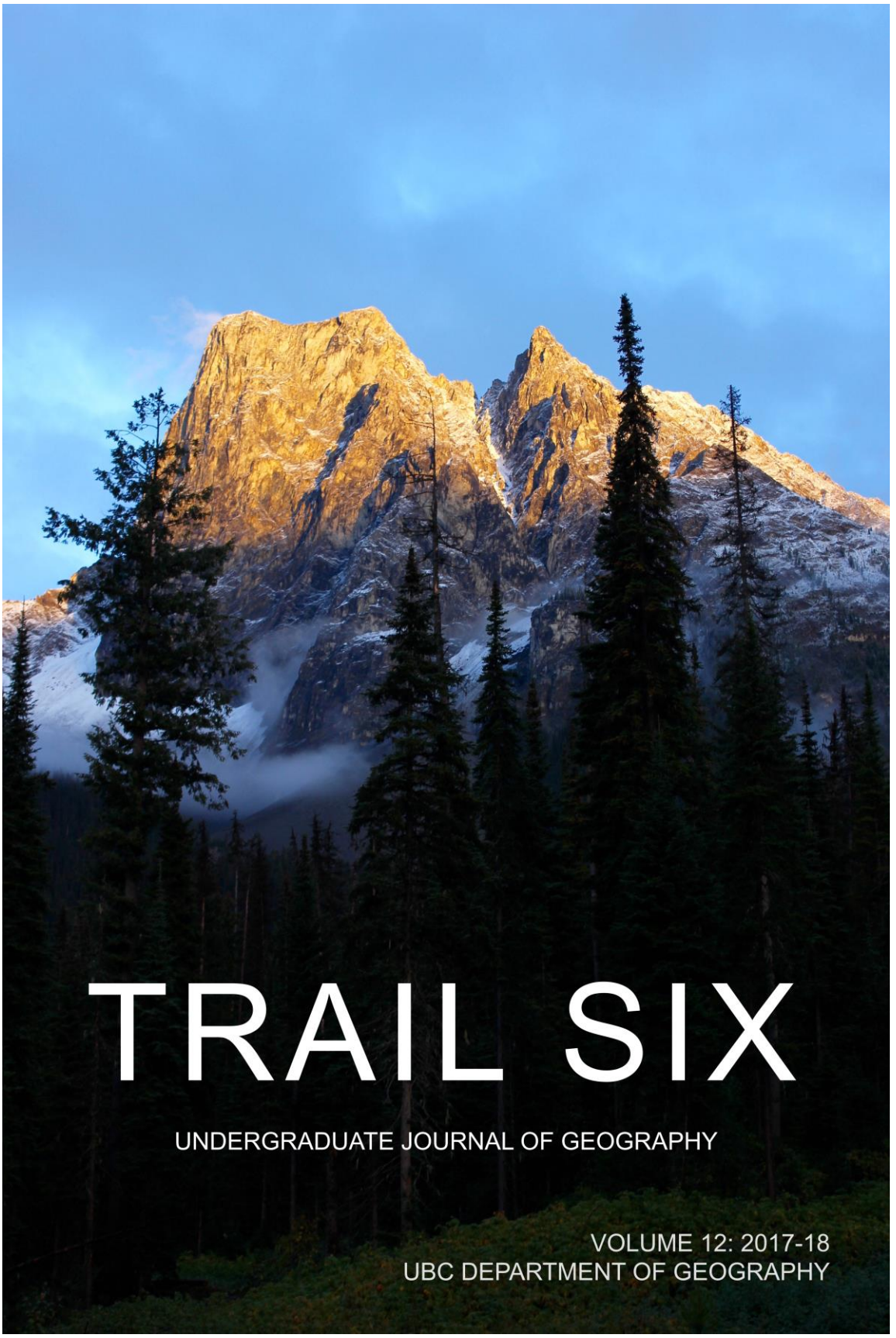

TRAIL SIX

UNDERGRADUATE JOURNAL OF GEOGRAPHY

VOLUME 12: 2017-18
UBC DEPARTMENT OF GEOGRAPHY

TRAIL SIX

UNDERGRADUATE JOURNAL OF GEOGRAPHY

VOLUME 12: 2017-18

Geography Students' Association

Department of Geography

University of British Columbia

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Dr. Marwan Hassan (Department Head), Dr. Trevor Barnes, Alec Blair, Dr. Jessica Dempsey, Dr. Simon Donner, Dr. Siobhán McPhee, Michael More, Dr. Geraldine Pratt, Dr. Elvin Wyly

Land Acknowledgment:

We acknowledge that UBC's Point Grey Campus is located on the traditional, ancestral, unceded territory of the Musqueam people. The land it is situated on has always been a place of learning for the Musqueam people, who for millennia have passed on in their culture, history, and traditions from one generation to the next on this site.

Special Thanks to:

UBC Department of Geography & Geography Students' Association

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TEAM TRAIL SIX 100

Foreword

Welcome to the 2017/2018 edition of Trail Six! This year's articles all centre on the theme of reimagining interactions between humanity and our world. From food waste to urban development, and from concerns on social justice to climate change. All nine of this year's articles constitute a clarion call that we need to delve deeper into the people, processes, and consequences of our presence on the earth. Each of these papers is an exemplar of that kind of thinking, investigating and analyzing often complex and contradictory dynamics, all with a lens of increasing our collective knowledge within the discipline of Geography.

In recognizing the significant knowledge and advancement to our field that this issue of Tail Six represents, it is also important that we as a Department recognize the excellence, dedication, and creativity of the hard-working students who make this journal possible. Over more than a decade, a new generation of young leaders steps forward to take the reins of this publication, and we continue to be impressed by the rigor, quality, and scope of its contents. On behalf of our faculty, staff, and the entire UBC Geography community, congratulations on another outstanding edition of Tail Six!

Marwan A. Hassan

Professor and Department Head

UBC Department of Geography

Letter from the Editor

Alongside the authors and editorial team, I am beyond excited to present this year's edition of Trail Six. Spanning from the intricate social aspects to the physical environments, geography presents itself as an interdisciplinary field of study that constantly explores evolving ideas, shares diverse conversations and challenges the creative world we live in today. Trail Six invites you to join us on this journey in discovering the endless wonders, questions and treasures that the nature of geography has to offer each and every day. Covering from the locally observed issues within Metro Vancouver to the globally recognized problems and everything in between, this edition of Trail Six aspires to invoke and contribute new perspectives to the ever-growing understanding of geography.

This publication marks the twelfth year of Trail Six and I want to share again with everyone the legacy and reputation that this journal's name has built up since the first issue released back in 2007. The following is an excerpt from the inaugural foreword presented in the first emanation of Trail Six written by Danny Oleksiuk and Christopher Chan, the two Editors-in-Chief:

> *Many of you have wandered down from UBC, off the Point Grey peninsula, past the Upper and Lower Quadra sands, and arrived at Wreck Beach. Presumably, you have also hauled yourself back up those same stairs. This is Trail Six. In some five minutes it takes you from the comfort of the academic campus to - depending on the time of the year - the cold, windy, and rainy ocean in the winter, or to the circus of sun, sand and skin that is Wreck Beach in the summer. The city is invisible from the beach; there is only the ocean, the sand, the mountains, and Trail Six leading back towards UBC and Vancouver. We chose it as the title because it is beautiful, it is local, and because in its limited space the trail reveals a spectrum of geographical issues.*

I would like to give a monumental applause and many thank yous to each of the editors, authors, faculty reviewers and the layout designer involved in this year's publication. The articles showcased in this year's journal are carefully chosen in confidence of illustrating the current curiosities and fascinations of UBC geography students. I have had the honour to work with the biggest editorial team to date and I can not express my gratitude enough through words. The Geography Student Association and I believe that the journal can only continue growing from here.

The Trail Six Team and I hope you enjoy this year's issue as much as we do!

Vinson Tam
Editor-in-Chief

Best Before Isn't an Expiry Date: The Problem of Date Labelling and its Effect on Household Food Waste

By: Alex Briault

Globally, one third of food produced for human consumption is wasted or lost. As the global population continues to rise, this level of food waste will be unsustainable as the need for food, water, and arable land will also increase. Food waste in the developed world occurs primarily at the household level and is exacerbated by consumer confusion surrounding date labelling practices, specifically the wording "best before." The aim of this paper is to examine the factors that contribute to unclear date-labelling practices and how they can be changed to reduce waste. Owing to the large number of stakeholders involved in food labelling, this paper discusses how change can be enacted from the consumer level ahead of changes made at the federal level. As a starting point, public education campaigns in the form of art installations and print/digital media are suggested.

Introduction

There is no single or clear solution to stopping or reducing food waste. Solutions will vary greatly between developed countries and developing countries as the reasons underlying this phenomenon differ. In developed countries, reducing food waste at the household level has been successful through increasing consumer education concerning proper food storage methods (Mancini & Vellani, 2016; Metro Vancouver, 2017; Newsome et al., 2014; WRAP, 2017). However, there has been much less work done to educate consumers about date labelling. Confusion over date labelling, including the language used on labels and how dates relate to food quality or safety, is often cited as a major cause of household food waste (Mena et al., 2014; Newsome et al., 2014; Priefer, Jörissen, & Bräutigam, 2016; Sagan, 2015).

The present level of food waste is unsustainable. The natural resources used for food production are already stressed and as one third of the food produced globally is wasted so are these valuable resources (FAO, 2011). The world population is expected to increase to 9 billion by 2050 and result in a 60% increase in demand for food (Dou et al., 2016). The increasing demand on food production coupled with high levels of food waste will result in higher levels of food inequality and will likely lead to shortages in food, freshwater, and arable land. Because of this, it is important to define environmental sustainability and how it relates to food production and food waste. For the purposes of this paper, environmental sustainability means engaging with the environment in a way that efficiently uses natural resources without unnecessary waste to allow for continued, long-term use of those resources. As the global population rises, it will be

important to manage our use of natural resources to ensure that the rising demand for food can be met without increasing waste.

The Impacts of Food Waste

Globally, 1.3 billion tons of food is wasted every year which is enough to feed 1.9 billion people (Kummu et al., 2012; Scholz, Eriksson, & Strid, 2015). In developed countries, 40% of food waste occurs at the retail and household levels when edible food is thrown away or allowed to spoil. In developing countries, the same amount of food is lost post-harvest and during processing due to infrastructural deficiencies (FAO, 2011; Nahman & de Lange, 2013). These extremely high levels of food waste lead to significant economic costs in developed countries. American families throw away 25% of all food and beverages they buy which costs the average family of four $1365-$2275 per year while food waste in the UK costs households an average of £420 per year (Nahman & de Lange, 2013). Venkat (as cited in Nahman & de Lange, 2013) estimates the total cost of food waste at the consumer level to be $124 billion per year.

The environmental costs of wasted food extend beyond the greenhouse gases (GHG) emitted during decomposition in landfills and composting sites. Food production uses limited natural resources such as freshwater, fossil fuels, arable land, and minerals for fertilizers (Richter & Bokelmann, 2016). Agriculture uses 70% of freshwater available globally and due to food losses and waste, one quarter of this water is used for food that is never consumed (Richter & Bokelmann, 2016). GHGs are emitted at all stages of food production from the farm, to the processing plant, to the marketplace, and finally in the household. In Europe, the consumption of food accounts for 20-30% of all GHG emissions, with methane from livestock and nitrous oxide from soils being the largest contributors (Scholz et al., 2015). Globally, food production is responsible for one-third of anthropogenic GHG emissions and as of 2013, annual food wastage was reported to emit approximately 3.3 gigatons of CO2e (Scholz et al., 2015).

In Canada, 30% of all calories purchased are never consumed (this includes waste/spoilage in stores, households, institutions/restaurants, and losses during preparation) (Statistics Canada, 2009). In 2007, solid food losses averaged 184 kg per person, with an additional 2.8 billion liters of liquids being wasted (Statistics Canada, 2009). This wastage of food amounts to roughly $31 billion annually and, as of 2016, there are no current plans by the federal government to address this waste (Mancini & Vellani, 2016). In 2003, Canadian food purchases resulted in 45,687 kilotons of GHG emissions, equivalent to 14% of all GHG emissions attributable to households and this number has surely grown in recent years as the Canadian population has continued to increase (Statistics Canada, 2009).

Food Waste and its Causes

Definitions of food waste vary among researchers. Some differentiate based on where the waste occurs within the

food supply chain (Dou, Ferguson, Galligan, Kelly, Finn, & Giegengack, 2016), while others categorize waste as avoidable, possibly avoidable, or unavoidable (Richter & Bokelmann, 2016; Secondi, Principato, & Laureti, 2016). The Food and Agriculture Organization of the United Nations (FAO) differentiates between food loss and food waste. Food loss is the decrease in edible food mass meant for human consumption throughout the food supply chain. Food waste is food loss that occurs at the end of the food supply chain (at the retail and household/final consumption levels). Food waste is therefore related to retailer and consumer behaviours (FAO, 2011). For this paper, food waste will be defined as food intended for human consumption at the household level that is either thrown away while still edible or allowed to spoil through improper storage.

Just as the definition of food waste varies, the causes of food waste are also highly variable. Food waste at the consumer/household level is often caused by poor planning when purchasing food items, over-sized portions, and safety concerns regarding food nearing or past its "best before" or expiry date (Dou et al., 2016). Over-buying of food items because of promotions encouraging buying multiple items (such as "buy-one-get-one free" deals) often lead to food waste because of a lack of knowledge of proper food storage methods, such as freezing, which extends the durable life of products (FAO, 2011; Newsome et al., 2014; Secondi et al., 2015). Food waste tends to be higher among the highly educated with higher disposable incomes, higher income households, and those under age 65, while it is generally lower among poorer households and with populations over age 65 (Secondi et al., 2015).

Date labelling uses a variety of terms to convey information about the quality or safety of food products to consumers. The "best before" date on packaging is used to convey to the consumer when the durable life of the food item ends and is meant to give information about the quality and freshness of the product (Canada Food Inspection Agency, 2014). The durable life of a food product is the anticipated amount of time that the product will retain its freshness, taste, or nutritional value when stored under appropriate conditions (Canada Food Inspection Agency, 2014). Expiration dates signify the last day that a food product is safe to be consumed and are only legally required on specialized foods such as formulated liquid diets and infant formula (Canada Food Inspection Agency, 2014). There is currently no standardized method of determining the durable life, and therefore the "best before" date of foods, and testing varies among manufacturers (Abraham, 2016).

The Long-term Solution

To reduce food waste caused by consumer confusion over date labelling, clearer labelling is needed. The current wording of "best before" is still thought of as an indicator of safety rather than quality by many consumers (Broad Leib, Ferro, Nielsen, Nosek, & Qu, 2013). Changing the wording to "for best quality, consume before" will help to alleviate consumer confusion because it will specify that the date is based on the product's quality. To

emphasize the importance of the "use by" date label, changing the wording to "to ensure safety, consume/use by" will reinforce the connection between the date and the food's safety to consume. Best before dates originated as a means of managing inventory and this original use is reflected in the link between food quality, taste, freshness, and the date (Abraham, 2016). It is also important to note that "best before" dates only apply to unopened products as opening the product disturbs its internal atmosphere and may introduce pathogens or bacteria (Abraham, 2016). Date labelling associated with retailers and stock management should indicate this on the label to avoid further confusion (Broad Leib et al., 2013). Adding "for retail stock management" to "sell by" and "display until" dates on packaging would help direct the consumer to look for the correct quality or safety date to make a properly informed buying decision.

Changing the date labelling standards may sound relatively simple, however, enacting change requires cooperation and agreement among a variety of stakeholders. The Canadian government sets the current standards for date labelling on food products and presently only food products with a shelf-life of 90 days or less must display a "best before" date (Canadian Food Inspection Agency, 2015). This leads to confusion among consumers who incorrectly link the "best before" date with the food's expiry or safety. Introducing legislation addressing this confusion is the ultimate goal; however, this solution will involve the largest number of stakeholders and enacting change at this level will be the most difficult and time-consuming. Changing the wording of "best before" labelling to reflect that the stated date indicates the quality and not the safety of the food will be the most important change. For example, the wording on labels could be rewritten to "For best quality, consume before" as this phrasing would link the food's quality to the date and should remove the ambiguity surrounding the safety of the food after that date. Updating food date labelling will require the Canadian government, food manufacturers, retailers, and consumer groups to work together to draft new regulations that best clarify the link between "best before" dates and food quality to reduce consumer level food waste.

The Local Solution

The difficulty in changing regulations guiding date labelling makes addressing the problem of food waste from a top-down approach impractical for combating food waste now. Wasting nearly one third of food purchased in Canada requires more immediate action. To combat household food waste, I propose a public art display and education campaign aiming to clear confusion surrounding date labelling. This two-fold solution will bring greater awareness to the issue by highlighting the physical amount of food wasted within Metro Vancouver, and simultaneously, work to clarify the meaning of the term "best before."

Love Food Hate Waste, a campaign dedicated to reducing household food waste in Metro Vancouver, states that the food wasted daily within Metro Vancouver is equal to more than 55,000 apples, 30,000

eggs, and 70,000 cups of milk (Metro Vancouver, 2017). The proposed public art display would be three-dimensional and would ideally be constructed of the pieces of wasted food (i.e., sculptures created using replicas of the 55,000 apples, 30,000 eggs, and 70,000 cups of milk). A project like this would fall under the purview of the Public Art Program Manager, the Public Art Committee, and related civic departments (City of Vancouver, 2016). Highlighting Metro Vancouver's food waste problem would meet most of the criteria for creating new public art works as set out by the City of Vancouver (2016). A Public Art Plan outlining the budget, artist participation, and various other processes would need to be created and then submitted to the Public Art Committee (PAC). After review by the PAC, the project would then be recommended to City Council for budget approval (City of Vancouver, 2016).

To coincide with the public art display, a public education campaign to clarify the lack of connection between "best before" dates and food safety would be run using posters in public places such as transit stations, on billboards, and via digital media (on websites and social media such as Facebook, Twitter, or Instagram). With retail stores' participation, educational posters would be placed beside or near food products to raise awareness at the point of purchase. I propose calling this campaign "Best before isn't an expiry date!" By demonstrating to consumers that expiry dates and "best before" dates measure different standards, consumers would be able to make educated decisions regarding the edibility or safety of their food. Educating consumers about the meaning of "best before" dates is closely related to the work already being done by Love Food Hate Waste. Currently, Love Food Hate Waste promotes preventing household food waste by providing information on proper food storage, meal planning, and recipes to use all food purchased (Metro Vancouver, 2017). By partnering with Love Food Hate Waste, the proposed public education campaign would benefit from the established presence and resources of Love Food Hate Waste. Financing this education campaign would likely rely on community partners like Love Food Hate Waste, local grocery stores, and the municipalities that make up Metro Vancouver.

The public art display and education campaign would be useful to inhabitants of Metro Vancouver because it would ultimately allow them to save money on food purchases. It is easy to ignore how much food one wastes as the waste is generally spaced throughout the week and organic waste is usually not kept in large quantities in plain sight. Confronting individuals with the total amount of food wasted will work to make them more aware of their own waste. The art display will work to begin conversations about food waste in the home and how to reduce it. Educating consumers about "best before" dates is another way in which consumers can become more informed about their purchases.

Conclusion

The problem of food waste is varied in its causes, impacts, and potential solutions. There is no single solution that will solve food waste globally due to the

complexity of the issue. To reduce food waste in Metro Vancouver, I have proposed a public education campaign to clarify the differences between "best before" and expiry dates. Due to Metro Vancouver's large number of existing public art works, I propose an art display to tangibly show residents the impact of their food waste. Due to the number of stakeholders involved in changing date labelling regulations or legislation, more effective change in food waste habits can be achieved by starting at the consumer level. To ensure the sustainability of food systems serving Metro Vancouver, it is more prudent to educate consumers and begin to change habits relating to food waste ahead of potential changes in regulations or legislation. By making consumers aware of the issues surrounding ambiguous date labelling, they will be better able to prevent food waste at the household level.

References

Abraham, L. (2016, March 14). Best-before dates guide food quality, not safety, experts say. *The Canadian Press.* Retrieved from http://www.ctvnews.ca/

Broad Leib, E., Ferro, J., Nielsen, A., Nosek, G., & Qu, J. (2013). *The Dating Game: How Confusing Food Date Labels Lead to Food Waste in America.* Retrieved from https://www.nrdc.org/sites/default/files/dating-game-report.pdf

Canada Food Inspection Agency. (2014). Date Labelling on Pre-packaged Foods [Fact Sheet]. Retrieved from http://www.inspection.gc.ca/

City of Vancouver. (2016). *Civic Commission Procedure for Public Art.* Retrieved from http://vancouver.ca/files/cov/culture-public-art-civic-commission-procedure-2016.pdf

Dou, Z., Ferguson. J., Galligan, D., Kelly, A., Finn, S., & Giegengack, R. (2016). Assessing U.S. food wastage and opportunities for reduction. *Global Food Security, 8*, 19-26. http://dx.doi.org/10.1016/j.gfs.2016.02.001

FAO. (2011). *Global food losses and food waste - Extent, causes and prevention.* Retrieved from http://www.fao.org

Kummu, M., de Moel, H., Porkka, M., Siebert, S., Varis, O., & Ward, P. (2012). Lost food, wasted resources: Global food supply chain losses and their impacts on freshwater, cropland, and fertiliser use. *Science of the Total Environment, 438*, 477-489. http://dx.doi.org/10.1016/j.scitotenv.2012.08.092

Mancini, M., & Vellani, N. (2016, October 26). A $31B problem: How Canada sucks at reducing food waste. *CBC News.* Retrieved from http://www.cbc.ca/

Metro Vancouver. (2017). *Why it matters.* Love Food Hate Waste. Retrieved from http://www.lovefoodhatewaste.ca/why-it-matters/Pages/default.aspx

Mena, C., Terry, L., Williams, A., & Ellram, L. (2014). Causes of waste across multi-tier supply networks: Cases in the UK food sector. *International Journal of Production Economics, 152*, 144-158. http://dx.doi.org/10.1016/j.ijpe.2014.03.012

Nahman, A., & de Lange, W. (2013). Costs of food waste along the value chain: Evidence from South Africa. *Waste Management, 33*, 2493-2500. http://dx.doi.org/10.1016/j.wasman.2013.07.012

Newsome, R., Balestrini, C., Baum, M., Corby, J., Fisher, W., Goodburn, K., … Yiannas, F. (2014). Applications and Perceptions of Date Labeling of Food. *Comprehensive Reviews in Food Science and Food Safety, 13*, 745-769. doi: 10.1111/1541-4337.12086

Priefer, C., Jörissen, J., & Bräutigam, K-R. (2016). Food waste prevention in Europe – A cause-driven approach to identify the most relevant leverage points for action. *Resources, Conservation and Recycling, 109,* 155-165. http://dx.doi.org/10.1016/j.resconrec.2016.03.004

Richter, B., & Bokelmann, W. (2016). Approaches of the German food industry for addressing the issue of food losses. *Waste Management, 48,* 423-429. http://dx.doi.org/10.1016/j.wasman.2015.11.039

Sagan, A. (2015, March 25). Best before dates and expiry dates: 5 things you may not know. *CBC News.* Retrieved from http://www.cbc.ca/

Scholz, K., Eriksson, M., & Strid, I. (2015). Carbon footprint of supermarket food waste. *Resources, Conservation and Recycling, 94,* 56-65. http://dx.doi.org/10.1016/j.resconrec.2014.11.016

Secondi, L., Principato, L., & Laureti, T. (2015). Household food waste behaviour in EU-27 countries: A multilevel analysis. *Food Policy, 56,* 25-40. http://dx.doi.org/10.1016/j.foodpol.2015.07.007

Statistic Canada. (2009). *Human activity and the environment: Annual statistics* (Catalogue no. 16-201-X). Retrieved from http://www.statcan.gc.ca/pub/16-201x/16-201-x2009000-eng.pdf

WRAP. (2017). *Use by or not use by? That is the question!* Love Food Hate Waste. Retrieved from https://www.lovefoodhatewaste.com/article/use-or-not-use-question

Hazardous Hedge: Context and Impacts of Vancouver's Real Estate Growth Machine

By: Louisa Hsu

By 1980s, the Keynesian Welfare State gradually lost popularity in Canada and policies began to shift to follow the ideas of neoliberalism. This shift can be observed through changes made to the immigration policy and the choice to sell the Expo 86 site as a whole in an attempt to draw in international tycoons. As the price of housing increased through time, more and more people are unable to afford living in Vancouver. This may lead to a labour crisis and set limits for economic growth. However, people involved in the real-estate business can profit by helping clients search for properties in suburbs and through a practice called shadow flipping. Not only that, an international money laundering network allows wealthy Asian gamblers to invest in Vancouver's housing market; AdvantageBC established 30 years ago also facilitates foreign investment. The NDP-Green Party coalition attempts to cool down the hot housing market in Vancouver through affordable rental and modular housing units, however, the actions taken are not targeting the problem at the root. Policies addressing foreign capital and speculation are needed. By studying the context, impacts, and actions taken, our focus is guided towards the role the government plays in facilitating the market.

Introduction

It is easy to look upon the current housing affordability problem in Vancouver and scapegoat wealthy foreigners, particularly those originating from Mainland China; however, a closer look at the political and economic context leading to the current housing market suggests that this explanation is too overly simplistic to be taken unreservedly. Understanding the political shift starting in 1980s from the Keynesian welfare state (KWS) to neoliberalism is important in deciphering current developments in the Vancouver housing market. Also, the various impacts of increased capital flow need to be addressed to realize the scope of the issue at hand. It is with these considerations that the suitability of actions taken can be evaluated. The housing affordability problem in Vancouver is mainly due to Canada's and China's political and economic context along with a booming Pacific Rim all culminating in Vancouver having the world's third highest house-price to income ratio in the world.

Political and Economic Context

By 2006, the government was "pouring money into Vancouver transportation infrastructure to extend its open door gateway strategy to the trade of the Pacific Rim" (Ley, 2010, p. 32). How did this open door strategy result from previous racist sentiments towards the Orientals? The development revolved around the relative economic prosperity of the Pacific

Rim compared to Canada in 1980s. KWS prospered between 1940s and 1970s due to experience with the Great Depression and interwar economic crisis as a way for "capitalist nations to actively intervene and influence the levels of investment and domestic income in an effort to regulate" (Moszynski, 2003, p. 14). In addition, unionization during war increased workers demand for "a more equitable society liberated from Depression-era miseries" (Katz, 2003, p. 29). This goal was echoed by capital, which understood the importance of domestic stability in ensuring post-war profits (Katz, 2003). The ultimate task was to achieve full employment that would extend the tax base to fund welfare programs and sustain demand for manufactured goods (Katz, 2003). Essentially, a large social policy component was involved in the KWS that would help prevent under-consumption even during times of economic downturn. Principles like equity and efficiency were promoted in Canada's interpretation of a KWS and resulted in universal social programs, such as a social security system, health care, and education (Moszynski, 2003). However, the KWS was blamed for the increasing unemployment rate. Some also thought the welfare state limited private profit and accumulation, by "introducing barriers to the free market mechanism" (Moszynski, 2003, p. 19). The Economic Council of Canada stated that "After 1974, government revenues began to significantly decrease, and so public debt consequently increased as a proportion of the country's gross national expenditure" (as cited in Moszynski, 2003, p. 19). There were also many other international factors that contributed to the rising negative sentiments towards the welfare state. As nation states became more interdependent on one another, multi-national corporations took flight with their capital by investing manufacturing facilities in developing countries where cheaper labour could be found. This led to an 8% drop from 34.8% to 26.7% in employment of the labour force employed in good and producing industries from 1951 to 1984 (Moszynski, 2003). The flight of multi-national corporations was further intensified due to China's economic reform starting in 1978 under Deng Xiaoping's governance. China opened up to foreign trade and investment, ending its isolation to the rest of the world. Many incentives were provided to encourage foreign investment including tax holidays, early remittances of profits, and better infrastructure facilities (Harvey, 2005). Furthermore, the rise in unemployment was exacerbated with technological advances which led to the ability to produce the same output with 8% fewer jobs (as cited in Moszynski, 2003). Criticisms continued to build and governments were gradually pressured to reduce the rigidity of policies, which appeared to be in conflict with the guiding principles of the KWS (Moszynski, 2003). Corporate Canada decided an "overhaul of domestic arrangements" was necessary to prevent the profit slide observed in the early 70s as a result of increasing international competition (Katz, 2003, p. 31). To make Canadian goods competitive would involve wage reductions, fewer and means-tested social benefits, and chastening of trade unions (Katz, 2003). Changing domestic and international developments pushed the

Canadian government, along with other western nations, to adjust policies.

The turn of events in Canada closely resembled Harvey Molotch's idea of a growth machine; and in the case of Vancouver, what became known as, a real estate growth machine.

> *"A city and, more generally, any locality, is conceived as the areal expression of the interests of some land-based elite. Such an elite is seen to profit through the increasing intensification of the land use of the area in which its members hold a common interest. An elite competes with other land-based elites in an effort to have growth-inducing resources invested within its own area as opposed to that of another. Governmental authority, at the local and nonlocal levels, is utilized to assist in achieving this growth at the expense of competing localities. Conditions of community life are largely a consequence of the social, economic, and political forces embodied in this growth machine."* (Molotch, 1976, p. 309)

To understand the emergence of Vancouver's real estate growth machine, a closer look at British Columbia is necessary. In the 80s, the stark contrast between a prospering Pacific against BC's high unemployment, north of 10% for the majority of the decade, pointed towards the Pacific's great economic potential (Barnes, Edgington, Denike, & McGee, 1992). Canadian raw materials were shipped through BC ports and Chinese goods were imported. In addition to the prospering Pacific Rim, tourism was another beacon of light for Vancouver (Ley, 2010). Hosting Expo 86 placed the city on the world map and was an important step for Vancouver to be recognized as a global city. Subsequent decision to sell the Expo site as a whole drew in global development firms and was eventually won by Concord Pacific, the largest shareholder being Hong Kong's tycoon Li Ka-shing (Ley, 2010). "Where the big fish swims, the smaller fish follow" (SFU Continuing Studies, 2016). With Li Ka-shing's winning bid, a flood of capital flow from Asian investors, mainly from Hong Kong, followed and forged the beginnings of Vancouver's real estate growth machine (Mitham, 2016; Wyly, 2016). Furthermore, to expedite from the Asian workforce and expertise, an investor stream was added to the 1978 Business Immigration Program in 1986. This tied in with a sensitive time in Hong Kong where uncertainty was rising with the Sino-British joint declaration in 1984 that set out the end of colonial rule in 1997 (Ley, 2010). Immigrants often cluster in metropolitan areas and secondary immigrations led to the accumulation of many wealthy immigrants in Vancouver. Vancouver's timing in opening its gates was closely in-step with trans-Pacific events and set the city up for a flood of capital flow (Ley, 2010).

Many different factors and developments played into Vancouver's current status as a hedge city, each intricately linked and led into the other. With the rise of capital flows and investment in the real estate market in Vancouver, a variety of social impacts are surfacing that affects Vancouverites. The multiple impacts of the heated housing market need to be discussed in order to assess the effectiveness of political actions taken in addressing the growing social concern.

Social and Economic Impacts

"By 2025, 85 of 88 in-demand jobs will be unable to afford to live in Metro Vancouver. Only those individuals working as senior business managers, senior construction managers and engineering managers will be able to maintain affordable housing." (Vancity, 2015, p. 1)

To study the housing affordability issue in Vancouver, Roslyn Kunin and Associates, a group of analysts and consultants based in Vancouver, performed a series of analyses using publicly accessible data, labour market information websites, and secondary information in order to project the potential job openings and wage growth in Metro Vancouver for a Vancity report (Vancity, 2015). Their study found an unsustainable development unravelling in Vancouver. Between 2001 and 2014, housing in Metro Vancouver increased by 63%, whereas salaries increased by only 36.2% during the same period (Vancity, 2015). Through time, the minimum income to maintain an average mortgage for a property located in Metro Vancouver would increase. As salaries are not keeping in pace with housing costs, more and more people may be priced-out of the city if they do not change their lifestyles or housing arrangements. It was said that "Vancouver suffered a net loss of 1,571 residents in the 20-30 age group in 2013" (Vancity, 2015, p. 2). *Work B.C. British Columbia 2022 Labour Market Outlook* estimates labour requirements in the Mainland/Southwest region of BC would need 640,000 new workers by 2022 (as cited in Vancity, 2015). This is particularly concerning as "[i]n ten years, most individuals may forgo a career opportunity in the region and relocate to a different labour market" (Vancity, 2015, p. 1). If a lot of out-migration occurs, Vancouver may be at risk of a labour crisis. Some employers may be capable of paying higher wages to keep skilled labourers; however, the impact of higher operation costs would reflect in the cost of products produced, which would further increase the cost of living (Vancity, 2015). If employers are unable to retain labourers at an efficient cost, this negatively affects the growth and competitiveness of the economy (Vancity, 2015). With no adjustments to the established system, unsustainable growth in housing cost relative to salary rise would lead to undesirable social and economic consequences.

"An urbanizing of the suburbs in under way…The millennial cohort is finding, and creating, urban pockets that fit a lifestyle demanding transit, affordability and walkability" (Gold, 2017, para. 9). The percent increase of millennials in areas that fulfill the above-mentioned criteria has shot up. According to a study done by Andy Yan based on Census data from 1996 to 2016, there has been a 31% drop in millennials in West Vancouver, North Vancouver, and White Rock; a decline, to a lesser degree, is also observed in Delta and Port Coquitlam (Gold, 2017). However, areas like New Westminster, Langley, and Port Moody have observed a growth in the number of millennials (Gold, 2017). These demographic changes place pressure for governments with an influx of millennials to develop creative residential or mix-used spaces to accommodate the increase in population that would also be able to

concurrently maintain a sense of community, often thought to be lacking in areas of dense high-rises. A sense of community may be something that is gradually lost in Vancouver as more speculators invest in Vancouver and leave the properties uninhabited. A local resident, Kerry Starchuk, says that there are at least 10 houses empty on her street and thinks that "[m]oney has taken precedence over our neighborhoods" (SBS Dateline, 2016). Returning to the Lower Mainland after living in Los Angeles for five years, Ali and Neil Grayston were shocked to find themselves priced-out of the market (Gold, 2017). They started with a tight Gastown microsuite at a hefty price tag of $2300 a month, considered moving out to Brentwood in Burnaby, but then finally settled in a spacious apartment for $1100 a month in New Westminster (Gold, 2017). The Graystons wanted to spend less than 30% of their income towards housing and so they progressively moved further and further away from Vancouver. In their new home in New Westminster there is a farmers market and outdoor movie nights as added bonuses, important activities for Ms. Grayston's emphasis on having a sense of community involvement (Gold, 2017). Furthermore, transportation to Downtown Vancouver is only a 30-minute SkyTrain ride. The Graystons offer a model example of outward moving millennials seeking for transit, affordability, and walkability.

Not only do individuals and families struggle, businesses are also having difficulties maintaining a store front in Vancouver. In one episode of Dateline, an Australian program, a documentary was made regarding China's millionaire migrants in Vancouver (SBS Dateline, 2016). A section of the program focused on the current condition of Vancouver's Chinatown. Surprisingly, Vancouver's Chinatown has "shrunk to a couple of blocks, with few signs of life" (SBS Dateline, 2016). Danny Quon, a second-generation Canadian of Cantonese descent, said that a lot of businesses have left Chinatown. He speaks of his long-standing ties with Hon Hsing Athletic Club and fears that the rising property taxes associated with sky-rocketing housing prices may be a deal-breaker for the athletic club in the future. However, there are real estate companies taking advantage of this out-migration trend. Suburban Jungle Realty Group, founded by Alison Bernstein in 2016, is assisting clients across the US to move from urban to suburban. They initially helped families and are now also assisting businesses with relocation (Gold, 2017). Suburban Jungle Realty Group brings attention to the impact changing conditions can have on the prosperity and success of different businesses and sectors.

The real estate business is evidently a sector where profits can be made. This is often made possible with loopholes in policies and the inadequacy of implementing and reinforcing the law. Real estate agents take advantage of the hot market to generate more commission through a process called shadow flipping. Even though shadow flipping does not have a huge impact on the rising cost of properties, it is done at the expense of the original seller. New Coast Realty is allegedly involved in shadow flipping (CBC News, 2016). Agents of New

Coast Realty pressure sellers to list at a low price to clients of other New Coast agents (CBC News, 2016). However, the owner does not know these clients are not the final buyer, but rather middle buyers. The final buyer is willing to pay a higher price, one that is probably a reasonable market value, compared to what the sellers agreed to sell for. Before the deal closes, the agent makes more profit from commission by selling to a few middle buyers by using the assignment clause (Omand, 2016). Not only does intermediate buyers not pay land transfer taxes, but they also pocket the difference of resale (Omand, 2016). The downside of this system is that the original seller does not benefit from what the property is actually worth and is probably not aware at all. The original purpose of the assignment clause was for buyers, who have already placed an offer, to withdraw due to circumstances and for sellers to still be able to sell the property (Omand, 2016). It is now being used to generate profit in an unfair manner to the original seller. One particular case involved Jordan Guo of New Coast Realty. In April 2015, his offer on a $7.5 million property was conditionally accepted, but, without the knowledge of the original seller, he placed the property on the market for $7.9 million in an attempt to profit from the transaction (Larsen, 2017). The practices of some real estate agents have a negative repercussion on the image and trust people have for the profession. In response to shadow flipping, the Liberal provincial government, in power at the time, took action and stated that the practice of using the assignment clause to generate profit can still be maintained, however, the seller must be notified and be the only party that benefits from it (Judd, 2016). How the government planned to monitor and reinforce this remains unclear.

Not only are local real estate agents taking advantage of the hot real estate market in Vancouver but so is a global system of money laundering linking drug traffickers, underground banks, and wealthy Asian gamblers. Sam Cooper describes this system in his article "Exclusive: How B. C. casinos are used to launder millions in drug cash" (Figure 1) (Cooper, 2017a; Vancouver Sun, 2017). From this system, the drug traffickers are able to transfer money to associates in Mainland China through an underground bank. The underground bank earns a transaction fee which can be loaned to gamblers recruited from Macau to gamble in BC casinos. These gamblers can have legal money to spend in Canada after cashing out from casinos, which are often used to invest in housing developments or to purchase properties in Vancouver. The gamblers pay back the loan by depositing money at a Chinese underground bank. This practice allows wealthy Mainland Chinese to move their assets outside of China and potentially into tax havens without officials' detection (Cooper, 2017b). It is difficult for FINTRAC (Financial Transactions and Reports Analysis Centre) to determine the owners of the properties bought by these wealthy investors because there are often layers and layers of nominees. Foreign capital flow has also been promoted through a little-known program established by the BC government 30 years ago. The purpose of this program, known as AdvantageBC, is to build Vancouver's reputation and to increase jobs. Tax rebate is provided to attract foreign

companies and banks (Lee-Young & Cooper, 2017). The businesses that facilitate foreign investment on real estate receives refunds. Despite the stated purposes, the program is really a club to facilitate deals which can essentially heighten the unaffordability crisis (Lee-Young & Cooper, 2017). To mention AdvantageBC alongside a money laundering network is not to suggest that there are characteristics of the program that parallels illegal activities, but rather to simply point towards the various conduits and actors intensifying the housing affordability crisis. It appears that money

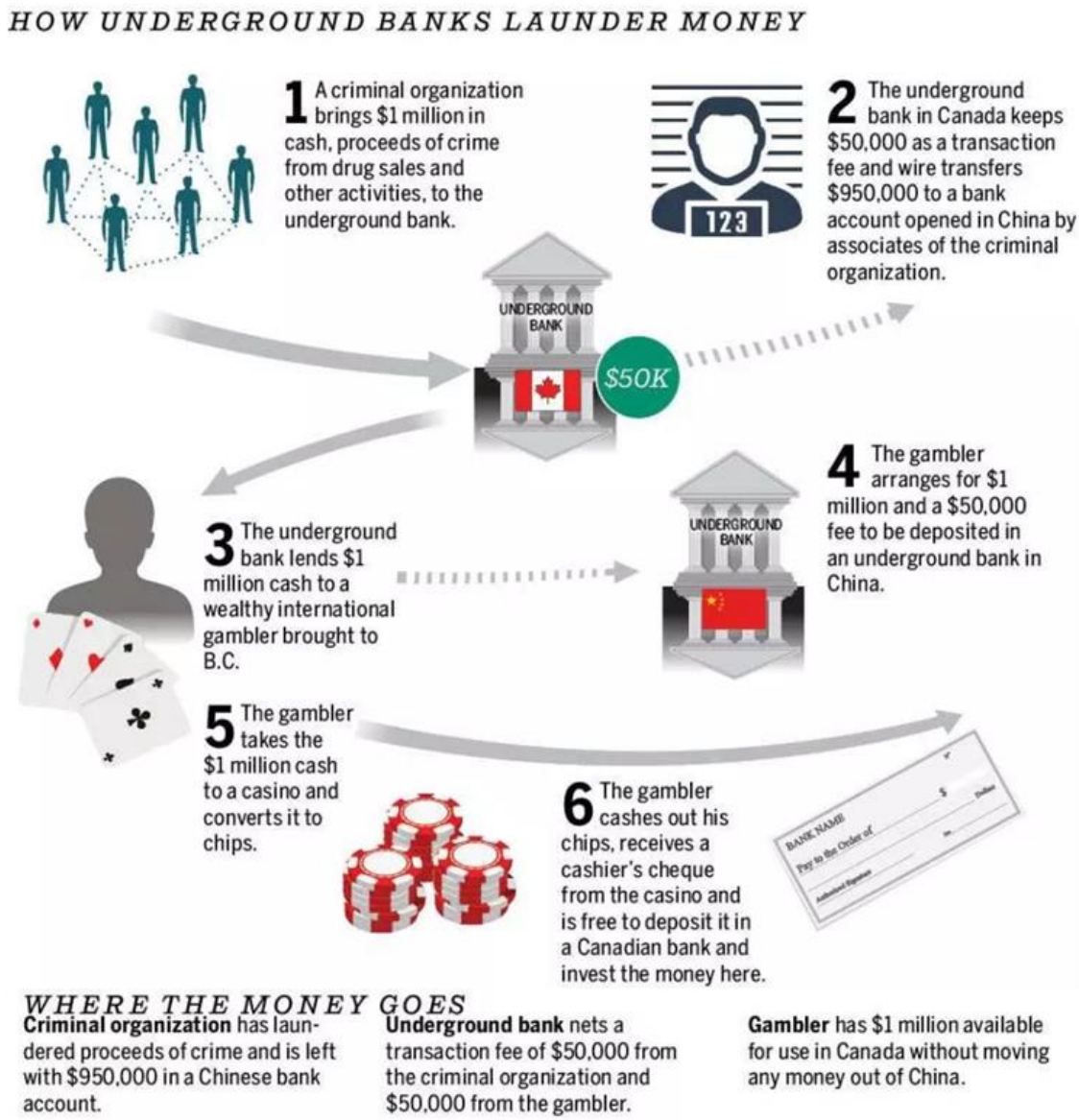


Figure 1: A money laundering system linking drug traffickers in BC with wealthy Asian gamblers (Vancouver Sun, 2017).

has taken precedence on a larger scale than Kerry Starchuk described and is demonstrated in Vancouver's real estate growth machine that many people want a piece of.

Actions Taken

David Eby of NDP criticized the Liberal government's inaction towards the housing market while in opposition, but now with NDP in a coalition with the Green party, the NDPs do not seem to be hitting the ground running either. This is the sentiment of many British Columbians after seeing certain promises regarding housing affordability omitted from the September budget, namely proposed taxes and renters' rebate (Connolly, 2017). The NDP's platform regarding housing affordability involved a 2% speculation tax for home owners who pay little or no taxes in BC, $400 renters' rebate, and affordable housing to list a few. The Green Party sought to increase the foreign owner tax from 15% to 30% for BC as a whole, eliminate money laundering and international speculation, and provide government-subsidized affordable housing (Hipolito, 2017). In an interview with Jon McComb, the Finance Minister Carole James continuously repeated that, up-to-date, the government has already invested $208 million to build 1700 affordable rental housing units and $291 million to build 2000 modular housing units for homeless people (Little, 2017). Certainly, these are actions in the right direction, however, to address the housing affordability problem from its roots would require the government to take action to crack down on speculation and money laundering, as promised. Introducing policies directed at the root of the problem will hopefully be the solution to keep the young workforce, close loopholes in the law, and eliminate illegal activities. In addition, Andrew Weaver of the Green Party has chastised the NDPs inaction in regards to the bare trust loop hole which allows people to avoid paying the property purchase tax (Smith, 2017). After a few months with the NDP-Green Party coalition, it is still uncertain how the two parties will collaborate to tackle housing affordability.

Conclusion

Many different conditions in Canada and the Asia Pacific gave rise to wealthy foreigners parking their wealth in Vancouver's housing market. With rising discontent over the KWS in Canada, the government took upon a more open-door policy. For Vancouver, hosting Expo 86 was an important turning point in forming a real-estate growth machine. Expo 86 put the city on the map and along with AdvantageBC, drew attention from investors unto itself. As this coincided with a time of rapid growth in the Pacific Rim and concerns over political stability, there has been a rapidly increasing flood of capital flowing into safe havens like Canada. As prices continue to rise, we observe an exodus of millennials who are no longer able to afford living in Vancouver. Not only this, but the real estate market also becomes a way to make profit and launder money by taking advantage of loopholes in the law. The new NDP-Green Party coalition sets out to do many tasks to cool down the housing market, however, the actions taken so far are criticized for not tackling the problem at the core. The common interpretation of Vancouver's sky-rocketing housing market

is to blame wealthy Chinese investors. Certainly, it is undeniable that Mainland Chinese represent a large portion of the foreign buyers in Vancouver, however, the series of events that led to the establishment of Vancouver's real estate growth machine demonstrate the indispensable impact of government policies. The question people should ask about the housing crisis is not who caused it, but what drove it.

References

Barnes, T., Edgington, D., Denike, K., & McGee, T. (1992). Vancouver, the province and the Pacific Rim. In G. Wynn & T. Oke (Eds.), *Vancouver and its region* (pp. 171-199). Vancouver: University of British Columbia Press.

CBC News. (2016). *New Coast Realty rebuts allegations as owner steps aside for investigation.* Retrieved from http://www.cbc.ca/news/canada/british-columbia/new-coast-realty-1.3544773

Connolly, J. (2017). *BC budget update: NDP sidelines two key housing pledges.* Retrieved from http://www.vancourier.com/news/bc-budget-update-ndp-sidelines-two-key-housing-pledges-1.22654696

Cooper, S. (2017a). *Exclusive: How B.C. casinos are used to launder millions in drug cash.* Retrieved from http://vancouversun.com/news/national/exclusive-how-b-c-casinos-are-used-to-launder-millions-in-drug-cash

Cooper, S. (2017b). *'Whale' gamblers identified by BCLC also placed big bets on B.C. real estate.* Retrieved from http://vancouversun.com/news/local-news/whale-gamblers-ided-by-bclc-also-placed-big-bets-on-b-c-real-estate

Gold, K. (2017). *Priced out of downtown Vancouver, millennials are building 'hipsturbia'.* Retrieved from https://www.theglobeandmail.com/real-estate/vancouver/priced-out-of-downtown-vancouver-millennials-are-building-hipsturbia/article35884038/

Harvey, D. (2005). *A brief history of neoliberalism.* Retrieved from http://www.proquest.com/

Hipolito, C. (2017). *NDP-Greens seek ways to cool British Columbia's housing market.* Retrieved from https://www.theglobeandmail.com/news/british-columbia/ndp-greens-seek-ways-to-cool-british-columbias-housing-market/article35185394/

Judd, A. (2016). *BC government ends practice of shadow flipping in Vancouver real estate.* Retrieved from https://globalnews.ca/news/2586433/watch-bc-premier-set-to-make-announcement-on-housing-affordability/

Katz, D. (2003). Fade-out: The unmaking of the Canadian Keynesian welfare state. *The Social Policy Journal, 2*, 27-37. doi:10.1300/J185v02n02_03

Larsen, K. (2017). *New Coast Realty agent facing fines, suspension, after shadow flipping attempt.* Retrieved from http://www.cbc.ca/news/canada/british-columbia/new-coast-realtor-fined-vancouver-shadow-flipping-double-agency-1.4298483

Lee-Young, J., & Cooper, S. (2017). *B.C. Liberals under fire for little-known program that gives tax breaks to wealthy foreign companies.* Retrieved from http://vancouversun.com/news/ local-news/b-c-liberals-under-fire-for-mystery-program-that-gives-tax-breaks-to-wealthy-foreign-companies

Ley, D. (2010). *Millionaire migrants: Trans-Pacific life lines.* Retrieved from http://onlinelibrary.wiley.com/

Little, S. (2017). *Details still scarce on BC NDP's housing affordability plan.* Retrieved from https://globalnews.ca/news/3837837/details-still-scarce-on-bc-ndps-housing-affordability-plan/

Mitham, P. (2016). *Expo 86 effect: A Vancouver developing legacy.* Retrieved from https://www.biv.com/article/2016/4/expo-86-effect-vancouver-developing-legacy/

Molotch, H. (1976). The city as a growth machine: Toward a political economy of place. *American Journal of Sociology, 82*, 309-332. Retrieved from https://www.jstor.org/

Moszynski, J. L. (2003). *Neoliberalism and its impact on Canadian social policy, childcare, and women* (Master's thesis). Retrieved from http://www.proquest.com/

Omand, G. (2016). *What you need to know about 'shadow flipping' in Vancouver.* Retrieved from https://globalnews.ca/news/2510453/what-you-need-to-know-about-shadow-flipping-in-vancouver/

SBS Dateline. (2016, June 7). *China's Millionaire Migration* [Video file]. Retrieved from https://www.youtube.com/watch?v=IZs2i3Bpxx4

SFU Continuing Studies. (2016, October 12). *Mapping the Hedge City – Vancouver and Global Capital [Video file]. Retrieved from* https://www.youtube.com/watch?v=3tkwYZkl_Xg

Smith, C. (2017). *Andrew Weaver chastises NDP government for not closing housing-investment loophole.* Retrieved from https://www.straight.com/news/975446/andrew-weaver-chastises-ndp-government-not-closing-housing-investment-loophole

Vancity. (2015). *Help wanted: Salaries, affordability and the exodus of labour from Metro Vancouver.* Retrieved from https://www.vancity.com/SharedContent/documents/News/Help_Wanted_May_2015.pdf

Vancouver Sun. (2017). *How underground banks launder money*. [Online image]. Retrieved from http://vancouversun.com/news/national/exclusive-how-b-c-casinos-are-used-to-launder-millions-in-drug-cash

Wyly, E. (2016). *Mapping the hedge city: Vancouver and global capital.* Retrieved from University of British Columbia Geography 350: Introduction to Urban Geography.

No Freeways on the Horizon: The path to livability

By: Cheryl-lee Madden, Nick Penner, Amanda Lu & Bryon Hon

Ranked once again as one of the "Most livable cities in the World" by the Economist Intelligence Unit, Vancouver has been consistently praised for its high quality of life (The Economist, 2016). A key component to the city's livability has been its unique urban fabric, untainted by freeway infrastructure. This study will investigate how Vancouver has grown without any freeways, and how this may be related to the rise in 'livability' as a planning discourse in the city. Several social, economic, and political factors have played into this social change, many of which were coalesced in the late 1960s and early 1970s. Working within this time period, our research interpreted an interview and archival sources, public surveys, and regional planning strategies to understand what roles SPOTA (Strathcona Property Owners and Tenants Association), TEAM (The Electors' Action Movement), and the 'livability' concept had in preventing the construction of freeways within Vancouver. Through this research we found that SPOTA's ultimate contribution to the lack of freeways in Vancouver today is only influential given that its progress was carried on by TEAM and the promotion of livability in the following decade. TEAM played a largely underappreciated role in the stopping of freeways and from the beginning, the principles of livability held strong opinions against the use of automobiles. The results of this research will be key in exposing the history of 'livability' as a planning discourse, and why Vancouver will not accommodate for freeway construction. Through our research, we have identified a few instances of social amnesia among these topics in Vancouver, and our results are intended to alleviate some of this memory loss to maintain this social change.

Introduction

In 2016, Vancouver once again made the list of the "most livable cities in the world" (The Economist, 2016). The researchers compared 140 cities based on living conditions and challenges affecting way of life. This included weighted categories such as stability, healthcare, culture and environment, education and infrastructure.

On a clear sunny day, viewing the geography of the North Shore mountains towering above an iridescent English Bay, Vancouver's status as a livable city should not come as a surprise! The livability Vancouverites today enjoy, however, did just spring out of nowhere. Origins of livability grew from a combined grass-roots led fight by neighbourhood civil activists, informed city planners and residents. The shift in power structure over who owns Vancouver and who runs the city formed through publicity-involved-planning which was not always how the City of Vancouver's urbanization had formerly developed. Urbanization had materialized under a developer's focus within a directive devoid of any public consultation. Through protest and subsequent debates, change occurred

over a Chinatown and Downtown freeway proposal by those residing in Vancouver and city hall officials. In 1968, the Electors' Action Movement, acronym TEAM, formed from strong professional management and academic representation, wresting a civic election grip from the ruling Non-Partisan Association. Freeways became obsolete under TEAM's vision of urban renewal. Their founding concept is still found today in Vancouver's skyline because it is in (our) "DNA not to have freeways (Ley, 2017)". We hypothesize that the freeway debates were a catalyst for the 'livable city' concept in Vancouver. TEAMs 'livability' was key in keeping freeways out of Vancouver until the present day.

Statement of Problems

One of the central tenets of Vancouver's urban mythology is that the people defeated a major freeway proposal in the late 1960s (Berelowitz, 2006, p. 81). The people of Vancouver fought and won against the similar urban renewal plans that swept through many other major urban cities. In our report we aim to tackle the myth head by investigating the parties at play during and after the freeway debates. How did we end up with no freeways in Vancouver? Was it just the Strathcona Property Owners Tenants Association (SPOTA), or are other actors' ideologies involved in this change? How did the events of the freeway debate lead to pursuing the "livable city" ideologies of the 1970s? What were the outcomes in planning strategies? We will start addressing these questions by examining the Great Freeway Debates of 1967, investigating the birth of TEAM and its values, and analyzing the Livable Region Plan and other Vancouver plans. By studying these critical documents, we can establish the social, political and economic context of Vancouver during the late 1960s and 1970s that fostered this change.

Our study is important as we assess how social change was achieved. The Great Freeway Debate enables us to understand how we can maintain a "no freeway city" for the foreseeable future. Moreover, this discourse serves as a narration, as people "need litanies or recitations or monuments to these victories, so that they are landmarks in everyone's mind. (Solnit, 2016, p. 25)". Our report comes at a time when Vancouver City Council, Vision Vancouver has just voted that the Georgia Viaduct will be demolished (Daily Hive, 2018). A perusal of the 1960s documents should awaken social conscience to an understanding of livable transportation between the public and government, thereby alleviating public amnesia.

Literature Review

Strathcona Property Owners and Tenants Association (SPOTA)

The Strathcona Property Owners and Tenants Association (SPOTA) was formed in 1968 as a result of the proposed demolition of homes to create a route for the Georgia Viaduct and freeway. SPOTA provided a strong unified voice to maintain what was left of their community and to challenge Mayor Tom Campbell's planning office. This grassroots movement of residents challenged structures of authority to protect their homes, as well as reforming

the democratic structures that left them in marginality (Bruce, 2005, p. 14). SPOTA had the support of numerous students, professionals and consultants who allied with residents. Notable supporters included: Darlene Marzari, the City of Vancouver's Neighbourhood Service Coordinator; Mike Harcourt, a lawyer who would eventually become British Columbia's Premier; Margaret Mitchell, the head of the Neighbourhood Service Association; and the architectural firm Birmingham and Wood (Ley et al., 1994, p. 113). The unique blend of ethnic cultural forms and mainstream institutional practices and discourse was critical in leveraging power to influence political actors outside the community (Lee, 2007, p. 3). The result was the mobilization of racialized 'others' claiming a right to place in contradiction of the tide of willful determination bent on displacing those seen as undesirable.

The initial protests against the freeways were based on economic values. Local community members in Chinatown argued that businesses would be negatively affected by freeways, and it would result in the loss of one of Vancouver's most popular tourist attractions. They also argued that the revitalization of Chinatown would be much more difficult with the presence of freeways (Gutstein, 2000, p. 155). Many sources have highlighted that SPOTA played a key role in the lack of freeways in Vancouver today (Gutstein, 1975; Green et al., 2014, p. 24; Lee, 2007, p. 383). Because of the wide variety of sources on SPOTA, we tried to focus on the key events following the freeway debates, to see how the values represented by SPOTA were carried on in the following decades.

Late 1960s Government

We found a many copious amount of sources speaking to the political issues surrounding urban renewal and freeway projects in Vancouver in the late 1960s. The municipal government under Tom Campbell had a rather authoritative, pro-development stance on city planning. The planners advocated for two freeways through Chinatown and Gastown effectively cutting through the Downtown Eastside. Campbell ran afoul of citizens opposed to the proposal to complete a 30-year-old transportation plan that would have seen a highway bisected Chinatown. He understood the value of publicity at the cost of citizenry losing long-time homes to the wrecking ball. Under Campbell's transportation planning, Hogan's Alley was demolished for the Georgia Viaduct expansion resulting in the eviction of many of Vancouver's Black Canadian citizens. When questioned about the reason of displacing Chinese citizens by a six-lane freeway Campbell responds, "[the freeway] … only affects those living in that neighbourhood (Ley & Barnes, 2014).

These pro-development ambitions of the municipal government were dampened by the inactive provincial government. The 1980 Simon Fraser University MacKenzie Thesis stated (abstract) that one of the reasons why Vancouver does not have freeways was partially due to a lack of local political will. Large scale projects, such as the 1960s proposed 200 million redevelopment of

revitalizing Vancouver waterfront under 'Project 200' involving a waterfront freeway system, dissolved with the death of the freeway proposal on which the project was dependent upon, (Project 200 brochure). Disagreements within the partnerships planning the project led to this demise (Gutstein, 1975, p. 162). The province also prioritized building freeways in rural British Columbia rather than in Vancouver because that was where the dominant Social Credit Party voters lived (the dominant provincial party at the time) (Gutstein, 2000, p. 162). The political discourses of the municipal government were contrasted with those of the federal government. Paul Hellyer was the Minister of Transportation of Canada between 1967-1969, who led the Task Force on Housing and Urban Development. He arrived in Vancouver when SPOTA was presenting its petition to City Council. Strathcona residents appealed to Hellyer to save their neighbourhood from demolition. After a tour of over forty communities across Canada, the Task Force concluded that urban renewal schemes produced adverse and disruptive conditions for Canadian communities. Consequently, Hellyer froze the federal funding for all urban renewal projects on the docket for approval. The Minister was one of the first federal politicians withholding funding (Stone, 2014, p. 396) unless the residents would be involved in the new plans, stating that they "supported renewal, not demolition" (Gutstein, 1975, p. 161). Consequently, the municipal government had to give in, resulting in the first time that a citizen organization had equal power with the government (in this case SPOTA) (Gutstein, 1975, p. 163). Once the city set up the Strathcona Working Committee composed of representatives from all three levels of government and an equal number of representatives from SPOTA, a citizen organization holding an equal power with civic government was realized.

The Electors' Action Movement (TEAM)

Immediately following the freeway debates of 1967, a new municipal party named TEAM formed, with forming members Art Phillips, (who later became mayor) and UBC professor Walter Hardwick. TEAM (The Electors' Action Movement) revolutionized how planning was done in Vancouver. New urbanization focused on civic engagement collaborating with urban planners, and those organizers being held to account for their financial decisions. Civic engagement then began yielding greater planning control than that of the city manager, the latter acting more as a facilitator than as a director (Punter, 2003, p. 56). Alderman May Brown said "we wanted something not so authoritarian and we wanted more local participation. We wanted to hear more from citizens." (Vancouver Sun, 2012, n.p.). These polarizing views led to Tom Campbell's early forced retirement when in 1972, TEAM won a majority on city council. One of TEAM's main goals was to directly benefit the middle class by increasing quality of life on small scales (Langford, 2012, n.p.). Through the creation of the Urban Design Panel, TEAM was also able to improve relationships between architects and planners, thus creating higher quality urban designs of public space (Punter, 2003, p. 57). TEAM

became a key player in the absence of freeways throughout the 1970s as they advocated for "balanced transportation" plans focused on walking, cycling, and public transit (Pendakur, 1972, p. 81). The Livable Region Plan in 1975 (which inspired the Livable Region Strategic Plan of 1997) implemented these ideals into the Greater Vancouver Regional District (GVRD).

Other Reasons for Absence of Freeways

The literature provided us with a variety of potential reasons for Vancouver's lack of freeways today. Freeways were arguably built primarily in global cities to accommodate and influx of residents. Since Vancouver did not become a global city until after the 1970s when the popularity of freeways had died down, the city now is imbued with more public transit systems such as the Skytrain (Perl, Hern, & Kenworthy, 2015, p. 108). The transportation needs of the industrial businesses and the average citizen often differ, and since the industrial and modern ports in Vancouver are spatially segregated, designing a single freeway system that satisfies all has been difficult (Stone, 2014, p. 401). Prior to the freeway age, Vancouver had a large streetcar system, which was later replaced by North America's largest trolley bus system; this encouraged this pace of transport in the city rather than the rapid-speed freeway (Berelowitz, 2005, p. 80). Additionally, the impetus for building freeways in United States cities was through their situated military establishments, Vancouver did not develop in the same way (Berelowitz, 2005, p. 81). Finally, it has been said that the protests may not have hindered the government as much as the costs of building this infrastructure was (Leo in Perl, Hern, & Kenworthy, 2015, p. 101; Pendakur, 1972, p. 35; Macdonald, 1987, p. 162).

Methods

Our methodology included both archival and interview methods. Our research topic involves an era that the term livability was coined, approximately half a century ago during the late 1960s and early 1970s, therefore we chose archival sources to explore rather than interview grass-root organizers of the movement. This meant that interviews of people directly involved in these events were hard to come by. A discussion with the University of British Columbia's Department of Geography Professor David Ley, was critical in our research because he has been studying Vancouver urban geography since 1970. His insight proved to be vital yielding the institutional knowledge we lacked. Moreover, how social change occurred during that timeframe by altering Vancouver's urban renewal during the liability locus within political, economic, and socio-environmental development of the city, province and the country. Gaining a broader understanding of "Freeway revolts", we read how other North American cities compared to Vancouver's livability debate within their urban renewal programs.

Social amnesia is such a factor in Vancouver tear-down city building mentality that even the Museum of Vancouver, MOV, with a four-month exhibit in 2014 show-cased failed architectural and urban projects entitled, "Vancouver Imagined: The way we weren't". Had it not

been for the late Architect Bing Thom who digitized Harland Bartholomew & Associates plans for Vancouver, we would never know what would have happened to our city (Vancouver Archives Blog). During 1926 when Vancouver Town Planning hired civil engineer, Harland Bartholomew & Associates, he brought his view of linking our Pacific port to his U.S.A. based architecture. Vancouver Archives challenges us to think, "What if city hall was on Beach Avenue? What if Burrard Bridge looked like this?" By clicking on their links, you can find out what Bartholomew thought about your local school, who also imagined a major harbor at Spanish Banks in his plans, "The Appearance of the City". Vancouver Archives furthermore, posted a selection of maps and images from reports commissioned by Vancouver Town Planning circa 1926 thereby countering social amnesia.

Data was collected largely from official studies and strategic plans committed during the 1970s, which were high quality, primary sources that demonstrated the values and meaning behind livability and livable transportation planning. Our official studies included the Urban Futures Project Opinion Survey, 1971, and A Report on Livability, 1972 while the strategic plans included the Livable Region Plan, 1975; Goals for Vancouver, 1980, and Freedom to Move, 1989. Newspaper articles were also examined which highlighted the values of the mayor and the public.

Period media articles were examined, providing context describing public mood. These sources proved to be very valuable because of their professional nature clearly underlying the author's motives behind why certain decisions were made, such as 'Project 200'. Despite this, we were limited by the data in some ways. The handwritten notes found within TEAM's web fonds were extremely helpful in stating concise livability values, although often times these documents were provided with only a date and no situational context or author. Were these hand-written changes made at meetings only among city planners, or were these concerns voiced by the community?

Our single interview involved speaking to David Ley. We chose Dr. Ley because of his vast knowledge on Vancouver transportation and the evolution of livability in the city, providing us with a better understanding of the history of livability in Vancouver.

Results and Analysis

What was SPOTA's role on freeways?

By investigating the chain of events following the Great Freeway Debate of 1967, we discovered that SPOTA did not have as strong of a role in the prevention of freeways compared to the economic and political factors during this period. Several freeway proposals released after 1967 included the ND Lea plan (1968), and Alternative Routes for Brockton Point (1969). In 1970, there was great confusion between the mayor at the time, Tom Campbell, and the city council about whether the city council had committed to a freeway plan that may have led to a study for a rapid transit plan in Vancouver. As a result of insufficient funds, the ND Lea plan was

rejected. With this intention, it appeared as though they were actually preferring the older freeway proposals for the purpose of affordability (Pendakur, 1972, p. 83). Thus, by 1972, freeway plans were officially out of the picture of Vancouver; and instead, rapid transit, and improved bus systems were in discussion (Gutstein, 1975, p. 166).

What is livability?

By searching through the archives and other literature, it became apparent that livability was a term that was undefined from its first use in planning discourses. 'Livability' was a "catch word" (A Report on Livability, 1972, p. 4) which allowed the GVRD to base an entire plan based on the term without a definition "because the livability concept is readily understood but too subtle for simple definition" (Faubert, 1990, p. 64). There is no true universal definition for livability, but instead everyone has their own idea of what it means (Faubert, 1990, p. 64), by emphasizing different aspects of what it looks like to "live safely and peacefully" or to "retain healthy living conditions and the natural scenic beauty of the region" (Faubert, 1990, p. 65).

Despite this, we were able to find a couple discrete examples of what livability means. In *The Vancouver Sun*, January 3rd 1973 edition, Mayor Art Phillips promised a more livable city, defining it as pedestrian oriented places emphasizing the downtown area (Leiren, 1973, p. 1). The finest definition for livability was found in An Introduction to Livability, which states: "Livability is a sense of belonging to a small community. Going to the community facilities by car breaks down neighbourliness" (1971, p. 2). We found this to be the summarizing statement of what livability entails, as it highlights the importance of human-scale in a city. David Ley mentioned that livability is exemplified by the area of South False Creek between Granville Island and Cambie Street. It includes developments "with lots of open space, with medium density, not high-density buildings, and with social mixing" (Ley, 2017). The community also contained no automobiles (Ley, 1980, p. 254).

What values in livability have influenced transportation planning in Vancouver?

The survey results from the Urban Futures Project highlighted livability values in the Livable Region Plan of 1975. They stated that: "People want to reduce the time and effort involved in travelling… They also want to be able to reach parks, beaches and the mountains easily…People are willing to rely less on their cars, but they want fast, frequent and convenient public transit to take them to work, shopping and recreation areas" (GVRD, 1975, p. 7). These results show that the public defined livability as preserving and connecting with one's natural environment, while also giving up the car as their primary mode of transportation; acknowledging that it is a quick way to commute, but not environmentally friendly. The Livable Region Plan continues to express the public's concerns about noise and air pollution from transportation (GVRD, 1975, p. 24). Again, in the Freedom to Move report of 1989, it mentions that livability is being conscious of the environmental effects of transportation (Faubert, 1990, p. 60). This was also reflected in TEAM's transportation

Figure 1: April 5th, 2017 Protestors

policy which aimed to "preserve the scenic beauty of Vancouver" (TEAM, 1972).

A number of sources emphasized the importance of the human-scale of transportation in cities. Timmer and Seymoar iterate that, "Overall, a livable city is one in which the car is accommodated but other forms of transportation are encouraged. Streets can then adopt a different role within the community and the city can focus on designing for its residents rather than for its cars" (Timmer & Seymoar, 2005, p. 22). Thus, walking was prioritized to keep transportation "safer, healthier and [to] improve the quality of life for residents" (Timmer & Seymoar, 2005, p. 21). Ley also mentioned that the 'small is beautiful' movement and downzoning contributed to a reduction in density and therefore a more livable city (Ley, 2017).

Recently, the most striking display of social resistance to urban renewal involving freeways was witnessed before the last provincial election. Apparently, Vancouver's livability freeway resistance DNA springs eternal. Prior to the arrival of the Minister of Highways, Todd Stone and Port Metro Vancouver President Robin Silvester, these protestors took over the microphone announcing their version of the positive proposed development. In their place, protestors holding cut-out masks whilst standing-in-place of these key players, commandeered BC Liberal Premier Christy Clark's media podium. (Denis Dossman/CBC, 2017 photos).

Through our review of 1970s TEAM Dr. Walter Hardwick's livability survey, we found that the major issue was a fear of car pollution. Apparently, noise, car congestion and pollution remain a number one issue for

residents desiring a livable city. Vancouverites may not remember how the livable city social movement generated, yet they instinctively know how to emanate those values for their city, witnessed during the 5th April, 2017 protest.

freeway city" (Ley, 1980, p. 239). TEAM implemented public participation into Vancouver's planning discourse, and it has remained ever since. It started with Hardwick's Urban Futures Survey (1974) which influenced the values portrayed in the

Figure 2: An artist's rendering of the proposed bridge to replace the George Massey tunnel. (CBC, 2017)

How did TEAM contribute to this social change?

Several sources indicated that the freeway debates in one way or another, led to the creation of TEAM (Macdonald, 1987, p. 162; Ley, 1980, p. 250; Green et al., 2014, p. 24). It can be argued that the impetus for the creation of TEAM came from the lack of public participation in the planning of freeways in the late 1960s. Along with encouraging public participation, John Volrich (TEAM mayor in 1978) stated that one of TEAM's greatest achievements was, "terminating plans to make Vancouver a Livable Region Plan (1975). Even after the death of TEAM, livability, and public participation continued. Creating Our Futures (1990) was a revisitation of Hardwick's survey of 1974 and later in 1996, the Livable Region Strategic Plan was issued; essentially an update of the 1975 plan. The 1996 strategy has been cited by Metro Vancouver as a resource in constructing its Metro Vancouver 2040: Shaping Our Future plan (Metro Vancouver, 2016).

Significance of Research Results

Upon the completion of our results, we have discovered that the effects of social amnesia were documented previously within the history of freeway development. Although planning of freeways as a transportation solution were thought to have been deemed implausible by all actors, it was revisited again by the ND Lea engineering consulting firm in 2000, who proposed that freeways are "required to handle increased automobile traffic" (Pendakur, 1972, p. 44). This proves that social amnesia does exist on a certain level despite the large ordeal in the 1960's to the 1980's which deemed the local social disapproval for freeways.

Tying into this idea, the largest factor for the decommission of freeways was determined within our results and literature review to be the lack of federal economic funding and support. Despite the public backlash and social activism surrounding freeways emphasized by the formation of SPOTA, its influence on the overall withdrawal of freeways plans was minimal. In contrast to this, TEAM was much more significant with its participation within the municipal government as a governing party who ultimately instigated the arrival of the concept of livability. Unlike the previous government in power, the Non-Partisan Association, who used a closed-door policy planning method, TEAM was adamant on being receptive to public opinions and demands especially within the confines of what livability means to them. The concept of livability thus incorporated the values and priorities of locals at the time which were centralized on reducing pollution and increasing community public spaces. However, the literature detailing the role of TEAM in livability and prevention in freeways were much less compared to SPOTA signifying an existence of social amnesia.

The relative ineffectiveness of SPOTA's influence, compared to TEAM, suggests that there is rhetoric of structural power and agency within the relationship between the city and its people. Despite encompassing a large amount of activists and supporters, SPOTA remained comparatively unsuccessful in its persuasion for the dismantling of freeway plans. The structural power in our research is represented by the municipal government of Vancouver which socially "exert enormous power and constraint over lives" (Musolf, 2003, p.1). On the other hand, the emergence of TEAM targeted the municipal government and set its sights on changing structural power from within the office through its participation in municipal elections, eventually winning the mayoral seat. This ultimately proves, that "endowed with agency, the oppressed can oppose [these] structures" (Musolf, 2003, p. 3) which would previously ostracize the rights of local residents without their consent.

It's important to revisit the roots of the disapproval for freeways as they provide us context to why, to this date, it is still not a viable solution for alleviating transportation congestion or enhancing the urban fabric within Vancouver. Understanding the concept of livability established at the time provides insight towards the rationale behind the disintegration of freeway plans. Effectively,

Figure 3: Protesters posing as B.C. Transportation Minister Todd Stone, right, and Port Metro Vancouver President Robin Silvester, left, forced a planned 'celebration' of the new bridge construction indoors.

this could be summarized to the public's support at the time for environmentalism and preservation which the automobile mode of transportation does not enthuse. Like the livability objectives created at the time, this is directly relational to current public concerns over the environment, which discontinue any spur to reinstate freeway plans again as a solution for congestion. Moreover, observing the success of "Vancouverism" which arose due to the Livable Region Plans supplementing the absence of freeways, serves as a powerful indicator for why freeway plans should not be reintroduced again.

We see a positive outcome for Vancouver's livability concept built on a DNA without freeways. On April 5th, 2017, the BC Liberal government proposed a photo-op ground breaking celebration which would have seen 10-lanes of traffic leading to and from Oak Street. In this photo (below) protesters represent (on the right), the Minister of Transportation and Highways, Todd Stone (CBC, 2017). Protesters were in front of the camera instead of the B.C. Transportation Minister, Todd Stone. Fears of 1970s pollution and congestion remain as relevant today. Whilst Vancouver's collective memory may experience freeway protest social amnesia, however, once Vancouverites feel threatened by carbon-producing cars choking their streets they find a collective voice.

Future Research Direction

The Livable Region Plan of 1976/1986 values were informed by the 1973

Urban Futures Project Survey. Headed by UBC's Department of Geography Professor Walter G. Hardwick and Dr. John Collins, an environmental psychologist, they looked at the attitudes towards a range of economic, social, mobility and lifestyle issues. Vancouver households in the 1971 to 1974 "Vancouver Urban Futures Project" consisted of 2,000 telephone and door-to-door surveys followed in 1989 to 1990 by the "Choosing Our Future" project of 1,300 randomly sampled households who were given telephone questionnaires (Hardwick, fonds, UBC Library, Archives web, 2011). With this knowledge, one question arises, "Whose definition of livability are we using?". Future research should focus on the power relations between the represented and under-represented. In the original Urban Futures Survey (1973), Dr. Hardwick defined livability:

> *The term "livability" has roots deep in the past. Forty or 50 years ago citizens of Vancouver viewed the Shaughnessy area of the city as quality urban environment. It was characterized as an area of imposing homes, quiet tree-lined street and beautiful gardens. And the people who lived in the area were those who patronized and supported the cultural life of the city"* (UBC Report 1974, p. 2).

Historically, Shaughnessy is an exclusive residential area, wrapped in an elite identity of wellbeing and privilege (Ley, 2010, p.177). Further questions emerge on: whose livability standards are reflected in the cityscape? How others like the urban poor interact in these built environments?

In Liberal Ideology and the Post-industrial City, Ley describes the housing bubble enabled by TEAM as a result of not keeping housing costs in check:

> *Fundamentally TEAM was for an active view of man. Its promotion of socio-cultural values was revealed most successfully in public development, most notably in the creativity of the False Creek redevelopment. But in its interaction with private interests, particularly in the land market, the reform movement was perhaps too naive, not recognizing that its humane philosophy might be co-opted by the calculus of the marketplace and lead to an inequitable outcome where the vulnerabilities of the poor would be exposed,* (Ley, 1980, p. 258).

Today, Vancouver's housing unaffordability emphasizes that livability is available for those who can afford it. The most recent Urban Future Survey 2012, led by PlaceSpeak's Colleen Hardwick further stresses the disconnection between livability and affordability. The vast majority of participants had Registered Retirement Saving Plan and the median income is higher at $100,000 - 120,000 (Place Speak, 2013, p. 58) than average median income of $76,040 the Metro Vancouver area (Canada Census, 2011). It is critical to research unaffordability in Vancouver and find processes balancing livability with affordability.

References

An Introduction to Livability. (1971). PUB: PD 471. City of Vancouver Archives, Vancouver.

A Report on Livability. (1972). PUB: PD 472. City of Vancouver Archives, Vancouver.

Berelowitz, L. (2005). *Dream City: Vancouver and the Global Imagination*. Vancouver: D&M Publishers.

Bruce, M. (2005*). A New Breed of Group: Community activism in Vancouver's Strathcona neighbourhood*, 1968-1972. University of British Columbia.

CBC News. (2017, April 5). *Protestors crash groundbreaking for bridge to replace George Massey tunnel.* Retrieved from http://www.cbc.ca/news/canada/british-columbia/bridge-george-massey-tunnel-protest-1. 4057172.

Daily Hive, *City Council Approves Viaducts Demolition and Northeast False Creek Plan,* (February 13, 2018), Web, http://dailyhive.com/vancouver/vancouver-viaducts-demolition-northeast-false-creek-plan-approved

Faubert, R.P. (1990). *Coordination of transportation and land use planning: A case study of Greater Vancouver*. ProQuest Dissertations Publishing.

Former Vancouver Mayor Tom 'Terrific' Campbell Dies. (2012, April 02). The Vancouver Sun. Retrieved from http://www.vancouversun.com/news/Former Vancouver mayor Terrific Campbell dies/6098754/story.html.

Green, A, Ricker, B., McPhee, S., Ettya, A., & Christina Temenos. (2014). *British Columbia in a Global Context*. Vancouver: BC Geography Open Text Collective.

Gutstein, D. (1975). *Vancouver Ltd*. Toronto: James Lorimer & Co. Ltd.

GVRD. (1975). *The Livable Region 1976/1986 Proposals to Manage the Growth of Greater Vancouver*. Retrieved from http://www.metrovancouver.org/about/library/HarryLashLibraryPublications/Livable-Re gion-1976-1986-Proposals-to-Manage-the-Growth-of-Greater-Vancouver.pdf.

Harland Bartholomew & Associates, (1928), *A Plan for the City of Vancouver, British Columbia*, Vancouver Town Planning Commission, p. 10, web

https://www.flickr.com/photos/vancouver-archives/sets/72157626484421302/
https://archive.org/details/harlandbartholomew
https://archive.org/details/appearanceofcityoovanc
https://archive.org/details/vancplanincgenoovanc

Langford, W. (2012). *Is Sutton Brown God?: Planning Expertise and the Local State in Vancouver*, 1952-73. BC Studies, 173. Retrieved from http://search.proquest.com/docview/1021199750?pq-origsite=summon&accountid=14656.

Lee, J. (2007). *Gender, Ethnicity, and Hybrid Forms of Community-Based Urban Activism in Vancouver,* 1957–1978: *The Strathcona story revisited*. Gender, Place & Culture, 14 (4), 381-407. Retrieved January 22, 2017.

Leiren, H. (1973, January 3). *Phillips vows to create more livable Vancouver*. The Vancouver Sun, p. 1-2.

Ley, D. (1980). *Liberal Ideology and the Postindustrial City*. Annals of the Association of American Geographers, 70 (2), 238-258.

Ley, D. (2010). *Immigrant Reception: Contesting Globalization…* or Resistant Racism? In Millionaire Migrants (pp. 162-195). Wiley-Blackwell. doi: 10.1002/9781444319262.ch6

Ley, D. (3 March, 2017). Personal Communication.

Ley, D., Kay A., & Doug Konrad. (1994). *Chinatown-Strathcona: Gaining an entitlement,* In S. Hassan & D. Ley (Eds.), Neighbourhood Organizations and Welfare State. Toronto, ON: University of Toronto Press.

Ley, D. & Trevor Barnes. (2014). *Lecture on the Modern World Since 1985*. University of British Columbia, Vancouver, BC.

Macdonald, N. (1987). *Distant Neighbours: A Comparative History of Seattle and Vancouver*. Lincoln: University of Nebraska Press.

MacKenzie, Ken, (1980), Thesis, Simon Fraser University, *Freeway Planning and Protests in Vancouver 1954-1972*, web http://summit.sfu.ca/item/5883

Metro Vancouver. (2016). *Resources Metro Vancouver 2040: Shaping our Future*. Retrieved from http://www.metrovancouver.org/services/regional-planning/metro-vancouver-2040/resources/Pages/default.aspx.

Museum of Vancouver, MOV, (2014), Exhibit, Vancouver Imagined: The Way We Weren't, web http://www.museumofvancouver.ca/exhibitions/exhibit/vancouver-imagined-way-we-werent

Perl, A., Hern, M., & Jeffrey Kenworthy. (2015). *Streets Paved with Gold: Urban Expressway Building and Global City Formation in Montreal, Toronto and Vancouver*. Canadian Journal of Urban Research, 24, 91-116. Retrieved from http://ezproxy.library.ubc.ca/login?url=http://search.proquest.com.ezproxy.library.ubc.ca/ docview/1769723971?accountid=14656.

Pendakur, V. S. (1972). *Cities, Citizens and Freeways*. Vancouver: V. Setty Pendakur.

PlaceSpeak. (2013, March). *Greater Vancouver Urban Futures Opinion Survey 2012*. Retrieved from https://www.placespeak.com/uploads/assets/UFS_2012_Technical_Report.pdf.

Project 200, (1968) brochure, web, https://www.flickr.com/photos/jmv/sets/72157629624481763/

Punter, J.V. (2003). *The Vancouver Achievement: Urban Planning and Design*. Vancouver: UBC Press.

Solnit, R. (2016). *Hope in the Dark*. Chicago: Haymarket Books.

Stone, J. (2014). *Continuity and Change in Urban Transport Policy: Politics, Institutions and Actors in Melbourne and Vancouver Since 1970*. Planning Practice and Research 29, 388-404.

TEAM. (1972). [Policy: Transportation]. *TEAM Fonds* (AM666, vol. 11, file 11). City of Vancouver Archives, Vancouver.

The Economist, *The World's Most Liveable Cities*. The Economist Newspaper, 18 Aug. 2016. Web. 11 Apr. 2017.

Timmer, V. & Nola-Kate Seymoar. (2005). *The Livable City: The World Urban Forum 2006*. Retrieved from http://www.cscd.gov.bc.ca/lgd/intergov_relations/library/wuf_the_livable_city.pdf.

Vancouver Archives, Blog, (2011), *How Did Harland Bartholomew's Ideas Shape Vancouver*? Web http://www.vancouverarchives.ca/2011/04/18/how-did-harland-bartholomew%E2%80%99s-ideas-shape-vancouver/

Pigs, Pestilence, and Prejudice: The Racialization of Early Chinese Settlers in Vancouver's Chinatown

By: Gillian Der

The Chinese community in Vancouver is presently under attack due to the gentrification of Chinatown and the racist discourses surrounding the foreign buyers tax. These events demand we consider the social and spatial histories that accompany these communities or risk repeating racialized violence. This essay seeks to unfold the ways in which early Chinese immigrants who settled in the Vancouver area were racialized, segregated and excluded from Vancouverite and Canadian Society. By drawing on both critical race theory and animal studies in the spatial context of the newly forming Chinatown of the mid-1880s, I suggest the Chinese community were racialized through discourses of the natural. Through this discourse, the Chinese were constructed as threatening to the White community through processes that that positioned them as less than human, likened them to pigs, and constructed their spaces and their communities as disease ridden and sites of infection.

The 15 per cent foreign buyers' tax on Vancouver homes has sparked renewed discussion of anti-Chinese racism in the Province. Historian Henry Yu, writing in the *Globe and Mail*, takes the position that the foreign buyers' tax is linked to Canada's anti-Chinese legacy. Yu argues the tax parallels and builds on historic forms of anti-Chinese legislation (2016). Historically, Canada has enacted notorious legislative measure to reduce or eliminate immigration from Asia. The most widely recognised example in Canadian cultural consciousness is the *Chinese Immigration Act of 1885*. Exclusionary measures such as these raise questions of citizenship and belonging within the white-settler nation of Canada for non-white immigrants, and what geographic spaces are considered available to them. Drawing on critical race theory, I suggest that the historic targeting of Chinese settlers and immigrants and their subsequent confinement to spaces of exclusion is justified through distinct technologies of racism articulated through discourses of the natural.

Discussions of racism hinge on the dualism of culture and nature, where culture defines what is human and nature defines what is not. This divide functions to position certain bodies as further from or entirely excluded from the category human. Activist-Scholar John Paul Catungal posits that the category human is formed not through the exclusion of certain humans, but rather that this category from its inception was defined as not including certain peoples (2016). This creates a very different dynamic, rather than have these certain peoples fight their way *back* into the category human, these peoples must fight to be recognised as human for the

first time. Critical race and animal rights theorists such as Lisa Kemmerer specify this human/non-human divide along lines of animalisation noting the importance of the category animal in the creation of race (2011). Political scientist Claire Jean Kim explains how animalisation of certain bodies renders them less than or non-human. This permits those seen as human to justify refusing to extend human rights to the animalised other. Racialization, however, does not start and stop with animalization. Larger discourses of the natural, like disease and death, come into play in the case of early Chinese immigrants. Furthermore, what is considered less than human is not immediately considered animal. How we come to position the Other as less than human through discourses of the natural needs to go beyond the imagery of animalization and toward a deeper reading of how nature is taken up to position certain bodies as less worthy of human dignity and rights. Animalization, although poignant, is only one facet of how a community becomes racialized and othered. By interrogating these other discourses of the natural, we can see more clearly how animalization is used and the larger picture of racialization.

In the context of the early Chinese community in Vancouver, the use of nature to delineate between human and less than human is solidified when these constructs and power relations map out over physical space. This confluence of discourse and physical space raises the question of the ways and effects to which the white hegemony of Vancouver at the time used discourses of nature in the racialization of the Chinese community to promote anti-Chinese legislation in the space of Vancouver's Chinatown. These powerful discourses of nature, which liken Chinese to pigs and infections, and the explicit exclusion of the Chinese from the category human, function to justify the institutional exclusion of the early Chinese community with significant material and spatial repercussions, most notably through the formation of Vancouver's Chinatown.

To understand lawmakers' justifications in creating legally sanctioned Chinese segregation and exclusion in Vancouver, we need to understand the historical and spatial contexts of how the Chinese first appeared and settled in Canadian society. Canadian immigration has historically relied on race, culture, and the need for labour (Abu-Lama, 1998). Immigrants during the mid 1800s were drawn to Canada's rapidly growing economy (Boyd et al., 2000). The building of the Canadian Pacific Railway (CPR) created a demand for cheap labour, which was provided largely by Chinese workers. Chinese workers completed the CPR in 1885, terminating in Vancouver, thus bringing many of the former CPR workers into the city. Not coincidently, 1885 was the same year a federal commission on Chinese immigration was conducted, headed by Commissioner J.A. Chapleau. This commission and Chapleau's recommendations at the House of Commons resulted in the Federal government passing the *Chinese Immigration Act*, which placed a $50 "head tax" on Chinese immigrants. In 1900, the head tax increased to $100, and in 1903, Federal government raised the tax again to an almost insurmountable $500.

The federal government implemented this tax to resolve racial tensions and protect what white workers in British Columbia viewed as an encroachment on white jobs and white space from the Chinese (Kim, 2015). The head tax, however, did not eliminate Chinese migration to Canada as desired, causing the Federal government to pass the even more draconian *Chinese Exclusion Act*, which banned Chinese immigration to Canada until 1946, though the act was not fully repealed until 1967.

With the Federal government setting an example of how to confront the perceived threat of the Chinese, local legislation in Vancouver dovetailed from these anti-Chinese sentiments taking the form of strict settlement patterns which were forced upon the Chinese who were able to overcome the head tax or who settled in Vancouver after the building of the Railway. Subsequently, the settlement pattern of early Chinese immigrants in Vancouver centred around Pender Street. Vancouver's White community considered this area, which became known as Chinatown, to be undesirable as it sat on and near the False Creek swamp, making the land difficult to build on. The City of Vancouver passed bylaws, which socially and spatially segregated the Chinese community by confining them within the Pender Street area. For example, laundries owned by Chinese entrepreneurs were forced to remain within the Chinese quarter to conduct their business (Anderson, 1991). For the most part, community members were extremely poor and had few, if any, other living options. Wages from building the CPR were low, and many community members sent much of what was earned back to their families in China. In Vancouver, employment opportunities for Chinese migrants were limited to low-wage positions as domestic servants, manual labourers or in the laundries. Coupled with the ongoing need to send remittances back to China to support families or, after 1885, to save money to pay the head tax in hopes of bringing family members to Canada, members of the community often lived in poverty. These factors limited the areas and quality of living arrangements available to them for settlement. It is important to not only acknowledge the social and physical barriers inflicted upon the Chinese community by Federal and Municipal legislation but to also unpack how the White hegemony of Vancouver constructed and maintained these barriers. In this case, exclusion and segregation was justified by the White hegemony and Municipal law makers through discourses and imagery of nature used to position the Chinese as less than human.

The racialization and subsequent justification of the treatment of the Chinese community coincides with the production of racial categories and hierarchies, which themselves rely on discourses of the natural. Race was historically considered biologically natural throughout the colonized world (Anderson 1991, 11). Scientific institutions, such as biology and pseudo-scientific investigations into the physical similarities between non-white bodies and animals, supported this understanding (Catungal, 2017; Anderson 1991). In this instance, the word 'natural' and the ideas behind it effectively make racial hierarchies a *fact* of

nature itself. Racism becomes normalised—the natural order of things—and therefore justifiable. Indeed, in his 1885 address to the House of Commons, Commissioner J.A. Chapleau, described the White community in British Columbia as having a "natural repulsion" to the Chinese (Chapleau 1885, 3006). This statement firmly positions Whiteness and White British Columbia as normal and the Chinese community as strange, foreign and not belonging in the idealised construction of British Columbia as a White province. This statement is exemplary of the dominant ideas surrounding race and how they ultimately fed into Chapleau's recommendations of exclusionary immigration laws and the municipal legislation of spatial segregation. These exclusionary measures hinge on a perception that they were natural and a process necessary to protect the interests of the larger White nationhood of Canada.

If race is to be understood as a process of positioning one group as the norm and one as less desirable than that norm, it is necessary to analyse the ways in which these positions have come into being. Kim theorizes a human/animal borderland: the space between what is fully human and what is fully animal (2015). It is here, she states, all racialized bodies are placed, in relation to whiteness. Racialized bodies are neither human nor animal, but rather sit somewhere in between. In other words, racialized bodies are removed from culture and civilization and placed closer to that which is savage and wild. White society rendered the Chinese less than human and therefore unworthy of full human rights—in this case, the rights to equality and mobility.

Figure 1 "evolution" of the Chinese (Thisleton's Jolly Giant, 1874)

Animalisation and the positioning of certain people as closer to nature is a tactic of social differentiation and has a lengthy social history with significant repercussions for those deemed proximate to nature.

Figure 1 demonstrates the human/animal border-land, showing a monkey evolving into a caricature of a Chinese man, who then devolves into a pig on the lower line. The use of the monkey directly evolving into the Chinese caricature illustrates a perceived proximity between the Chinese and nature. The subsequent devolution and the image of a pig as the final evolutionary form further racializes the Chinese. The degeneration of the Chinese from a human figure into a pig functions to place the Chinese as less than human, **and** unworthy and incapable of assimilation. The cartoon demonstrates the belief that China was a civilisation that had progressed to a point, stopped, and degenerated (Kim, 2015). Kim asserts that a lack of cultural progress or evolution was understood as

evidence of Chineseness as "incompletely human" (2015, 53). Kim understands this cultural stagnancy and incomplete humanity as a barrier to Chinese assimilation into western society because the Chinese were deemed incapable of cultural 'advancement' (2015). Chapleau's assertions in the House of Commons pertaining to the incapacity and unwillingness of the Chinese to assimilate aligns and illustrates the reality of this theory of a perceived incapacity for cultural advancement amongst the Chinese (1885). The dehumanised construction of the Chinese as unassimilable made it possible for British Columbia's White community to justify their decision to not fully extend the spatial and social resources necessary for the Chinese community. This was expressed through both the government legislated Chinese head tax, and the City of Vancouver's decision to spatially confine the Chinese population within the boundaries of Chinatown. The head tax worked to limit the 'unassimilable populations' influx into Canada, therefore protecting White homogeneity. The spatial confinement to Chinatown, on the other hand, was the physical manifestation of the idea that the Chinese were unassimilable. Like a feedback loop, spatial segregation reinforced and reproduced these ideas back to the White community.

Figure 2. Further likening of Chinese bodies to pigs (Grip, 1885)

The animals used to represent a less powerful community is telling of the sentiments of the more powerful hegemony toward the animalized community. The choice of the pig to represent the Chinese community functions to racialize the community in a very specific way. The pig functions to construct and visually represent the Chinese as dirty and greedy. These assumptions about hygiene and greed often miss the social and spatial conditions under which early Chinese settlers were living, like the need to send money home to China and the geography of the false creek swamp. The dirty, greedy pig became a way of glossing over these factors and further dehumanizing the Chinese community. Moreover, the connotations associated with pigs contributed to and solidified definitions of Chinese space and culture within the minds of White Vancouver. Figure 2 from the Toronto based publication *Grip*, a political magazine, vividly depicts anti-Chinese sentiments and what seems like frustration toward Prime Minister John A. MacDonald for the building of the CPR. Here the pig is branded with "CPR", and "John A." stating "Yes, I fattened 'er all myself" (Grip 11, 1885). Cartoonists at *Grip* seem to be playing with the idea of Chinese workers

supposedly benefitting greatly from working on the CPR. "Fattened" recalls ideas of gluttony and greed associated with pigs. From this cartoon, Chinese workers, as depicted through the pig, are seen as greedy and as having taken jobs away from white workers. This cartoon exemplifies the anxieties of White Canada toward Chinese workers through animalizing and dehumanizing Chinese peoples.

The depiction of the Chinese race as greedy and unclean is inextricably linked to the spaces in which they inhabited. Kay Anderson suggests the creation of Chinatown as a physical space solidified the racial ideologies and stereotypes of White-defined Chineseness (1991). For example, Chinatown was often depicted by those who did not live there as unclean, littered, and unsanitary with little acknowledgement of there being no city sewers servicing it (Anderson, 1991). Similarly, Chinatown was constructed as a place of vice, where unregulated gambling was a common social activity (Anderson, 1991). Mapping the racialized Chinese subject onto a place, in this case, Vancouver's Chinatown, marks an important shift of racialization out of the imaginary and into the lived experiences and physical spaces of both White and Chinese Vancouverites, solidifying racial ideology within the daily lives of Vancouverites (Anderson, 1991). The racialization of the Chinese as pigs squarely places the spaces of their community and their bodies as less than human. One citizen described Chinatown as "places that a hog would die in" (Quoted in Anderson 1991, 84). This marks a significant departure from merely depicting the Chinese as pigs. Now, the spaces that the Chinese occupied were not even worthy of the life of a pig bringing into focus another discourse of the natural, mortality and death. The use of mortality and death highlights how discourses of the natural were used to equate the Chinese and Chinatown as sites of disease and pestilence that should be kept separate from the White community so as not to infect it through customs and perceived illness. Anderson states that China itself was understood to be infected (1991). These understandings migrated with Chinese workers evident in a report from the *Vancouver News* which stated that Chinatown was considered "pest producing" (quoted in Anderson, 1991, 82). With the space of Chinatown understood as infected, Chinese people too were considered infected. Yet another feedback loop between place, perception, and total culture led to persistent fears among White Vancouver residents that the Chinese community was infected with diseases such as leprosy and cholera, and were thus a danger to their healthy, clean, and civilised, *White* communities (Anderson, 1991). In his closing statements in favour of the Chinese Exclusion Act, Chapleau states quite strikingly:

> *As a piece of wood in the human body unless it is removed must cause disease in the places around it and ultimately the whole body. So the civilisation of Chinese introduced into Christian civilisation must be removed or it will be a cause of danger to the community* (1885, 310)

This statement highlights the use of nature through the imagery of wood and utilizes notions of disease to exclude the Chinese and reinforce White Canada's fears and

perceptions of Chinese populations as a possible danger to their nation. Statements and sentiments like Chapleau's feed back into the pattern of segregation and containment of the Chinese community via Chinatown. The containment of the Chinese community was undoubtedly an attempt at containing an imaginary sickness, that was the Chinese community in Vancouver itself.

Finally, we must return to the genesis of who is human and who is not. Beyond the specifics of animalization or disease and death, those deemed less than human by systems of racialization and pseudo-science are subjected to fewer realised rights and dignities than those who are allowed to occupy the category human. Recalling Catungal's previous sentiments around how the category human was created not through exclusion but through certain bodies not being considered human in the first place. These lofty theories are not far removed from lived realities. Indeed, Chapleau's opening remarks to the House of Commons saw him state repeatedly how no member of the "human family" should be barred from migration into the British Empire or Canada (1885, 3003). Yet Chapleau concludes his address by recommending the federal government bar specifically Chinese migrants through the head tax. It seems as though the Chinese are not members of the human family giving striking colour to Catungal's theory.

Discourses of the less than human significantly impacted the social ideologies and subsequent settlement patterns and legislation surrounding early Chinese immigration into Vancouver and Canada more broadly. The Chinese were repeatedly positioned as further from the category human through dominant discourse as well as Federal and Municipal legislation through the use of cultural stagnancy, animalisation, infection, and outright exclusion from the category. These tactics were used to justify their exclusion from the nation by White law-makers. It is necessary to analyse the ways in which Chinese populations have been historically racialized through systems of whiteness perpetuated by Canadian institutions to fully understand the significance of the current regeneration of anti-Asian sentiments within Vancouver and Canada. Since the municipal legislation that led to the segregated construction of Chinatown in Vancouver, anti-Asian sentiments have further evolved and continue to play out over space. To what extent the foreign buyers' tax is targeting and racializing Chinese immigrants could perhaps be debated; however, there is an undeniable link between the history of early Chinese settlers and those immigrating now. Despite surface level commitments to multiculturalism and redress for the head tax, my lived experiences and those of my family and ancestors demonstrate a darker undertone of remaining racist tendencies. An undertone of continued unease and tension between the White settler nation and people of colour. The failure to engage with and acknowledge these social and spatial histories makes room for these undercurrents to resurface in contemporary Canadian society, albeit in different ways. By unfolding these social histories, we can begin to understand where racism is rooted and how it plays out over bodies and space.

References

Abu-Laban, Y. (1998). Keeping 'Em Out: Gender, Race and Class Biases in Canadian Immigration Policy. In V. Strong-Boag (Ed.), *Painting the Maple: essays on race, gender, and the construction of Canada* (pp. 69-82). Vancouver, BC: UBC Press. Retrieved March 5, 2017.

Anderson, K. (1991). Constructing Race through Place and Practice. In *Vancouver's Chinatown: Racial Discourse in Canada 1875-1980* (pp. 73-105). Montreal: McGill - Queen's University Press.

Anderson, K. (1991). Race, Place and the Power of Definition. In *Vancouver's Chinatown: Racial Discourse in Canada 1875-1980* (pp. 8-33). Montreal, QB: McGill -Queen's University Press.

Bengough, J. (Ed.). (1885, September 12). Beats' em all [Cartoon]. *Grip*, *25*(11), 2. Retrieved March 28, 2017, from http://eco.canadiana.ca/view/oocihm.8_06509_642/2?r=0&s=1

Boyd, M., & Vickers, M. (2000). 100 Years of Immigration in Canada. *Canadian Social Trends,* 2-13. Retrieved March 28, 2017.

Catungal, J. (2016, October 19). *Human Animal Relations*. Lecture presented at Ecologies of Social Difference in University of British Columbia, Vancouver.

Catungal, J. (2017, March 21). *More than Human*. Lecture presented at Disturbing Subjectivities in B.C., Vancouver.

Chapleau, J. (n.d.). *Chinese Immigration*. Address presented at Canadian House of Commons Debates in House of Commons, Ottawa. Retrieved March 28, 2017.

Kemmerer, L. (2011). Connections: Speciesim, Racism, and Whiteness as the norm. In *Sister Species: Women, Animals and Social Justice* (pp. 72-78). Champaign, IL: University of Illinois press. Retrieved March 6, 2017.

Kim, C. J. (2015). *Dangerous crossings: race, species, and nature in a multicultural age*. Cambridge: Cambridge Univ. Press.

T. (2016, April 20). *N/A* [Cartoon]. Retrieved March 28, 2017, from http://theconversation.com/when-americans-thought-hair-was-a-window-into-the-soul-53260

Yu, H. (2016, September 22). Is the B.C. property levy on 'foreign buyers' a new head tax? *Globe and Mail*. Retrieved March 28, 2017, from http://www.theglobeandmail.com/opinion/is-the-bc-property-levy-on-foreign-buyers-a-new-head-tax/article32013536/

The Application of a Physical Model for Slope Stability Changes Due to Wildfire: A Case Study of the Elephant Hill Fire in Central British Columbia

By: Carla Urquhart

After wildfire events, soil becomes less cohesive as roots degrade, decreasing slope stability. Understanding the magnitude of this decrease is essential for risk management and mitigation strategies as the rate and intensity of fires are projected to increase in British Columbia due to climate change. In this study, I use a predictive model based on physical and hydrological relationships to estimate changes in landslide susceptibility after the Elephant Hill wildfire. Using a geographic information system, two landslide susceptibility layers are created to represent pre- and post- fire conditions. The results show decreased slope stability in the post-fire case. Pre-fire, there are no unconditionally unstable slopes and 325.71 km² are conditionally unstable; post-fire these values increase to 33.62 km² and 450.26 km², respectively. This indicates that prior hazard assessments are now likely invalid. It demonstrates how the use of predictive models based on known physical processes is key to understanding dynamic systems. One cannot assume that a system's behaviour will reflect its past after a catastrophic event, and due to climate change this assumption may not apply to Earth surface systems in general. Therefore, building, testing and improving quantitative models that do not assume steady-state conditions is critical to hazard planning in geomorphology.

Introduction

Wildfire is detrimental to human and ecological systems, and its secondary effects can shape the landscape for decades after an event. The loss of vegetation and changes to the soil profile can change the state of affected geomorphological systems in complex ways, potentially increasing the risk of landsliding through loss of soil cohesion (Cannon & Gartner, 2007, p. 363). The root structures of trees contribute to soil cohesion, and thus slope stability, by reducing the pore water pressure in soil by extraction. Lower pore pressure increases the soil's shear strength and frictional strength by anchoring it along potential failure planes (Fookes et al., 2007, p. 95). After a wildfire event, cohesion decreases as roots degrade which leads to more slope instability in affected areas. Determining which slopes are more susceptible to landslide following a fire could allow for better risk management and mitigation strategies, and will become increasingly important in British Columbia where the rate and intensity of fires is projected to

increase due to climate change (Flannigan & Van Wagner, 1991, p.72).

The aim of my report is to investigate how wildfires affect slope stability using a case study and a simple model for estimating landslide susceptibility and the critical precipitation needed for slope failure. To do this, I will consider the Elephant Hill wildfire discovered on July 6th, 2017 near Ashcroft, British Columbia which grew to an estimated size of 191,865 hectares (BC Wildfire Service, 2017). Using the SHALSTAB model for landslide susceptibility, described below, I will look at the modeled slope stability change after the fire and use the results to make predictions about the increased likelihood of slope failure after wildfire events.

It is important to note that without precise geotechnical information from intensive field investigation, the results of this analysis are not sufficient to determine the probability of landslide occurrence for any particular slope in the study area, and cannot be used for hazard assessment. The below results can, however, be used to show the effect of root strength on slope stability, and to make estimates about changes in slope stability after large-scale wildfires. These results can be used to direct further study on the impact of the Elephant Hill fire, as well as the impact of wildfires on slope stability in general. Similar analyses using physical models have shown the effects of timber-harvesting on slope stability due to loss of root strength, and I expect my results to be consistent with these findings (Montgomery et al., 1998; Sidle, 1992).

The SHALSTAB Model

The SHALSTAB model was developed by William Dietrich and David Montgomery for use with a digital elevation model in ESRI's ArcView. It models shallow landslide susceptibility based on the infinite slope model for slope stability (Dietrich & Montgomery, 1998), which asserts that a slope will fail when the shear stress acting on the soil exceeds its cohesion and frictional resistance. The basic infinite slope model is used to calculate a factor of safety (FS) which indicates stability when FS > 1 and instability for FS ≤ 1, where FS is the ratio of shear strength(s) to shear stress (τ) (Fookes et al., 2007, p. 16). The shear strength is calculated by the Coulomb equation, given by Fookes et al. as:

$$s=c+(\sigma - u)\tan\Phi \quad (1)$$

Where c is the soil cohesion, $(\sigma - u)$ is frictional resistance as the difference between normal stress and pore water pressure, and Φ is the friction angle at the failure plane (Fookes et al., 2007, p. 16). The shear stress (τ) is given by:

$$\tau=\gamma z(\cos\beta)(\sin\beta) \quad (2)$$

Where β is the slope angle and the weight of material is $\gamma z(\cos\beta)$, γ is the unit weight of soil, and z is the soil depth (Fookes et al., 2007, p. 16.) The infinite slope model is based on the assumption that soil will slide parallel to the slope, and that the slope is infinite in extent (Fookes et al., 2007, p. 119).

SHALSTAB combines this basic model with a hydrologic model to account for topographic effects on slope stability. The hydrologic model considers the number of upslope cells draining into a given cell,

and uses that value to calculate the saturation for that cell under a specified precipitation rate. This model is given as

$$h/z=(q/T)[a/(b\sin\theta)] \quad (3)$$

where (q/T) represents the magnitude of a precipitation event with q the effective precipitation and T the transmissivity. The topographic effect is given by: [a/(bsinθ)] captured from a, the drainage contribution from upslope; b, the grid cell width from the DEM; and the slope gradient, θ (Dietrich & Montgomery, 1998). The resulting combined equation gives the critical precipitation threshold for slope failure by solving for q/T as follows:

$$q/T=\rho s/\rho w(1-\tan\theta/\tan\Phi)(b/a)\sin\theta \quad (4)$$

which is derived from equations (1), (2) and (3), and can be modified to solve for (a/b) which gives the upslope drainage area per grid cell length (Dietrich & Montgomery, 1998).

The addition of the topographic component gives more accurate results than the infinite slope model alone, as shallow landslides are initiated more often on convergent slopes (Montgomery & Dietrich, 1994, p. 1153). Topographic ridges tend to have steep slopes and factor of safety values approaching or less than 1, but are less likely to reach the saturation level necessary for failure.

Montgomery et al. found that topographic controls dominate shallow landslide rates in the Pacific Northwest region of the United States for watersheds with a range of geology and soil conditions (1998, p. 951), which indicates that their model is likely useful for examining slopes in British Columbia. However, Cannon and Gartner found that in terms of debris flow events triggered by shallow slope failure, many burned drainage basins showed no response, suggesting that bedrock lithology, surficial materials, burn extent, severity and other factors control debris flow occurrence after wildfire events (2007, p. 372).

It is worth noting that the version of the SHALSTAB model used for this report allows users to enter values for both soil cohesion and root strength, although the original documentation does not recommend estimating values for these parameters. The authors state it is intended to be run with a cohesion value of zero and an increased friction angle to compensate (Dietrich & Montgomery, 1998). We use it here because of its simplicity and ability to run without detailed information about surficial materials.

Method

Data for this analysis was obtained from Data BC's Open Data Catalogue, and includes digital elevation models (DEM) produced by GeoBC (2017) and a perimeter for the Elephant Hill fire from the BC Wildfire Service (2017). Road features from the Ministry of Transportation (2017) were included in the output maps for reference, but were not used in any part of the analysis. The DEM's resolution is approximately 20 m, with a spatial extent of 8412.37km^2, slightly larger than the Elephant Hill fire perimeter polygon.

In this analysis I use the r.shalstab function, an add-on for GRASS GIS based on the original SHALSTAB script for ESRI's ArcViewer (which is no longer supported in ArcMap 10), written by Andrea Filipello, University of Turin, and Daniele Strigaro, University of Milan in 2017. Their model creates a landslide susceptibility layer with values from 1 (unconditionally unstable) to 7 (stable), with layers 2 through 6 corresponding to critical rainfall values for which slope failure may occur. The function relies on six input parameters: a DEM, the soil friction angle and soil and root cohesion values representing shear strength in the factor of safety equation; as well as the vertical thickness of soil, the hydraulic conductivity, and the soil density (Filipello, 2017).

While the source code is publicly available, I did not investigate its accuracy or similarity to the original SHALSTAB function for this study. For the purpose of this study, I assume that r.shalstab differs very little from the original program by Dietrich and Montgomery and that it carries out the same calculations described above, as is claimed by Filipello and Strigaro (2017). Their documentation indicates that soil density is in kgm^{-1}, however testing indicated it should likely be entered as gm^{-1}. This should be verified by comparing manual calculations to the output given for a single cell in GRASS. I assume that the modified soil density parameter is correct.

The results of this analysis are based on constant parameters across the spatial extent of the study area, which are chosen using averages similar to those used by Montgomery et al. to test the SHALSTAB model (1998, p. 946), which may not reflect the true conditions in the study area. The output landslide susceptibility maps are based on a soil friction angle of 30 degrees, 1 meter soil thickness, 2000 gm^{-1} soil density, and hydraulic conductivity of 1 mh^{-1}. The root strength values used are based on Campbell and Hawkins' estimate of between 2.44 and 8.91 kPa (2003, p. 1583) for the additional cohesion of lodgepole pine, a common tree species in the interior of British Columbia (Ministry of Sustainable Resource Management, 2003, p. 8). The pre-fire susceptibility map is based on a soil cohesion value of 0 nm^{-2} and root strength value of 8000 nm^{-2}, and the post-fire map has soil cohesion 0 nm^{-2} and root strength of 0 nm^{-2}. Our model assumes an equal distribution of trees over the affected area and keeps root strength values constant over its spatial extent. While this considerably simplifies and reduces the accuracy of the model, using constant values is useful in highlighting the role of root strength and soil cohesion in slope stability.

The output susceptibility maps were re-classified into five categories given below:

1. Unconditionally Unstable
2. Conditionally Unstable, 0–100 mm per day precipitation threshold
3. Conditionally Unstable, 101–200 mm per day precipitation threshold
4. Conditionally Unstable, 201–999 mm per day precipitation threshold
5. Stable

6. No Data

A second reclassification was created to look solely at slopes with critical precipitation for failure estimated at between 0–30 mm per day, as this has been shown to correspond loosely with a 10 to 20 year return period for summer rainfall events in the Thompson region (Martin, 2015, p. 84). The re-classification categories are as follows:

1. Unstable for precipitation under 30 mm per day

2. Stable for precipitation under 30 mm per day

3. No Data

The results are given with respect to both the total study area of 8412.37 km² and a modified study area in which cells with no slope or gradients under 5 degrees are removed. The modified total study area is 3,029 km². Modified categorical layers are as the lists above, but excluding the "No Data" category, and were created by re-classifying areas under 5 degrees in gradient as No Data, then removing No Data cells from the output reports in GRASS. The included maps were produced with the original layers; sinks and depressions were given No Data values. All of the under 5 degree slopes were calculated to be "stable" in the original output.

While numerical results and tables reflect the entire study area, many of the maps produced focus on the area along Highway 97 between Ashcroft and north of Cache Creek. I chose this area for visual representation of results because of the high density of unstable slopes in both the pre- and post- fire cases. Additionally, this area contains two major highways which are essential for the transport of people and goods through the province, so the region is of increased importance for hazard management. A large scale debris flow in this area could be catastrophic in terms of loss of life and economic impact to the province.

Results

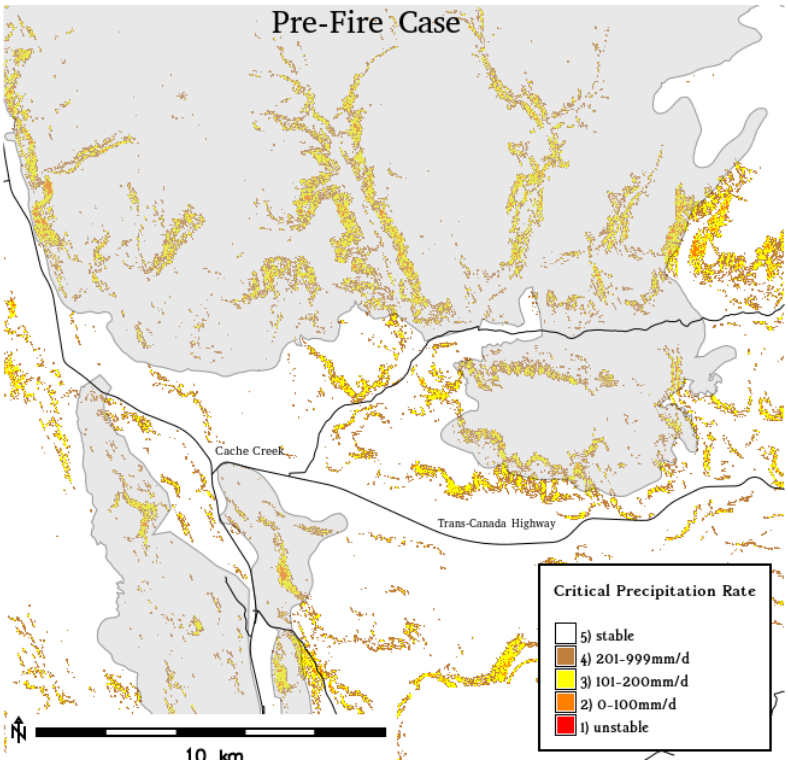
In general, slope stability decreased in the post-fire case. Notably, in the pre-fire results there were no unconditionally unstable slopes recorded, where 33.62 km² were recorded as unconditionally unstable in the post-fire case. Pre-fire, 325.71 km² were calculated to be conditionally unstable, which increased to 450.26 km² post-fire. The proportion of conditionally stable slopes expected to fail with under 100 mm per day precipitation rate more than doubled from the pre- to post- fire case. This category is more indicative of conditional stability as climatic models for B.C.'s Thompson region indicate that precipitation rates over 100mm/day are highly unlikely to occur (Martin, 2015, p. 84).

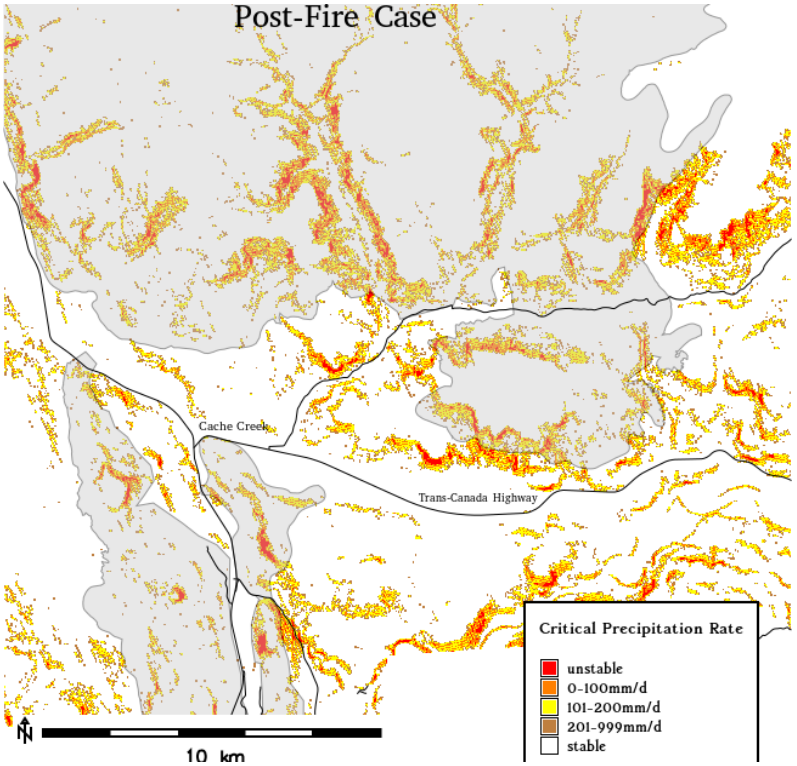
The immediate results of the SHALSTAB analysis over the entire study area are shown below by Table 1 and Table 2. The area recorded as "No Data" corresponds to sinks and depressions which are automatically removed by the slope function in GRASS used to calculate the topographic component of the SHALSTAB model.

Category Value	Qualitative Stability	Critical Precipitation Rate (mm/day)	Pre-Fire Area (km^2)	Post-Fire Area (km^2)	Pre-Fire Percent of Total Area	Post-fire Percent of Total Area	Percent Change
1	Unconditionally Unstable	N/A	0	33.62	0	0.4	N/A
2	Conditionally Unstable	0 – 100	12.94	104.81	0.15	1.25	709
3	Conditionally Unstable	101 – 200	119.03	184.75	1.42	2.2	55
4	Conditionally Unstable	201 – 999	193.74	160.7	2.3	1.91	-17
5	Stable	N/A	5400.94	5242.76	64.2	62.32	-2
*	No Data	N/A	2685.71	2685.71	31.93	31.93	-3

Table 1. Results of SHALSTAB analysis in terms of stability and critical precipitation for failure.

Slope Stability Changes After Elephant Hill Fire





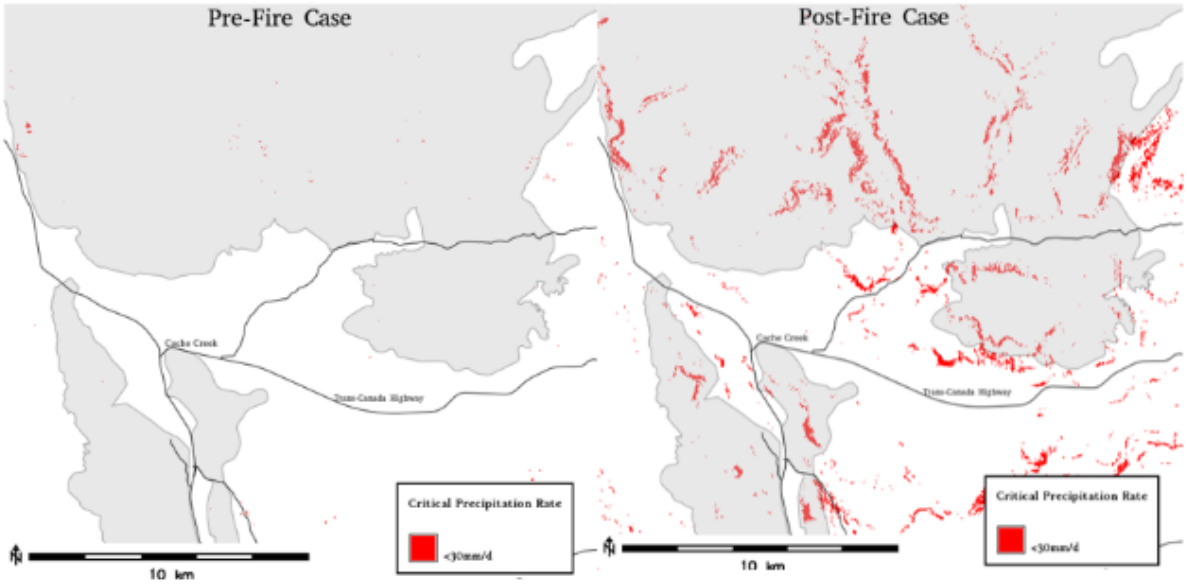
Map1 (a&b)

Produced by Carla Urquhart on 23 February with GRASS GIS
Data from Natural Resources Canada & BC Wildfire Service
BC Environmental Albers Projection NAD 1983

Category Value	Failure Potential for 10–20 Year Precipitation Event	Pre-Fire Area (km^2)	Post-Fire Area (km^2)	Proportion of Study Area Pre-Fire (%)	Proportion of Study Area Post-Fire (%)	Percent Change
1	Failure Expected	1.38	88.2	0.02	1.05	87
2	Stable	5725.28	5638.45	68.06	67.03	-1.5
*	No Data	2685.71	2685.71	31.93	31.93	N/A

Table 2. Results of SHALSTAB analysis showing failure potential for 10–20 year return period summer storms in the BC Central Interior Region, estimated as 30mm/day.

Slopes Expected to Fail During 10-20 Year Precipitation Events



Map 2 (a&b)

Produced by: Carla Urquhart on 20 February 2018 with GRASS GIS
Data from Natural Resources BC & BC Wildfire Service
BC Environmental Albers Projection NAD 1983

Category Value	Qualitative Stability	Critical Precipitation Rate (mm/day)	Pre-Fire Area (km^2)	Post-Fire Area (km^2)	Proportion of Study Area Pre-Fire (%)	Proportion of Study Area Post-Fire (%)	Percent Change
1	Unconditionally Unstable	N/A	0	33.62	0	1.1	N/A
2	Conditionally Unstable	0 – 100	12.94	104.81	0.43	3.5	709
3	Conditionally Unstable	101 – 200	119.03	184.75	3.93	6.1	55
4	Conditionally Unstable	201 – 999	193.74	160.7	6.39	5.3	-17
5	Stable	N/A	2703.59	2545.41	89.25	84	-6

Table 3. Results of SHALSTAB analysis as Table 1 with sinks, depressions and extremely low gradient slopes removed.

Category Value	Failure Potential for 10–20 Year Precipitation Event	Pre-Fire Area (km^2)	Post-Fire Area (km^2)	Proportion of Study Area Pre-Fire (%)	Proportion of Study Area Post-Fire (%)	Percent Change
1	Failure Expected	1.38	88.2	0.04	2.91	87
2	Stable	3027.93	2941.1	99.96	97.09	-0.03

Table 4. Results of SHALSTAB analysis showing likelihood of failure during a 10–20 year return period precipitation event, as Table 2 above, with sinks, depressions and extremely low gradient slopes removed.

Based on the slope calculation in GRASS, 2811.11 km² of the study area's slopes are less than 5 degrees, which are extremely unlikely to fail and thus irrelevant to this study. Table 3 and 4 are the modified tables from which the sinks, depressions and slopes under 5 degrees have been removed.

From the results in Tables 1–4 above, it is evident that approximately 6% of stable slopes in the modified study area have become unstable after the Elephant Hill Fire, and 10% of conditionally stable slopes are now unconditionally unstable. For 10–20 year precipitation events, approximately 2% of previously stable slopes are now at risk of failure. While a very small amount of the total area is at risk of failure, that area almost doubled in the post-fire case.

Conclusion and Discussion

As expected based on previous studies investigating loss of root strength and landslide susceptibility (Montgomery et al., 1998, Sidle, 1992), the results of the SHALSTAB model highlight the importance of root strength to understanding slope stability. In general, the loss of soil cohesion due to root desiccation decreases the precipitation threshold for slope failure. The results indicate that the proportion of slopes likely to fail within the first decade after a wildfire has almost doubled. Any hazard assessment done prior to the wildfire event is likely no longer useful if these results are valid. As the area affected by the Elephant Hill fire is proximate to essential infrastructure such as highways as well as residential areas, new hazard and risk assessments for landslide should be conducted where human developments are at risk.

In addition to the loss of soil cohesion, the removal of vegetation due to wildfire has other impacts on geomorphological processes, such as higher rates of overland flow due to increased water-repellency, decrease of interception of rainfall after canopy loss and removal of obstructions to overland water and material flow (Cannon & Gartner, 2007; Istanbuluoglu & Bras, 2005). The combined impacts of vegetation removal dictate that affected systems will behave in

fundamentally different ways than they did previously. As these are secondary effects on complex systems, it is difficult to account for them in a meaningful way.

Root strength does not immediately diminish after a wildfire, but rather decreases over the first decade following the occurrence (Istanbulluoglu & Bras, 2005, p. 11); thus, the actual relationship between wildfire and slope stability is more complex than the SHALSTAB model is able to demonstrate. Regrowth of pioneer species increases root strength and therefore soil cohesion while simultaneously diminishing the root strength of burned trees. Further analysis comparing these two processes would provide information about the relative landslide risk for each year post-fire, and could be combined with SHALSTAB or other physical models to show both the temporal and spatial probability of landslides after a wildfire event.

The post-fire conditionally stable slope values could be processed to provide critical gradients for failure given specific precipitation rates by comparing values to slope gradient for each raster cell. This output would be more useful in hazard planning than the results of this study as it would give a measurable criterion for failure potential. Combining such an analysis with a statistical model that considers the variability of input parameters over space could produce meaningful estimates for slope failure potential under a wider variety of conditions. These types of analyses would improve upon the SHALSTAB model used here, and make it more useful in predicting landslide susceptibility for hazard assessment.

Perhaps most importantly, my study demonstrates the importance of predictive models based on known physical processes to understanding dynamic systems. Traditionally, hazard and risk assessments conducted by geomorphologists are based on empirical analysis which relies on the assumption that a system's past behaviour is indicative of its future behaviour. The above results indicate that this assumption can no longer be made after catastrophic events. Further, as climate change progresses the behaviour of Earth systems are unlikely to reflect past behaviour, and empirical analysis may become less and less useful in hazard assessment. Therefore, building, testing and improving quantitative models like SHALSTAB which are based in physics, mathematics and statistics is vital for improving accuracy and precision in hazard planning in the future.

Limitations

The data I use to estimate the affected area is intended to show the fire perimeter. However, the enclosed area and actual area burned may differ, and my analysis incorporates areas outside the perimeter in its results. Consequently, my results do not reflect the actual proportion of slopes affected by the Elephant Hill wildfire, and should not be represented as such. Rather, the results of my analysis present information about the effect of wildfire on landslide susceptibility in general. Tests on various slope stability models have shown that models based on infinite-slope, such as SHALSTAB give lower

root strength values necessary for stability, (Montgomery et al., 1998, p. 946) and therefore slopes in the pre-fire case are presumably less stable than our results indicate. My results should be treated as a high estimate for change in stability after wildfire. The SHALSTAB model has also been shown to perform poorly where thick glacial deposits are present (Montgomery et al., 1998, p. 952), which likely includes some of our study area.

Lodgepole pine may not be the dominant species, and this study does not account for other species with different cohesion values, or areas which were previously deforested or were never forested. My analysis also assumes complete loss of root structures after wildfire, which may not be consistent with true conditions. The use of constant, roughly average values for all parameters means that the results cannot be used for predicting actual slope stability in the area, and are not sufficient for landslide hazard assessment. In order to produce more accurate results, a detailed geotechnical layer should be constructed after extensive field investigation. Cataloguing landslide events in the affected area over the next 20–30 years would be necessary to test the accuracy of the results of this study. Alternatively, the SHALSTAB model could be applied to a region where wildfire has occurred in the past, and the results compared to landslide observations, as was done by Montgomery et al. to test the model's application to landslide susceptibility post-timber harvesting (1998).

References

BC Wildfire Service. (2017). *Fire perimeters - current* [Data File]. Retrieved from: https://catalogue.data.gov.bc.ca/dataset/fire-perimeters-current

Campbell, K. A., & Hawkins, C. D. (2003). Paper birch and lodgepole pine root reinforcement in coarse-, medium-, and fine-textured soils. *Canadian Journal of Forest Research,33*(8),1580-1586. doi:10.1139/x03-076

Cannon, S. H., & Gartner, J. E. (2007). Wildfire-related debris flow from a hazards perspective. In *Debris-flow hazards and related phenomena*(pp. 363-385). Berlin: Springer Science and Business Media. doi:10.1007/3-540-27129-5_15

Construction and Maintenance. (2017). *Ministry of Transportation (MOT) road features inventory (RFI)* [Data file]. Retrieved from https://catalogue.data.gov.bc.ca/dataset/ministry-of-transportation-mot-road-features-inventory-rfi

Dietrich, W. E., & Montgomery, D. R. (1998). *SHALSTAB a digital terrain model for mapping and shallow landslide potential*(Technical Document). Retrieved from http://calm.geo.berkeley.edu/geomorph/shalstab/index.htm

Filipello, A., & Strigaro, D. (2017). Addon r.shalstab - A model for shallow landslide susceptibility. In *GRASS GIS Manual*. Open Source Geospatial Foundation. Retrieved from https://grass.osgeo.org/grass72/manuals/addons/r.shalstab.html

Flannigan M. D., & Van Wagner C.E. (1991). Climate change and wildfire in Canada. *Canadian Journal of Forest Research, 21*(1). 66-72. doi:10.1139/x91-010

Fookes, P. G., Lee, M., & Griffiths, J. S. (Eds.). (2007). *Engineering geomorphology theory and practice*. Scotland: Whittles Publishing.

GeoBC. (2017). *Digital elevation model for British Columbia - CDED - 1:250,000* [data file]. Retrieved from: https://catalogue.data.gov.bc.ca/dataset/digital-elevation-model-for-british-columbia-cded-1-250-000

GRASS Development Team. (2017). *Geographic Resources Analysis Support System (GRASS) software, 7.2.* [Electronic Document]. Open Source Geospatial Foundation.

Istanbulluoglu, E., & Bras, R. L. (2005). Vegetation-modulated landscape evolution: Effects of vegetation on landscape processes, drainage density and topography. *Journal of Geophysical Research, 110*(F2), 1-19. doi:10.1029/2004JF000249

Martin, C. A. (2015). Regional frequency analysis of seasonal rainfall and snowfall for the southern interior of British Columbia. Retrieved from Thompson Rivers University

Ministry of Sustainable Resource Management. (2003). *British Columbia's Forests; A Geographical Snapshot*, Government of British Columbia. Retrieved from: www.for.gov.bc.ca/hfd/pubs/docs/mr/mr112/pdf.htm.

Montgomery, D. R., & Dietrich, W. E. (1994). A physically based model for the topographic control on shallow landsliding. *Water Resources Research, 30*(4), 1153-1171. doi:10.1029/93WR02979

Montgomery, D. R., Sullivan, K. and Greenberg, H. M. (1998). Regional test of a model for shallow landsliding. Hydrol. Process., 12: 943–955. doi:10.1002/(SICI)1099-1085(199805)12:6<943::AID-HYP664>3.0.CO;2-Z

Sidle, R. C. (1992). A theoretical model of the effects of timber harvesting on slope stability. *Water Resources Research 28*(7) 1897-1910. doi:10.1029/92WR00804

Climate Change and Global Migration

By: Alice Cavanagh

The implications of climate change on global migration patterns are becoming increasingly evident as we push our planet towards its environment limits. An 'environmental refugee' is a person 'who can no longer gain a secure livelihood in their homelands because of drought, soil erosion, desertification, deforestation and other environmental problems, together with the associated problems of population pressures and profound poverty' (Myers, 2002, p.609). This paper focuses on the specific sub-group of 'climate refugees' which may be defined as: a person who has to leave their habitat due to sudden or gradual alterations in their natural environment due to the impacts of climate changes (Biermann and Boas, 2010). We are seeing increasing numbers of 'environmental refugees' and people being displaced by the impacts of environmental change. This paper discusses the lack of acknowledgement concerning 'environmental refugees' under international refugee law and the implications of this absence of recognition. The complexity of the issue is also acknowledged through a discussion of the multitude of factors which lead to climate-induced displacement and the need to consider the range of contributors to this displacement. As the consequences of climate change become apparent, there is a need to engage with the ethics of the debate surrounding 'environmental refugees' in order to provide sustainable and fair solutions to the issues at hand. Instead of taking a defensive approach to the issue in order to avoid responsibilities and duties towards refugees, policy debates should re-engage with the rights of the displaced people. This paper suggests the Nansen Initiative as an example of a bottom-up approach which could help resolve issues arising from migration induced by climate change.

Climate change and global migration.

Myers (2002, p.609) defines an 'environmental refugee' as a person 'who can no longer gain a secure livelihood in their homelands because of drought, soil erosion, desertification, deforestation and other environmental problems, together with the associated problems of population pressures and profound poverty'. Although not based on empirical evidence, it is estimated that climate change and its related environmental factors could result in 200 million people being displaced by 2050 (Myers, 2002). This has significant implications for global migration trends and resulting policies. The implications of climate change on migration will be explored under four key themes: the complexity of current issue faced, the rhetoric used to explain this issue, the ethical aspect of climate induced migration and the options for future attempts at resolution drawing on the example of the Nansen Initiative.

It is important to examine the intricacy of the term 'environmental

refugee'. The term is broad and encompasses both climatic and non-climatic issues as illustrated by Myer's (2002) definition. Many of the environmental factors which result in displacement are explicitly interwoven and should be considered with regard to one-another. For example, deforestation can lead to the displacement of people by disrupting their habitat and way of life. This is a direct cause of displacement but is also linked to climate change more generally, due to the reduction in carbon sequestration which would otherwise be occurring if deforestation had not occurred. On a wider scale, this has implications for global climate change and therefore may cause displacement in other places through extreme weather conditions or sea level rise. The complexity of the term 'environmental refugee' should be considered throughout this essay in order to understand both climate and non-climate issues influencing migration. This essay will mainly focus on displacement caused by climate-change related induced migration. A 'climate refugee' falls under the broad definition of a 'environmental refugee' but can be specifically defined as a person who has to leave their habitat due to sudden or gradual alterations in their natural environment due to the impacts of climate changes (Biermann and Boas, 2010). This relates to sea-level rise, extreme weather events, drought and water scarcity. The complexity of both terms can be further extended due to the importance of other factors in inducing displacement. The positionality of the person and the local and national context are significant. For example, in the case of Bangladesh which will be explored in this essay, the population is particularly vulnerable due to the low income levels and living conditions which lead to an inability to adapt or protect the population from vulnerabilities. If the same situation were present in a wealthy country, available resources would be invested to protect populations and therefore displacement would not be as significant. This demonstrates how climate is a stress multiplier rather than a sole driver of migration or resettlement 'decisions'.

Anthropogenic action leading to climate change is widely cited as having the potential to influence migration, creating millions of 'environmental refugees'. Bawden (2015) claims we have already seen the first wave of migration explicitly linked to climate change, indicating that change is already underway and in need of policy creation. Negative effects on agricultural productivity, water resources and biodiversity, as well as more extreme weather events and sea level rise, leave many populations vulnerable (McLeman, 2011). We are already seeing the implications of this, as more than 19 million people from 100 countries were forced to flee their homes in 2014 due to natural disasters alone, leaving them as 'environmental refugees' (Lieberman, 2015). An important consideration to make is that an 'environmental refugee' lacks formal recognition under international refugee law (McLeman, 2011). This law still relates to the 1951 Geneva Convention definition of a refugee as: a person who has a well-founded fear of persecution for reasons of race, religion, nationality, political opinion or membership in a

particular social group (UNHCR, 1951). This means it is not easy to appeal for resettlement in another country as a consequence of not being defined as a refugee.

Not only do 'environmental refugees' lack formal recognition, people in resettlement situations often object to being labelled refugees. This is often the case when people are displaced within their country rather than across international borders. The lack of formal recognition of these displaced people as refugees within policy space as well as by the populations themselves indicates the complexity of the issue and the implications for resolution. There is a need for another form of recognition which can be accepted by both populations and policy makers in order to provide sustainable and suitable solutions for the displacement which is currently occurring.

The current impacts of climate change can be seen in the highly-cited case of Bangladesh (Murphy, 2015; Ferrie, 2017). 160 million people in Bangladesh are squeezed into an area slightly smaller than Tunisia, most of which being within low elevation coastal zones (areas of 1-20 metres elevation above mean sea level) (LECZ), making it one of the most densely-populated countries on earth (Ferrie, 2017). Various climate change impacts have led to this, including increasing frequency and intensity of cyclones, Himalayan glaciers melting and leading to swelling rivers and rising sea levels engulfing coastlines. Bangladeshi cities will not be able to accommodate the displaced people, which poses huge problems for the government. This is just one example of the level of displacement resulting from climate change, and illustrates the urgent need to address the issue of 'climate refugees'. This example of a country facing population displacement reflects the general global pattern of climate-induced migration, with the most vulnerable being in the 'Global South' in densely populated LECZ zones. As previously mentioned, climate change is not the sole driver of displacement in Bangladesh. The nature of the infrastructure and living arrangements in Bangladesh makes the population particularly vulnerable.

The rhetoric employed within the debate sounding 'environmental refugees' needs to be reflected upon when discussing the issue of climate-induced displacement. Not only are 'environmental refugees' not formally recognised within policy space, but they are presented as a threat to the national security of the United States and Western Europe. This is based on the generalised assumption that the involuntary displacement of people, alongside resource scarcity, will result in violent conflicts which compromises state security (McLeman, 2011). This narrative of violent conflict related to environmental change reflects the work of Homer-Dixon (1999) who asserted that resource scarcities can contribute to violent intra-state conflict. These sorts of narratives ignore more complex political concerns, including issues of power relations (Hartmann, 2011). McLeman (2011) further recognises the issues of assuming environmental displacement will lead to violent conflict, explaining that conflicts are just as likely to arise from

resource abundance as resource scarcity. Statistics show that conflict levels are declining, yet the discourse uses conflicts in Africa (such as in Darfur) to frame the debate (Nordas and Gleditsch, 2007).

Swartz and Doug (2003, p.3) cite abrupt climate change as an immediate threat to the United States' national security, despite the possibility of this scenario being 'uncertain and quite possibly small'. It is important to consider this stance as much of the resultant policy is likely to continue to exclude those most vulnerable to the negative impacts of climate change. Moreover, the framing of the problem as a threat to US national security seems egotistical when considering the dire consequences of those forced to flee their own countries due to reasons including food shortages and decreased availability of fresh water (Swartz and Doug, 2003, p.14), which are fundamental human rights. This neomalthusian [1]narrative seems to distract from the real issue at hand: that millions of lives are at risk (Hartmann, 2010).

Despite the largest movement of people resulting from climate change being from within vulnerable countries (McLeman, 2011), the discourse surrounding climate-based migration seems to focus on the negative implications faced by countries such as the US, instead of concentrating on discussion and resolutions for those vulnerable populations. A refocusing of the debate is needed to attempt to resolve the issues faced by increasingly vulnerable populations, instead of being geared towards wider national security contexts (Hartmann, 2010).

This consideration of the rhetoric surrounding 'environmental refugees' leads on to a reflection on the ethical aspects of the debate. The framing of the issue as a 'climate war' is arguably a defensive strategy, which seems to reflect colonial pasts. Surely there is a duty from those countries which have contributed the most to climate change to provide aid for those displaced peoples, instead of presenting them as a threat to national security. Industrial growth over the past two centuries has relied predominantly on fossil fuels which release carbon into the atmosphere. Scientific evidence has revealed that this contributes to an enhanced greenhouse gas (GHG) effect, warming the planet (Clark, 2008). Lynas (2003) raises questions about which sectors of humanity have had the most impact on climate change, and which groups are most likely to suffer the worst consequences. The example of Tuvalu is used, as the population argues that larger and more affluent nations should take responsibility for the climatic changes, as the consequences being suffered are caused by industrialised countries (Lynas, 2003). This discussion relates to the academic discourse of Moral Geographies which explores dynamics such as geographical distance from others and explores the past, present and future, questioning responsibility in relation to relationships between people and places (Smith, 2000). We must consider our moral

[1] Neomalthusism is the advocacy of population control programs to ensure resources for future populations.

duty to those in distant territories to whom we are entangled through human-induced climate change (Clark, 2008). Singer and Fei (2016) address the issue of fairness and climate change and discuss the methods of allocating GHG emission quotas to different countries, questioning whether we should reflect on historical emissions. This reflects on ethical questions within the migration debate such as: should governments and policies account for historical environmental damage by providing a home for those displaced by this damage?

Murphy (2015) discusses the mobilities and immobilities of those negatively affected by climate change. Populations tend to be 'trapped' as a result of under-development, uneven development and in-migration from rural areas to urban areas located in LECZ (Murphy, 2015). The ethical debates of climate-induced migration are reflected here, as we must consider our duty to provide a solution to the 'immobility' of vulnerable populations.

From interrogating the rhetoric and ethics behind the climate-induced migration debate, we have considered the complexities of the issue at hand and the need to re-focus attention on the vulnerable populations. Reflecting on how immobility is affected by climate change is fundamental for efforts aimed at identifying support strategies for exposed populations (Murphy, 2015). Further deliberation should be made into the multi-causal and varying temporal and spatial implications of the situation (Murphy, 2015). Consideration of the spatial differences both in physical environmental changes and the social outcomes of these changes is important (Nordas and Gleditsch, 2007). There is not a 'one-size-fits-all' approach to be taken, and it may vary from the household level to the regional to the national.

We must also acknowledge that there are multiple causes of mobility according to existing economic, political, social, environmental and demographic contexts (Black et al., 2011). This raises further difficulties when categorising 'environmental migrants' due to the lack of consideration of these multiple factors. Murphy (2015, p.380) describes this as a 'blunt tool with which to address the vastly different implications of distinct patterns of human mobility'. There is a need to move away from binary categories which may not consider the complex and context-specific causes of migration (Hartmann, 2010).

Looking towards the future, McLeman (2011) defines two options: reducing climatic triggers for distress migration or building greater capacity within vulnerable populations so they may adapt through means which do not lead to distress migration or conflict. Currently these sorts of resolutions are not seen within policy discussions. 'Environmental refugees' were not central to the talks in the Paris Climate Agreement, and terms such as migration and mobility are absent from the documents (Lieberman, 2015). There needs to be a deep consideration and re-focus of policy spaces such as in the Paris agreement to consider challenges to human mobility and alleviate issues of vulnerability. Analysing the current issues of the discussion guides us to re-engage with the politics of migration and take a more

ethically considered approach to accommodating displaced peoples.

The Nansen Initiative is an example of aid for displaced populations which should be reflected upon within policy space (Lieberman, 2015). The Initiative was launched by the Swiss and Norwegian governments in 2012 to address the gap in international law which fails to provide assistance and assurance to people displaced by disaster (Kälin, 2015). The initiative is aimed at building a consensus on protection agenda for people displaced by climate change and advocates legal rights for climate refugees. Moreover, the initiative recognises the current inadequacy and insufficiency of protection for people forcibly displaced by destructive climatic events (The Nansen Initiative, 2017). The approach taken is bottom-up, state-led and seeks to develop a protection agenda which considers regional needs. The holistic approach taken by the Nansen Initiative consults states, civil society, academics, international organisations and affected communities which is more suitable and sustainable than the current singular top-down approach of policymakers (Kälin, 2015). The approach has been developed to understand the importance of preventing displacement as well as planning relocation or voluntary migration to avoid otherwise inevitable negative impacts. The plan also fills a gap in the complexity of the topic, which has previously been discussed which relates to the multi-causal nature of displacement. This recognises the gradual consequences and the importance of the context of disasters and climate change rather than them being exclusively caused by disaster events (Kälin, 2015). This Initiative exemplifies steps towards identifying the rights and requirements of 'environmental refugees' and the complexity of the causes of displacement.

Six years have gone by since the writing of McLeman's (2011) document. Since then, Trump's election and Brexit have significantly impacted the migration debate. These populist type movements reflect intended progression towards more restricted movement which will have implications the global refugee population in general including 'climate refugees'. As this essay has explained, there is an increasingly pressing need to address the debate of 'climate refugees' and this is augmented in an era of closing borders and increased national security. Development of initiatives such as the Nansen Initiative may enable the prevention of neglecting the needs of refugees, and provide a space for discussion which includes the states, academics, international organisations, sending societies and receiving societies. However, the significant events of the US election and the Brexit vote point towards a need to push these ideas upwards into policy space in order for countries to be legally obliged to take responsibility and protect these vulnerable populations. There is a need for dialogue between the various groups involved with an emphasis on the connection between vulnerable populations needs and resulting policy decisions.

In conclusion, discussions surrounding the increasingly significant debate of climate-induced migration must be considered critically. The framing of the

debate from the perspective of receiving countries such as the US tends to be defensive and does not ethically consider the negative tangible implications of displacement on vulnerable populations. There is currently a protection gap in policy, as recognised by the Nansen Initiative (2017). There needs to be a refocusing of the debate to account for this gap, with the Nansen Initiative exemplifying a step in the right direction of alleviating the problems of displacement by taking up a bottom-up, regional approach. The issue is progressing rapidly, with more and more people being displaced annually. The significant events of the Brexit vote and the US election are likely to result in a reduction of migration in general. This should be accounted for in the re-focusing of the debate in order to provide appropriate sustainable and ethical international policy.

References

Bawden, T. (2015, September 7) Refugee crisis: is climate change affecting mass migration? *The Independent*. Retrieved from: http://www.independent.co.uk/news/world/refugee-crisis-is-climate-change-affecting-mass-migration-10490434.html

Biermann, F., Boas, I. (2010). Preparing for a Warmer World: Towards a Global Governance System to Protect Climate Refugees. *Global Environmental Politics*, 10(1), pp. 60-88.

Black, R., Adger, N. W., Arnell, N. W., Dercon, S., Geddes, A., Thomas, D. S. G. (2011). The effect of environmental change on human migration. *Global Environmental Change*, 21S, pp.S3-S11.

Clark, N. (2008). 'Climate changes: island life in a volatile world', in Clark, N., Massey, D., Sarre, P. *Material Geographies: a world in the making*. London: Sage, pp.7-55.

Ferrie, J. (2017, January 19). Climate change and mass migration: a growing threat to global security. *IRIN News*. Retrieved from: https://www.irinnews.org/analysis/2017/01/19/climate-change-and-mass-migration-growing-threat-global-security

Hartmann, B. (2010). Rethinking climate refugees and climate conflict: rhetoric, reality and the politics of policy discourse. *Journal of International Development*, 22(2), pp.233-246.

Homer-Dixon, T. (1999). *Environment, scarcity and violence*. Princeton, NJ: Princeton University Press.

Kälin, W. (2015). The Nansen Initiative: building consensus on displacement in disaster contexts. *Forced Migration Review*. Retrieved from: http://www.fmreview.org/climatechange-disasters/kaelin.html?text_size=large-text

Lieberman, A. (2015, December 22). Where will the climate refugees go. *Al Jazeera*. Retrieved from: http://www.aljazeera.com/indepth/features/2015/11/climate-refugees-151125093146088.html

Lynas, M. (2003, October 5). At the end of our weather. *The Observer*. Retrieved from: https://www.theguardian.com/environment/2003/oct/05/scienceandnature.observersciencepages

McLeman, R. (2011). *Climate change, migration and critical international security considerations*. Switzerland: International Organisation for Migration.

Murphy, D. W. A. (2015). Theorizing climate change, (im)mobility and socio-ecological systems resilience in low-elevation coastal zones. *Climate and Development*, 7(4), pp.380-397.

Myers, N. (2002). Environmental refugees: a growing phenomenon of the 21st century. *Philosophical Transactions of the Royal Society London: Biological Sciences: Series B*, 357(1420), pp.609-613.

The Nansen Initiative (2017). *The Nansen Initiative: Disaster-induced cross-border displacement*. Retrieved from: https://www.nanseninitiative.org

Nordas, R., Gleditsch, N. P. (2007). Climate change and conflict. *Political Geography*, 26(6), pp.627-638.

Singer, P., Fei, T. (2016). 'Fairness and climate change', in Singer, P. *Ethics in the real world: 82 brief essays on the things that matter*. Princeton: Princeton University Press, pp.260-263.

Smith, D. M. (2000). *Moral Geographies: Ethics in the World of Difference*. Edinburgh: Edinburgh University Press.

Swartz, P., Randall, D. (2003). *An abrupt climate change scenario and its implications for United States national security*. Washington, DC: Environmental Media Services.

UN High Commissioner for Refugees (1951). *Convention and Protocol Relating to the Status of Refugees*. Retrieved from: http://www.unhcr.org/3b66c2aa10

Driving Innovation: Fueling the Transition from Rust Belt to Brain Belt

By: Nicolo Jimenez

The purpose of this paper is to analyze the emergence of Brain Belt economies that have replaced the previously prominent Rust Belt in the United States. This study argues that waves of deindustrialization and neoliberalism have cemented a place of no return to prominent secondary sector dominance of old. Despite attempts to appeal to the nostalgia of the manufacturing belt and bring back the industries of old in the Trump era, a rigorous analysis of the economic and historical geography of the region highlight the transition from the traditional provision of goods to a more robust sector centered on services. Drawing on a shift-share analysis of Akron, Ohio and Pittsburgh, Pennsylvania to outline the growth and decline of particular sectors of industry, this research provides a trajectory for the future of these two states as cities trying to reinvent themselves into Brain Belts.

The economy of United States has undergone several transformations over the past century. A notable feature of these changes is a general trend that is dependent on a shift from the production of goods to the provision of services (Bluestone & Harrison, 1982; Knox & McCarthy, 2005; Neumann, 2016). Although manufacturing belts have contracted differently across space and time, this can be seen in the situation of Akron Ohio, where only sixty years ago, the rubber industry employed more than 50,000 people. By the 1980s, however, most jobs have disappeared following the exit of three of the four major tire companies (Putre, 2016). Despite the decay of industry in Ohio, there is a sense of optimism for a new path of transformation and growth. This paper will look to outline the historical context of the American Rust Belt through the lens of deindustrialization and neoliberalism, examine the discourses around capital mobility, and demonstrate though a shift-share analysis that recent trends are irreversible. This analysis is applied in two cities that demonstrate reinvention: Akron, Ohio and Pittsburgh, Pennsylvania.

Ripple Effects of Deindustrialization

Often coined the "Rust Belt," this region refers to an economically devastated region home to manufacturing industries and geographically tied together by major waterways such as the Great Lakes, the Ohio, Mississippi, and Missouri Rivers (Winder in Warf, 2010; Bluestone & Harrison, 1982; Knox & McCarthy, 2005). Stretching from New York to parts of Iowa in the United States, the term was also applied to geographies north of the border in cities like Hamilton, Ontario, as well as

east to Europe, where, "the steel and coal country, from Lille to the Ruhr to Sheffield and Glasgow, was *corroding* as well" (Neumann, 2016, p. 5; emphasis mine). Moreover, "Rust" in the term "Rust Belt" refers to deindustrialization, urban decay, and loss in industrial economic power that occurred in these areas.

Deindustrialization refers to the large-scale loss of manufacturing jobs and "reflects the mobility of capital, its constant and restless search to minimize costs and maximize profits, and its mounting ability to pit places against one another" (Warf, 2010, p. 700). With major disruptions beginning in the 1970s, the International Monetary Fund noted that in 23 of the most advanced economies, employment in the manufacturing sector declined from about 28 percent of the workforce in 1970 to roughly 18 percent in 1994. Looking at the United States as one of the earliest countries to undergo deindustrialization, the share of manufacturing employment fell almost simultaneously with the collapse of the Fordist systems of production, from a peak of 28 percent in 1965 to 16 percent in 1994 (International Monetary Fund, 1997; Warf, 2010).

The Engine of Neoliberalism

The movement towards a post-industrial economy in the United States was not in isolation, but embedded in global systems and flows. The processes of trade liberalization, competitive capitalism, and neoliberalization that drove declines in manufacturing in the US and its transition to service and finance sector economies took place as a result of coordinated action by elected officials on both ends of the North Atlantic (Neumann, 2016). Scholars like David Harvey (2005) have also agreed with the intentionality with which these changes took place during the late 1970s and early 1980s. Stemming from the post-war industrial boom, a new type of global order of neoliberal theory was manufactured by prominent figures such as Ronald Reagan, Deng Xiaoping, Margaret Thatcher, and Paul Volcker emerged (Harvey, 2005; Peck & Tickell, 2002). Neoliberal theory and practice focuses on rolling back state intervention and opening markets to international fluctuations, and coupled with other globalization processes discussed, can provide some explanation for the deindustrialization of the Rust Belt. Mark Pendras speaks against the tendency to normalize capital mobility as a phenomena or inevitable process, but rather, "see [the] political character of capital mobility [and] the political conditions that enable the mobility of capital" (Pendras 2009a, p. 1692; Pendras, 2010).

With cities at the center of globalization, they are embedded "in an international division of labor (IDOL) in which they compete with one another to occupy particular economic roles" (Hobor, 2013, p. 421). Cities in the Great Lakes Region have felt the pressure from this movement through the notions of off-shoring and outsourcing. Moreover, this

regional economy has become particularly vulnerable as a result of lower cost manufacturing overseas (Pacione, 2009). Competition, coupled with increased automation and a new demand for services has driven industrial employment out of North America. As a result, in these troubled manufacturing centers, "the late twentieth-century changes to local economies, to the built environment and to social relations are best understood as an acceleration of processes," resulting in the pervasive emergence of neoliberalism following the post-war period (Neumann, 2016, p. 12; Peck and Tickell 2002). These changes with regards to the mobility of capital is a subject of great inquiry and relevance as it relates to an "America First" White House.

Confronting Capital Mobility

To tackle the discourse around place-based and placeless capital in the industrial transition, the subject of capital mobility emerges. As a ubiquitous and complicated geography, Mark Pendras defines the mobility of capital as "the ability of capital investment and production facilities to be shifted from one place to another" (2010b, p. 480). Related to mobility of capital is capital switching, whereby through capitalist accumulation, "capital 'switches' from production per se into production of the urban built environment as a means to absorb surplus capital" (Christophers, 2011, p. 1347). This follows the work of David Harvey's laws of motion inherent to the capitalism system (1989). From this notion, in order for capital to thrive, it requires a double-edged sword of both fixity and mobility.

As it pertains to fixity, capital finds shelter and residence in the built environment. Through spatial constructs and configurations, the flow of investment and goods from boom and bust cycles are housed in designated silos of accumulation. These warehouses ensure capitalists can have the ability to both generate a surplus as well as finance and satisfy accumulation needs. On the other side of the sword, due to the acceleration of neoliberalism and globalization, capital is able to exit the system and become mobile by "abandoning social and physical investments in one place and starting over somewhere else" (Pendras, 2010b, p. 481). This process of abandoning investments and moving somewhere else is a direct reflection of what happened to the Rust Belt.

Winning the Rust Belt

Following global economic restructuring in the late twentieth-century, many cities have been left struggling to compete and sustain the manufacturing-intensive jobs that remain. The question then, is why "do politicians continue to pose in front of derelict industrial landscapes for dramatic effect when the role of heavy industry in the U.S. economy has been shrinking for so many years?" (Pendras, 2010b, p. 478). This looks to the rhetoric of president Donald J. Trump, the 45th President of the United States, who has been concerned with one focal point: to 'make

America great again'. His campaign platform has evoked powerful sentiments of nostalgia profoundly reverberating in the jobs that existed in the Rust Belt. In order to understand the narratives present today, it is vital to analyze the discourses that first emerged in connection to a specific place or region. Forced to tackle economic and political restructuring, Neumann contends that the discourse and language used to describe the industrial transition intensified dramatically in the late twentieth century:

> *"On the ground in economically troubled cities, 'deindustrialization' and 'post-industrial society' functioned as rhetorical devices through which urban constituencies articulated competing visions for cities [...] Planners and politicians embraced the positive connotations of the forward-looking 'post-industrial society.' Labor activists preferred the term 'deindustrialization,' which evoked powerful place-based imagery of abandoned factories and boarded-up buildings in a way that 'post-industrial' did not"* (2016, p. 9-10).

Trump understands that these labor activists and citizens see these characteristics of the Rust Belt such as the abandoned factories as a huge loss in jobs and economical strength. Trump evoked imagery of 'the good old days' to working class Americans who have seen the very best and worst over the span of just over half a century by standing behind old manufacturing plants and warehouses while campaigning and now into his presidency. Donald Trump acts as if he is the only one who can fix the situation and has sole monopoly of knowledge on how to do so. His platform focused on doing whatever it would take to bring the return of jobs and capital back into the Rust Belt. The provocation *TRUMP DIGS COAL*, is common jargon associated with a specific place and time. Using the word "dig" is synonymous to a sense of enjoyment, and "coal" speaks to the economy of the 1950s and 1960s. It is interesting that Trump chose to target these deindustrializing areas as a leverage tool to his advantage, even through this transition to the Brain Belt is an irreversible practice; which we will see in the next section.

Trump's ammunition to champion such a strong support base is the bid to renegotiate trade deals such as the North American Free Trade Agreement (NAFTA), slash taxes impeding growth, and pull out of international commitments such as the Paris Climate Accord In addition, his over- and under-tones have added a "twist to the conservative interpretation by blaming immigrants and foreign nations for 'stealing' US jobs, a move intended to fuel the resentment that Trump ultimately rode to the White House" (Walley, 2017, p. 231). Effectively capitalizing on key battleground, swing states, Trump turned the Rust Belt 'red' by arguing that he, and he alone, had the keys to the ignition to jumpstart heavy industry once again. With so much nostalgia tied to one place, the context behind the aftermath is of critical importance to understand the trajectory of the United States economy today.

Shift-Share Analysis

To evaluate changing trends in the United States regarding the industry employment, this paper employs a shift-share analysis on two key Rust Belt cities, Akron, Ohio; and Pittsburgh, Pennsylvania. The methodology behind this analysis highlights two main principles: First, the "mix" or "share" effect looks at local employment in a particular sector at the start of a certain time period, multiplied by the difference in the national growth for that sector and the national growth rate for all activities. Second, the "shift" or "local growth" effect compares the local employment in a particular sector at the beginning of a certain time period, multiplied by the difference in the local growth rate for that sector and national growth rate for that sector (Wyly, 2017). The time frame chosen for this analysis is the period between 2007 to 2012. This allows for a study of trends before the economic recession in 2008, and examines how cities are responding a few years later.

Table 1. Total Employment by Industrial Sector, United States of America and Akron, Ohio, 2007 and 2012.

	USA			Akron, Ohio		
	2007	2012	pct change	2007	2012	pct change
Farming	2,664,000	2616000	-1.80	1,380	1,351	-2.10
Mining	1,012,300	1,328,700	31.26	1,281	1,010	-21.16
Utilities	580,600	575,200	-0.93	1,315	1,028	-21.83
Construction	11,462,000	8,830,900	-22.95	21,848	18,322	-16.14
Manufacturing	14,471,800	12,596,500	-12.96	49,196	41,294	-16.06
Wholesale Trade	6,583,600	6,300,100	-4.31	19,643	19,763	0.61
Retail Trade	19,022,300	18,184,800	-4.40	46,373	42,786	-7.74
Transportation and Warehousing	5,948,900	5,838,400	-1.86	13,150	16,012	21.76
Information	3,556,900	3,257,900	-8.41	5,697	5,008	-12.09
Finance and Insurance	8,802,600	9,985,200	13.43	15,127	17,815	17.77
Real Estate, Rental, and Leasing	7,766,500	8,243,200	6.14	12,607	12,941	2.65
Professional, Scientific, and Technical Services	11,937,100	12,244,700	2.58	23,500	23,990	2.09
Management of Companies and Enterprises	1,959,600	2,166,800	10.57	14,024	15,618	11.37
Administrative and Waste Management Services	11,077,500	11,087,500	0.09	28,826	25,732	-10.73
Educational Services	3,728,800	4,196,400	12.54	6,935	7,347	5.94
Health Care and Social Assistance	18,013,300	19,855,000	10.22	47,683	52,043	9.14
Arts, Entertainment, and Recreation	3,710,100	3,997,600	7.75	8,541	8,582	0.48
Accomodation and Food Services	12,267,000	12,798,500	4.33	27,893	27,402	-1.76
Other Services, Except Public Administration	10,215,200	10,544,200	3.22	22,283	22,413	0.58
Government and Government Enterprises	24,254,000	24,101,000	-0.63	52,071	48,921	-6.05
Federal, Civilian	2,784,000	2,875,000	3.27	2,284	2,256	-1.23
Military	2,042,000	2,055,000	0.64	1,762	1,809	2.67
State and Local Government	19,428,000	19,171,000	-1.32	48,025	44,856	-6.60
Total full- and part-time employment	203,288,100	202,849,600	-0.22	471,444	458,299	-2.79

Source: U.S. Bureau of Economic Analysis (Annual). *Regional Economic Information System* . Washington, DC: U.S. Department of Commerce.

Table 2. Shift-Share Analysis, United States of America and Akron, Ohio, 2007 and 2012.

	Mix Effect	Local Growth Effect	Combined Effects
Farming	-22	-4	-26
Mining	403	-671	-268
Utilities	-9	-275	-284
Construction	-4,968	1,489	-3,479
Manufacturing	-6,269	-1,527	-7,796
Wholesale Trade	-803	966	162
Retail Trade	-1,942	-1,545	-3,487
Transportation and Warehousing	-216	3,106	2,890
Information	-467	-210	-677
Finance and Insurance	2,065	656	2,721
Real Estate, Rental, and Leasing	801	-440	361
Professional, Scientific, and Technical Services	656	-116	541
Management of Companies and Enterprises	1,513	111	1,624
Administrative and Waste Management Services	88	-3,120	-3,032
Educational Services	885	-458	427
Health Care and Social Assistance	4,978	-515	4,463
Arts, Entertainment, and Recreation	680	-621	59
Accomodation and Food Services	1,269	-1,700	-431
Other Services, Except Public Administration	766	-588	178
Government and Government Enterprises	-216	-2,822	-3,038
Federal, Civilian	80	-103	-23
Military	15	36	51
State and Local Government	-532	-2,534	-3,065
Totals	-1,245	-10,883	-12,128

Comparing the United States as a whole, and Akron, Ohio, the overall percentage change and decline in secondary manufacturing employment appears to be striking. The change from 2007 to 2012 resulted in a loss of -12.96% in the United States and a decline of -16.06% in Ohio (See *Table 1*). Examining the resultant mix effects and local growth effects through a shift-share analysis, calculations yield a total of -6, 269 for the mix effect and a local growth effect of -1, 527 for manufacturing (See *Table 2*). The mix effect illustrates the consequences of a particular pattern or trend of specialization for a region's growth or decline. With a -6,269 mix effect, Akron, Ohio's specialization in low-growth activities comes as a result of new economic and political restructurings on a global scale. The same can be said with regards to the local growth effect of -1,527, which outlines the consequence of difference between local and national activity for the same industry whereby the figures echo the historical and present context embedded in the new trajectory and world order.

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A similar analysis can be drawn from Pittsburgh, Pennsylvania during the same timeline (See *Table 3*). Pittsburgh experienced a change of -9.75% in comparison to the national score of -12.96% in manufacturing. In addition to having a lower percentage change in manufacturing

Table 3. Total Employment by Industrial Sector, United States of America and Pittsburgh, Pennsylvania, 2007 and 2012.

	USA			Pittsburgh, Pennsylvania		
	2007	2012	pct change	2007	2012	pct change
Farming	2,664,000	2616000	-1.80	8,300.00	8,450.00	1.81
Mining	1,012,300	1,328,700	31.26	9,081	14,521	59.91
Utilities	580,600	575,200	-0.93	5,704	6,108	7.08
Construction	11,462,000	8,830,900	-22.95	84,980	77,601	-8.68
Manufacturing	14,471,800	12,596,500	-12.96	103,629	93,525	-9.75
Wholesale Trade	6,583,600	6,300,100	-4.31	53,142	50,751	-4.50
Retail Trade	19,022,300	18,184,800	-4.40	159,726	152,677	-4.41
Transportation and Warehousing	5,948,900	5,838,400	-1.86	46,390	44,370	-4.35
Information	3,556,900	3,257,900	-8.41	25,082	21,846	-12.90
Finance and Insurance	8,802,600	9,985,200	13.43	75,925	90,924	19.76
Real Estate, Rental, and Leasing	7,766,500	8,243,200	6.14	44,719	48,531	8.52
Professional, Scientific, and Technical Services	11,937,100	12,244,700	2.58	101,561	105,593	3.97
Management of Companies and Enterprises	1,959,600	2,166,800	10.57	31,080	38,617	24.25
Administrative and Waste Management Services	11,077,500	11,087,500	0.09	72,953	74,584	2.24
Educational Services	3,728,800	4,196,400	12.54	55,565	60,922	9.64
Health Care and Social Assistance	18,013,300	19,855,000	10.22	195,009	204,525	4.88
Arts, Entertainment, and Recreation	3,710,100	3,997,600	7.75	29,624	33,449	12.91
Accomodation and Food Services	12,267,000	12,798,500	4.33	95,542	97,588	2.14
Other Services, Except Public Administration	10,215,200	10,544,200	3.22	83,447	81,309	-2.56
Government and Government Enterprises	24,254,000	24,101,000	-0.63	134,385	128,226	-4.58
Federal, Civilian	2,784,000	2,875,000	3.27	18,728	17,908	-4.38
Military	2,042,000	2,055,000	0.64	7,215	6,692	-7.25
State and Local Government	19,428,000	19,171,000	-1.32	108,442	103,626	-4.44
Total full- and part-time employment	203,288,100	202,849,600	-0.22	1,550,229	1,562,343	0.78

Source: U.S. Bureau of Economic Analysis (Annual). *Regional Economic Information System* . Washington, DC: U.S. Department of Commerce.

Table 4. Shift-Share Analysis, United States of America and Pittsburgh, Pennsylvania, 2007 and 2012.

	Mix Effect	Local Growth Effect	Combined Effects
Farming	-132	300	168
Mining	2,858	2,602	5,460
Utilities	-41	457	416
Construction	-19,324	12,128	-7,196
Manufacturing	-13,205	3,325	-9,880
Wholesale Trade	-2,174	-103	-2,276
Retail Trade	-6,688	-17	-6,704
Transportation and Warehousing	-762	-1,158	-1,920
Information	-2,054	-1,128	-3,182
Finance and Insurance	10,364	4,799	15,163
Real Estate, Rental, and Leasing	2,841	1,067	3,908
Professional, Scientific, and Technical Services	2,836	1,415	4,251
Management of Companies and Enterprises	3,353	4,251	7,604
Administrative and Waste Management Services	223	1,565	1,788
Educational Services	7,088	-1,611	5,477
Health Care and Social Assistance	20,359	-10422	9,937
Arts, Entertainment, and Recreation	2,359	1,529	3,889
Accomodation and Food Services	4,346	-2,094	2252
Other Services, Except Public Administration	2,868	-4,826	-1,958
Government and Government Enterprises	-558	-5,311	-5,869
Federal, Civilian	653	-1,432	-780
Military	61	-569	-507
State and Local Government	-1,201	-3,381	-4,582
Totals	14,072	1,386	15,458

than Akron, Ohio's -16.06%, Pittsburgh's total full and part-time employment experienced an overall gain of 0.78 in contrast to a -2.79% change in Akron. Turning to the shift-share analysis, a clearer interpretation is presented (See *Table 4*). However, a distinction can be made with regards to the local growth effect. Here, the local growth effect for manufacturing results in a positive 3, 325, which explains a difference between local and national in manufacturing.

The results derived from the shift-share analysis accurately reflect the historical context following the period of deindustrialization and a move towards a new division of labor fueled by neoliberalism. Conclusions from the mix effect show a total decline of 13, 205, and highlights the pattern of increased specialization and industrial jobs from 'off-shoring'. This demonstrates the pervasiveness of competitive capitalism, which has withstood threats of global

financial crisis and recession. With the fluidity and mobility of capital, Donald Trump's appeal to make America great again must do so from another vantage point; one that does not include or entail a reversal back to the 1970s. With the acknowledgment that bringing back all the jobs from the past fifty years is an almost impossible feat, cities are beginning to reinvent themselves in more nuanced ways and the Brain Belt is most definitely in power over the Rust Belt.

From Rust Belt to Brain Belt

In their book *The Smartest Places on Earth: Why Rustbelts Are the Emerging Hotspots of Global Innovation*, Antoine van Agtmael and Fred Bakker (2016) bring good news by providing a nuanced perspective filled with hope to the manufacturing belt. Championing this new wave of optimism, Agtmael and Bakker claim that North American economies are not on the decline, but rather, regaining competitiveness. Further, they advocate for a paradigm shift in thinking. Rather than heavy industry coming back, industry and manufacturing are being reinvented and reflected in new smart technologies. Instead of succumbing to cheap labor overseas, cities in the Rust Belt are able to capitalize on existing expertise and transfer that knowledge in the emerging smart economy. In the past, where industries had isolated knowledge production centers, sharing brainpower has become a vital necessity to innovation. Today, research is being conducted from a multidisciplinary approach that puts an emphasis on collaboration and builds on existing collegial knowledge and urban innovative quarters. From this notion, Rust Belt cities are reinventing themselves into Brain Belts by building on forgotten strengths and capitalizing on existing resources (Agtmael & Bakker, 2016).

Akron, Ohio and Pittsburgh, Pennsylvania are two examples of cities on the verge of innovation. As it pertains to Akron, a central figure leading the change by cultivating an environment of collaboration, is Dr. Luis Proenza, now president emeritus of the University of Akron. During his time as president, Proenza realized that although a lot of the tire industry left in the late 1900s, Akron's world-class research on polymers stayed. Moreover, "his motivation lies in a desire to advance common good through collaborative networking and building new frameworks to enhance the region's innovative ecosystem" (Bacher, 2012, p. 73). As a result, "Northeast Ohio is a place where manufacturing expertise meets innovation, a region that is transitioning from a Rust Belt to a Tech Belt, a place that is as much bits as it is bolts" (Bacher, 2012, p. 64). Building on existing research and development resources such as the University of Akron and NorTech, coupled with being in close proximity to manufacturing giants in tune with Rockwell Automation, has allowed innovators to "quickly take ideas from the research lab to the factory floor, to the consumer, and it has made the region a leader in industries like

biotech, aerospace, and advanced energy" (Bacher, 2012, p. 64).

Providing the horsepower to innovate in new ways, Pittsburgh is moving from being a household name for steel to robotics with Google and Uber (Agtmael & Bakker, 2016). Looking back to *Table 3* and *Table 4*, cities like Pittsburgh are responding to a new type of specialized demand centered around a smart economy. As it pertains to growth of total employment in the professional, scientific, and technical services sector, the percentage change in Pittsburgh was 3.97% and this industry rose by 2.58% on a national level over the period of 2007-2012. Moreover, translating these results through the medium of a shift-share analysis, the mix effect highlights a positive 2, 836. This is consistent with national trends which speaks to growth in that particular sector. In terms of the local growth effect, results of 1, 415 speak to the increase in activity from a local scale in comparison to trends on a national level. Cities in the historic manufacturing belt that are able to adapt to global demands and change by looking inwards as the fuel to reinvent themselves are positive examples in the new geographical Brain Belt.

Shaking off the Rust

Through a nuanced paradigm shift, this paper put the American Rust Belt in concert with the waves of deindustrialization and neoliberalism, critically challenged and examined the discourses around capital mobility in relation to Donald J. Trump, highlighted recent industry trends through a shift-share analysis, and looked to Akron, Ohio and Pittsburgh, Pennsylvania as case studies of two cities in the trajectory to becoming Brain Belts. The transition from a manufacturing giant to one centered around a knowledge economy and innovation takes shape in many different ways. Just as manufacturing bases expand and contract at various times, the same can be said about the ways in which cities are able to reinvent themselves. In order to make sense of the flows of capital and processes in the Rust Belt, deindustrialization needs to be seen in the global context. It is imperative to read the landscape in light of a sustained and gradual move decades in the making; whereby the local and international flows are ushered in by key stakeholders who dictate the mobility of capital. In sum, there is no simple formula or template for cities desperate to shake off their rust.

References

Antoine, V. A., & Bakker, F. (2016). *The Smartest Places on Earth: Why Rustbelts Are the Emerging Hotspots of Global Innovation*. New York, NY: PublicAffiars

Bacher, T. (2012). *Under the rust belt: Revealing innovation in northeast Ohio* (First ed.). Akron, OH: The University of Akron Press.

Bluestone, B., & Harrison, B. (1982). *The deindustrialization of America: Plant closings, community abandonment, and the dismantling of basic industry*. New York, NY: Basic Christophers, B. (2011). Revisiting the urbanization of capital. *Annals of the Association of American Geographers*, *101*(6), 1347-1364. doi:10.1080/00045608.2011.583569

Harvey, D. (1989). *The urban experience*. Oxford: B. Blackwell.

Harvey, D. (2005). *A brief history of neoliberalism*. Oxford: Oxford University Press.

Hobor, G. (2013). Surviving the era of deindustrialization: The new economic geography of the urban rust belt. *Journal of Urban Affairs*, *35*(4), 417-434. doi:10.1111/j.1467-9906.2012.00625.x

Knox, P. L., & McCarthy, L. (2005). *Urbanization: An introduction to urban geography* (2nded.). Upper Saddle River, NJ: Pearson Prentice Hall.

Neumann, T. (2016). *Remaking the rust belt: The postindustrial transformation of North America*. Philadelphia: University of Pennsylvania Press.

Pacione, M. (2009). *Urban geography: A global perspective* (3rd Ed) New York, NY; London, UK: Routledge.

Peck, J., & Tickell, A. (2002). Neoliberalizing space. *Antipode*, *34*(3), 380-404. doi:10.1111/1467-8330.00247

Pendras, M. (2009). Urban politics and the production of capital mobility in the united states. *Environment and Planning A*, *41*(7), 1691-1706. doi:10.1068/a41221

Pendras, M. (2010). Confronting capital mobility. *Urban Geography*, *31*(4), 479-497. doi:10.2747/0272-3638.31.4.479

Putre, L. (2016). From Rust Belt to Brain Belt: How Older Manufacturing Cities Are Remaking Themselves. *Industry Week*. Retrieved from http://www.industryweek.com/innovation/rust-belt-brain-belt-how-older-manufacturing-cities-are-remaking-themselves

Rowthorn, R., & Ramaswamy, R. (1997). Deindustrialization: It's causes and implications. *International Monetary Fund*. Retrieved from https://www.imf.org/EXTERNAL/PUBS/FT/ISSUES10/INDEX.HTM

United States Bureau of Economic Analysis (Annual) 2007-2012. *Regional Economic Information System* [Data file]. Washington, D. C: U. S. Department of Commerce. Retrieved from data compiled by Elvin Wyly http://ibis.geog.ubc.ca/~ewyly/Private/g350proj.html

Winder, G. M. (2010). Manufacturing belt. In Warf, B. (2010). *Encyclopedia of geography*. Thousand Oaks, CA: SAGE Publications Ltd. doi: 10.4135/9781412939591

Walley, C. (2017). Trump's election and the "white working class": What we missed. *American Ethnologist*, *44*(2), 231-236. doi:10.1111/amet.12473

Warf, B. (2010). *Encyclopedia of geography*. Thousand Oaks, CA: SAGE Publications Ltd. doi: 10.4135/9781412939591

Wyly, E. (2017). *Metropolitan economic analysis* [Lecture]. University of British Columbia, Vancouver, British Columbia.

Blood, Tusks, and Horns: An Examination of the Militarized Conservation Response to Poaching

By: Gareth Chevreau

Poaching is a major threat to the extinction of many endangered animals. The rising black market demand for goods like elephant tusks and rhinoceros horns not only harms animals but also creates a violent industry. Governments and conservation organizations are using militarized responses, creating a 'war' between poachers and wildlife agencies. The militarized response to protect animals and quell the poaching industry has largely been ineffective. This is particularly apparent in the case of rhinoceros horn poaching in Southern Africa. This paper will explore the poaching industry, both its demand and suppliers; how specific framing of poachers gains social license for a violent response; and the negative impact on local people caused by militarized conservation policies.

Introduction

Many species are, and will continue to be, threatened and endangered by poaching. As black market demand for elephant tusks and rhinoceros horns continue to rise, poachers are only further incentivized to reap greater profits – in spite of greater risks. Governments and conservation organizations have countered poaching with a militarized response, thus creating a feedback loop that has led to increased armament and violence on both sides. For example, the number of rhino poaching arrests has increased year after year: with 343 in 2013, 267 in 2012, 232 in 2011, and 165 in 2010 (South African Dept. of Environmental Affairs, 2014). The creation of a 'war' between poachers and wildlife agencies has resulted in many negative consequences including human rights abuses, the assault and killing of local people, and the perpetuation of violence. This paper will argue that a militarized conservation response is ultimately ineffective in addressing the problem of poaching, the underlying socioeconomic factors behind poaching, and in protecting endangered species. This will be explored through first examining what is currently fueling the poaching industry and what motivates individuals to become poachers; secondly, how poachers and the act of poaching is strategically framed in the popular discourse to legitimize a militarized response; and thirdly, the impact of militarized responses and their subsequent policies like 'shoot-on-sight'. A case study of rhinoceros horn poaching in southern Africa will be used to illustrate these topics of focus.

The Poaching Industry

The poaching industry is a global network that supplies animals and valuable parts of animals to the black market. Duffy

(2014) defines poaching as "the hunting of any animal not permitted by the state or private owner" (p. 828). Certain cultures significantly value animal goods, with common examples being elephant ivory, rhinoceros horns, and shark fins. For example, in the 1970s and 1980s, there was large demand in Europe and North America, as well as in China and Japan, for ivory, which was not being met with the legal supply (Duffy, 2014, p. 830). This led to dramatically increased poaching and the stockpiling of illegal ivory, which "halved Africa's elephant population in 20 years, from 1.3 million to just 600,000" (Duffy, 2014, p. 830). The main case that this paper will examine pertains to rhinoceros horn poaching in southern Africa. Rhino poaching has significantly escalated in South Africa, with an average of 1.83 rhino poached per day in 2012, which was up from 1.23 in 2011, 0.91 in 2010, and 0.33 in 2009 (CITES, 2013, p. 5). Moreover, the country of South Africa itself holds "83 percent of Africa's and 73 percent of the world's approximately 28,000 remaining rhino", with over half in Kruger National Park (Lunstrum, 2014, p. 820). Currently, demand is rising for rhinoceros horn from Vietnam and China due to a larger affluent consumer base that places high value on the horn for "perceived medicinal properties" (Lunstrum, 2014, p. 820-821). This rising demand has led to an increase in "the involvement of sophisticated crime syndicates" (Humphreys & Smith, 2014, p. 801). Fetching prices at US$65,000 per kilogram on the black market, criminal organizations are highly motivated to reap the growing financial rewards from poaching these endangered animals (Lunstrum, 2014, p. 821). Through both the presence of high prices for poached goods, as well as growing demand due to the increased affluence in the Far East, poaching continues to be a thriving and profitable industry- despite its illegality.

The immense profits available and growing demand has transformed both the extent and efficiency of poaching. Previously, a "relatively haphazard activity", poaching has become a "highly organized enterprise and commodity chain" (Lunstrum, 2014, p. 821). These criminal syndicates "actively contract men on the supply end to do the poaching, paying between US$1,000 and US$9,000 per kilogram" (Lunstrum, 2014, p. 821). Those contracted are often vulnerable individuals being exploited by local representatives of larger international poaching syndicates. Their relatively limited pay in contrast to the end sale of the horn reflects the exploitive and callous disregard that is afforded both the animals and the local people; both are treated as disposable. However, it is worth noting that earning between US$1,000 to US$9,000 per kilogram is a significant amount of money in the countries where the poaching is occurring. For example, in 2016, Mozambique's gross national income (GNI) per capita was US$480 (World Bank, 2017, p. 3). The significant amount of money available to potential poachers drives participation, often out of a place of desperation and a lack of consistent employment opportunities. Due to dire socioeconomic prospects and limited alternatives to sustain and provide for their families, individuals are pushed into the poaching trade as it offers a path for sustenance, despite the growing risks of

imprisonment, injury, and death. Describing poaching in South Africa, Humphreys and Smith (2014) state that the "demographic profile of the individual rhino shooter is almost always that of an impoverished black from South Africa or Mozambique" (p. 802). It is not surprising then, given the increasing pressure to obtain the rhino horn, that there has been a parallel increase in violence between the combatants: those who poach and those who wish to stop them.

The Framing of Poaching

Framing is an important strategy used to legitimize, manipulate, and shape certain responses and perceptions. With wildlife under threat of endangerment and extinction due to overexploitation and poaching, how the situation is perceived influences future action and social license of government and conservation agencies. Duffy (2016) argues that poachers are being defined in terms that invite a "more forceful approach to conservation" (p. 243). The framing of threatened animals is important to first unpack. The rhinoceros in South Africa has come to embody the nation due to its symbolism of the Country's rich natural heritage and biodiversity. Thus, as Lunstrum (2014) states, "an attack on the animal becomes an attack on the nation itself, economically, ecologically, and symbolically" (p. 821). In the 1980s, mainstream conservation ideology and rhetoric started to view wildlife as "belonging to an expanded moral community" (Lunstrum, 2014, p. 819). The belief in the intrinsic value of animals, and their connection to national identity legitimizes and allows for a certain response. By placing such value on the rhinoceros and other animals, militarized and violent actions become justifiable in the name of biodiversity protection and the preservation of a national myth and identity.

Framing poaching, and poachers themselves, as explicitly negative allows for a militarized response. How these individuals are perceived in the greater social consciousness legitimizes violence in the name of, and for the protection of, biodiversity conservation. Poachers are denigrated and construed as "ruthless and morally lacking", thus justifying violent actions against them (Lunstrum, 2014, p. 819). The representation of poachers as "immoral or less civilized in their treatment of wild animals" is used to frame them as "less worthy of full moral consideration" (Neumann, 2004, p. 833). These perceptions and constructions have concrete and material results and consequences. They allow for militarized and violent responses to be seen as "rational and ethical" tools to be employed due to the 'sub-human' values and morals associated with poachers (Neumann, 2004, p. 833). The moral inferiority that poachers are framed as having allows for an acceptance of violent actions in the name of protecting endangered animals. In their efforts to protect endangered elephants, rhinoceroses and other animals from slaughter, these policy makers and conservationists are faced with the difficulty of stopping the poachers at all costs. Military intervention has been seen as the most visible way of preventing further poaching.

A key figure leading South Africa's rhinoceros counter-poaching mission is the retired Major General Johan Jooste, who has framed South Africa as being "under attack from foreign nationals" (Humphreys & Smith, 2014, p. 796). The framing of poaching as having "foreign nationals transgressing the international border and violating national sovereignty" normalizes and further supports the calls for a militarized response (Lunstrum, 2014, p. 827). Poaching becomes not only an issue of biodiversity conservation, but also national security. Duffy (2014) states "categorizing poachers as criminals or rebel groups" justifies militarized responses that lock "poachers, rangers and associated military personnel… into the use of lethal force" (p. 831). Given the insatiable demand for rhino horn, there are few strategies available to those seeking to protect them. Though some of these will be discussed in the conclusion, it is apparent from the literature that both the militarized 'war' against poaching and the propaganda that is used to justify that militarization have not been particularly successful in protecting these animals.

The Militarized Response to Poaching

The militarization of conservation has had various impacts, one of which being the creation of an arms race with poachers. Militaries, in "post-conflict settings", reinvent "themselves and their legitimacy by putting their skills to use as anti-poaching and broader conservation enforcers" (Massé & Lunstrum, 2016, p. 229). Lunstrum (2014) coins the idea of 'green militarization', which is "the use of military and paramilitary personnel, training, technologies, and partnerships in the pursuit of conservation efforts" (p. 816). A competition between poachers, and the soldiers and rangers has emerged with each seeking to use more advanced weaponry. Anti-poaching forces have adopted new technologies such as "UAVs (drones), camera traps, thermal imaging and GPS trackers" (Duffy, 2014, p. 826). With both parties constantly advancing their tactics, a violent cycle of militarization and armament is unfolding. Lunstrum (2014) notes that as "both sides beef up resources and force in response to the other, the value of rhino horn increases accordingly, giving poachers even more incentive to poach and to fight back using militarized means" (p. 289). Militarization is a zero-sum game that leads to a focus on improving armaments and security rather than protecting biodiversity conservation and preventing poaching. It creates violent conflict, which distracts and diverts from its initial mission of protecting threatened animals.

Militarization uses violence and weapons as a means to stop the poaching of animals. It also seeks to incentivize local people to aid in anti-poaching efforts. South Africa "offers a cash reward of R100,000 for information which leads to arrest and R1 million for successful conviction of the heads of criminal poaching gangs" (Duffy, 2014, p. 823). Militarization has led to the implementation of shoot-on-sight or shoot-to-kill policies. Orders to shoot-on-sight poachers in protected areas have been issued in Kenya, Zimbabwe, Tanzania, Central African Republic, and Malawi (Neumann, 2004, p. 814). Rangers and park officials are "given permission to shoot suspected poachers rather than arrest them"

(Lunstrum, 2014, p. 819). This policy results in widespread violence and death. In Malawi from 1998-2000, park staff (who were trained by South African mercenaries) "were implicated in 300 murders, 325 disappearances, 250 rapes, and numerous instances of torture and intimidation in the Liwonde National Park" (Lunstrum, 2014, p. 819). This policy led to widespread violence and fear due to an abuse of powers by conservation officers and soldiers. Moreover, a report by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) shows that the number of recorded poached rhinos has increased year over year in South Africa. In 2008, there were 83 poached rhinos recorded, which then increased in 2009 to 122, 2010 to 333, 2011 to 448, and 2012 to 668 (CITES, 2013, p. 4). Thus, it must be asked whether militarized conservation is an effective means for protecting animals. This is especially poignant as local people are being threatened, assaulted, and killed – all while the rate of poached rhinos continues to increase.

The shoot-on-sight policy is highly problematic – and not only due to its obvious infringement on human rights. It uses a pre-emptive attack based on the "assumption that anyone found in a privately owned or state-protected area is potentially engaged in criminal behavior" (Duffy, 2014, p. 832). This assumption of guilt and immediate execution follows no due process and is left to the judgment of the militarized conservation officer. These policies have the potential to be incredibly damaging with local rural communities. As previously discussed, those who are often directly responsible for the killing and harvesting of horns and tusks are impoverished rural individuals. Further, many of them hunt small-scale game for subsistence and survival purposes yet are viewed as poachers and thus killed by enforcers (Neumann, 2004, p. 829). These deaths cause tension between communities and conservation officials that inhibit and disrupt "the potential for building strong relationships that successful long-term conservation, including anti-poaching work, depends on" (Lunstrum, 2014, p. 289). Militarized responses to conservation do not constructively address local community needs, instead exacerbating conflict and preventing effective solutions. Improving local socioeconomic conditions offers a peaceful and nonviolent solution to quell the growing poaching industry.

Conclusion

This paper has argued that a militarized conservation response is ultimately ineffective in addressing the problem of poaching, the underlying socioeconomic factors behind poaching, and in reducing the number of poached animals. This has been explored through examining the poaching industry, the framing of poaching, and the militarized response to poaching. Militarized approaches to conservation have been ineffective and counterproductive as they fail to address deeper underlying factors. Alternative actions may include empowering local rural people with meaningful livelihood activity alternatives for prosperous lives. This would prevent the draw to the poaching industry as a way of earning significant amounts of

money. Moreover, there has been a movement towards the legalization of the rhino horn trade, which would allow for the creation of rhino farms. This proposal it not without controversy, but certainly has the potential to quell the illegal poaching industry and its associated violence. Peaceful solutions, focused on combating poverty and desperation, might be the way forward to reduce the circle of violence associated with blood, tusks, and horns.

References

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). (2013). African rhinoceroses – latest trends in rhino numbers and poaching. 1-6. https://www.cites.org/sites/default/files/eng/cop/16/inf/E-CoP16i-51.pdf

Duffy, R. (2014). Waging a war to save biodiversity: The rise of militarized conservation. *International Affairs*, 90(4), 819-834. doi:10.1111/1468-2346.12142

Duffy, R. (2016). War, by conservation. Geoforum, 69(C). 238-248. doi:https://doi.org/10.1016/j.geoforum.2015.09.014

Humphreys, J., & Smith, M. L. R. (2014). The 'rhinofication' of south African security. *International Affairs*, 90(4), 795-818.

Lunstrum, E. (2014). Green militarization: Anti-poaching efforts and the spatial contours of Kruger National Park. *Annals of the Association of American Geographers*, 104(4), 816-832. doi:10.1080/00045608.2014.912545

Massé, F., & Lunstrum, E. (2016). Accumulation by securitization: Commercial poaching, neoliberal conservation, and the creation of new wildlife frontiers. *Geoforum*, 69(C). 227-237. doi:https://doi.org/10.1016/j.geoforum.2015.03.005

Neumann, R. P. (2004). Moral and discursive geographies in the war for biodiversity in Africa. *Political Geography*, 23(7). 813-837. doi:https://doi.org/10.1016/j.polgeo.2004.05.011

South African Department of Environmental Affairs. (2014). Update on rhino poaching statistics (17 January, 2014 update). *Media Releases*. https://www.environment.gov.za/mediarelease/rhinopoaching_statistics_17jan2014

World Bank. (2017). Gross national income per capita 2016, Atlas method and PPP. *World development indicators database*. 1-4. http://databank.worldbank.org/data/download/GNIPC.pdf

The Video Game Development Industry: Looking Beyond Locational Proximity

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The creative industry is of growing importance to the service economy of many countries worldwide. While locational and spatial proximity are of utmost importance for the success stories of many in the video game industry, there is a paramount need to also explore the different forms of proximities and dynamic relations in bringing about the successful operations of these creative firms. Using two case studies on the video games industry patterns and dynamics, this paper seeks to challenge the emphasis on the notion of "cluster theories". We argue that a more holistic and comprehensive approach should be undertaken in analyzing creative firms. In order to fully grasp the complex nature of creative processes and flows of knowledge, multiple geographical perspectives and alternative proximity theories have to be utilized, especially against the continuing force of globalization.

Introduction

Video game production as a creative industry

Creative industries are increasingly seen as an important sector of the service economy, a pillar of growth for many developed and developing countries. The United Kingdom's (UK's) creative industry was worth £84.1 billion per year in 2016 and it grew at twice the rate of the wider UK economy in 2015 (DCMS, 2016). According to the United Kingdom's Department for Culture, Media and Sport (DCMS), creative industries are industries that generate value based on the creation and exploitation of intellectual properties through the creative capacities and skills of individuals (DCMS, 2001).

This paper focuses on the video game industry and the development process of a video game. This development process fits well into the definition of the creative industries by DCMS. It requires collaborative work between a wide range of creative, skilled individuals (game designers, graphic artists, sound engineers, writers and even voice actors) which involves considerations of time, costs and market economics (Darchen, 2015). The study of clusters and its related theories has been well documented. More recently, the idea of 'creative clusters' has gained more attention due to their growing prominence. We argue that while localization and spatial proximity are no doubt important factors in the development, configuration and success of creative service firms, equally crucial considerations are alternative forms of proximity and the transfer of knowledge at different scales. This paper seeks to challenge the emphasis on the notion of "cluster theories" when looking at the

structural and spatial configuration of video game industries. This will be achieved by examining both the academic literature and supporting company reports.

This paper begins with a brief introduction on cluster theories and creative clusters. We will then examine alternative ideas of proximity that play important roles in the facilitation of knowledge transfer, innovation and the success of creative firms. The importance of interfirm translocal networks and interfirm relations will be discussed, showcasing how these factors facilitate both the formation of knowledge within firms and transfer of knowledge between firms. By highlighting these broader perspectives, this paper seeks to demonstrate the complex dynamics of creative firms and industries beyond the scale of the local cluster. These ideas will then be supported by the discussion and analysis of two case studies regarding the video game development sector.

Attributes of clusters and looking beyond them

Porter (2000) defines clusters as a group of interconnected and related companies and institutions of a particular industry that are connected based on shared characteristics and supplementary of each other's functions. More specifically, Malmberg and Power (2006) discussed the four attributes that true clusters should possess. First, there is usually "a spatial agglomeration of similar and related economic activities" (Malmberg & Power, 2006, p.57). Second, the activities must be "interlinked by interactions and relations of local collaboration and competition" (Malmberg & Power, 2006, p.57). Third, there should be "some form of self-awareness among the participating firms of the cluster and hence certain joint policy actions". Lastly, the cluster should be successful in one way or another (Malmberg & Power, 2006, p.57). The key argument of cluster theory is that firms which co-locate are able to survive better and enjoy greater economic performances than those that are located outside the perimeters of such clusters (Darchen, 2016). The successes resulting from co-location are possible because of the presence of traded and untraded interdependencies (Storper, 1997). Traded interdependencies are the reduction of transactional costs with proximity to other related firms, such as costs related to communication and information exchange (Coe, Kelly, & Yeung, 2013). On the other hand, untraded interdependencies are related to the socio-cultural aspects of clusters, notably the creation of informal relationships as well as face-to-face communication between firms (Coe et al., 2013). Such informal exchanges help create a local 'buzz' which encourages the transfer of tacit knowledge within the cluster (Coe et al., 2013).

However, associating the successes of firms within these clusters solely based on their physical proximity may be problematic. Clusters may not always lead to desirable outcomes, nor do they all share the same qualities. Instead of strictly defining spatial configuration as the sole criterion for a firm's success and existence, we should see it as one of many attributes that enable firms to succeed (Malmberg & Power, 2006). Video game development firms that are

structured in or as part of other spatial configurations can also be successful. In the next section, alternative concepts which contribute to the success of firms in the video game industry will be explored.

Key Concepts

Alternative proximities and innovation

Apart from the economic advantages that are often associated with clustering and physical proximity, firms can also reap benefits from alternate forms of proximities. These other dimensions of proximities are also the basis of learning and innovation for many firms (Boschma, 2004). Organizational proximity can be defined as the extent of relationships that firms share "in an organizational arrangement, either within or between organizations" (Boschma, 2004, p. 65). It involves a degree of control and restriction exercised by firms that are in a common organizational arrangement (Boschma, 2004). There is a sense of shared formal representation and practice among the firms, but informal rules and boundaries can also be found in the form of shared beliefs (Torre & Rallet, 2005). Hence, firms that share organizational proximity are able to work more efficiently by adhering to sets of formal and informal guidelines and principles, allowing for greater creative processes.

Another form of proximity that can help us examine the ways firms innovate is the idea of cognitive proximity. Given that the cognitive bases of firms differ from each other, their ability to learn and process new knowledge varies (Boschma, 2004). Cognitive proximity, then, can be seen as the level of closeness between the knowledge base of different firms (Boschma, 2004). Close cognitive proximity is needed for firms to translate, process and absorb information, knowledge and technology which they may come into contact when working with other firms (Boschma, 2004). This is needed for firms to convert or integrate knowledge into actual processes to gain economic value (Exposito-Langa, Molina-Morales, & Capo-Vicedo, 2011). As firms inherently possess different knowledge levels, having close cognitive proximity allows cooperating firms to better interpret and make sense of the world, thereby establishing similar norms, daily routines and ways of doing things (Molina-Morales, García-Villaverde, & Parra-Requena, 2014). As such, the level of cognitive proximity determines not only how well firms absorb and transfer knowledge, but also the generation of creative ideas and products (Molina-Morales et al., 2014).

Translocal interfirm relationships and networks

Apart from alternative proximities, the transfer of knowledge between firms is also dependent on their efforts in constructing translocal inter-firm relationships and networks. In addition to maintaining relationships in the localized network of clusters, many firms located in clusters develop relationships with other firms that are beyond their locale. This is especially true with the increased availability and affordability of intercommunication technologies. Once a potential partner from outside the cluster

has been found, the actions and operations of the firm will be observed while decisions are made on how much information should be shared with that potential partner (Bathelt, Malmberg & Maskell, 2004). On this note, we argue that the translocal relationships of firms are increasingly important to a firm's success, especially against the backdrop of a highly globalized world. In order to establish such "global pipelines", trust must be built up, which can be achieved through minor transactions and interactions that are less risky and do not involve much exchange of knowledge (Bathelt et al, 2004). The transfer of knowledge between firms due to these networks leads to greater creativity and innovation. Established networks and translocal 'pipelines' thus allow firms that are spatially distant to effectively exchange knowledge as well (Smith & Powell, 2004).

Furthermore, physical separation can encourage diversity in the translation of knowledge in that it is reused and adapted to different contexts and locales (Bathelt & Glückler, 2011). Distance between firms can encourage diversity through the adaptation of knowledge to different contexts. This diversity can lead to both the application of existing knowledge and the production of new knowledge (Bathelt & Glückler, 2011). Sites process the never-ending knowledge inflows and outflows from various distances and in different forms through receipt, combination and transmission (Amin & Cohendet, 2005). As such, firms should be seen as nodes of a knowledge circulation network unconfined by physical spatiality whereby embeddedness can be across different spatial scales. Therefore, for creative firms to facilitate optimal innovation, creativity and competitiveness, they maintain relationships with other firms and foster their own network of pipelines. The growth of collaborative partnerships and trust over time encourage knowledge transfer and innovation.

Case Studies and Analysis

Clusters? The unique case of the UK video games development industry

While it has been widely recognized that proximate agglomerations or clusters have helped establish the video game industry, recent scholarship has brought this into question. Darchen (2016) and Vallace (2014), for example, are debating the need for clusters to generate a "local buzz" of knowledge, as seen in the case in the United Kingdom.

The UK video game industry is an anomaly amid the dominant cluster theories for innovation and creativity. Vallance (2014) argues that video game development in the UK has a "relatively decentralized locational pattern" (p.17). He notes that many developmental studios set up in isolated regions, contrary to the expectation of co-location and localized clusters (Vallance, 2014). The decentralization pattern visible in the UK illustrates a new form of spatiality. This new form deviates from the tradition of concentrated clusters and the idea that firms must be proximate to other related media services. The dispersed nature of the developmental sector is an excellent example of this new form of spatiality, contradicting the usual patterns of clustering typical of many mature video

game development industries (Conford & Naylor, 2001; SSC, 2002).

While spatial proximity has been argued as the best way to transfer tacit knowledge, many UK video game development studios have an unspoken "non-disclosure agreement culture" (Vallance, 2014, p. 18). This non-disclosure culture refers to a mutually understood work ethic that creative knowledge will not be shared between companies or creative workers. Information is kept private in order to stay original and maximize economic gains. In the UK video game industry, tacit knowledge may not necessarily be transferred even with spatial proximity. As such, this non-disclosure culture explains their decentralization strategies since spatial proximity is not a key ingredient for success and transfer of knowledge. Many UK firms thus choose to prioritize organizational proximity instead, which is arguably more useful in fostering greater creativity among individuals and firms to avoid homogeneity within the UK gaming industry (Cornett, 2012). Organizational proximity therefore seems to be more dominant in controlling the locations of these firms, rather than spatial proximity. Spatial proximity is arguably irrelevant in the UK given the shared practice of a "closed" culture within the industry. Even if firms cluster, the protective culture of firms will limit social interactions and valuable knowledge transfers, thus may not be as successful as expected by cluster theory. Besides cheaper rents, the strategy of being in dispersed and remote locations is surprisingly preferred by many developmental firms within the UK. The UK firms do this to prevent the threat of both the replication and leakage of ideas, as well as to reduce the potential for poaches and talent loss made possible with proximity (Conford & Naylor, 2001). This is vastly different from the open practices and clustering strategy of many game developing firms so as to increase the probability for collaboration and cross-pollination with other creative firms, as well as to conveniently tap into a concentrated pool of creative professionals (Darchen, 2016; Vallance, 2014).

Beyond the spatial rhetoric of co-location for cultural and knowledge exchange, many video game development firms are increasingly seeking to scale up to increase their capacity and the number of projects to be done simultaneously. This is often to reduce the risks associated with having only one project and to reduce production costs via "economies of scale from sharing development tools, technologies, and organizational systems and processes" (SSC, 2002, p. 35). As such, by outsourcing some areas of their production (such as certain routinized production activities) rather than employing more in-house artists, firms are able to lower wage costs and scale-up to effectively manage the increased demand. As such, UK development firms are increasingly turning to international outsourcing, thereby destabilizing the hegemonic idea of situated knowledge (Vallance, 2014). Translocal interfirm relationships thus have a role to play in the transfer and sharing of some knowledge and ideas. More importantly, by engaging in such partnerships and outsourcing strategies, development firms

are able to better maintain efficiency while expanding their production capabilities (Vallance, 2014). This allows the UK firms to better focus on intra-firm creative and innovative processes. This new trend also suggests a strategic movement within the industry to organizational proximity. This shift means UK video game firms are now outsourcing and using upscaling strategies to cope with greater demand (Vallance, 2014).

UK development firms are employing design tools and reference documents between the local and outsourced firms to ensure standardization and facilitate better knowledge generation. These tactics, as part of the larger theory of cognitive proximity, help to ensure the "closeness" of ideas or work practices with a given set of rules (Vallance, 2014, p. 8). As Vallance explains, this facilitates the "correct work [to] be produced by the outsource supplier despite the geographical and cultural distance from the in-house team" (2014, p. 8). The cognitive proximity between UK firms and their partners minimizes unnecessary repetition of work and reduces the risk of mismatched ideas, which will improve the overall efficiency of how creative works are produced.

The effect of globalization is clear in the UK, through the increasing importance of translocal interfirm relationships and networks. This is particularly seen in the facilitation and management aspects of video game development firms' creative and innovative processes. Vallace (2014) noted that "due to the expansion of development team sizes and the introduction of outsourcing, knowing is spatially and temporally distributed across a wider group of people" (p. 16). Inter-firm relations and networks beyond local boundaries are therefore increasingly more important than spatial proximity. Such translocal relationships are paramount in ensuring greater success and knowledge transfer for both creative industries and for video game development.

FIFA Online: The cross-border co-development of video games

The co-development of games between geographically dispersed firms further broadens the discussion of spatiality from local clusters to global networks. FIFA Online, a video game with co-developed client programming by firms Electronic Arts (EA) and Neowiz, is a unique case in demonstrating the benefits and success of cross-border inter-firm collaboration. At the time of their collaboration, EA was located in Vancouver and Neowiz in Seoul. Despite not having the advantages of agglomeration economies in its development, FIFA Online became one of the most popular games in Korea, with over 4.4 million registered subscribers in the year of its release (Electronic Arts Inc., 2007). Such a success challenges whether firms must be spatially proximate to derive benefits in the video games industry.

First, the development of games across borders can bring several benefits. EA and Neowiz's collaboration tapped into the expertise that came with their locational niches. EA was able to use its original game titles like FIFA to increase its profit margin by expanding the platforms on which the

games were operated (Choi, 2010). In FIFA's case, EA decided to extend its production into online gaming platforms, which were popular in Asian markets. As the video game cluster in Vancouver had insufficient knowledge regarding the creation of online games, EA collaborated with Neowiz to utilize their expertise and understanding of the Asian online gaming market (Jin, 2011). On the other hand, Neowiz sought to benefit through reducing market uncertainties and risk by working on an already popular game title from EA (Choi, 2010). This was especially important due to increasing competition from countries like Japan, the US, and China, which threatened Korea's survival as a relatively new country in the game development industry (Choi, 2010). EA and Neowiz's collaboration is an example of translocal interfirm relations and global networks promoting knowledge transfer between different localities with diverse yet specific specializations and advantages. This reduces risks and stimulates creativity.

Interestingly, FIFA Online was not co-developed through the outsourcing of work such as audio or music, which is usually the case in game development (Bethke, 2003). Since products such as FIFA Online can be easily transferred between firms as completed files, there was no transfer of intangible knowledge in creating them. Rather, the game was made through the co-development of client programming. This is one of the core competencies of a game development company. Conventionally, firms are discouraged from outsourcing such programming tasks (Bethke, 2003) as it heightens the risk of leaking intellectual property in the form of the programming source code. When creating FIFA Online, the need for frequent interactions to exchange information between collaborating firms was challenged by the need to protect source code knowledge within the firm. This unique scenario led to the relationship between EA and Neowiz to be described as having "close communication but minimal intervention" (Choi, 2010, p. 131). This informal principle that the firms adhere to fosters organizational proximity. The "close communication" improves efficiency by helping to reduce misunderstandings that may occur otherwise. Therefore, organizational proximity is one way through which firms can more effectively co-develop video games. This allows greater focus on creative processes even when the firms lack physical proximity.

To achieve "close communication", cluster theory may seem useful given that when firms are physically proximate, employees can interact face-to-face. Knowledge can, however, be successfully transferred without the constant co-location of firms. In the case of FIFA Online, face-to-face interactions occurred during the pre-production and test phases, while weekly teleconferences and e-mails characterized the interactions during the development stages (Choi, 2010). Advancements in communication and transport technology thus enable firms to interact much more than before. With each interaction, firms understand each other better and align their specifications, thoughts, and working style with more coherence, thus maximizing their cognitive proximity and the effective translation of any transferred knowledge.

Once more, the facilitation and success of knowledge exchange and creative processes in the video game industry can arise even without spatial proximity.

Furthermore, Choi (2010) argues that physical co-location might increase the intervention between EA and Neowiz, which is undesirable and can lead to conflicts of interest. This is of particular concern regarding the leakage of knowledge about source codes, which is more liable to occur with the sharing of knowledge from frequent face-to-face interactions and the local "buzz" in clusters (Coe, et al., 2013). In Choi's (2010) study, interviewees who participated in the co-development process of FIFA Online highlighted that "because the source code was the product of invisible expertise and know-how, it was not easy to open up to others" (p. 132). This leads to the shared agreement of "minimal interaction" and highlights the importance of organizational proximity in keeping good understanding and relationships between firms which in turn facilitate further learning and innovation. The co-development of FIFA Online thus emphasizes the potential of close relationships and success for collaborating firms that are geographically dispersed. Such collaboration is therefore largely attributed to the alternative types of proximities involved in the operations of these firms.

Conclusion

From the evidence we reviewed in the two case studies, there is a different form of proximity than the physical kind that is operating among creative firms and more specifically the video game development industry. This does not dismiss the notion and importance of physical proximity and the many associated benefits attributed to it. Instead, a more holistic and comprehensive approach that involves multiple geographical perspectives and scales should be utilized when analyzing firms of the creative sector. This is due to the complex nature of the generation and flows of knowledge, innovation and creative works, especially when the process of globalization does not seem to be slowing down.

References

Amin, A. & Cohendet, P. (2005) Geographies of knowledge formation in firms, industry and innovation, *(12)*4, 465-486.

Bathelt, H. & Glückler, J. (2016). Global knowledge flows in corporate networks. *In The Relational Economy: Geographies of Knowing and Learning*, 1-34.

Bathelt, H., Malmberg, A., Maskell, P. (2004). Clusters and knowledge: local buzz, global pipelines and the process of knowledge creation. Progress in Human Geography, 28(1), 31-56.

Boschma, R. (2004). Proximity and innovation: a critical assessment. *Regional Studies, 39*(1), 61-74.

Bethke, E. (2003). *Game development and production*. Wordware Publishing, Inc.

Choi, J. (2010). Creative industries and global co-development: Lessons from the first successful case in korean online games. *Creative Industries Journal*, 3(2), 125-136.6

Coe, N. M., Kelly, P.F., Yeung, H.W. (2013). *Economic geography: a contemporary introduction*, 2nd edn, Wiley-Blackwell, Hoboken, N.J.

Cornford, J., Naylor, R. (2001). Cutting edges in strange places: new media debates and the computer and video games industry in the uk. *CURDS Discussion Paper, Centre for Urban and Regional Development Studies.*

Cornett, A.P. (2012). Clusters and cluster development in the knowledge economy. In K.I. Westeren (Eds.), *Foundations of the Knowledge Economy: Innovation, Learning and Clusters*.

Darchen, S. (2016). Clusters" or "communities"? analysing the spatial agglomeration of video game companies in australia. *Urban Geography, 37(2)*, 202-222.

DCMS (Department for Culture, Media and Sport). (2016). Creative industries worth almost £10 million an hour to economy. Retrieved 28 March 2017 from https://www.gov.uk/government/news/creative-industries-worth-almost-10-million-an-hour-to-economy

DCMS . (2011). Foreword. Creative industries mapping documents 2001, 4-23. Retrieved 28 March 2017 from https://www.gov.uk/government/publications/creative-industries-mapping-documents-2001

Electronic Arts Inc. (2007). Available at: http://investor.ea.com/releasedetail.cfm? ReleaseID=314487 (accessed 27 March 2017).

Expósito-Langa, M., Molina-Morales, F. X., & Capó-Vicedo, J. (2011). New product development and absorptive capacity in industrial districts: A multidimensional approach. *Regional Studies, 45*(3), 319-331.

Jin, D. Y. (2011). The digital korean wave: local online gaming goes global. *Media International Australia Incorporating Culture and Policy*, (141), 128-136.

Malmberg, A. & Power, D. (2006). True clusters: A severe case of conceptual headache. In B. Asheim, P. Cooke, & R. Martin (Eds.), *Cluster and regional development: Critical reflexions and explorations.*

Molina-Morales, F. X., García-Villaverde, P. M., & Parra-Requena, G. (2014). Geographical and cognitive proximity effects on innovation performance in SMEs: A way through

knowledge acquisition. *International Entrepreneurship and Management Journal, 10*(2), 231-251.

Porter, M. (1998). Clusters and the new economy, *Harvard Business Review, 76*(6), 77–90.

Porter, M. (2000). Location, competition, and economic development: Local Clusters in a Global Economy. *Economic Development Quarterly, 14*(1), 15-34.

Spectrum Strategy Consultants (SSC). (2002). From exuberant youth to sustainable maturity: Competitiveness analysis of the UK games software sector. *DTI*, London.

Storper, M. (1997). The regional world. New York: Guilford Press.

Torre, A. & Rallet, A. (2005). Proximity and localization. *Regional Studies, (39)*1, 47-59.

Vallance, P. (2014). Creative knowing, organisational learning, and socio-spatial expansion in UK videogame development studios. *Geoforum, 51*, 15-26.

Team Trail Six

Trail Six is only made possible by the dedication, effort and time contributed by our team of editors, authors and faculty members. This section is to recognize those who have supported us on the journey to this year's publication of Trail Six.

Editor-In-Chief

Vinson Tam

As a fourth-year undergraduate student majoring in the Environment and Sustainability program, Vinson has built up a loving passion for everything geography related since the very beginning of his university career. While his key interests lie in atmospheric sciences, he is equally fascinated by sustainable urban development, political ecology and data visualization. In the future, he hopes to work in a career where he is able to push for sustainable initiatives at the community level in an effort to further connect residents to their surrounding nature. Outside geography, Vinson loves indulging in music and mixing beats on his DJ set.

Journal Support

Melissa Lee (VP Academic)

Melissa is a fifth-year Human Geography and International Relations student. Through her love of traveling and immersion into different cultures and geographies as well as her fascination with the diversity and complexity of civilization, she knew she wanted to explore geopolitical issues. She took up her role as VP Academic in the GSA with a passionate desire to make important conversations happen and to inspire students. In the near future, she hopes to work towards her Masters of Global Affairs with a specialization in environmental issues. In her free time, Melissa likes to spend hours at book stores, go to concerts, and plan her next travel of many to come.

Trail Six Editors

Dean Abberley

Dean is a third-year undergraduate student on exchange from the University of Manchester in the UK. Dean joined Trail Six this year to explore more about geography at UBC and learn more about the publishing articles. He has studied a wide variety of topics in geography over the years, looking into moral geographies, sustainability in the global south, and the creative and cultural industries. When Dean returns to Manchester, he hopes to complete a dissertation on the exploding vegan social movement in the UK and study a Master's in governance and political science.

Andrew Butt

Andrew is a fourth (but not final) year Geography student in the Environment and Sustainability program. His passion about education, with a focus on bridging the gap between the environmental and social sciences, and love for the outdoors has driven him across the world. From Toronto where he was raised, to northern Canadian rivers, to the mountains of British Columbia, and to the wonders of overseas travel and culture, there is no telling where Andrew may end up next. He is always looking for new ways to get involved, and extremely excited to be part of the Trail Six team!

Kristina Bell

Kristina is in her fourth year of her undergrad in the Environment and Sustainability Program with a minor in International Relations. Along with being an editor, she is part of the Geography Student's Association as the Geogarden Project Manager. Kristina grew up in Whistler and loves to ski and board, and recently went on exchange in Amsterdam! She aspires to have a career in the energy/transportation/urban planning sector and is looking forward to building her professional and personal career. She's honoured to be an editor this year.

Julian Villafuerte Diaz

Julian is a fourth-year student in the Global Resource Systems program in the Faculty of Land and Food Systems. Having specialized in urban policy and community development, he has been an active member of the Geography community since enrolling at UBC. He is one of two undergraduate recipients of the 2017 Walter G Hardwick Scholarship in Urban

Studies. Julian intends to engage in the social challenges of the 21st century at the inter-urban level, and eventually pursue a Master's in Urban Planning.

Eva Fong

Eva is third year student majoring in Human Geography and minoring in Environment and Society. Out of all the wonderful things geography has to offer, she's particularly interested in cartography, ethical consumerism/consumption, and urban development. Like many geography majors, Eva plans to go into planning after her undergrad. When she's not in the geography building, you can find Eva eating with her friends, at the gym, or playing games with kids after school.

Meredith Gillespie

Meredith Gillespie is in her final year of an honours degree in Human Geography. Her academic passion lies in urban planning and the implications of neoliberalism. In her personal life, she loves hiking, biking and ice cream! She has loved the opportunity to get involved in editing a paper for an undergraduate journal. She looks forward to opportunities to produce and write academic papers in the future!

Nicholas Hare

Nicholas is a third year Environment and Sustainability major. His academic interests include human ecology, political geography, and GIS. He enjoys volunteering with local nature and historical organisations. Nicholas loves sports such as soccer and running, and as a tradition has participated in every Vancouver Sun Run since 2006.

Clea Harrison

Clea is in her fourth and final year at UBC, majoring in human geography and minoring in political science. While she loves every aspect of human geography, she is particularly fascinated by political geography and migration studies and plans to attend graduate school in the near future to further explore an undecided aspect of migration. Before diving into more school, however, she intends to spend a couple years living and volunteering in Europe.

David Li

David is a UBC undergraduate student majoring in Human Geography. His hobbies include (but are not limited to) listening to music, random trips around Greater Vancouver, and hanging out with friends. Even though geography tends to be depressing for David, he

enjoys its multidisciplinary nature and its thought-provoking topics and concepts. He became an editor with the goal of learning more about Geography in general.

Einer Lim

Einer is a 4th year Geography Student majoring in Human Geography. His interests in the field are urban management, sustainable management, and international development. After graduating this May he intends to get work experience in Canada and eventually go back to his hometown in the Philippines. Some of Einer's hobbies are swimming, hanging out with friends, and Netflix. This is Einer's first year in Trail Six.

Mielle Michaux

Despite being extremely directionally-challenged and gifted with neither flags nor capitals, Mielle is a 5th year Human Geography student who makes maps for both fun and profit. She is drawn to health geography, natural hazards, and GIS. Pretty good at colouring in the lines, too.

Sebastian Miskovic

Sebastian Miskovic is a fifth year Human Geography Major, a three-time editor for Trail Six, the Western Regional Representative of the Canadian University Press, the President of the Ubyssey Publications Society, and an avid fan of both sneakers and bow ties. His interests include all matters pertinent to the spatial distribution of populations, foreign affairs, military history, space exploration, market analysis, and videos of chimpanzees slapping lion cubs (It's a long story).

Aaron Obedkoff

Aaron Obedkoff is a third-year human geography student. His scope of study includes urban and political geography. He is very proud to be part of a faculty with such a diverse and passionate group of students. Outside of school his interests include hiking, playing guitar and brewing kombucha.

Julius Rusko

Julius is a fifth-year student majoring in Geography (Environment and Sustainability). He is excited to be involved as an editor for Trail Six working to put together another amazing volume of this fine journal. His interest within geography focuses on the changing nature of urban and transportation planning. In the future, he plans to attend graduate school with the intentions of becoming a planner in his hometown, the great city of Vancouver. In his

free time Julius enjoys playing hockey, soccer, hiking on the South Coast, and travelling to far off places.

Eva Streitz

Eva is in her third year of her Geography degree (Environment and Sustainability). While she doesn't know what she'll be doing after college, she does know that she is passionate about renewable energy policy. She hopes that someday she can help make a big shift towards a greener planet, but in the meantime, she will be skiing, climbing, and playing in the mountains.

Izzy Thiele

Izzy is a fourth-year student in Human Geography. As a budding geographer, she has immersed herself in an array of both urban and rural environments on four continents during her four years at UBC. She digs sustainability, economic geography, transportation planning, urban development, and hummus. She does not know which career path that she will pursue after her impending graduation. Instead, Izzy plans on travelling the world for as long as possible and trying all of the glorious food that every nation has to offer!

Cassandra Torres

Cassandra Torres is a second-year student in the program of Geography, Environment and Sustainability. She focuses her studies on the relation between society and the environment, and how these will be affected by climate change. Currently, she is passionate about promoting sustainable living in her community, specifically within the UBC campus. Consequently, she decided to join Trial Six this year to learn more about her community, its interest and current ongoing research. In her spare time, she enjoys hiking, running and exploring hidden unique geographical locations, like the cenotes in Mexico.

Natalie Wu

Natalie is completing her fourth and final year at UBC pursuing a major in Human Geography with a minor in International Relations. Her academic interests include international development and sustainable urban development. After completing her degree, Natalie intends to gain a few years of work experience and eventually pursue graduate studies. Outside of the classroom, she enjoys long distance running, hiking, baking and reading. This is Natalie's first year with Trail Six.

Jack Wiltshire

Jack Wiltshire is completing an undergraduate degree in human geography studying and interpreting the little cosmologies, rhetorical manipulations and imaginative ways people turn space into time and geography into history to re-imagine the world as they see fit. Mr. Wiltshire hopes to embark on endless expeditions to far off and forgotten places such as Easter Island where lost clues about our direction as a species may still be found. In his free time, this young geographer and native to Vancouver's North Shore makes the most of sea to sky country skiing the costal mountains or plunging into the Pacific.

Layout and Design

Danielle Main

Danielle is a fourth-year Geography student in the Environment and Sustainability program minoring in Biology (and obtaining a certificate of recognition for the completion of a French minor). Her plans post-graduation include a long, well-deserved nap and attending Graduate school hopefully in the near future. She has special interest in phytogeography, botany and sustainable resource management. In her spare time, she enjoys the great outdoors, dancing, adventuring and tending to her urban jungle.

Trail Six Authors

Alex Briault

Alex Briault is a fourth-year Geography student majoring in Environment and Sustainability. A lifelong love of terrible natural disaster movies sparked her interest in the study of natural hazards and, through learning to cook, her passion for issues surrounding food waste developed. Alex's favourite landmark around Vancouver is the view of the Lions on the North Shore when the weather cooperates. Though she will disagree, Alex likely drinks too much coffee. Outside of school, Alex can usually be found running and has run a half marathon with plans to run a full one after graduation.

Alice Cavanagh

Alice is third year undergraduate student from the University of Manchester currently on exchange at UBC. She is a Human Geographer, focusing mainly on sustainability and urban environments with a particular interest in learning from past and present practices in order to design a sustainable future. Over the past couple of years, she has also focused her attention on academia supporting the importance of engaging with local communities in order to provide appropriate solutions to local and global issues. Other interests outside of Geography include a passion for cooking, travelling, running and skiing.

Gareth Chevreau

Gareth is a fifth year Political Science major born and raised in Vancouver. His academic interests encompass global development and inequality as well as environmental politics and sustainability. He is passionate about the outdoors, travel, and different cuisines. Gareth is often found exploring the local mountains, planning his next trip, or confidently being out of his depth in the kitchen.

Gillian Der

Gillian is a CPR descendant on her father's side and is learning to be proud of her heritage and the resilience of her ancestors. She also follows a strong line of activist mothers with roots in the British Isles. This paper has become the catalyst to reclaiming her culture, language, and traditions. Gillian will travel this spring to Toronto to learn from the elders in her family, after which she will journey to her ancestral lands in southern China. She knows this essay is only the beginning of connecting to the rich history of the Cantonese diaspora.

Louisa Hsu

Louisa is confounded by the workings of her own mind and is constantly trying to catch up with her own likes and dislikes when planning for her future. But geography is something that runs throughout all of her different phases. She currently aspires to be a planner, but who knows when that will change! As a fourth year Environment and Sustainability student, Louisa is interested in ways to reduce the impact of human establishments on the environment. When she is not madly studying, you will probably find her munching on taro with an Agatha Christie novel in hand.

Nico Jimenez

Nicolo Jimenez is a third year Political Science and Human Geography Honours student at the University of British Columbia. His research interests include building sustainable and resilient cities, comparative politics, and state sovereignty. Nico has the privilege of working with student leaders on campus through his involvements with student government, humanitarian organizations, and orientations at UBC. During his free time, Nico enjoys playing sports, listening to podcasts, and being in community.

Tiffany Loh

Tiffany Loh is in her fourth and final year of undergraduate studies, doing an Honours in Geography and a second major in Sociology. Having lived and worked in both Singapore and Vancouver, she is an avid lover of understanding cities, cultures and society. With her unique sociological and geographical lens, she aspires to be an educator and hopes to inspire future generations in areas related to education, society and sustainability. Tiffany is also super passionate about competitive dragon boating and had created one of her fondest memories in university with her fellow teammates (*both from TeamNUS Singapore and UBC Thunder Vancouver*).

Cheryl-lee Madden

Cheryl-lee Madden, UBC, BA Arts program, Major: Human Geography 4th year is graduating May 2018. What she likes about Geography is relating statistical data into spatial data sets through cartographic modelling and coding of data sets so that she does not become either a statistic or is replaced by Siri - a spin-out from SRI International Artificial Intelligence Center. The co-authored paper, “No Freeways on the Horizon: The path to livability”, was written for the GEOG 419 class. Her hobbies are walking Henry, her pet tortoise, in Kitsilano park beside her home. See him on, YouTube, Secret Life of Henry.

Carla Urquhart

Carla is a third year Geography student majoring in Environment and Sustainability with a minor in Mathematics. Carla chose to study geography after participating in community planning workshops and neighbourhood advocacy in her East Vancouver neighbourhood. Through her studies, she developed an interest in quantitative analysis, GIS, mathematics and computer science. When not desperately trying to keep up with her coursework, Carla enjoys hanging out with her two-year-old at their local playground and cycling in the rain.