are being felt across the world. The warming of the climate system is "unequivocal," and since the 1950s many of the observed changes are "unprecedented over decades to millennia" (IPCC 2013). No longer a hypothetical, future risk, climate change has already had a drastic impact on our landscapes and weather patterns. The temperature of our atmosphere and oceans have increased, the amounts of snow and ice have diminished, the sea level has risen, and the concentrations of greenhouse gases (GHGs) in our atmosphere have increased (ibid). These changes have impacted our economic systems as well as human and environmental health.

Each of the last three decades has been successively warmer at the Earth's surface than any preceding decade since 1850 (IPCC 2013). In the Northern Hemisphere, 1983-2012 was likely the warmest 30-year period of the last 1400 years (ibid). It is virtually certain that the upper ocean (0-700m) warmed from 1971 to 2010, while over the last two decades, the Greenland and Antarctic ice sheets have been losing mass, glaciers have continued to shrink almost worldwide, and Arctic sea ice and Northern Hemisphere spring snow cover have continue to decrease in extent (ibid). The rate of sea level rise since the mid-19th century has been larger than the mean rate during the previous two millennia, and over the period 1901 to 2010, global mean sea level rose by .19 metres (ibid). The atmospheric concentrations of carbon dioxide, methane, and nitrous oxide, all GHGs, have increased to levels unprecedented in at least the last 800,000 years, all due to human activity (ibid).

Human influence of the climate system is clear; it is *extremely likely* that human influence has been the dominant cause of the observed warming since the mid-20th century (IPCC, 2013). Carbon dioxide concentrations have increased by 40% since pre-industrial times, primarily from fossil fuel emissions and from human caused land use changes. Carbon dioxide and other GHG emissions have caused scientists to estimate that the average temperature could increase by another 1.4 to 5.8 degrees Celsius by 2100 (Steinfeld et al. 2006). Even under optimistic scenarios, the increase in average temperatures is projected to be larger than any "century-long trend in the last ten thousand years of the present-day interglacial period" (ibid). It is urged that warming be held below 2 degrees Celsius, but the door of climate targets is closing: "the later the global emission reduction takes place, the greater the effort needed to achieve a given stabilization scenario" (ibid). If there is a greenhouse gas emission reduction rate of 5 percent a year, the 2 degree target will be missed if no action is taken prior to 2027 (ibid). Thus, drastic measures need to be implemented, and soon.

Climate change is expected to have severe impacts on the environment. The faster changes happen, the greater the risk that the damages will exceed our ability to "cope with the consequences" (Steinfeld et al. 2006). The impacts and severity of these changes will vary by region but all communities will face new risks and pressures. Water resources will be affected because "precipitation and evaporation patterns will change" (ibid). Physical infrastructure will be damaged, especially in low lying costal regions, as the IPCC expects mean sea level to rise 26 - 98 cm by 2100 (2013). Economic activities and human health will experience many direct and indirect effects, with the poor and marginalized being the most vulnerable to the negative consequences of climate change due to their, "weak capacity to develop coping mechanisms" (Steinfeld et al. 2006). The overwhelming evidence of anthropogenic climate change documented suggests both current impacts with significant

costs, and extraordinary future risks to society and natural systems. In other words, climate change puts the "well-being of people of all nations at risk" (AAAS 2014).

These consensus statements by the IPCC have been endorsed by nearly two hundred scientific agencies around the world, including the scientific agencies of every one of the G8 countries (Governor's Office of Planning and Research 2014). Additionally, the consensus statements have been supported by independent scientific literature reviews. In 2013 a study looked at 11,944 abstracts of peer-reviewed journal articles from 1991 to 2011 and found that of those articles expressing a position on anthropogenic global warming, 97.1 percent endorsed the consensus position that humans are causing it (Cook et al. 2013). Further, surveys show that it is the belief of the majority of "practicing" climate scientists that the change is real. For example, in a 2011 survey of 489 members of the American Geophysical Union and the American Meterological Society, 97 percent agreed that global temperatures have risen over the past century, 84 percent agreed that human induced greenhouse warming is now occurring, and only 5 percent disagreed with the idea that human activity is a significant cause of global warming (Farnsworth and Lichter 2011).

But What to Do About It?

The numbers are shocking. The information is clear. But, after expressing my hard-won understanding as I have above, I was left again with the question of what to do. What good is all this information if it stays wrapped up in scientific jargon? How was I supposed to make a difference in regards to climate change? I decided that in order for me to gain meaningful insight into the ways in which climate change can be brought "down to earth," I needed to get involved with people doing environmental communication. Remembering Klein's lecture led me to her work on The Leap Manifesto, signed by individuals across Canada banding together to map out a possible pathway for a sustainable Canada. It has become a vision for how Canada can tackle climate change in a way that changes our country for the better.

I was put in contact with Bianca Mugyenyi, the Outreach Lead for The Leap Manifesto, and we scheduled a video conference. I woke up the Tuesday morning before our call anxious, really hoping there would be an opportunity to somehow get involved. Initially Bianca told me more about The Leap Manifesto and how it got started - in 2015 when a two-day meeting was convened and attended by representatives from Canada's Indigenous rights, social and food justice, environmental, faith-based and labour movements. The goal of the meeting was to find out ways to "move beyond saying "no" to the worst attacks on our rights and environment, and dream together about the country we actually want and how to get there" (The Leap Manifesto 2015). This call, for a Canada based on caring for the earth and one another, is referred to as "The Leap." Fifteen demands were drafted, each one

guiding this "just transition" in hopes of achieving a renewable-based economy (ibid). As a result, there would be meaningful justice for First Nations, more and better jobs, restored and expanded social safety nets, a better food system, and reduced economic, gender and racial inequalities (ibid).

After several minutes of attentive listening and happy nodding I heard the words "So what do you think you can bring to The Leap?" Nervously I explained to her my history in marketing and communications and my academic background in environmental studies, with a focus on climate change. After hearing more about The Leap from Bianca, I knew now more than ever, that I wanted to be a part of the team. But suddenly I worried there may not be space for me, and then what? Bianca told me she would need to converse with the rest of the people at The Leap and that she would get back to me.

After waiting anxiously for a few days hoping for good news, I joined the virtual conference room. Shortly thereafter I heard a ding, which only meant one thing. Bianca's smile immediately calmed my nerves, and I eagerly listened to her as she told me The Leap was looking for "creative new ways to make alliances with smaller groups" and was interested in "finding new ways to create emotionally resonant content." What seemed like an eternity later, she said "so we'd love it if you would help us launch The Leap Manifesto's Instagram account." I finally caught my breath. I barely contained my excitement, "I would love to join the team and help," I said. I thanked Bianca for the opportunity and was told that she'd be in touch with further instructions.

At that time The Leap's social media presence was limited to Twitter and Facebook. While Facebook and Twitter are valuable platforms, Instagram is quickly becoming more popular, especially with the younger generation. As of February 17, 2017, Instagram had six hundred million users, almost double Twitter, but still one billion less than Facebook. Clearly here was an untapped market, one that The Leap could use in order to reach a new audience.

Climate Change as Framed in Literature

Through the Instagram account, I would be reaching people who didn't necessarily have an extensive background in climate science. I decided that I needed to explore some of the "popular" sources of climate change information, starting with non-fiction and fiction. Then, I could get a sense of what information was coming through these channels, and what the average Joe typically knew about the subject.

I was already on my way into this world of popular climate change literature, having previously read *This Changes Everything,* which was indeed very popular. In fact it debuted on the New York Times bestsellers list at number five, winning the 2014 Hilary Weston Writers'

Trust Prize for non-fiction, and shortlisted for the 2015 Shaughnessy Cohen Prize for Political Writing. Needless to say, this book had made a notable impact. Walking into Indigo in 2014, shortly before I saw Naomi speak, I saw for the first time an environmental book on the main display tables. No longer were books about climate relegated to back shelves, read only in classrooms or by environmentalists; here was a book being presented to us all, enticing us to learn about the issue in an in-depth way. In *The New York Times Book Review,* Rob Nixon wrote that *This Changes Everything* was "the most momentous and contentious environmental book since *Silent Spring"* (2014).

As scientific knowledge of the effects of climate change entered the public and political arena, fiction, termed "cli-fi," about the problems of anthropogenic climate change also began to appear. Margaret Atwood, one of my favourite authors, wrote a series of books now referred to as the *MaddAddam trilogy.* I decided to start with this series which gives a compelling, though chilling vision of the future that is both familiar and beyond our imagining. Ian McEwan's *Solar* as well as Kim Stanley Robinson's *Forty Signs of Rain,* both take place in a world much closer to our own; while not completely dystopian like Atwood's, the worlds imagined in both stories are faced with the issue of climate change.

In all of the fiction books, feelings of loss, and the desire for action are evoked. Miller in *On Literature* speaks of the power that literature wields; the ease with which the "generation of a virtual reality occurs" (2002). Literature has the ability to create or reveal alternative realities, enabling the reader to see the world through the literature we read. This power is extremely important when it comes to climate change, because the current effects of it aren't being felt everywhere. Additionally, many of the effects of climate change have yet to be seen, rendering many of us unable to envision the personal impacts of climate change. This is where fiction comes into play, because it "presents not what actually happened but what can happen" (Miller 2002, 101). These books, along with other "cli-fi" works, opens up a "singular world, attainable in no other way than by reading that work" (ibid, 118). Our feelings while reading the books are genuine, feelings of fear, of loss and even hope. It is through these outlets that we can gain insight into what our world may look like in the future, and become genuinely concerned for its wellbeing.

In addition to widely received "cli-fi" novels, I read other "popular" non-fiction books on climate change that address it in an equally approachable way. *The Optimistic Environmentalist* (Hoffman 2015), and *Geography of Hope* (Turner 2007)*,* are books that chronicle many of the strides we have made in relation to environmental challenges, including transport, housing, design and power. Hoffman echoes Klein's sentiment that we need to overcome the failures of the free market, and curb the unequal and unjust power dynamics, especially the power wielded by multinational corporations. Hoffman stresses the

importance of recognizing that all people, including future generations, have the right to live in a healthy environment, and that governments need to protect and fulfill this right (2015). To name the necessary steps towards fostering a healthier environment called upon by both books is far too exhaustive for the confines of this paper, however some include rigorously implementing and enforcing strong environmental laws and policies; using taxes and fees to make polluters pay; accelerating the shift to renewable energy, and sustainable housing, transport, and design; applying the precautionary principle; and ensuring that environmental benefits and burdens are fairly shared (Hoffman 2015, Turner 2007). The solutions to our problems are presented as being readily available, illuminated by multiple examples where solutions have been tried and tested. The goal of these books is not to reproduce our current social order minus the greenhouse gas emissions, but to find the "right fragments to assemble into a whole new way of life" (Turner 2007). All these books help chart a course in a new direction, towards a more just and sustainable future.

What is required of us at this juncture seems extremely daunting. I think it is worth looking to past social movements in order to inform this goal, a total overhaul of the economic system. Thus begs the question, has an economic shift of this kind ever happened before in history? We have seen it happen during war time, when presidents and prime ministers commanded transformation from above. But has it ever been demanded from below, by regular people, when leaders have "wholly abdicated their responsibilities" (Klein 2014). In the West, the best examples of social movements being a "disruptive historical force," are the human rights movements of the past century. Civil, women's, and gay and lesbian rights sought to create transformative change in the dominant culture (ibid). But given that the challenge for the climate movement "hinges on pulling off a profound and radical *economic* transformation, it must be noted that for these movements, the legal and cultural battles were always more successful than the economic ones" (ibid, 453).

The more radical wing of the second-wave feminist movement illustrates this point. It urged for fundamental challenges to the free market economic order. Women wanted to not only get equal pay for equal work in traditional jobs, but also to have their work in the home caring for children and the elderly recognized and compensated (Klein 2014). But as we know, while this movement "won huge battles against institutional discrimination," the victories that "remained elusive" were those relating to economics; the 1970s movement would not win its demand for wages for housework, and even today in parts of the world, paid maternity leave remains a battle (ibid). "Sharing legal status is one thing; sharing resources is another" (ibid, 454).

There have been social movements, however, that have succeeded in challenging "entrenched wealth in ways that are comparable to what today's movements must provoke if

we are to avert climate catastrophe" (Klein 2014, 455). One of these includes the movement for the abolition of slavery, which forced ruling elites to stop practices that were extremely profitable, much as fossil fuel extraction is today. It is worth noting first that there can be no direct comparison between the injustice and brutality committed to a race of humans, and the emission of greenhouse gases. With this said, the abolitionist movement shows us that a transition as large as the one we need today has happened before, in fact the economic impacts of abolition in the mid nineteenth century have "striking parallels" with the impacts of "radical emission reduction" (Klein 2014).

In *The New Abolitionism*, Chris Hayes pointed out "the climate justice movement is demanding that an existing set of political and economic interests be forced to say goodbye to trillions of dollars of wealth" (2014). Losing the legal right to own slaves represented a major economic blow for a large sector of the ruling class, one as huge as the one players ranging from BP to Shell would have to take today (Klein 2014). Historian Greg Grandin put it, "in the realm of economics, the importance of slaves went well beyond the wealth generated from their uncompensated labour. Slavery was the flywheel on which America's market revolution turned - not just in the United States but in all of the Americas" (2014). Again while not the equivalent, "the dependence of the US economy on slave labour is certainly comparable to the modern global economy's reliance on fossil fuels" (Klein 2014, 456). According to historian Eric Foner, at the start of the civil war, "slaves as property were worth more than all the banks, factories and railroads in the country put together." (Hayes 2014). Further, Hayes points out that "in 1860, slaves represented about 16 percent of the total household assets—that is, all the wealth—in the entire country, which in today's terms is a stunning $10 trillion." (2014). According to Klein, that figure is "roughly similar to the value of the carbon reserves that must be left in the ground worldwide if we are to have a good chance at keeping warming at bay" (2014, 456).

The economic demands of previous social movements, for basic public services that work, for adequate housing, for land redistribution etc., represent "nothing less than the unfinished business of the most powerful liberation movements of the past two centuries. The massive global investments required to respond to the climate threat is a chance to change all that; and to get it right this time" (Klein 2014, 458). In one form or another, all of these past social movements are still fighting today, for human rights and equality. What this means is that climate change does not need some "shiny new movement that will magically succeed where others failed" (ibid, 459). Rather, climate change can be the force that will bring together all of the still living movements (ibid).

Although there is no perfect historical comparison for the challenge of climate change, there are certainly lessons we can learn from the movements of the past. One of the

main lessons is that when major shifts in economic balance of power take place, they are "invariably the result of extraordinary levels of social mobilization" (Klein 2014, 459). Therefore, we learn that in order to adequately tackle the climate issue, diverse groups will need to converge on a scale previously unknown. Luckily, this level of social mobilization is much easier to achieve today. This is because we are significantly less isolated than many of us were even a decade ago - "the new structures built in the rubble of neoliberalism," including social media, have helped us "find community despite the fragmentation of postmodern life" (ibid, 466). Indeed thanks in particular to social media, many of us are constantly engaged in a global conversation that is "unprecedented in its reach and power" (Klein 2014). The development of the "fifth estate" has signalled substantive changes in how people "access and interact with information, who has access and who are content producers. At present, new / social media offers a platform for people to more democratically shape the public agenda. These communications are a shift from broadcast 'one-to-many' communications to interactive 'many-to-many' webs of communications" (Boykoff 2011).

LetsLeap - Launching the Instagram Platform

Social media is a powerful tool in today's modern society, one with plenty of potential to help mobilize and engage users. By the beginning of February 2017, I felt more inspired than ever to finally launch The Leap Manifesto's Instagram page. Instagram allows users to share either photos or videos with a public or private audience. Visual content is "liked" or commented on by users and sometimes reposted on personal accounts, for their own followers to see. The audience can be extremely far reaching, with some accounts having 50+ million followers. Building a following is a challenge at first: content needs to be engaging to grab new people's attention. It was going to be a long process to get the page up and running.

　　The first major decision I had to make, was what the page's "handle" would be. This is your screen name, a way for you to be identified and searched for. In a video conference with Bianca and Jody, The Leap Manifesto's Organizing Associate, we discussed options. "We should keep with the brand, perhaps stick with 'The Leap'" suggested Bianca. "I agree, I think it makes the most sense to be consistent with our other social media profiles, both called The Leap or Leap Manifesto," added Jody. I took out my phone and tried to make an Instagram profile with that handle. "Sorry guys, it's already taken," I had to say. "What about Leap_Org" Jody suggested. Again, I had to be the bearer of bad news that that handle, along with our three other options, were already in use.

　　After further discussion, we landed on 'LetsLeap.' "I like it," I said, "it insinuates actions and forward thinking, like we're a group in motion." The three of us spoke for a while longer, all agreeing that the first post should be a photo taken from the launch of The Leap Manifesto

back in 2015. On February 9, 2017, I posted the very first photo on LetsLeap. The caption read: "On September 15, 2015, The Leap Manifesto launched a vision for the future: A Call for a Canada Based on Caring for the Earth and One Another. We know the time for this great transition is short so we need to LEAP. Follow us as we explore what a Leap looks like in communities across the country and beyond #LeapManifesto" Here, we asked people to join us on our journey, while hopefully learning about The Leap and what people can do to get involved. Every Monday since the launch of the page, I have posted an infographic, a text based image, detailing one of The Leap Manifesto's fifteen demands for tackling climate change. These images coupled with other photos that have been posted are a first attempt at gaining exposure. As of writing this, LetsLeap has 55 followers, continuing to stimulate engagement through approachable visual content.

Acknowledging the difficulties climate change science has posed for public engagement, Chief scientist for Greenpeace UK, Doug Parr, has identified the need for properly framing this science in order for it to make sense to the public (Doyle 2007). Visual content can be involved in the public communication of science by framing it for popular consumption. Greenpeace International has said that if the issues of climate change are ever to truly command the attention of politicians, they will need to infiltrate popular culture (ibid). Somehow we must infiltrate popular culture through a media presence by making "environmental issues culturally meaningful and symbolically recognizable" (ibid).

I think Instagram, coupled with other social media platforms such as Facebook and Twitter, have the capacity to infiltrate popular culture, as they are so frequently used by a wide variety of people. Additionally, it is said that images have a crucial, if often underestimated, part in the, "progressive elaboration and shifting public views of climate change" (Lester and Cottle 2009). So the visual content created for such platforms can play an important role in the development of a global environmental awareness and contribute to a "sense of ecological citizenship and associated rights and responsibilities" (ibid).

There are many barriers preventing people from really engaging and changing their behaviour accordingly; climate change is an "abstract issue, with a long term horizon and global boundaries" (Nicholson-Cole 2005). These make it difficult for people to relate to and understand what they can do to make a difference. The LetsLeap page is a space that I hope will bring the issue down to a personal level, and both help to elicit people's feelings about climate issues and engage them through successful visual communication. Visual representations disseminated on platforms such as Instagram can "convey strong messages, making them easy to remember; condense complex information and communicate new content; provide the basis for personal thoughts and conversations, contributing to people's memory and issue-awareness; (and) communicate ideas in an instant using many different

media and contexts" (ibid). The new global cultural space that has been created by increasing flows of images, which is in part a result of the increasing use of Instagram and other social media platforms, may indeed provide resources for the "constitution of new identities and reimagination of solidarity and care" that we need to address climate change at the global level (Szerszynski and Toogood 2000).

The Culture of Climate Change
My hopes for this new Instagram page were beginning to grow. But first, I needed to figure out what people currently thought about the subject of climate change in order to create meaningful content. Being so passionate about climate change, I tended to assume that everyone was on my page, that they too understood, and believed the science. After doing some preliminary research, I learned that sadly, my assumptions weren't entirely correct. In North America, more than 90 percent of the public is aware of climate change (Lee et al. 2015). However, one in five Americans, as of 2014, still do not believe anthropogenic climate change exists; current acceptance is only 64% (Leombruni 2015). In fact, the public's perception of climate change is quite inaccurate (Brommell et al. 2015).

People "systematically misunderstand climate change and the actions required for mitigation" and lack "vivid, concrete, and personally relevant affective images of climate change" (Brommell et al. 2015, Leiserowitz 2007). While people perceive climate change as a moderate risk, it remains a low priority relative to other national environmental issues. In other words, climate change lacks a sense of urgency. This is because most of the American public considers it a risk that is most likely to affect "people and places that are geographically distant" (Leiserowitz 2007). Only 28% of American citizens ranked "dealing with global warming" a "top priority" for the President and Congress, and only 33% of Canadians are "very concerned" about the effects of climate change (Motel 2014, Canada NewsWire 2007).

Given that climate change is an "abstract issue, with a long term horizon and global boundaries," people find it difficult to relate to (Nicholson-Cole 2005). This helps explain the inattention and inaction on climate change in our society today. Other factors that contribute to the lack of urgency surrounding the issue include the creeping nature of climate change, the complexity and uncertainty of the issue, the lack of immediacy, and communication failures.

Climate change has been highly politicized in North American culture (Carlson and McCormick 2015). This highly politicized nature I soon learned, has not been a result of debate over carbon dioxide and GHG models. Instead it is due to "opposing cultural values and world views through which that science is seen," as people absorb new information through pre-existing frames of reference (Hoffman 2015, Moser and Dilling 2004). Scientific

knowledge does not appear to inform what many believe. In fact, research suggests that "knowledge does not predict perception of climate change risks, or is a minimal predictor compared to other factors" (Leombruni 2015). Thus information about the state of the environment is not the only thing that matters. Cultural identity becomes key to understanding how the climate change debate has become so deeply politicized.

More than anything, what matters is how information is interpreted (Hall 2014). Important factors that influence how we relate to and interpret climate change information include personal experiences, beliefs, knowledge, values and world views (Broomell et al 2015, Hoffman 2015). We employ ideological filters that are influenced by our belief system, which are to a large extent "formed through the referent groups to which we belong" (Hoffman 2015). We are "influenced by group values and we will generally endorse the position that most directly reinforces our connection with others in our referent group and at the same time strengthens our definition of self" (ibid). This comes from an innate desire to be consistent in our beliefs both within ourselves, and with others we value and trust, such as work colleagues, political party, church group etc. Once this process begins, these belief structures "become increasingly stable and resistant to change" (ibid). As a result, we give greater weight to evidence and arguments that support our pre-existing beliefs and tend to refute views or arguments that fall contrary to those beliefs (Maibach et al. 2008). In other words, audiences are most receptive to content that is consistent with their existing attitudes and beliefs (ibid).

We know that there are diverse audiences, each predisposed to interpret climate change in different ways, drawing on life circumstances, experiences, social networks and value orientations. Understanding the underlying worldview of various audience segments could thus be used to tailor messages that resonate with the values and predispositions of different groups (Maibach et al. 2008). Choosing "message frames for climate change" that are consistent with the "values of target groups" is one important way to disseminate information and make the recommended behaviours or policies easier to accept (ibid). For example, conservation messages can use an "economic frame (*This is an excellent way to save money*); an energy independence frame (*This is a means for our country to free itself from dependence on foreign oil*); a legacy frame (*This is a way to protect our children's future*); a religious frame (*This is a way to serve God by protecting His creation*)" (ibid). Each of these frames is likely to resonate more effectively with the values of different segments of people. Thus, in order to effectively reach and influence people, climate change messages must be targeted on the basis of the audiences' interests, values, and current behavioural patterns (ibid).

No General Public

A fundamental truth has emerged: there is no such thing as a general public (Maibach et al., 2008). This truth is further exemplified when looking at the responses to frightening projections of the risks of climate change. While realities of rising seas, flooding, mass extinctions and displaced populations arouse concern and motivate action in some, other are left with feelings of indifference, despair, or powerlessness. Much research has been done on "fear appeals," or the use of fear, guilt and other threats as motivators to action. There has been an increasing impulse among many to make "climate change more scary and thereby more salient;" some scientists and editors suggest fear provoking measures are needed to "motivate adequate response, to break through disinterest, indifference and apathy" (Moser and Dilling 2004). Risk communication research typically finds that people must "feel personally threatened for messages to influence behaviour," and that "fear appeals are effective in motivating behaviour change" (Maibach et al. 2008). However, climate change literature contains frequent warnings to avoid fearful messages. There is a contradiction within the literature, to avoid fear in climate change communication and "experimental evidence indicating its effectiveness" (ibid).

The best way to resolve this contradiction is to take a more nuanced approach to presenting fear-based information. While fear may change attitudes and levels of concern, positive motivations and forms of communication such as "perceived self-efficacy in responding to a threat" can help to ensure active engagement with the issue or actual behavioural change (Moser and Dilling 2004). Lorenzoni and Pidgeon found, through fifteen years of climate-change perception research, that the "extent to which people perceive that they can make a difference significantly determines levels of ongoing (dis)engagement, and the complexities of perceptions about climate change" (Boykoff 2011). They concluded, "successful action is only likely to take place if individuals feel they can and should make a difference" (Lorenzoni and Pidgeon 2006). Therefore messages need to have "useful and very specific information about possible precautionary actions," while helping people to appraise their own ability to carry out the action, and help them feel the suggested action will effectively solve the problem (Moser and Dilling 2004). People are therefore more responsive and productive when they feel in control of their lives; motivating action on climate change issues requires focusing on people's strengths and abilities.

Armed with this knowledge I began to plan content for the LetsLeap Instagram page. While fear and guilt can serve as a motivating function, I needed to accompany that with positive motivations in order to more successfully engage the audience. Ways in which I could engage social actors included "identifying recommended actions through which to reduce the threat, persuasive affirmations that collectively the audience is capable of

implementing these actions, and supporting the individual audience member's sense of personal efficacy in taking action" (Maibach et al. 2008). The Infographics of the 15 Leap Demands illustrate what it is we're asking people to do, what actions people can take to reduce the threat. While these goals are generally at a policy level as opposed to individual action, they lay out what we, in society, need to be pushing our leaders towards. Additionally, we can act in ways that align with these goals. In the future, I will post photos of the various Leap regional coalitions engaging with The Leap Manifesto, which will provide affirmations to all the followers that collectively, we are capable of creating change. Illustrating the strides many of the Leap regional teams have achieved at the local and neighbourhood level supports and endorses The Leap vision, which has the potential to inspire others. Evidence that there are people already creating new approaches and opportunities that build a new world will hopefully support individuals' sense of personal efficacy in taking action. This is my goal for the Instagram page.

The Leap Regional Call
To gain insights as to what is happening across The Leap Manifesto's regional channels, I was invited to join the monthly video conference with the various regional Leap organizers. There are currently seven Leap chapters, from Victoria, to Thunder Bay, to Ottawa. Each chapter supports The Leap Manifesto as a general vision, and attempts to bring the lofty goals to a locality and bring about tangible change. They hold meetings with community members and Leap supporters to discuss and plan future events and actions that align with The Leap Manifesto's Demands. "Here in Ottawa we are working with other groups now on a community fundraiser for the Algonquins of Barrière Lake (ABL) who are fighting an attempt by a junior mining company to engage in copper drilling on ABL lands. This is being done without consent or consultation with ABL folks." Joel, Ottawa's regional chapter leader told us.

"Sixty people gathered last Tuesday night to hear the Local Leap Proportional Representation working group present information about the positive relationship between Proportional Representation and Climate Change," said Guy when talking about the January 31 meeting held in Peterborough. It was extremely interesting and empowering for me to listen in on the call, as I had no idea there were already so many people on the ground taking action. It delighted me to hear that the meetings across the country continue to grow in size every time they are held.

"Jaclyn, would you like to tell everyone about what you've been up to?" asked Bianca. I took a deep breath, "I have been working on a new Instagram account for The Leap Manifesto," I looked at my computer screen to see everyone's reactions. They all looked intrigued. I continued on with more confidence, telling everyone about the page and about

my future plans. "I would love it if people could send me any and all photos they would like for me to share. I think it would be really great to have the page feature community members taking action. We want to show people that there are many ways they can get involved. We need to send a message that there are already many climate warriors on the ground, making a difference." I continued with my vision, "The account can only have a genuine impact if the photos are of real people from the communities around us." "I have an event coming up at UofT that I will send you photos from" Julia offered. Suddenly, my vision was becoming realized.

Social media was not the only facet of media that got brought up in the call. "CC4BC (Third party registered advertiser for the upcoming B.C. election) is hoping to make the Leap Manifesto a wedge issue liability for the BC NDP and leader John Horgan, and if nothing else draw vote-splitting support to the BC Greens in key Lower Mainland and Vancouver Island swing seats," Howard from Victoria told us. We learned about Jim Shepard who wrote an Op Ed in the Vancouver Sun on February 16, 2017, called "B.C. should be concerned about NDP's Leap Manifesto" which was filled with misrepresentations and inaccuracies about The Leap Manifesto. It was followed by an attack ad published in the same paper on March 4, 2017, asking NDP leader John Horgan to reserve his support for The Leap Manifesto. This Op Ed as well as the Ad have since been countered by The Leap Manifesto, clarifying many issues put fourth by the slanderous media pieces.

Climate Change in Media

This example brings up a very important aspect of climate change: the media's representation of it. People throughout society rely upon media representations to "help interpret and make sense of the many complexities" relating to climate change (Boykoff 2011). Further, media messages are "critical inputs to what becomes public discourse on today's climate challenges" (ibid). Studies across many decades have shown that citizens gain understanding about science, and more specifically climate change, largely from mass media (ibid). In this context there are fundamental and immediate challenges associated with media portrayals of climate change, namely fairness, accuracy and prevision (ibid). Given the high stakes of reporting on climate change, journalists, editors, producers as well as scientists, policymakers, and educators must very carefully negotiate how climate change is articulated and represented.

Whenever "biophysical phenomena are captured and categorized through media portrayals… they undergo varying degrees of interpretation" and are influenced by numerous factors (Boykoff 2011). Some of the most important factors that have affected how climate change has been articulated as well as how alternatives for climate action are considered,

include portraying the climate change issue as one of large uncertainty; balanced reporting, which overstates the actual degree of disagreement; and a failure to create a solid public understanding of climate change.

Various dimensions of uncertainty in complex environmental issues, like climate change, are "particularly susceptible to misrepresentation and manipulation" (Boykoff 2011). The media tends to portray the climate change issue as one of "large uncertainty, filled with competing claims and intense debate within the scientific community" (Moser and Dilling 2004). There have been many deliberate efforts to raise the broad perception of uncertainty surrounding climate change in attempts to "destabilize public support for climate mitigation and adaptation measures" (Boykoff 2011). These media representations of uncertainty have the potential to distract as well as impede substantive actions to reduce GHG emissions, as the "reduction of uncertainty has long been framed as a prerequisite for political and policy progress" (ibid).

The journalistic norm and the culture of "balance" in reporting give skeptics exposure and credibility and overstates the actual degree of disagreement in the field of climate change (Moser and Dilling 2004). Balanced reporting requires reporters who write about controversial topics to present competing points of view, which when writing on issues of a political or societal nature, is a "check on biased reporting" (Gelbspan 1998). However, balanced reporting causes problems when presenting issues of science, because it demands that journalists present "competing points of views on a scientific question as through they had equal scientific weight when actually they do not" (ibid). This has served to impede both the public and policy maker's understanding of anthropogenic climate change over time (Boykoff 2011).

Through this journalistic norm, evidence based knowledge generated by scientists and experts through the peer-review process has been put on par with the opinions and arguments offered by skeptics (Boykoff 2011). This process has amplified outlier and contrarian views on anthropogenic climate change, and simultaneously "engendered an appearance of increased uncertainty regarding climate science" (ibid). This in turn has entered into an already highly contested arena where it has "permeated climate policy discourse and decision making" (ibid). When balanced media coverage distorts rather than clarifies the science surrounding climate change, it can greatly impact how policy actors as well as lay populations perceive, approach and engage in actions and remedies (ibid).

The media has also largely failed to create a solid public understanding of the science and causes of anthropogenic climate change and hence potential solutions (Moser and Dilling 2004). The differences in language use between science, policy, media and the lay population can impede efforts to make climate change meaningful in society; important

research and insights can suffocate under a "wet blanket of jargon" (Boykoff 2011). Jargon-laden climate science has struggled to be translated into the "crisp, unequivocal commentary that is valued in the press, policy community and civil society" (ibid). Information surrounding climate change needs to be translated into more colloquial terms in order for them to be widely understood and valued in the public and in decision making. Without such an understanding, individuals are left with "overwhelming, frightening images of potentially disastrous impacts, no clear sense of how to avert this potentially dark future, and therefore no way to direct urgency toward remedial action" (Moser and Dilling 2004).

Media are not merely a "conduit through which information is inefficiently transmitted. They also become part of the rhetorical war when they alter and filter it, whether through deliberate or accidental means" (Hoffman 2015). We must then work towards improving the communication of climate change. Moser and Dilling propose seven strategies, which build on research on communication, information processing, and emotional and cognitive responses to the risk information (2004). While it is not within the limits of this piece to go into vast detail, it is worth noting some of the strategies that aim to enhance wider public appreciation for the seriousness of the problem, and build momentum for social and policy change. Firstly, it is important to abide by basic communication rules; ask who the audience is, pick the right messenger to maximize credibility and legitimacy with the audience, and carefully choose the communication channel (Moser and Dilling 2004).

Secondly, communicators should address the emotional and temporal components of urgency. To increase the likelihood that threatening information "leads not to denial and apathy but to action, a focus - in tone and content - on empowerment should be the highest priority" (Moser and Dilling 2004). As previously discussed, highlighting the effectiveness of recommended actions, bolstering people's sense of self-efficacy and even addressing concerns over costs, all contribute to a "can-do attitude" (ibid). In this context, it is helpful to "share examples of success and to reward early action through visibility and public acknowledgement" (ibid). This is my goal for the LetsLeap page, to post photos of community members' taking action in their communities and focus on their successes.

Moser and Dilling also propose that communicators should try to increase the persuasiveness of the message, and use opportunities, such as climate disasters, well. Additionally, they should try to broaden the circle of messengers, as convincing arguments are best received if they come from people with the most pertinent expertise. For example an economist will carry more weight than a climate scientists in speaking to the costs and feasibility of certain solutions (2004).

Research points to another strategy that climate change communicators can use: unite and conquer. Moser and Dilling suggest that the unite and conquer strategy is the "antidote

to divisive tactics and isolationism of individuals and issues" (2004). If one instance of climate change impacts does not convey the magnitude and urgency of the problem, then "the public and policymakers must be aided in seeing the patterns of change" (Moser and Dilling 2004). For example, "one species migrating to higher latitudes or elevations in response to warming may be a locally caused phenomenon; hundreds of species doing so all in response to the same environmental driver is more convincing evidence" (ibid).

A further way to address issue compartmentalization is to "unite around the human activities that both emit heat trapping gases and cause other problems," the *collateral damage* of human activities (Moser and Dilling 2004). An example of this would be that the reliance on fossil fuels imported from politically unstable regions reduces energy security. Consequently, solutions for the climate problem are also solutions for other problems, *collateral benefits* such as reducing GHG emissions to tackle air pollution (ibid). Many actions taken to manage climate change will help address others, an argument "increasingly made in favour of viewing mitigation and adaptation actions as complementary and synergistic activities, rather than as trade offs" (ibid). A final way to "unite and conquer and counter isolationism applies to engaging people;" if we can't as individuals be convinced that our personal actions will have any impact in the global context, we must be made to "feel part of a larger collective that can successfully tackle the problem" (ibid). Thus we must build on communal achievements and tap into a desire for community and meaning.

The final strategy pertains to tapping into individuals' and cultures' strengths and values. As previously discussed, communicators must tailor messages for particular interpretive communities, or groups of individuals who share "mutually compatible risk perceptions, affective imagery, values and sociodemographic characteristics" (Leiserowitz 2007). If a problem and the actions people can take to address it are, "framed in a way that resonates with their cultural values and beliefs, people are more likely to take the action" (Moser and Dilling 2004). Thus the message of climate change must be presented in a way that affirms the individuals sense of self, and "emphasizes the linkages between his or her values (Hoffman 2015). In this way, the message can be understood and accessed through a "pre-existing set of concerns," which people are already prepared to address (ibid).

Media representation continue to have many implications on relations between science, policy, and public understanding and engagement. It is clear that climate issues themselves shape media reporting. However, it is also true that journalism shapes ongoing conceptions of climate change which in turn influence how citizens make sense of and value the world (Boykoff 2011). This shapes their activities along with politics and policy decisions. It is important to carefully and effectively communicate all the intricacies and nuances of climate change in order to bring about desirable engagement. Scientific communicators and the

media have not done a great job at translating climate change science so that it is accessible to a large audience. More energy needs to be directed towards communicating in a way that does not rely on outdated journalistic norms.

In today's world, especially given the rise of social media, information is inescapable and seemingly unlimited. But information can only be held together meaningfully if it is constructed in a particular way. Now that I have an understanding of how people relate to climate change and what might potentially drive them to act, I will rely on the aforementioned tactics in an attempt to convey urgency and incite action. Meaningful visualizations of climate change and communication strategies can help to bridge the gap between what may seem a far away, unimportant concept and everyday experience. I hope to, through my work with The Leap and beyond, create lasting motivation for people to participate in conversation and partake in communal action that addresses climate change. It is only then, once everyone sees climate change as an issue they need to be concerned with, will a path forward be possible.

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Boyd, David Richard. The Optimistic Environmentalist: Progressing towards a
      Greener Future. Toronto: ECW, 2015. Print.
David Boyd is one of Canada's foremost experts in environmental law and policy. He has been an advisor for many governments, including Canada, on environmental and constitutional issues. *The Optimistic Environmentalist* is a book meant for the everyday citizen, who likely feels disheartened and possibly overwhelmed by the constant bombardment of pessimistic environmental outlooks as often portrayed by scientists, media and environmental NGOs. Boyd aims to provide a much needed positive antidote, attempting to confront the ecological negativity by providing readers with real world, tangible examples of environmental success stories. This book, unlike many of the others, has an optimistic outlook, one that shares good stories, instead of overwhelmingly negative facts. This book is a resource for inspiring readers of every education level, helping them to understand not only environmental issues, but more importantly possible and tangible solutions. It explores and demonstrates that the human population can in fact make positive change in the face of many environmental issues. Instead of avoiding the issues, people are able to see the benefit in remaining positive, understanding that making certain environmental changes can be cheaper and easier than ever imagined. Boyd's work was a useful resource for me as it demonstrates that we have the ability to overcome many of today's environmental challenges including climate change, and it is a great tool to inform the general population and foster an optimistic attitude, which can lead to action.

Boykoff, Maxwell T. Who Speaks for the Climate?: Making Sense of Media Reporting on
      Climate Change. New York: Cambridge UP, 2011. Print.
Maxwell Boykoff is an Assistant Professor in the Environmental Studies Program at the University of Colorado and is also a senior visiting Research Associate in the Environmental Change Institute at Oxford University. His interests include climate adaptation, cultural politics of climate change, political economy and the environment, and he is considered the leading researcher and critical voice on media and climate change. He has written many books and articles on the subject and engages many critical questions throughout his research. *Who Speaks for the Climate* is for concerned academics, journalists and even politicians, looking to explore how media influences climate change matters and vice versa. The information and syntax of this book is complex, making it slightly inaccessible for the everyday person, but the overall message of the book seeks to benefit the general population as it explores the ways in which journalists can properly represent climate change. Boykoff argues that media influence

the public understanding of climate science and policy and his book explores how media representations shape and influence decision-making within political and cultural spheres. He asserts that ways of knowing and thinking about climate change, as taught by media, shape discourses and considerations for possible climate action. This book was useful to me because it addresses the question of 'who speaks for the climate,' and the effects this may have on on possible cultural, political, and economic responses. It presents many of the challenges communicators face when dealing with climate related issues.

Callison, Candis. *How Climate Change Comes to Matter: The Communal Life of Facts*.
    Durham and London: Duke University Press, 2014.
Candis Callison is an Associate Professor of Journalism at the University of British Columbia, her research focusing on changes to media practices, the role of social movements, and understanding how issues related to science and technology become meaningful for the public. *How Climate Change Comes to Matter,* is intended for someone with an academic background, as the subject matter and syntax is advanced, and assumes prior knowledge on climate change. Callison approaches climate change by bringing together the experiences of three distinct social groups and the work of scientists and journalists. She does this in order to investigate and theorize how different epistemologies are evolving and forming around the issue of climate change. She explores how, or if at all climate change is discussed in groups and what it means to them; each of her chapters reflects on how climate change is represented and understood. We learn how climate change is framed as a scientific phenomenon, an experience reality, and a moral and ethical problem that must be addressed personally and collectively. Callison, similar to Boykoff (2011), also examines public engagement with science and the role of media. This book illuminates my research by exploring the efforts by media to engage the public, and it illustrates how journalists deal with the challenge of properly articulating climate change scientific facts and risks to the public. This informs my research as it discusses current scientific and policy efforts to educate or engage the public and regards media as one of several mediating factors.

Crow, Deserai, and Maxwell Boykoff, editors. Culture, Politics and Climate Change. New
    York: Rutledge, 2014.
Deserai Crow is an Assistant Professor in the Environmental Studies Program, Centre for Science and Technology Policy Research and Centre for Environmental Journalism at the University of Colorado. This collection of works, edited by Crow and Maxwell Boykoff, draws from multiple perspectives to explore our current understanding of climate change culture and politics. This collection is geared toward students, policy makers and media dealing with

climate change, politics and communication. The four sections, culture and climate change communication, media as actors and contributors to climate politics and policy, climate politics and policy, and emerging research in climate politics and policy provide a thorough description of how media and information shape the present and future. Similar to Boykoff's book, this volume includes an analysis of the challenges and opportunities media has when it comes to influencing climate change both in the public and political realm. My research was greatly aided as a result of this work because it explores the attitudes, perspectives, behaviours and intentions in society when dealing with climate change. This work demonstrates that media coverage does not necessarily determine engagement or behaviour change, which answers one of my main research questions. Instead, media has the potential to shape different responses, such as instilling fear or promoting feelings of self-efficacy, which in turn can determine engagement.

Doyle, Julie. "Picturing the Clima(c)tic: Greenpeace and the Representational Politics of Climate Change Communication." *Science as Culture* **16.2 (2007): 129-50.**

Julie Doyle is a Professor of Media and Communications at the University of Brighton. She is Media Research Leader and Co-Founder and Co-Chair of the Centre for Research in Spatial, Environmental and Cultural Politics. Her focus is on the role of media and communication in understand and addressing climate change. *Picturing the Clima(c)tic: Greenpeace and the Representational Politics of Climate Change Communication* is an article intended for academics and communicators wishing to learn more about the possibilities and limitations of visual communication in representing climate change. Doyle explores the history of Greenpeace and their use of photography as a visual mediation of environmental protest. However it was Doyle's exploration of various reasons as to why it remains difficult to communicate and validate climate change, that directly informed my research. Some of these difficulties include the temporal and spatial dilemma that underpins climate change communication, and the invisible materiality of climate change. This article additionally illuminates current discursive strategies of environmental communication within media, such as the practice of aestheticizing nature and using fatalistic images. In my photo essay, I reference some of the important limitations Doyle names that are associated with trying to communicate the complex nature of climate change when relying on a visual communications.

**Frumkin, Howard, and Anthony McMichael. "Climate Change and Public Health,
thinking, communicating, acting"** *American Journal of Preventive Medicine*
35.5(2008): 403-410

Howard Frumkin is a Professor of Environmental and Occupational Health Science at the University of Washington with an interest in climate change and health. Professor Anthony McMichael is an Honorary Professor in Climate Change and Human Health currently researching the health risks of climate change. McMichael played a leading role in health risk assessment for the Intergovernmental Panel on Climate Change. This article appeared in a journal of medicine, thus its intended audience is likely those interested in the human health aspects of climate change. C*limate Change and Public Health, thinking, communicating, acting* reflects a growing interest of health professionals in addressing the challenge of climate change. Climate change, Frumkin and McMichael argue, must be confronted beyond the formal health sector through means such a promoting co-benefits, which are actions that address climate change that also yield health, environmental, economic and social benefits. Some co-benefits include planting trees in cities, eating less meat, and energy policy and air pollution control. Co-benefits are important in climate change communication as they are a way to unite multiple publics who may have varied opinions on climate change, but still want to address other issues, such as improving human health. Thus they will support a necessary action to improve one thing, which simultaneously addresses climate change. In promoting co-benefits, current and future risks to health become part of the information base for decisions about the mitigation of climate change itself.

Hayes, Christopher. "The New Abolitionism." *The Nation* **22 Apr. 2014**

Christopher Hayes is the Editor-at-Large of *The Nation,* a weekly journal of opinion featuring analysis on politics and culture, and writes on a wide variety of political and social issues. Hayes is a former Fellow at Harvard University's Centre for Ethics. In *The New Abolitionism*, Hayes compares slavery and the abolition movement to today's issue of fossil fuel extraction, and the lengths we must go to in order to adequately address climate change. Hayes argues that similar to what the climate justice movement is currently demanding, there has only been one movement in the past to call for an existing set of political and economic interests to say goodbye to trillions of dollars of wealth. This past movement was the push for the abolition of slavery. Hayes offers a thorough comparison of the two movements, which provided my research with a good analogy of how far we must go in order to address climate change. The climate justice movement is demanding the abolition of fossil fuels, and nothing short of that will keep climate change at bay. This article shows us that such a great transformation is possible and that in fact, it has happened before.

IPCC: Summary for Policymakers. In: *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.* Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.). Cambridge University Press: Cambridge, United Kingdom and New York, NY, USA, 2013.

The Intergovernmental Panel on Climate Change is a scientific, intergovernmental body under the United Nations, with the task of providing an objective account of climate change and its many impacts. The science is not conducted by the IPCC itself, instead it assesses information already published in literature. The reports are written by thousands of scientists and experts from around the world, which are then reviewed by governments of more than 120 countries. The language features a lot of scientific jargon, thus the intended audience is other scientists and political bodies tasked with addressing climate change. *The Fifth Assessment Repor*t details the current accepted science regarding anthropogenic climate change, noting the causes, effects, and options for adaptation and mitigation. Given that the IPCC is the internationally accepted authority on climate change and there is no equivalent voice on the matter, I relied extensively and almost exclusively on its report to inform my section on climate science. This report allowed me to claim with a high degree of certainty that anthropogenic climate change is real, therefore enabling me to shift the focus of my research away from climate science towards other, more pertinent aspects such as culture and media.

Klein, Naomi. *This Changes Everything: Capitalism vs. the Climate*. New York: Simon & Schuster, 2014. Print.

Naomi Klein is a well respected Canadian author and social activist, previously writing about globalization and capitalism. Her latest piece of non-fiction, *This Changes Everything,* takes on the issue of climate change in an approachable and easily understood way, intended for a wide audience. It is likely that this book is the most wide reaching piece of work included in this collection, and perhaps of all climate change literature nationally. Climate change is a complex and nuanced issue, which she tackles bit by bit, bringing in a wealth of other related and important information. Klein helps the audience see the bigger picture and draw their own connections to the issue. While the book covers a large amount of information and is slightly daunting, it does not leave one numb or feeling completely helpless. This is because she suggest there are ways in which climate change can be addressed. Klein calls for drastic measures that urge the dismantling and restructuring of our current political and economic system, particularly neoliberal market fundamentalism; it is argued that climate justice and

capitalism are incompatible. Klein's book makes one question to what extent we are willing to go and how far we must go for the sake of the climate. This question and Klein's book in general was my initial inspiration for this research. I wanted to learn more about the culture and communication of climate change and how I could make a difference.

Leiserowitz, Anthony. "Communicating the Risk of Global Warming: American Risk Perceptions, Affective Images, and Interpretive Communities." *Creating a Climate for Change: Communicating Climate Change and Facilitating Social Change.* **Ed. Susanne C. Moser and Lisa Dilling. Cambridge: Cambridge UP, 2007. 44-63.**

Anthony Leiserowitz is a Research Scientist and Director of the Yale Project on Climate Change. He is an expert on public opinion surrounding climate change, including public perception of the associated risks, support and opposition for climate policies, and willingness to make behavioural change. *Communicating the Risk of Global Warming* is intended for academics and professionals in climate change policy and communication. Leiserowitz argues that climate change remains a low priority in society and lacks urgency. In order to understand why this is, Leiserowtz explores how global climate change is currently perceived as a risk, and the affective images currently being used in climate change communication. Leiserowitz's analysis of current perceptions surrounding climate change greatly helped my research as it enabled me to get a sense of how the issue is currently viewed - as a moderate risk - and why it has not taken on a more urgent and prominent position in society. Additionally, he provides five strategies to communicate about climate change in ways that resonate with the public, which nicely compliments Moser & Dillings work.

Leombruni, Lisa. "How you talk about climate change matters: A communication network perspective on epistemic skepticism and belief strength." *Global Environmental Change* **35 (2015): 148-161**

Lisa Leombruni is the Communication Program Manager at University of California, Santa Barbara. She has experience in broadcast science media, communication research, and environmental policy. In *How you talk about climate change matters*, Leombruni explores current attitudes and beliefs surrounding anthropogenic climate change. She introduces a concept called the network perspective, which accounts for the social embeddedness of individuals in order to predict climate attitudes. The idea that information is maintained by social groups suggests that climate attitudes flow through interpersonal communication networks, thus making bottom-up or grassroots style campaigns important. Her results were important to my research because she ascribes the role of knowledge-building in society to

people, who can arm others around them with knowledge. Leombruni's article further solidifies my argument that we must choose the right message frames for climate change, ones that are consistent with the values of social networks, in order for information to get disseminated.

Maibach, Edward, Connie Roser-Renouf, and Anthony Leiserowitz. "Communication and marketing as climate change - intervention assets" *American Journal of Preventive Medicine* **35.5 (2008): 488-500**

In this article, Anthony Leiserowitz is joined by Edward Maibach, Professor and Director of Mason's Centre for Climate Change Communication, whose research is focused exclusively on how to mobilize populations to adopt climate friendly behaviours. Connie Roser-Renouf is Associate Research Professor at the Centre for Climate Change Communication and focuses on understanding how diverse audiences interpret and respond to climate change information. *Communication and marketing as climate change - intervention assets* examines the potential of communication and marketing strategies to influence population behaviour in ways that reflect climate prevention and adaptation objectives. The concept of interpretative communities is introduced, diverse audiences within the population that are predisposed to interpret climate change in different ways. This article details effective climate change messages communicators can use in order to motivate behaviour change. This article was extremely helpful in my research as it discusses the potential of fear appeals, and the importance of choosing the right message frames based on the values of diverse audiences; audiences are most receptive to content that is consistent with their existing attitudes and beliefs. I learned the necessity of tailoring messages in order to resonate with the values and predisposition of different groups, or interpretative communities.

McEwan, Ian. *Solar***. New York: Random House, 2010. Print.**

Ian McEwan is a prominent English novelist, publishing many well known books such as Atonement. He is a member of the 10:10 project which is a charity that supports local action on climate change. While the book is a work of fiction, it frequently references real science and aspects of modern history. McEwan acknowledges many mathematicians and scientists for guiding his writing. There are physics lessons scattered throughout *Solar*, explaining things from the greenhouse effect, to photosynthesis, and photovoltaics. These lessons don't seem misplaced and unwarranted, instead they add great depth to the novel. Though a work of fiction, *Solar* comments on our world's present situation and the current state of affairs. McEwan writes about a world that too is struggling with the issue of climate change. Through a fictional lens, McEwan enables the reader to reflect on climate change and think about it's

present and future implications without arousing fear, which is a common problem when discussing climate change today. This book, an allegory to our current global system and the dire situation we are faced with, is an important educational tool, one in which people can learn about the issues   and solutions associated with climate change in a way they can understand.

Moser, Susanne, and Lisa Dilling. "Making climate hot: Communicating the urgency and challenge of global climate change." *Environment* **46.10 (2004): 32-46**

Susanne Moser is a Researcher and Consultant in California, focusing on adaptation to climate change and climate change communication. Lisa Dilling is Associate Professor of Environmental Studies at The University of Colorado, interested in the use of information in decision making related to climate change. *Making climate hot* provides reasoning as to why there has been inattention and inaction on climate change within the public. Moser and Dilling call for more effective communication of climate change's urgency, and they explore different ways in which communicators can enhance wider public appreciation and understanding for the problem. Fear, guilt and other threats as motivators are examined, looking at the ways fear-provoking measures have been used by many to make climate change more salient. They suggest communicators must also use positive motivations in addition to fear tactics, in order to more successfully engage the public. Their exploration of strategies to build momentum for social and policy change greatly informed my research as I relied extensively on their writing to find ways to enhance climate change communication.

Robinson, Kim Stanley. *Forty Signs of Rain***. New York: Bantam, 2005. Print.**

Kim Stanley Robinson is a science fiction writer with ecological, cultural and political themes running throughout his books. According to an article in The New Yorker, Robinson is generally acknowledged as one of the greatest living science-fiction writers. Additionally, Robinson was appointed Muir Environmental Fellow in 2011 by the John Muir College, University College San Diego, and named "Hero of the Environment" by Time Magazine in 2008. *Forty Signs of Rain* is a useful tool to reach the general population as it is an easy read. The book's main theme is ecological sustainability, taking climate change as it's subject. It is a great example, along with McEwan's *Solar,* of real science playing a role in both the telling and plot of the story. It's an exciting look at science without the jargon or without going into too much dry detail. Instead, the reader gets wrapped up in the extremely convincing and engaging plot. This book informs my research as it is a great way to explore the topic of science and climate change in society in an accessible form. It tackles some of the hard issues surrounding the subject and lets the reader draw their own conclusions and understand the

urgency with which this issue must be addressed. It becomes evident that we must confront the threat of climate change in the real world, before we experience the reality that is drawn up in the book. Robinson's story is extremely thought provoking and is the wake up call many of us need to start caring about our planet's future.

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Oil Breezwood, by Edward Burtynsky. Used under personal permission.

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BTW The person in the image is not a gentleman but a woman activist, Zhong Yu. Here is the caption to the image:-

Activist Zhong Yu shows a scientific (public domain) 1968 photo of the Middle Rongbuk Glacier to the camera to illustrate the 2km retreat and deterioration of the Rongbuk glacier in just under 40 years. A Greenpeace team from Beijing visit Mount Everest to investigate the rapid melting glaciers. The Rongbuk Glaciers are one of the prime sources of water feeding into the major rivers of China and India. Glaciers in the Himalaya are receding faster than in any other part of the world as a result of climate change. Photo by @johnnovis

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