

Canadian Association of Geographers – Ontario Division
Annual Meeting Program

October 25-26, 2019

Hosted by the Department of Geography, Environment and Geomatics
University of Guelph





**COLLEGE *of* SOCIAL AND
APPLIED HUMAN SCIENCES**

DEPARTMENT OF GEOGRAPHY, ENVIRONMENT
AND GEOMATICS

October 21, 2019

Dear CAGONT 2019 Registrants,

Welcome to the University of Guelph and thank you for joining us at CAGONT 2019! The Department of Geography, Environment and Geomatics is delighted to host the 2019 annual meeting and we would like to thank the Ontario Division of the Canadian Association of Geographers for the opportunity.

This conference is an important one for the community of Ontario Geographers as well as for the broader national network of researchers, practitioners and educators that the Canadian Association of Geographers represents. Many students present their research at CAGONT conferences for the first time. We all benefit by learning from presenters and as we help to support each other along career and life paths.

We are excited to showcase our department and this campus. It is a lovely place to work and we hope you will enjoy your time. Best wishes for a productive two days!

Sincerely,

A handwritten signature in black ink, appearing to read "W. Yang".

Dr. Wanhong Yang
Chair

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CAGONT 2019 FINAL PROGRAM

Department of Geography, Environment and Geomatics, University of Guelph

Please contact us at cagont@uoguelph.ca if you have any questions or concerns.

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Friday, October 25

5:00PM – 7:00PM: Registration (Peter Clark Hall, University Centre)

5:45PM – 7:00PM: Welcome Reception (Peter Clark Hall, University Centre)
Hors d'oeuvres and light refreshments will be served – sponsored by the Department of Geography, Environment and Geomatics and the College of Social and Applied Human Sciences, University of Guelph

7:00PM – 8:30PM: Opening Plenary Panel – **Graduate Education and Training in Geography: Challenges and Opportunities** – Peter Clark Hall, University Centre

Moderator: Dr. Ben Bradshaw, Assistant Vice President, Graduate Studies, University of Guelph

Panelists:

Dr. Laura Brown, University of Toronto Mississauga – training in physical geography

Dr. Diana Lewis, Western University – working with Indigenous communities

Dr. Faisal Moola, University of Guelph – preparing for non-academic careers

Dr. Kate Parizeau, University of Guelph – mental health and the academy

Dr. Siera Vercillo, University of Waterloo – conducting feminist fieldwork

Saturday, October 26

(Please note: Abstracts have not been systematically edited and may contain typos)

7:45AM – 12:00PM Registration (Peter Clark Hall, University Centre)

8:00AM – 8:45AM Light Breakfast and Coffee Available in Peter Clark Hall, University Centre

Session 1: 8:45AM – 10:15AM

A1: Water and Resource Governance (HUTT 348)

Chair: Richard Nyiauwung

1. Coping with household water insecurity: A meta-ethnography

Meshack Achore, Queens University

Water insecurity is a key public health and developmental challenge for many communities across the world. Using a meta-ethnographic synthesis, this study examines how households cope with water insecurity and identified factors that influence their choice of coping strategy. A systematized keyword search was conducted in various electronic databases (PubMed, CINAHL EBSCOHost, Embase Ovid,

Science direct, Medline, Global Health and SCOPUS). Out of 1347 potential articles, 16 studies were selected for review. Households employed nine key coping strategies. These strategies include: employing water storage and handling techniques to preserve water after collection; constructing a water source for personal use and for sale; acquiring water from social networks; acquiring water from private vendors; applying measures to conserve and reuse water; illegally connecting or stealing from public water networks; harvesting natural water through installation of tanks; acquiring water from distant sources; and applying purification products to improve the quality of water. These coping strategies were influenced by factors such as geography, cost, time, reliability, and quality. We found that poor households, due to their over-reliance on short term labor-intensive and time-consuming coping strategies, are further economically disadvantaged by water insecurity. Achieving universal access to safe water is very important for addressing poverty and promoting population health for the underserved population.

2. How well protected are natural areas in the Lake Simcoe Watershed? Combining policy and spatial analysis

Assim Sayed Mohammed, University of Guelph

The Lake Simcoe Watershed is roughly 3,400 square kilometres of rivers, streams, and wetlands that drain into Lake Simcoe. The region is home to various environmentally sensitive areas that are vulnerable due to extensive agricultural activity, tourism, and growing residential development. In the face of these pressures, local environmental organizations and other stakeholders are asking: to what extent is the watershed protected against development, and are these protections meeting stated objectives? This research combines multi-level policy analysis and spatial analysis in order to answer this question. Development and landcover changes in the watershed are governed by the Official Plans of five municipalities, Provincial regulation (Lake Simcoe Watershed Act and Environmental Protection Act), and is managed by the Lake Simcoe Region Conservation Authority (LSRCA). Policy documents from each of these entities were analyzed to identify specific regulations that applied to landcover types and landscape features. A classification system was developed to indicate the strength of those protections. Finally, we applied the classification to the landcover types and landscape features for the entire watershed in a geographic information system and then assessed protections. A series of maps are created to demonstrate different levels of protection by policy and jurisdiction, as well as a composite map that depicts the overall state of environmental protections in the watershed under all the policies analyzed in the study. The results show that roughly 21% of the watershed's land area is heavily protected by policy, while an additional 41% is moderately protected, and the remaining 38% remains as unprotected land. These results indicate that much of the LSRCA's 40% high quality natural vegetative cover target remains only loosely protected (Lake Simcoe Protection Plan, 2009). In contrast, the majority of the unprotected area is existing agricultural and urbanized land, suggesting that most natural areas in the watershed are still protected to some degree. However, there are implications for moderately protected areas given that these policies in particular can be bypassed for certain developments, which can put those ecosystems at risk of degradation.

3. An insight into BC fisheries policy: Visualizing Historical Landings

Jasmeen Bhangu, University of Guelph

Fishing is important globally, and innumerable indigenous and coastal communities rely on fisheries for food, trade, and their livelihood. Over the last 50 to 60 years, there has been a clear trend towards private property rights-based fisheries management systems (Bennett et al., 2018; Capistrano, 2012). Under these systems, management authority and decision-making tend to centralize, and licenses and quota for valuable fisheries are allocated and exchanged through free market transactions. This means that access rights can consolidate over time and that fewer have opportunity to benefit from the resource

(Sumaila 2010, 2018). Moreover, as the number of vessels and harvesters decreases, it becomes more likely that processing facilities in smaller and more remote communities will close, resulting in larger processing facilities in centralized locations (Newell 1993; Etyorsson 2000; Bodwitch 2017). This research addresses the implementation of quota and licence limitation policies in BC by analyzing different ways in which changes in fisheries policy have impacted landings. This mixed-methods research digitized and analyzed 44 years of landing data for salmon, herring, and halibut in BC from 1951-1995. Findings have quantified and spatially represented how many fish were caught over time and how this has changed in-relation to fisheries management policies implemented by DFO. Provisional graphical and statistical results show significant differences within specific regions across time that coincide with two policies implemented in BC in the 60's and 70's; The Davis plan and Individual transferable quotas. This study fits into the broader context of fisheries research as it offers insights into fundamental questions that can be investigated in other industrialized nations where fisheries have undergone license limitation.

B1: Modelling and Conceptualizing Space and Scale (HUTT 240B)

Chair: Shawn Shao

1. Understanding the Anthropocene through scales

Alessandro Glaros (University of Guelph), Christopher Luedertiz (University of Waterloo)

The Anthropocene, as a geological epoch and societal discourse, has highlighted the symbolic and material mark of humanity's indelible effect on Earth processes. As interest piques in transitions to a more sustainable future, scholars are increasingly scrutinizing the trajectories promoted by various actors and the diverse solutions these trajectories beget. Sustainability transition researchers, resource economists, and human geographers, among others, have provided significant critical attention to the types of solutions promoted in the context of the Anthropocene. Concerns are shared over the Anthropocene's generalized scope, obscuring spatial and temporal inequalities in resource-use as well as prompting an array of seemingly contradictory actions for sustainability. In this paper, we contribute to this important body of work by providing a more geographically-nuanced understanding of actions for sustainability in the Anthropocene. More specifically, we highlight that the Anthropocene – an inherently scalar concept – can lead to dichotomous depictions of local-global, small-large scale, or alternative-conventional solutions. We are particularly interested in the discussion of 'small-scale' or 'local' actions for sustainability. Such actions can be overlooked or dismissed as ineffectual or, conversely, lauded through a 'small is beautiful' scenario; however, these simplifications fail to recognize the complementarity between diverse transition trajectories across a range of scales. We argue that diverse philosophical understandings of scale contribute to these challenges and illustrate this point through four practical examples of household gardening, baking, brewing, and woodworking. In each example, realist, hierarchical, constructivist and relational understandings of scale correspond to different interpretations of their efficacy or impact. In conclusion, we emphasize the need for scholars of the Anthropocene concept to 'take scale seriously' – that is, to recognize that diverse philosophical framings of scale lead to real material and political consequences.

2. Shape Stability of Features: Assessing Vertical Profiles of UAV Imagery

Barbara Kerr (York University), Tarmo K. Rimmel (York University), Scott W. Mitchell (Carleton University)

Natural phenomena exhibit different characteristics when viewed, represented, or interpreted at different spatial scales. Until now, it has been difficult to isolate the most informative or important scales for

specific ecological phenomena or processes. This study controls for the data acquisition platform and timing by collecting data from a camera attached to an unmanned aerial vehicle (UAV) where only the rising altitude changes the spatial resolution of each pixel. The objective of the study is to quantify mean relationships among shape/complexity and spatial resolution, and variability of relationships. We computed shape and pattern metrics at various spatial resolutions using FRAGSTATS Spatial pattern analysis program for categorical maps and GuidosToolbox MSPA (Morphological Spatial Pattern Analysis). Linear and non-linear functions were fitted to scatterplots of shape metrics versus scale to assess which functions best capture the scaling relationships. Preliminary results suggest that for small irregular features such as plants, shapes become increasingly variable at around 17 mm spatial resolution. Further statistical investigation will also examine the influence of plant size and shape on determining the spatial resolution at which degradation occurs. Determining the coarsest spatial resolution, and thus maximum height of the remote sensing sensor, is important for planning data collection when using UAVs.

3. A 4D spatio-temporal approach to modelling land value uplift from rapid transit in high density and topographically-rich cities

Chris Higgins, University of Toronto, Scarborough

The land value uplift effects of rapid transit infrastructure provide evidence of willingness to pay for more sustainable forms of development and suggest a rationale for land value capture. The present research utilizes spatio-temporal methods in a quasi-experimental research design to examine changes in property values associated with pedestrian accessibility to the West Island Line heavy rail extension in Hong Kong. Several innovations in methods and techniques are proposed that respond to the econometric challenges involved in conducting research in high density, topographically-rich cities. Of these, the paper incorporates landscape topography throughout its estimation process, including the calculation of slope-aware measures of walkable accessibility on a 3D pedestrian network and proposes a new Spherical Distance Weights method for capturing horizontal and vertical spatial association among observations in 3D space. Finally, these weights are combined with measures of temporal distance for a 4D approach that accounts for relations among observations in space and time. Results reveal a significant change in the value of pedestrian access to the new transit stations of between 26% and 41% after opening. Implications for research and practice are discussed.

C1: Special Session – Conservation, communities and ecotourism I: Rethinking prospects for symbiosis in a rapidly changing world (HUTT 234)

Chair: Caitlin Laidlaw

1. Forest Conservation and Agricultural Livelihood in Phnom Kulen National Park, Cambodia

Leah Marajh, University of Toronto

As environmental conservation becomes more important in Cambodia, new legislature by the Ministry of Environment to protect forest areas has fostered in both a wave of awareness for local residents in how they use their land, while at the same time creating tensions in the use of that land for sustaining their livelihoods. In northwestern Cambodia, the northernmost part of the Greater Angkor Region is home to Phnom Kulen National Park, the largest forested area in the Siem Reap province. In addition to being regarded as a holy site dating back to the Angkor Era (800-1400 CE), it provides some of the most important ecosystem services for the region in terms of natural resources. After the civil war ended in 1975, the area contained landmines, but over the last 20 years, significant mine clearance has made much of this area safe and inhabitable once again. As residents moved back, they began to turn from

centuries old slash and burn farming to establishing cashew nut plantations – a cash crop for this rural population. This involved large clearance of trees, resulting in forest cover decreasing in the last decade, from about 42% in 2003, to roughly 25% presently. Given these figures, the Ministry of Environment has not only banned the expansion of cashew nut plantations on the mountain but has also demarcated land that cannot be used for agriculture, in addition to educating residents on not farming too close to critical water sources. This presentation discusses the movement for forest conservation in Phnom Kulen, the tensions it creates for the residents on this mountain that depend on agriculture, and alternatives such as ecotourism that may play a role in the future.

2. From Conflict to Collaboration: Atewa Forest Governance

Victor Mawutor Agbo, University of Waterloo

Many countries are addressing deforestation through sustainable ecosystem management collaborations to achieve SDG 15. Successful ones recognize local participation as essential to any conservation effort. Unfortunately, in Ghana, the country's forest cover has experienced significant exploitation over the years leading to the less desirability of these nature-based attractions. Despite its designation as a protected area for biodiversity and watershed services, the Atewa Forest in Ghana has been significantly impacted by humans. The problem of forest degradation has increased over the years. The Government of Ghana has outlined its plans to mine the Atewa Range Forest Reserve for bauxite. Despite strong opposition from local communities, state actors and international conservation organizations, the Ghanaian government is determined to proceed with a plans for bauxite mining in the Atewa Forest. To understand these dynamics, ascertain stakeholder and actor positions and interests, and to recommend ecologically-based management approaches such as community-based ecotourism for win-win outcomes, this study adopts the interactive governance model and the case study approach to finding answers to the research questions. Different actors and stakeholders at various scales and levels were engaged in interviews and focus group discussions. The study reveals that to achieve SDG 15 through effective forest governance, a bottom-up, all-inclusive approach to the management of forest resources is the most recommended. It also emphasizes the importance of ecotourism's ability to deliver greater sustainable returns than alternative land-use practices and highlight its potential as a conservation tool for forest lands for purposes of recreation and tourism in nature-based environments.

3. Engaging local communities to improve law enforcement efforts in protected areas

Michelle Anagnostou, University of Waterloo

Wildlife crime is a major challenge to conservation and sustainable development. Improving law enforcement in protected areas is a key strategy to combat wildlife crime, and one way of doing this is by intelligence-led policing. However, little is known about the role of local communities in providing information on illegal activities, especially whether engaging local communities in protected area conservation helps incentivize the provision of information. Addressing this knowledge-gap is essential for conservation authorities to respond to international calls for effective and fair approaches to address wildlife crime. As an initial exploration of this complex topic, we aimed to understand the perceptions of people working directly with local communities on the conditions under which local people provide information to park rangers, using Murchison Falls Protected Area in Uganda as a case study. We used semi-structured interviews and questionnaires to understand the perceptions of staff from the Uganda Wildlife Authority and non-governmental organizations. There was consensus that people who provide information are those who have trusted relationships with rangers; interact regularly with community outreach rangers (either formally through community programs or informally); and believe that the protected area benefits them and their community. All respondents believed that information provided by local people can enable the success of wildlife crime investigations, however, the associated ethical

issues must be addressed. This study indicates that engaging communities in protected area conservation is crucial for law enforcement efforts to be effective in addressing wildlife crime, and to be fair and beneficial to communities.

D1: Geographies of Health (UC 430)

Chair: Lauren Drakopoulos

1. Hacking Health: Exploring the outcomes of Waterlupus

Francesca Cardwell, University of Waterloo

There is a large and growing literature demonstrating the benefits of engaging knowledge-users throughout the research process. We engaged a multi-stakeholder team to undertake a health hackathon as part of an integrated knowledge translation (iKT) process to develop non-pharmacological interventions to enhance the working lives of individuals with Systemic Lupus Erythematosus (SLE). This research aimed to: 1) increase understanding of the economic challenges of living with SLE through stakeholder engagement at a research hackathon; 2) investigate possible interventions to improve the economic lives of individuals affected by SLE; and, 3) document the outcomes of the Waterlupus hackathon. Waterlupus was held in May 2019, attended by advocacy organization representatives, researchers, physicians, individuals with lived experience, and students. Participant observation was conducted, and notes from the hackathon were qualitatively analyzed to document hackathon outcomes. Five teams pitched non-pharmacological interventions to address the economic challenges of living with SLE, and two teams are continuing to develop their innovations over the next 12 months. Other Waterlupus outcomes include increased awareness of SLE amongst participants, and professional and informal networking opportunities. This research contributes to a limited literature on health hackathons, and the successful outcomes emphasize the value of hackathons as an iKT tool. Understanding how knowledge-users themselves perceive health hackathons is an important next step of this research.

2. Neighbourhood dynamics and health insurance enrolment in Ghana

Irenius Konkor, University of Toronto

The role of neighbourhood has gained prominence in population health research globally with a robust body of evidence suggesting positive association between rich neighbourhood and access to good healthcare and poor neighbourhoods with poor access to healthcare. One strategy many countries including Ghana are using to bridge the healthcare access gap between the rich and poor is the implementation of national health insurance schemes. The extent to which neighbourhoods influence peoples' enrolment onto these health insurance schemes however, has remained largely unknown. The objective of this study therefore was to examine the relationship between neighbourhood and health insurance status in two Ghanaian cities. **Methods** We randomly selected three neighbourhoods (poor, middle and rich neighbourhoods) in two cities in Ghana (Accra and Tamale) and administered 1222 surveys. Logistic regressions were fitted to examine the independent effect of neighbourhood and the cumulative impact of other theoretically relevant variables on health insurance enrolment status. **Results** Even though living in rich neighbourhood is associated with greater likelihood of enrolling onto the health insurance program, evidence between living in middle or poor neighbourhoods were mixed. For instance, the likelihood of enrolling for people living in a relatively rich neighbourhood like Teshie did not significantly differ from living in Aboabo/Sabonjida— a poor neighbourhood. There was also a significant difference between the two poorest neighbourhoods. **Conclusion** It was expected that Korle/Gonno— a poor neighbourhood would exhibit similar characteristics as Aboabo/Sabonjida, the

other poor neighbourhood. Similarly, enrolment status for those living in Teshie was expected to significantly vary from that of Aboabo/Sabonjida. These mixed results seem to be influenced by the distribution of health insurance posts in these neighbourhoods. It is therefore important for health insurance policy makers to vigorously consider the spatial distribution of insurance posts in Ghana for impactful results.

3. Prediabetes - Status, Challenges, and Opportunities in Canada

Minal Waqar, University of Toronto Mississauga

Diabetes mellitus is becoming a serious epidemic, both in Canada and all over the world, largely fueled by an aging population and unhealthy lifestyle choices. In addition, particular ethnic groups in Canada experience a higher incidence of diabetes due to genetics and environmental factors. The rising incidence of diabetes and its associated complications put a tremendous strain on the healthcare system, which is why it is imperative to detect and manage this condition at an earlier stage. Thus, the crucial role of early detection and management of prediabetes (a precursor state to type 2 diabetes) is important in the fight against type 2 diabetes. Studies show that if managed and treated on time, prediabetes can be reverted, thus preventing progression to type 2 diabetes. This study presents the current state of research regarding prediabetes' awareness, screening, prevention, and treatment specifically in Canada, by using a scoping review methodology. The results of this review identified the various screening, prevention, treatment interventions available for prediabetes, however, they also revealed a prominent lack of focus on effective awareness strategies for the condition, thus indicating the substantial under-recognition and undertreatment of prediabetes in Canada. Implications of these findings are discussed, and broader policy options are recommended.

4. Exploring the use of traditional medicine among older persons with chronic health conditions in Ghana

Sanewal Singh, University of Toronto

Irrespective of the dominance of the biomedical model in health delivery systems across the world, millions of people in several low- and middle-income countries (LMICs), such as Ghana continue to rely on traditional medicine (TM) for treating different types of illness. The World Health Organization and the United Nations indicate that billions of dollars are spent annually on traditional medical practices and interventions. Using 17 in-depth interviews and roughly 1100 survey responses, this paper investigates the perceptions and motivations surrounding traditional medicine use among residents of Ghana's Upper West Region. Preliminary findings from thematic analysis of qualitative data indicate that the use of TM is still pervasive despite the increasing availability of western medicine and hospitals/medical doctors, due to a few reasons; 1) perceived efficacy, 2) prohibitively expensive cost of western medicine (WM), 3) compatibility of traditional medicine and individuals lifestyles, as well as 4) readily availableness of TM. Nonetheless, results also indicate that there is a mixed perception of TM, recently more individuals are turning to WM, and the dependency on TM as the sole form of medication may be shifting. Findings of this research may be useful for health care providers and government officials, as results may indicate how TM should be promoted, while also preventing the proliferation of fraudulent practitioners.

E1: Geographies of Education (UC 441)

Chair: Alexander Wray

1. The geography of graduate student associations in Canada

Alexander Wray, Western University

Graduate student associations are an integral part of university life in Canada, however, little research has explored their governance, membership, or service offerings. We report on a comprehensive review of 36 graduate student associations, identifying the variations by provincial regional areas and urbanicity. Overall, we found graduate student associations were more related by the urbanicity of their surrounding community, followed by provincial region in the case of Ontario and Alberta. Graduate student associations at universities in smaller regional centres tended to provide more intensive support services - like bus passes, childcare, food banks - for their members than associations located in larger urban areas.

2. “In Between a Rock and a Third Place”: The Hidden Cultural Spaces Facilitating Somali Youth Entry into Post-Secondary Education

Ismahan Yusuf, Western University

Much of the literature coming out of the new millennium on education and Somalis finds the Somali-Canadian academic pathway as rife with institutional racism (Ali, 2014; Abokar, 2016). Students experience academic marginalization in the form of schools streaming them into lower educational ranks (applied versus academic; special education programming; ESL classes even when fluent in English), high suspension rates, as well as hostile interactions with teachers and students treating their intersectional Black and Muslim identity as suspect (Zine, 2014; Mohamed, 2015). In response to this marginalization, diasporic Somalis have collectively turned inward to support and cultivate their youths' trajectory toward postsecondary schooling — a phenomenon that serves as the focal point of this paper. Using Oldgenburg's (1991) concept of “third place”, this qualitative study unpacks how Somali-Canadians rely and draw upon concealed cultural spaces within the city to facilitate entry into (or continuance within) higher education. Twenty-six semi-structured interviews were conducted with second-generation millennial Somali-Canadian men and women, aided by the data collection strategy of snowball sampling. Findings reveal that these culturally-unique, “authentically Somali” spaces (e.g. Quran classes, library sections, local homes etc.) provide second-generation Somalis with differing forms of capital — namely financial, spiritual, human capital and cultural capital — salient in nurturing their tracks toward higher education. This study situates Oldgenburg's (1991) “third place” in intertextual conversation with Bourdieu's (1986) “forms of capital” to analyze the relationship between space, place and collectivism within the diaspora.

3. Pedagogy and the Practice of Teaching Controversial Topics in Geography

Laxmi Pant, University of Guelph

This research examines how academics engage in pedagogy and the practice of teaching controversial topics in Geography, from identity and inclusion to climate change, gentrification, extractive industries, recreational marijuana, genetically modified foods, and biofuels. What has happened in the discipline and discourse of geographical thoughts and environmental ethics and what pedagogy and teaching practice would be required to teach Human Geography in a post-truth world? We will bring a diversity of controversial topics into the discussion to illustrate possible value incongruences within the classroom and in society. Available literature suggests that academics are conscious to provide a balanced examination of controversial topics without necessarily holding or disclosing their own preferred position. As long as geographers remain in the natural science discipline, they can enjoy the same level of immunity to attacks enjoyed by other natural scientists. However, this year's conference theme, Geographies of Resistance serves as a reminder for an increasingly controversial post-truth world. To this end, some examples of pedagogical questions this research to addresses are as follows. • Why does the notion of impersonal or apolitical science limits critical thinking and analytical skills among

students? How should human geographers engage in pedagogy and the practice of teaching controversial topics? • What pedagogical and curriculum development supports are available (or should be developed) for effectively teaching controversial topics in the classroom and beyond? An earlier version of this paper was presented at the Teaching and Learning Innovation Conference, University of Guelph, May 1-2, 2018 and at the annual meeting of the Canadian Association of Geographers (CAG), University of Winnipeg, May 27-31, 2019.

4. Review of Equity Considerations in Active School Travel (AST) Interventions

Alina Medeiros, Western University

In North America, recent trends have shown that fewer students today, than in previous generations, are engaging in active modes of travel to/from school (AST) such as walking, cycling, roller-blading, and scootering. This trend is of concern as AST can improve children's health, air quality and road safety. Despite the success demonstrated by some interventions promoting AST, inequity remains with certain groups of students. This research aims to explore ways in which gender, ethnicity/race, SES, and urbanicity are taken into consideration in AST interventions. A systematic review was conducted to understand how these equity factors are treated in AST research. The literature search returned 49 relevant intervention studies. Results indicate that while effective at increasing rates overall of AST in students, interventions are more effective with boys than they are with girls. Translation of surveys into other languages was a common method to overcome barriers associated with race/ethnicity, however, English surveys have the highest return rates. Furthermore, low income schools showed the greatest uptake of AST, but, middle-income schools showed the greatest long-term behavioral changes. Finally, AST interventions are less successful in rural areas than urban and suburban areas likely due to a lack of pedestrian infrastructure. It would appear AST interventions are most effective for boys, whose parents are acculturated to the region, and families who live in middle-income urban neighborhoods. Future research will determine the specific barriers to AST for different subpopulations.

F1: Urban Physical Environments (UC 442)

Chair: Scott Krayenhoff

1. TUF-Pedestrian: A three-dimensional microscale model for pedestrian thermal exposure in urban environments

Jacob Lachapelle, University of Guelph

The majority of the human population today lives in cities, many of which are expected to expand in coming years. Along with city expansion, climate change will likely increase the number and severity of heat waves in cities, with potential consequences for human health and comfort. It therefore becomes increasingly important to design cities to optimize the thermal comfort of humans by minimizing thermal exposure. During heat waves, spatial variability of human thermal exposure in cities is often controlled mainly by radiation, or Mean Radiant Temperature (TMRT). Here, we further developed an existing microscale three-dimensional urban energy balance model (TUF3D) to assess pedestrian radiation and thermal exposure and the important shading effect of trees (TUF-Pedestrian). TUF-Pedestrian mimics the six-directional method for TMRT measurement, and explicitly calculates in three dimensions the radiative impact of the environment on a "pedestrian" at high temporal resolution over the entire diurnal cycle. We test this model against six-directional shortwave and longwave radiation fluxes measured by a mobile biometeorological station (MaRTy) in an urban canyon on the Arizona State University campus in Tempe, AZ, USA. Our comparisons of TUF-Pedestrian with MaRTy observations show a reasonable performance by the model during the daytime, when solar radiation is

the main contribution to the variation in TMRT. As such, this model can be applied to assess current and future urban designs during the daytime, when temperatures are hottest, to optimize human thermal exposure and comfort in cities.

2. Airborne Observations of Thermal Anisotropy from Urban Residential Neighbourhoods in Salt Lake City

Samantha Claessens, Western University

Most surface covers show a directional dependence (anisotropy) of remotely sensed brightness temperature due to their surface structure. This is important as more interest is placed in extracting urban surface temperatures, particularly from satellite imagery. This research focuses on characterizing the anisotropy of urban residential areas with varying amounts of tree canopy coverage. Two sites in Salt Lake City, Utah USA were sampled over the course of two days in July 2018. Measurements were obtained by imaging the two study sites of approximately 500m x 500m with a thermal imager (FLIR T650sc with a spectral resolution of 7.5 to 14 μm and a 45° x 34° lens) from a helicopter. A total of 7 off-nadir view angles for each of the 8 cardinal and intercardinal view directions were obtained over 6 flights. The large field of view permits subdividing the images to represent three separate off-nadir angles each associated with a FOV of 20°. Atmospheric corrections using the single channel method were performed using MODTRAN6 with atmospheric profile data obtained from locally launched radiosondes and a ground-based microwave radiometer. Simultaneous measurements of surface temperature obtained from fixed and mobile traverses are used to evaluate the corrections. For each study site we present polar plots of the directional brightness temperature, from which the maximum anisotropy and difference from nadir temperature are derived along with an assessment of the spatial and temporal variability of the anisotropy. These observations will provide an important evaluation data set for models of urban thermal anisotropy.

3. City-scale nocturnal urban heat mitigation with selectively emitting roofs

Timothy Jiang, University of Guelph

The canopy-layer urban heat island (UHI), whereby urban nocturnal air temperatures are observed to be higher than rural ones, is a common feature of cities. Especially in warm, dry climates, it degrades thermal comfort at night. Much research has been dedicated to urban heat mitigation strategies that are effective during the day such as reflective and green roofs and urban trees. However, because of the projected significant contribution to urban canopy-layer warming during nighttime hours that results from GHG-induced climate change and expanding built environments, it is important to explore heat mitigation strategies that target nighttime cooling. To assess potential nocturnal cooling from urban adaptation strategies, we apply high-resolution numerical modelling for contemporary and projected urban climates in Phoenix (Arizona) during a 2006 heat wave. Using the WRF-BEP model configured to explicitly resolve the pedestrian-layer air temperature, we demonstrate that the widespread implementation on roofs of a novel material that is emissive in the atmospheric window but reflective elsewhere has the potential to cool air temperature more than do standard reflective roofs that have comparable shortwave radiative properties. Furthermore, unlike standard reflective roofs, selectively emitting high-reflectivity roofs cool pedestrian-level air temperature at night, demonstrating the potential of this mitigation strategy to offset urban-induced warming during the portion of the diurnal cycle when the UHI is greatest.

4. Tree canopy effects on in canyon radiative fluxes and road surface temperatures in Salt Lake City, Utah, USA

Austine Stastny, Western University

Impervious surfaces such as roads and parking lots cover a large fraction of urban areas. These surfaces become hot under strong solar radiation input and stay warm at night due to their radiative and thermal properties, leading to impacts on urban thermal comfort and cooling energy demand. Shade produced from trees can be used as a heat mitigation strategy to cool the temperatures of these surfaces and the air above them. This research observed road surface temperatures and radiative forcing variability in neighbourhoods with different vegetation cover and evaluated a surface energy balance model, BEP-Tree (Krayenhoff et al. 2014), for its ability to reproduce incident radiative fluxes and surface temperatures. Road surface temperatures, along with other micrometeorological variables, were measured using a vehicle traverse method for two sub-neighbourhoods with different vegetation assemblages. Results show that road surface temperatures, air temperature, and incoming shortwave radiative fluxes were lower, and incoming longwave radiative fluxes were higher in neighbourhoods with more vegetative tree canopy compared to neighbourhoods with lower tree canopy coverage. Modelled incident shortwave and longwave radiation agree well with observed measurements with some exceptions. However, modelled road surface temperatures were higher than measurements, suggesting a greater influence of tree shade on surface temperatures than the model can represent. This research marks the first attempt to evaluate an urban canyon energy balance model at this scale. With further evaluation, BEP-Tree may be used as a tool for policy makers and urban developers to optimize the cooling impacts vegetation has on surface temperatures.

G1: Thesis Proposals I (PCH UC001B)

Chair: Emily De Sousa

1. Social Dimensions of Digital Agricultural Technologies and the Governance of Global Agri-food Data

Emily Duncan, University of Guelph

This research will explore the socio-economic and political factors influencing the governance of agri-food data collected by a variety of new digital agricultural technologies that are revolutionizing agricultural production around the world, such as sensors, robotics, and big data analytics platforms. 'Big data' is often characterized by the volume, velocity, variety, and veracity of data that is being generated. The use of this digital agricultural data by farmers can lead to more informed decision making, resulting in increased production and profitability, as well as improvements in environmental sustainability. However, to realize these benefits there needs to be effective models of agricultural data governance in place that allow for data ownership, sharing, and interoperability. While new digital agricultural technologies are often associated with industrial farming practices of developed countries, these technologies have the potential to make a significant impact to global food security if they are adapted to the context of smallholder farms in developing areas and are coupled with effective data governance models. In this proposal, the four case studies from varied contexts that will comprise my Ph.D. dissertation will be presented. The technologies associated with digital agriculture offer potential to address global food security issues, yet technology is not a panacea and to realize the benefits of the digital agricultural revolution, research in partnership with community groups, such as NGOs, farmers and ag-tech startups, is necessary to deploy these new technologies in a way that benefits both society and the environment.

2. Urban outcasts: A comparative history and geography of how cows disappeared from Kingston and Cape Town

Claudia Hirtenfelder, Queens University

Cows have been an important part of human's social processes and were once visible characters in urban life in both Canada and South Africa. However, today they are absent in most of these countries' cities. By focusing on how cows were removed from Kingston and Cape Town (respectively their country's first colonial capitals) this research may illuminate the processes through which cows, and animals more generally, come to be excluded from cities as lively beings and included only as commodities. This research is important as there is scant literature on understanding how cows have been involved in processes or urbanisation and there is even less comparing how these processes manifest differently in cities outside of the U.S. Understanding how cows went from being participants in urban landscapes to only included as objects to be bought and sold may provide a glimpse into understanding how urbanisation is contingent on processes of multi-species exclusion and commodification. Further, Urban Geography tends to side-line the contributions of animals to the shape and cultural practices of cities and Critical Animal Studies has overwhelming built theory based on examples from the Global North. Therefore, by applying a comparative urban methodology this project will contribute to the development of both.

3. Digital agriculture and the changing dynamics in agricultural landscapes

Abdul-Rahim Abdulai, University of Guelph

Agriculture and food systems may be at the onset of another transformation: a transformation showing glimpse of both old and new revolutionary and incremental changes in the forms, meaning and values of food and farming. Today, food and agricultural systems are once again experiencing what can be seen as another technological surge, a digital-driven transformation of agriculture. Emerging technologies including mobile support systems, precision agricultural tools, drone technologies, RFID and blockchain, sensors, satellite system, just to mention a few, are being employed across the food system, a system intrinsically and extrinsically connected to many societal functions. There is no hiding that these recent development holds broader implications for both agriculture and farming, and society at large. However, at present, we are mainly oblivious to the particularities of these implications in varied contexts. Hence, what I seek to do in my research is to explore the social implications of the digital surge in agriculture, with specific emphasis on how it will affect practices and performativities of agriculture across scales. It is my intention to spur discussions with this preliminary presentation of the research ideas and engage audiences in exploring specific forms of food and farming that should be considered in this emerging field

4. Citizen Participation in Resilience Planning: A qualitative analysis of public engagement in the development of Toronto's First Resilience Strategy

Garrett T. Morgan, University of Toronto

This project will apply theoretical arguments and derive methods from urban planning literature on innovative civic engagement in a qualitative study of how the Toronto Islands community engaged with the development of Toronto's first resilience strategy. It is critical to investigate engagement efforts on the Islands because the neighbourhood residents were (and continue to be) acutely impacted by the effects of climate change during the development of the city's strategy. This project aims to contribute to existing literature on urban resilience, climate change adaptation strategies, and civic engagement while also providing the city and its partners with additional citizen driven recommendations to consider as the strategy moves toward implementation. Understanding how Island citizens participated in, and continue to contribute to, their community's resilience is timely not only because of the imminent implementation of Toronto's strategy but also because the language of urban resilience is increasingly being adopted by Canadian Municipalities to develop their own plans to address the impacts of climate change.

5. The Dead Archives

Atif Khan, University of Toronto

This presentation unpacks entanglements between borderlands, territory and death. I investigate the armed drone as a weapon that makes and creates death specifically in the borderlands of Afghanistan and Pakistan, dubbed ‘Af-Pak’ in United States foreign policy. I engage in a self-reflexive process that blends artistic and research practice in contending with ‘how to research’ the archive of the dead in Af-Pak. Conversating across works by Saidiya Hartman, Ann Laura Stoler, Madiha Tahir and Nora Akawi, I map out the political terrain of drone warfare in Af-Pak while asking questions of knowledge extraction, production and limitations. Shifting away from disciplinary International Relations that seeks to know worlds through categories and borders, I ask what the limits are to engage with (drone) warfare that has led to the deaths of nameless bodies and lacerated lands. Rather than presenting a history of drone warfare in the South Asian subcontinent, I contend with what happens after the drone has come. I seek to deepen the category of ‘violence’ by attempting to pick up the broken pieces in Af-Pak against a linear reading of what drone warfare is. The urgency of such a topic is to remember the wars are still to come.

6. Urban Livelihoods, Flood Vulnerability and Preventive Resettlement in Iquitos, Peru

Dena Coffman, University of Toronto

Preventive resettlement projects are increasingly being implemented to move people out of environmentally risky areas before disaster strikes; in some areas, resettlement may be the only feasible option to cope with the effects of climate change. However, many resettlement projects have failed to deliver on promises, leaving vulnerable populations isolated and impoverished. Further discussion is needed to guide future projects, grounded in the perspectives of those directly affected. In the city of Iquitos, the Peruvian national government is working to relocate 16,000 residents from a flood-prone area called Bajo Belen, a low-income, largely informal neighborhood on the Amazon floodplain. Relocated families receive a small prefabricated house in “Nuevo Belen,” located 13 km outside of Iquitos. Since 2015, 400 households have relocated; further construction is anticipated in the coming year. My research investigates how resettlement has affected residents’ livelihood activities and incomes, using 60 household surveys conducted in Bajo Belen and Nuevo Belen. Findings indicate that while relocation has reduced exposure to floods, it has also left many households economically isolated. This suggests that livelihood security is crucial to the success of resettlement projects yet may be neglected by decision-makers.

7. Probing lake sediment profiles in the Peace-Athabasca Delta near the Peace River for evidence of hydrological change caused by hydroelectric regulation

Anita Ghosh, University of Waterloo

The Peace-Athabasca Delta is a world-renowned northern floodplain landscape that has been the center of debate for over 50 years due to drying of the abundant perched lakes within the delta. It has been perceived by many that the main driver of drying is hydroelectric regulation from the W.A.C. Bennett Dam located on Peace River, ~1100 km upstream of the delta. However, prior paleolimnological studies have identified trends of drying and reduced flood frequency beginning in the early 20th century decades before river regulation. New and preliminary paleolimnological results in the previously uninvestigated northwestern region of the Peace Delta suggests that ‘PAD 52’ (located 4.5 km south of Peace River) has experienced drying since the mid-1970s, shortly after the construction of the dam in 1968. To further discern the region of possible influence from river regulation, sediment cores were collected along a 5.5 km transect of five lakes south of PAD 52 (i.e., increasingly distal from the Peace

River) during summer 2019. Each lake sediment core will be dated using radiometric methods. Loss-on-ignition, diatoms, organic carbon and nitrogen elemental and isotope composition, and cellulose oxygen isotope composition will be used to reconstruct lake paleohydrology. Findings will aid in further defining the relative influence of the multiple potential stressors on the perched lakes in the PAD.

8. Social and environmental change and dietary intake: A mixed methods approach to understanding the decline in milk consumption among a sample of Canadian high school students

Carise Thompson, University of Waterloo

The influences of increasing globalization on dietary intake are unknown. Previous work on food environments illustrates neighbourhood differences with regards to urban/rural locale, socio-economic status, availability and accessibility, but does not consider the changing cultural landscapes in Ontario. A potential indicator for overall healthy lifestyle factors was examined to elucidate place-related, environmental- and social- impacts on youth nutrition, namely milk and milk alternatives (MMA) consumption. Our objective was to determine youths' (13 – 18 years) knowledge, attitudes, and practices related to MMA consumption. Using a mixed methods design, longitudinal COMPASS data from a sample of 62 secondary schools across Ontario and the students attending those schools were analyzed for trends in MMA consumption from 2012 – 2017. Four schools were selected to reflect the salient trends in consumption over time, which were declining- and steady- consumption. Among these schools, 16 age- and gender- specific focus groups will be held, guided by the Theory of Reasoned Action. In addition, school-level characteristics will inform the areas of inquiry; these characteristics include urban/rural status, school median income, staff training on nutrition, and food vendors within 500m of school property. Using the photo elicitation technique, students will be asked to discuss dietary practices, and influencing factors. Deductive and inductive analysis will be used. This study will take an assets-based approach to identify local circumstances and cultural factors which could influence MMA consumption among youth.

10:15AM – 10:45AM Refreshment Break, Peter Clark Hall, University Centre

Session 2: 10:45AM – 12:15PM

A2: Analyzing Watersheds and Aquatic Environments (HUTT 348)

Chair: Wanhong Yang

1. Testing the Cyano-Fe Model in a meso-eutrophic polymictic embayment of Lake Nipissing

Kayden Sim, Nipissing University

Since the 1990s, there have been an increasing number of reported cyanobacteria blooms in oligotrophic and meso-eutrophic lakes in central and northern Ontario. Why are eukaryotic algae being displaced by cyanobacteria in these low phosphorus lakes? One possible explanation for this is the Cyanobacteria-Ferrous model, which hypothesizes that large scale blooms require high external supply rates of Fe²⁺ released from anoxic sediments. The model suggests Fe²⁺ released by anoxic sediments is the limiting mineral for cyanobacteria growth when light, water temperature, and P and N macronutrient levels are sufficient. We test the Cyano-Fe model in a meso-eutrophic embayment of Lake Nipissing using water temperature and dissolved oxygen profiles, water chemistry and phytoplankton data collected in 2017 and 2018. In 2017, the dominant phytoplankton biomass (>50%) was cyanobacteria from July 24 to the end of sampling season at the start of October. The cyanobacteria dominance was evident shortly after

(~1 week) the sediment-water interface was anoxic. This period coincided with a significant rise in hypolimnetic Fe²⁺ concentrations below the redox boundary. In 2018, the 50% threshold of cyanobacteria did not occur, despite an extensive period of anoxia (~ 2 months) and high concentrations of Fe²⁺ in the hypolimnion. However, water temperatures in 2018 were much cooler than 2017 due to the later ice off date in the spring. The results of this study are similar to other studies that found water temperature plays a critical role in productivity of cyanobacteria growth, despite sufficient macronutrients and Fe²⁺.

2. Evaluating the effects of climate change on closed-drainage lakes near the Peace-Athabasca Delta using paleolimnology

Kathleen C. Brown (University of Waterloo), Jennifer K. Adams (University of Waterloo) James V.K. Telford (University of Waterloo) Johan A. Wiklund (University of Waterloo) Roland I. Hall (University of Waterloo), Brent B. Wolfe (Wilfred Laurier University)

In the Peace-Athabasca Delta (PAD; northern Alberta), where water is central to ecosystem function, there are ongoing concerns about changing hydrology and associated impacts for flora and fauna, as well as land users. The PAD is culturally integral to local residents and is a Ramsar Wetland of International Importance, home to species at risk including Whooping Crane and Wood Bison. The majority of the PAD is located within Wood Buffalo National Park (WBNP), a UNESCO World Heritage Site. Previous paleolimnological studies have identified drying during the 20th century to be mainly driven by climate change, but it has been difficult to distinguish the relative influence of local versus regional effects. Here we use sediment cores collected from shallow, closed-drainage lakes near the Athabasca Delta and multi-indicator paleolimnological approaches (loss-on-ignition, organic carbon and nitrogen elemental and isotope composition, cellulose oxygen isotope composition, diatoms and radiometric dating) to reconstruct past local climate. Preliminary results show increases in organic matter at two lakes beginning at ~25 cm indicating a potential increase in aquatic productivity and possible declines in lake water levels at this time. Findings will help in interpreting the role of local climate on water level changes in the delta and will be especially important in light of ongoing policy decisions aiming to conserve and maintain natural conditions in WBNP and the PAD.

3. An introduction to IMWEBs: a location specific watershed model for BMP eco-services assessment

Hui (Shawn) Shao, University of Guelph

Watershed models are useful tools for examining Ecosystem Services (ES) of agricultural best management practices (BMPs) such as nutrient management, riparian buffer enhancement, and wetland restoration. However, assessment of location specific BMPs (site or field scale) is challenging by using existing models (e.g SWAT) because of their semi-distributed (aggregated spatial unit) modelling structure. Funded by federal and provincial agencies for over 15 years, a cell-based IMWEBs (Integrated Modelling for Watershed Evaluation of BMPs) has been developed at the Guelph Watershed Evaluation Group (GWEG) which evaluates water quantity and quality impacts of agricultural BMPs at four scales: site, field, farm, and watershed. IMWEBs supports the assessment of over 30 BMPs, including management of crops, nutrient, grazing, livestock, irrigation, tillage, marginal land, riparian buffer, wetland, and many others. IMWEBs has a modular modelling structure, which allows new process or BMP modules to be added and the model can be calibrated and validated based on monitoring data. By including an economic component in IMWEBs, the model can be used to evaluate cost effectiveness of different BMP program options. In addition, supported by computer interface and other eco-service (ES) models, a range of ES indicators including water quantity, quality, carbon sequestration and biodiversity benefits can be visualized by a wide range of users including conservation managers and farmers. The modelling system and interface will help target and evaluate BMP programs more effectively and

provide an evidence-based framework to leverage and scale up private and social investments in ecosystem services on agricultural landscapes.

B2: Forest Ecosystem Change (HUTT 240B)

Chair: Jude Keefe

1. Modelling the Future of Maple Sap Flow: Spatial and Temporal Impacts of Climate Change

Laura J. Brown, University of Guelph

Maple syrup production is dependent upon the sap season, a few weeks in the Spring when the tree sap is sweet. Diurnal freeze thaw temperatures are needed with freezing nighttime followed by warm day time temperatures for sap to flow. Once temperatures warm sufficiently the tree's buds break, and the sweet sap season ends. Knowledge of future sap seasons is needed so maple syrup producers can adapt their methods or abandon production because their endeavours will no longer be profitable. Forecasts of future sap seasons in Ontario were modelled using five downsized (10km) AR5 regional climate data sets. Climate Data Operators, R and ArcGIS software tools were used to analyze, extract and map sap flow seasons for the current sugar maple tree range and all of Ontario for 2030, 2050 and 2100. The 4.5 and 8.5 Representative Concentration Pathways (RCPs) best modelled current sap season data collected from Ontario producers. Future optimal and potential sap season temperatures are forecast to expand northward beyond and in some cases outside of the current sugar maple range.

2. Characterizing forest succession at Monks Wood (UK) using airborne laser scanning

Rachel Jade Kuzmich (Queen's University), Paul Treitz (Queen's University), Ross Hill (Bournemouth University)

Succession refers to the directional change in species composition and structure of an ecosystem over time. In a forest ecosystem, succession is associated with four distinct seral stages: stand initiation, stem exclusion, understorey reinitiation and old growth. Forest succession is a three-dimensional process that can be characterized using airborne laser scanning (ALS) metrics. Metrics related to the distribution of ALS pulse returns can be used to describe the distinct arrangement of structural components for each seral stage. The goal of this project is to characterize forest succession at Monks Wood National Nature Reserve (MW) in the United Kingdom using metrics derived from a time series of ALS data available between 2000 and 2014. The MW dataset is comprised of multiple sample plots representing the four seral stages over time based on a known start date. Following ALS normalization, metrics were extracted for non-ground returns and aggregated into grid cells to serve as predictor variables for seral stage classification. The final classification model retained the most important metrics with model performance based on an error matrix (i.e., errors of omission and commission). The results demonstrate that all seral stages were present at MW and classification results suggest that ALS can be used to distinguish between different seral stages. Given that MW exhibits distinct seral stages, classification may be more challenging in more complex forest ecosystems where there is a more gradual transition between seral stages. Forests exhibiting these more gradual transitions are worthy of further investigation.

3. Using High Spatial and Spectral Resolution Data to Detect Forest Disturbances

Alexander Axiotis, University of Toronto Mississauga

Emerald Ash Borer (EAB) is an invasive insect that was first detected in Canada in 2002 and has spread to five provinces in Canada. Since the arrival of EAB, millions of ash trees have died, which has caused

widespread ecological, cultural, social and economic impacts. Using field and airborne hyperspectral data collected from an old mixed-wood forest in King City, ON, we aim to detect various stages of ash tree health related to EAB infestations. This work involves three processing steps: 1) identifying ash trees in the forest using high accuracy GPS units, 2) delineating the ash trees on the images, and 3) relating ground observations with ash reflectance in the airborne hyperspectral imagery. Using the spatial, textural and spectral information from the hyperspectral data, we hope to propose a workflow to better map the severity of EAB infestations. The challenges and opportunities of working with high spatial and spectral resolution data for disturbance detection will be discussed at the end.

C2: Special Session – Conservation, communities and ecotourism II: Rethinking prospects for symbiosis in a rapidly changing world (HUTT 234)

Chair: Michelle Anagnostou

1. Deer culling as an effective management strategy to preserve the Carolinian Forest ecosystem in Rondeau Provincial Park, Ontario

Rachel Hodgson, Wilfred Laurier University

The Carolinian Life zone in southern Ontario contains 25% of Canada's population on 0.25% of the area of the country while also containing more endangered and rare species than any other region in Canada. The high density of people and concentration of biodiversity in this region has been a source of conflict to maintain biodiversity levels in a region of high current and historical human impacts. An example of the conservation challenges in this region is the controversial use of deer culling as an effective management strategy within Rondeau Provincial Park to reduce deer numbers which impact the biodiversity of Carolinian forest species. To illustrate the complexity of this issue a systems description was developed to identify whether the continuation of this practice within the park is an effective method for preserving the forest type. Using a systems description to identify scales, key system components, boundaries, alternative perspectives, and limitations was intended to show that this seemingly ecological park management issue has much greater implications. The systems description was written from a parks management perspective with the intent to meet requirements under acts, policies, and management plans pertaining to Rondeau Provincial Park. The management of the park's deer populations have a long a complex history involving species extirpation and subsequent reintroduction, impacts of colonialization on local First Nations, and dual mandates. In order to meet park management requirements more education and outreach is necessary for this practice is to continue in order to preserve the Carolinian forest ecosystem.

2. The contribution of small-scale fisheries to sustainable urban development in Mumbai, India

Sarah Ghorpade, University of Waterloo

Small-scale fisheries (SSF) are an important source of income, food security, and sustainable livelihoods, with benefits disproportionately distributed to low-income populations in the Global South. As cities globally grapple with the challenge of supporting rapidly growing populations in the face of large-scale changes (urbanization, climate change), urban SSF enhance prospects for sustainable development. However, they are threatened by multiple stressors, many of which are heightened in urban settings (eg, environmental degradation, competition for coastal resources). Despite the potential for SSF to meet the increasingly critical needs of cities, their contributions are generally overlooked; accordingly, their needs are often de-prioritized in favour of economic development priorities, as defined by more powerful actors. This research conceptualizes the disconnect between the goals of SSFs and of other actors as a governance issue, and addresses: what governance arrangements are conducive

to the long-term viability of urban SSF and hence their contribution to sustainable urban development? Using the case study of SSF in the mega city of Mumbai, India, I will apply the Interactive Governance framework to i) characterize the system according to the interactions between stakeholders, with respect to disparity of their goals; and ii) identify opportunities for improvements to the governance system for SSF viability and to facilitate their contribution to sustainable urban development. This research, on the under-explored area of urban SSF, will expand the Interactive Governance framework to a new study context; and fills a general gap within urban sustainability research, which has to date overlooked the role of SSF.

3. Indigenous Perspectives on Reconciliation: Micro-level Renewal of Settler/Indigenous Relationships at Two National Parks

Chance Finegan, University of Toronto Mississauga

This session will report on research documenting the strong Chinook Indian Nation/National Park Service (NPS) relationship at Lewis and Clark National Historical Park and Fort Vancouver National Historic Site. This research integrates settler-colonial studies with park management. I assert studying the power of individual autonomy within broader systems can be instructive and use stories told to me by NPS staff and Chinook Elders to identify lessons-learned emerging from these two parks. Although these are not places concerned with challenging settler-colonialism's broad continuities, for current efforts are not directly concerned with ensuring future Chinooks will live as citizens of a prosperous sovereign Indigenous nation re-connected with its ancestral territory and culture, they highlight how to renew park/Indigenous relationships at a micro-level.

D2: Geographies of Care (UC 430)

Chair: Lauren Drakopoulos

1. Achieving a caregiver-friendly workplace standard for Canadian carer-employees: A partnership approach

Allison Williams, McMaster University

Carer-employees provide unpaid family support for adult and aged friends/neighbours/members while simultaneously being employed. With the assistance of a Committee of experts, McMaster University partnered with the Canadian Standards Association (CSA) to develop the Caregiver Inclusive and Accommodating Organizations Standard (B701-17). It is now being internationalized via a partnership with the International Standards Association (ISO). The Standard provides workplace guidelines to better accommodate carer-employees. A public review of the significance and potential uptake of the Standard was implemented via semi-structured qualitative interviews with key stakeholders (n=17) across Canada. Following transcription, data were thematically analyzed, resulting in four themes: (1) necessity; (2) impact of employer size; (3) motivators for adoption, and; (4) use as an educational tool. This contributes to our understanding of how to better accommodate carer-employees in the workplace, while providing a real-world application of health geography, framed within a social justice paradigm.

2. Evaluation of the Effectiveness of the Caregiving Essentials Course for Informal Caregivers of Older Adults in Ontario

Shelley Rottenberg, McMaster University

The presentation will present the evaluation of the effectiveness of an eight-week knowledge intervention course on informal caregiving of older adults. The objectives of this course are to provide

caregivers with information to: better equip them in meeting the needs of their care recipients, to offer resources to help caregivers understand and navigate the healthcare system, and to promote mental health and well-being of caregivers. The participants were recruited from Hamilton, Sudbury and Timmins. The inclusion criteria were that at least half of the participants were older adults themselves, and all caregivers had to live with their care recipient. The evaluation component includes two main forms of data collection – a post-course survey, followed by a retrospective interview. Interview transcripts were analyzed in NVivo through thematic coding. In connection with the original objectives of the course, the following four major themes were identified from the data: 1) Higher level of caregiver burden correlated with increased effectiveness, 2) The health and well-being of the caregivers and their care recipients were more impacted by external factors, 3) Participants found the course content to be relevant to their personal caregiving experiences, and offered them the help they were looking for, and 4) Participants expressed being advocates for their care recipients, and felt that the course material supported them in that role. The findings from the evaluation will be analyzed to inform changes to the course in the future.

3. Fragile and Conflict-Affect Care: Timing and Utilization of Antenatal Care and Skilled Birth Attendants in the Democratic Republic of the Congo

Bianca Ziegler, Western University

Maternal mortality represents one of the widest gaps between developed and developing countries, 99% of deaths occur in developing countries, with over half occurring in sub-Saharan Africa. This health indicator became a global priority when Sustainable Development Goal (SDG) 3.1 set out to decrease the global maternal mortality rate to less than 70 per 100 000 births by 2030. For every 100 000 women who give birth in the Democratic Republic of the Congo (DRC), 693 die due to pregnancy related complications. Amid prolonged political violence and authoritarian governments, women living in the DRC face difficulties in accessing maternal health services. These preventable deaths can be significantly reduced if antenatal care (ANC) utilization is increased. This study analyzes the timing and utilization of ANC over time in the DRC by applying logistic regression and survival analysis techniques to Demographic Health Survey data. The findings show that women in 2013-2014 were 5.92 times more likely to utilize a skilled birth attendant during delivery than in 2007, however, there has not been significant progress in meeting the other recommendations for ANC utilization. This study provides an indication of the state of ANC progress within this region as well as the relationship between environmental, population, and health behaviour factors and ANC utilization. These findings suggest that conflict-affected countries including the DRC, require context-specific interventions if SDG 3.1 is to be met and if the inequitable gap in maternal mortality is to be reduced globally.

4. We built it, but why are they not coming? Children's perceptions of a free physical activity program

Emma Ostermeier, University of Western Ontario

Children's physical inactivity is a concern for their overall health and quality of life. The ACT-i-Pass program is a community-based physical activity initiative that encourages children to be active outside of school by providing free activities to grade five students. However, community-based programs have limitations including physical and social barriers to programs. Additionally, the effectiveness of community-based programs have been questioned. Objective There are three objectives: (1) evaluate participant's perceived physical activity levels during the ACT-i-Pass program; (2) determine the barriers and enablers children encountered in the ACT-i-Pass program; and (3) suggest improvements that enhance the quality and use of community programs. Methods Eligible participants were grade six students who were previously registered in the ACT-i-Pass program. Focus groups (n=28) consisted of 3-4 students each and participants were stratified by program use. Transcripts were analyzed using a

conventional content analysis. ResultsOverall, participants believed the ACT-i-Pass increased their physical activity levels. Program features, such as free and a plus one, family involvement, and program flexibility enabled program use. However, the built environment, administrative issues, personal challenges, and the social environment limited participation in activities. Participants proposed the following as improvements: improving accessibility, expanding the program to more people, higher variability of activities, and increasing promotional efforts. ConclusionsParticipants felt the ACT-i-Pass program increased their physical activity levels and highlighted promotions and program expansion as improvements. Understanding children's unique viewpoint on community-based programs provides policy makers and community groups with suggestions to improve current and future physical activity initiatives.

E2: Special Session – The (R)evolution of Agri-Food in the Anthropocene I (UC 441)

Chair: Lisa Ashton

1. Taking the Pulse of Canada's Industrial Food System

Jodi Koberinski, University of Waterloo

In the context of catastrophic climate change, reducing climate implications of food systems is a central challenge. Shifting diets away from meat towards protein-rich pulses reduces climate change related pressures while offering myriad agronomic benefits. Yet how we produce pulses and not just that we produce pulses matters if those benefits are to be realized. Despite rapid growth, little research on industrial pulse sustainability exists. This research explored connections between world views and food systems in order to assess sustainability claims made by Canada's industrial pulse sector. First, I distinguished the underlying productivism rooted in mechanistic models and ecologism rooted in holistic models, distinguishing food science from food systems paradigms and how they affect evidence. After contextualizing Canada's pulse sector, I conducted a discourse analysis revealing shortcomings of conventional narratives on the concepts of choice, efficiency and safety. Next, I analysed eight lock-ins driving Canada's industrial food system. Finally, I tested two Pulse Canada sustainability claims -- low carbon foot print and soil health—finding these claims ignore the reliance of industrial food systems on 1) petrochemicals and other mined inputs, and 2) excessive fossil energy. Canada's pulse sector is vulnerable to both ecological shocks associated with industrial production and to social shocks associated with climate unrest and with policy changes that could curtail access to certain pesticides. By forcing pulses to conform to the economics of industrial production, Canada's farm community bypasses pulses as transition crops toward a truly regenerative agriculture. Given the reality of unavoidable catastrophic climate breakdown, scholars must confront the elephant in the room that is globalized corporate capitalism driving unsustainable approaches to food systems. This paper calls for a radical reorientation of the economy in the direction of food commons.

2. Partnerships and Paradoxes: How New Retail Businesses Transform Food Risk Governance in Nanjing, China

Dai Ning, University of Waterloo

In light of rampant food safety scandals and environmental contamination, various scholars conclude that China has come to a risk society whereby pervasive food risks become a major concern for the government and citizens alike. With this background, an innovative food retail format named new retail businesses appeared, featuring self-operated ecological food supply chain and omnichannel retail logistics. Bearing the potential to provision convenient, accessible, and safe food, some of the new retail businesses gained momentum in growth. Based on field research and interviews with key stakeholders

in Nanjing, China, we capture the distinctive features of new retail businesses, reveal the economic and political mechanisms behind their rapid development, and assess their effects on the local food governance. We identified that the largest local new retail business was part of a public-private partnership with the local government, and we argue that this partnership reflected the government's sustained zeal to modernize the food system in addition to its intention to control food risks. However, this modern, technocentric approach to food governance is no panacea to widespread risks. Rather, we reveal that new retail businesses have yet to redress the existing food safety anxiety, but imposed new dimensions of unintended risks to consumers and the environment. In conclusion, this study delineates the paradox within this public private partnership in food governance and revisits the conception of China's risk society.

3. Beyond Charity? A Social Enterprise Model to Address Food Waste & Food Insecurity

Rachel Vander Vennen, University of Guelph

It is widely accepted in literature and society that the charitable model of food aid insufficiently addresses both the systemic problem of food surplus and the deeply political problem of food insecurity and financial poverty. Yet, the reality is also potentially clear that 850,000 Canadians depend on the food bank every month to feed themselves and their families (Tarasuk et al, 2016). Is there an alternative to the charitable food aid model that can address both structural issues in the meantime? Can such a model move beyond the shortcomings of the charitable model by fostering a dignified approach to food access, and meanwhile capturing some of the 58% of avoidable food waste (Nikkel et al, 2019) destined for the landfill? This case study examines the development of The Upcycle Kitchen, a social enterprise in Guelph, ON that upcycles food diverted from the waste stream into high quality value-added products sold on a sliding scale, while training and employing young adults facing barriers to employment. Critically analyzing its development, feasibility and potential replicability in other communities, this research documents the creation of The Upcycle Kitchen as an alternative to the traditional charitable model of food aid.

4. The Power of the Precision Agriculture Platform and the Impact of Agricultural Data Commodification: A Case Study of Climate FieldView

Sarah Marquis, University of Guelph

As the world contends with a digital revolution, technology is transforming the way Canadian farmers interact with the environment. Precision agriculture, for example GPS technologies, robotic milkers and yield mapping, allow farmers to use technology to tailor management to different fields, or different livestock. These technologies can collect data about microclimates, yields, soil composition, livestock health and many other parameters on the farm. As technological limitations of farming operations become increasingly surmountable, vast amounts of diverse and disparate agricultural data (Big Data) can be generated, collected, stored and analyzed. These analyses, performed by precision agriculture platforms, can transform data into economically valuable insights. My research explores the ways in which the emergence of Big Data in the agricultural sector in Canada is changing power dynamics within food production systems and supply chains. With the rise in popularity and use of precision agriculture platforms on farms across North America, questions arise around the issues of agricultural data storage, privacy, and governance. My project explores the perception and impact of one particular digital precision agriculture technology platform, Climate FieldView. Climate FieldView is now owned by Bayer, the largest agrochemical firm in the world. My research is a case study of Bayer's Climate FieldView and explores the ways in which Canadian crop farmers' rights, access and ownership of agricultural data are affected by this precision agriculture platform.

1. Academic Loitering: Public Park Use Patterns in High and Low-Income Neighbourhoods of Toronto

Basil Southey, Queen's University

It has been widely recognized that access to greenspace benefits the residents of urban centres in many ways. Correlations between access to greenspace and lowered rates of both mental and physical health issues have been shown in several studies. The health benefits of public greenspace are more notable in lower income areas where residents have less access to private greenspace. While there is a great deal of scholarship showing that higher income areas have greater access to greenspace, there has been little empirical research on how parks are used. This study; 1) measured the amount of use in parks located in areas across the socio-economic spectrum of Toronto and 2) recorded how people are using these parks. Recorded variables included, tree canopy cover, socioeconomic status of the neighbourhood, park facilities (benches, sports facilities, washrooms, playgrounds, etc), weather, and seasonality. Three parks were selected and surveyed for approximately 350 hours. Each park is roughly the same size and is located in a differing socioeconomic status area of Toronto. Preliminary findings show that lower income parks receive higher use-rates than high income parks, benches are poorly placed, and that the two most common park uses are pet and childcare.

2. Open Smart Cities: Impact of Critical and Socio-Technological Research

Tracey P. Lauriault, Carleton University

There are several 'smart' city initiatives, programs, and practices in Canada and abroad. While most 'smart' city strategies are being deployed in cities with open data programs, very few 'smart' initiative are open, and instead resemble connected forms of urbanism and 'data' enclosures. To counter balance this trend, this paper will present the Open Smart Cities concept and project, developed by Lauriault in collaboration with OpenNorth and funded by the GeoConnections Program at Natural Resources Canada. The talk will also discuss socio-technological data assemblage framework that guided the research and how those who conducted the research did so as technological citizens. The Open Smart City Guide V 1.0 is being translated into 24 education modules for city officials and is part of a 1:1 Advisory Service led by Open North and funded by the Infrastructure Canada Smart Cities Community Support Program. This paper will also discuss the value of this form of engaged research and some of the impact this research has had to date in real terms in socially and materially shaping the 'smart' terrain in Canada.

3. Toponymic Place Branding in a Post-Soviet City: A Case of Minsk, Belarus

Sergei Basik, Conestoga College

Recently, toponymic commodification as a spatial strategy of neoliberal urbanism and the use of place naming as a city branding mechanism have been examined within the "second wave" of critical toponymic studies on the examples from the wide range of geographical locales (Rose-Redwood, Vuolteenaho, Young and Light, 2019). However, there is much less known about the modern neoliberal toponymic practices within the post-Soviet realm. This paper aims to examine the spatial politics of place names' commodification on the example of the toponymic system of the new multifunctional business and residential complex "Minsk World" in Minsk, Belarus. The study reveals that the neoliberal toponymic place branding as a global phenomenon that aims at the mobilization of symbolic capital and the privatization of the urban spatial identity have specific politically motivated regional

variegations in the post-Soviet urban cultural landscapes of Belarus. The names of the quarters such as Emirates or North America, and the high-rise condominiums' names (ecodomonyms) such as New York, San Francisco, or Hong Kong, symbolically signify both elitism and globalism, convert symbolic capital into the economic capital, and reflect the neoliberal processes of city branding. These names also express the desired characteristics in order to provide a sign of prestige and, consequently, to raise the economic value of the urban space. Besides, the findings unveil that the toponymic place branding of "Minsk World" allows the foreign developers and the authorities that merge with them to create an artificial "globalized" urban space in a post-Soviet cityscape.

4. **A child's Space-Time continuum? Spatiotemporal analysis of how children use their neighbourhoods.**

Malcolm Little, Western University

Initiatives to get Canadian children more active, especially outdoors, have accelerated in response to rising rates of obesity and sedentary lifestyles. But do we truly know where, when and how children spend their time outdoors? This research uses novel geospatial methods to examine the locations of children's frequented and habitual environments. Children ages 8-14 years were recruited from schools throughout London, Ontario, to participate in a health and environments study. Participants' locations were recorded via portable GPS, corroborated with activity diaries and parent/child surveys. GPS data were recorded every second, every day during awake hours throughout one week in both Spring and Fall. GPS data was processed using a GIS-Python tool that extracted routes and stops from GPS tracks of children. A Random-Forest-based algorithm determined which spatial variables (e.g., building distances, positional precision, SNR) best predict whether children were indoors or outdoors. Together with conventional cleaning and imputation, the GPS data was analyzed within a spatial typology reflecting urban environments (i.e. aggregated into hexagonal bins containing spatially-related variables). Preliminary findings from 516 uniquely recorded weeks collected through 449 unique participants (53% female, median age = 11) revealed frequented spaces centered on locales such as schools, homes, parks, recreation facilities, and sports fields. Habitual locales included bus stops, retail outlets, greenways, and churches. Future work will involve spatiotemporal scrutiny of greenspace venues, and linkages to physical activity levels via synchronized accelerometer data. Findings from this study can fill gaps in our understanding of how Canadian children use their neighbourhoods, and help inform policies and programs aiming to promote outdoor play.

G2: Thesis Proposals II (PCH UC001B)

Chair: Chelsea Major

1. **Negotiating and contesting space and power in the coastal zone in Mauritius**

Emilie Wiehe, University of Guelph

My PhD research explores how marine conservation policies and coastal livelihoods in Mauritius are impacted by what is often known as the 'blue economy'. Specifically, this research will investigate the extent to which the blue economy and its accompanying policies in Mauritius can advance an effective, just, and equitable marine conservation agenda. Despite the compromised ecological integrity of the marine environment of the island, current national policies encourage large-scale aquaculture ventures, offshore extractive industries and industrial fishing and processing. These policies are often presented as compatible with marine conservation, contributing at the same time to economic growth and social equity. However, Mauritius is struggling to conserve its vulnerable coastal ecosystems: it is grappling with the effects of climate change, the ebbs and flows of funding, and longstanding conflicts between

different marine resource users. Despite attempts to promote inclusive and equitable approaches to marine resource management and conservation, there are concerns that inequality is increasing and coastal livelihoods are becoming more precarious. Applying a political ecology approach my research will (1) identify the different discourses relating to marine conservation and the blue economy in Mauritius through a discourse analysis of policy documents, legislation and other relevant documents; (2) investigate the reliance of coastal communities on the lagoon, focusing on the intersection of livelihoods with marine conservation and blue economy activities using in-depth interviews as well as surveys in selected sites; and (3) examine the perspectives of different stakeholder groups on these themes using in-depth interviews and focus groups.

2. Seafood Security in Coastal Communities: Governance Prospects and Challenges

Emily De Sousa, University of Guelph

3.2 billion people worldwide currently rely on fish as their main source of protein and over 10% of the global population relies on fisheries for their livelihoods. Additionally, fish represents much more than a protein source; they provide essential micronutrients which are necessary to end malnutrition. As food security has become an urgent, global concern in the wake of climate change and population growth, decision makers around the world are racing to find solutions to ensure food security and nutrition for a population that is expected to reach 9 billion by the year 2050. While food security is covered extensively in academic literature, most existing research focusses on the contributions of land-based food systems to food security and nutrition. The few studies that have been done on the contribution of fisheries to food security and nutrition are geographically limited, focussed primarily in Asia and the United States. My research will aim to expand the literature to include new geographic regions and their ability to leverage fisheries for food security. Using community-based research approaches, my research will examine the contribution of fisheries to food security and nutrition, specifically through a governance lens, with the goal of identifying effective governance models for maximizing the contribution of fisheries to food security, nutrition, and livelihoods in coastal communities. This research will provide a governance framework for other fisheries dependent coastal regions and open an opportunity for further research on the contribution of fisheries to food security and nutrition.

3. Examining Post-Harvest Loss Mitigation on Horticultural Crops in Tanzania

Evodius Rutta, Queen's University

Today, nearly a third of the Sub-Saharan Africa's population has limited access to nutritious food, and the majority of children are malnourished due to low agriculture productivity and post-harvest losses. The situation is dreadful in Tanzania: about 25 percent of grains are lost before they reach markets, and more than half of fruits and vegetables perish before they are consumed. With the growing population and increasing threats of climate change, increasing agriculture productivity alone cannot adequately address food insecurity challenges in Tanzania. Studies confirm that helping farmers control food losses is central to Tanzania's food supply and rural economy where subsistence farming is the dominant livelihood. Yet, preventing food losses on fresh produce has not received significant research and policy attention among policymakers in Tanzania. This research therefore, seeks to examine capacity building needs/challenges towards enhancing dissemination and adoption of improved post-harvest technologies for small-scale horticultural farmers in the country. The study will engage farmers, policy makers, individuals in Non-Government Organizations (NGOs) and academics in the field of agriculture to understand effective interventions for increasing adoption of low-cost post-harvest technologies for small-scale horticulture farmers. Study findings will inform effective interventions and influence policies for preventing food losses, ending hunger and rural poverty in Tanzania.

4. Identifying Snow Leopard–Human Conflict Hot Spots in Shey Phoksundo National Park, Nepal

Caitlin Laidlaw, University of Waterloo

Large carnivores are often found at the center of conservation efforts across the globe. They are socially regarded as charismatic mega fauna and functionally identified as keystone species in their respective ecosystems. But the conservation of large carnivores is often the most controversial when implemented on the ground as a result of the human-wildlife conflict between these species and local communities living in or near protected areas. The snow leopard is one such keystone species that is listed as vulnerable to extinction by the IUCN and is in conflict with local communities through livestock depredation. Depredation events can negatively impact local perceptions of snow leopards, and may result in retaliatory killings, both of which negatively impact the conservation of this vulnerable species. Management strategies have been suggested to mitigate this conflict, but limited funds and large park areas make the decision of where to implement these strategies difficult. For my masters thesis I aim to investigate how habitat suitability mapping for the snow leopard in conjunction with human settlement mapping can be used to identify conflict hotspots, using Shey Phoksundo National Park as a case study. I will use MaxENT software to produce a snow leopard habitat suitability map, which models suitability based on key environmental habitat variables and presence data. Human settlement areas will be determined with household surveys to identify the extent of settlements, rangeland, and depredation events. The suitability map will be overlaid with human settlement to identify conflict hotspots. These conflict hotspots would allow managers to prioritize areas across their landscape for human-wildlife conflict mitigation strategies.

5. Assessing the capacity to implement Integrated Watershed Management in Ontario: A case study approach

Kyle Wittmaier, York University

Cyanobacteria blooms and related water quality issues have emerged as significant threats to Ontario inland lakes. Ontario endorses an Integrated Watershed Management (IWM) approach to combat water quality concerns. IWM involves various government and non-government actors sharing authority and responsibility for planning, implementing, monitoring, and adapting management plans. Studies have shown the implementation of these principles can present some challenges, especially when there is limited financial, technical, political or social capacity. This research aims to assess the capacity to implement IWM in three case studies under different contexts and circumstances. The Lake Simcoe watershed management project employs a holistic ecosystem approach with an emphasis on IWM, which is supported by a legal framework provided through the Lake Simcoe Protection Act (LSPA). In contrast, Callander Bay and Eagle Lake represent two regions in central Ontario without watershed-specific legislation, which have varying local capacities for IWM. Callander Bay is a municipal drinking water source, thus protected under the Clean Water Act and actions are coordinated by the North Bay – Mattawa Conservation Authority. Eagle Lake is not within the jurisdiction of a conservation authority, so activities are coordinated by the Lake Association and Township. A review of local capacity to implement IWM will be conducted in each region, exploring how varying local conditions impact IWM implementation. This research will assist in addressing the capability of regional authorities in implementing IWM. Additionally, it will work towards developing minimum data and capacity requirements for successful adaptation.

6. Developing indicators to evaluate the outcomes of biocultural conservation programs in Canada

Jessica Lukawiecki, University of Guelph

As one of the signatories to the United Nation's Strategic Plan for Biodiversity, Canada has committed to protecting 17 per cent of terrestrial areas and inland waters by 2020. Canada has also committed through the United Declaration on the Rights of Indigenous Peoples to advancing reconciliation and

supporting Indigenous systems of governance. To meet both goals, the Canadian government is working closely with Indigenous peoples to protect both biological and cultural diversity, through what are being called ‘biocultural approaches’ to conservation. Canada has made initial investments in supporting Indigenous Guardians programs, for instance, which employ Indigenous peoples to engage in activities that protect the land and associated cultural activities. There is increasingly an interest from government and Indigenous peoples in understanding the outcomes of biocultural approaches to inform decision-making in the conservation sector. Evaluation methods are currently limited in their ability to capture the full range of outcomes derived from biocultural approaches, spanning areas such as food security, economic impacts and biocultural knowledge. This research proposes to co-create evaluation frameworks for Guardian’s programs that utilize culturally appropriate indicators to assess program outcomes. Such research is timely and necessary given the need for new pathways that move Canada towards meeting its international obligations while also supporting reconciliation.

7. Remote Sensing of Experimental Cropland Using Airborne Hyperspectral and Thermal Sensors
Ali Al Wafi, University of Toronto Mississauga

Precision agriculture promises a more sustainable and environmentally conscious future for farms. It exchanges traditional farming methods with integrated sensory inputs and new farm management techniques. The active utilization of remote sensing in the field of agriculture will allow farmers to make efficient and informed herbicide and fertilizer deployment decisions. This will primarily reduce the levels of ecological catastrophes caused by nutrient and chemical buildup due to over-application. Hyperspectral and thermal data are used to assess the structural, biochemical and physiological states of crops. Researchers have already attempted and succeeded at the incorporation of hyperspectral remote sensing and thermal imaging in the field of agriculture to assess the health of vegetation. However, little work has been done using high-resolution sensors, aircrafts and experimental crop fields. We will utilize a high resolution hyper-spectral sensor and a thermal sensor mounted on an aircraft. This combination will be used to capture spectral data of vegetation in an experimental agricultural area with multiple study sites. Each site undergoes a different crop treatment which allows us to capture the crops at different physiological states and assess visible and non-visible properties.

8. Using stable water isotopes to evaluate the correlation between agricultural stream water age and water quality during runoff events
Larissa Gospodyn, Ryerson University

It has been well-established that water quality in agricultural streams change over the course of hours during runoff events, but the sources and mechanisms for these changes are not well understood. This study looks at the variation of stable water isotope ratios ($\delta^{18}\text{O}$ and $\delta^2\text{H}$) during runoff events in three southern Ontario headwater catchments, dominated by agriculture. These catchments differ in their nutrient application, soil class and presence of tile drainage. In order to infer flow paths, a relative comparison of ages is used with the assumption that surface flow or tile drains would take much less time to reach the stream than subsurface flow, or soil stored in the soil matrix. Integrating isotope sampling with water quality allows a glimpse into the hydrological controls on water chemistry and composition and may allow us to better understand the mechanisms for these observed changes in water quality. An increased understanding of the flow of water during an event may allow improvements on policy and management to reduce nutrient losses to stream.

9. Analyzing Shanghai’s disaster vulnerability using the ‘Pressure-and-Release’ Model
Dana Moss, University of Waterloo

Shanghai's importance as a financial centre, and its population, has grown dramatically in recent years. At the same time however, impacts of climate change in the city are becoming more apparent with each passing year. As a result, the potential for flood disaster has risen in this coastal region due to the combined effects of climate change on river flooding, sea level rise, and extreme rainfall events. A major Shanghai flood disaster could have an incredibly adverse effect on current rates of technological and financial development in the city, and on the country as a whole. This presentation will use the 'Pressure-and-Release' model made popular by Wisner et al. (2004) to analyse Shanghai's disaster potential. By using this model, social, economic, political, and physical geographical vulnerabilities apparent in Shanghai are understood, which in turn allows for a better understanding of the impact climate change could have on the city, and the possible adaptation pathways which might reduce these impacts. Research was conducted in Shanghai over the September-December 2017 period and included secondary data gathering (n=15), key informant interviews (n=11), and observations of current structural flood risk reduction measures. This presentation will be of interest to those concerned with the current state of climate change preparedness in the region, and those interested in the use of the 'Pressure-and-Release' model as a disaster analysis and climate change impact analysis tool.

H2: Poster Session I (1st Floor HUTT)

(Posters to be displayed from 8:45AM to 12:15PM; Authors will be with their posters during this session)

1. **Mackenzie Wood Bison**
Daphne Pan, University of Waterloo
2. **An agenda for community-centred conservation in the post-2020 global biodiversity framework**
Ella-Kari Muhl, University of Waterloo
3. **Spatial Modeling of Ambient Nitrogen Dioxide and Ozone Air Pollution in Canadian Cities with Mobile Monitoring Methods**
Felix Massey, University of Toronto
4. **Deforestation in China**
Jing Rao, University of Waterloo
5. **Identifying the role of hydrological changes in a tributary driving ice-jam formation at the Peace-Athabasca Delta**
Mia Stratton, University of Waterloo
6. **Extreme Weather Impacts on the Infrastructure Development Sector**
Muhammad Rizwan, McMaster University
7. **The Impact of Urban Agriculture on Food Accessibility in the McQuesten Neighbourhood of Hamilton, Ontario**
Nicole Langdon & Patrick DeLuca, McMaster University

12:15PM – 1:00PM Lunch – Food Court, University Centre

1:00PM – 1:30PM Refreshment Break and CAGONT Annual General Meeting – please attend Peter Clark Hall, University Centre

Session 3: 1:30PM – 3:00PM

A3: Geographies of Migration I (HUTT 348)

Chair: Hannah Harrison

1. Return Migration of Ghanaian Immigrants

Aaron Nartey, Brock University

Scholars have observed that in the face of wage differentials that favor destination countries, an increasing number of presumably rational Ghanaian migrants in developed countries choose to return to Ghana (Twum-Baah, 2005; World Bank, 2006; IOM, 2009). To explore this phenomenon a systematic literature review methodology is employed in collecting, sampling and analyzing migration literature in general, and Ghanaian migration literature in particular to ascertain the dominant mechanisms that surround the return migration of Ghanaian immigrants. The paper shows that (un)favorable social, economic and political conditions in Ghana and destination countries are the critical underlining conditions that influence the return of Ghanaian immigrants — suggesting that Ghanaian immigrants are rational actors who perform a cost-benefit analysis of the contextual realities that circumscribes the economic landscape of Ghana and destination countries. The paper finds that the family (both at origin and destination) is the dominant social-cultural institution that significantly affects return migration decisions of Ghanaian immigrants. For some returnees, employment-related difficulties in destination countries necessitated their return, while for other immigrants, the hope of securing better jobs that commensurate with their qualifications remain as an underlying factor that induced their return to Ghana. Against this backdrop, the paper recommends the formulation of a comprehensive return migration policy that emphasizes the socio-cultural context of immigrants.

2. Syrian Refugee Resettlement and Second Tier-Cities: A Case Study Of Local Immigration Partnerships from Waterloo, Ontario

Blair Cullen, Wilfred Laurier University

As of January 29, 2017, Canada has received 40,081 Syrian refugees (IRCC 2017). Although Canada has a history of accepting refugees, the scale of Syrian refugee resettlement is historic, comparable only to the arrival of 60,000 Indo-Chinese refugees, 35 years ago. Since then, refugee resettlement policy has changed. Following decades of decentralization, the Federal Government's role in resettlement has been reduced, sparking concern about how Syrian refugee resettlement will be affected (Alboim 2016). Such concerns are raised with little consideration given to Immigration, Refugee and Citizenship Canada's current refugee resettlement policy, Local Immigration Partnerships (LIPs). Introduced in 2008, LIPs are community-based councils whose goal is to develop a local settlement strategy to produce a welcoming community. LIPs have been praised, especially in policy-making circles, yet, research is limited, primarily policy in vein and not empirically based. To address this gap, our Social Sciences and Humanities Research Council funded research uses the Syrian example to examine how effectively LIPs can be in coordinating resettlement efforts and to what extent their coordination role can enhance the refugee resettlement process and outcomes. Unlike most of the literature, where the majority of case studies are based in gateway cities, the research features findings from a second-tier city, Waterloo Region, an IRCC official reception centre. Data collection consists of 24 interviews and one focus group with key informants from the Waterloo Region LIP. The research sheds light on policy lessons learned from developing innovative local policy under trying international circumstances.

3. Nigerian Diaspora in Canada and the Role of Nigerian Migrant Networks

Sheri Adekola, Wilfred Laurier University

There is a scarcity of literature on African diaspora in Canada, especially those from Nigeria. Much of the meagre literature focuses on sub-Saharan Africa in general. I conducted key informant interviews on migrant networks and analyzed the sparse literature on African immigrants in the diaspora with a focus

on previous literature, gaps in the literature and important areas for consideration in future research, as well as policy recommendations. The rationale for highlighting Nigerian diaspora as a subset of African immigrants within Canadian society is to address the conceptual, empirical and methodological gaps in the literature, which tends to homogenize all black people. This article presents the waves of migration of Nigerians to Canada, the Nigerian diaspora and the efficacy of migrant networks that exist in Nigerian communities. The study finds that migrants join such networks to keep in contact with the people in their culture, for a sense of belonging and for networking and religious reasons.

4. Extended Displacement: Life-history methods in, but beyond, camps

Yolanda Weima, York University

Most histories of refugee hosting in Tanzania categorize the Burundian refugees who lived in camps created in the 1990's as having simply fled from violence in Burundi that same decade. Yet, already, many Burundian refugees had much longer and more complicated forced migration trajectories, overlooked in simplified, and present-focused descriptions of camp populations. In response to the homogenizing tendencies of refugee management, life histories and other narrative approaches have become popular in forced migration research because of their ability to highlight diversity and complexity (Clark-Kazak, 2009, 2011), and allow for research into aspects of migration trajectories that are often overlooked (McDowell, 2018). In this paper, I demonstrate these methodological strengths specifically in situations of refugee encampment, complicating the characterization of Burundian refugees in Tanzania. I draw on eighty life-history interviews with forty-five Burundian refugees in two refugee camps in western Tanzania in 2017 and 2018, and discuss some of the practical, ethical, and methodological challenges in conducting life history research in camps. The stories recounted extend over four decades and include lived experiences of more than twenty-five camps in five countries, transit camps, jails, farms, villages, and cities. Some events they highlighted, such as life outside of camps, and immigration management campaigns, are particularly neglected in research, as practically and ethically difficult to access. The use of life-history methods allows for important contributions to geographies of refugee encampment, as participants' life histories entwine spaces and times beyond present camp boundaries.

B3: Mapping and Using Spatial Data (HUTT 240B)

Chair: Kirby Calvert

1. How Participatory GIS can help to defend Indigenous Peoples' rights

Ghanimat Azhdari, University of Guelph

The United Nations Declaration on the rights of Indigenous Peoples (13 September 2007) states that: "Indigenous peoples have the rights to the lands, territories and resources which they have traditionally owned, occupied or otherwise used or acquired." The very first step in our approach to achieving sustainable development, livelihood improvement and land tenure security is to delineate accurate territories of indigenous peoples and local communities including both their ancestral domains and their current situation.

2. Assimilating Spatial Big Data Analytics into Retail Location Decision-Making

Joseph Aversa, Ryerson University

The current state and evolution of retail location decision-making (RLDM) in Canada is examined in this research. Three in-depth cases studies were performed with the results showing that during the last

decade RLDM changed in three main ways. Those being: (i) an increase in the availability and use of technology and Spatial Big Data (SBD) within the decision-making process; (ii) that the type and scale of location decisions that a firm undertakes remain relatively unchanged even with the growth of new data; and, (iii) that the range of location research methods that are employed within retail firms is only just beginning to change given the presence of new data sources and data analytics technology. Finally, while most retailers are aware of the new SBD techniques that exist, they are not often adopted and made part of the decision making process.

3. Seasonal spatial patterns in police calls for service

Ysabel Castle, Nipissing University

Police call data, collected over a four-year span, were acquired for a small city (pop 52,000) located in Northern Ontario which experiences extreme seasonal variability in weather. The data were filtered to remove any personal information, integrated within a GIS platform, and anomalous data points removed. The remaining georeferenced data were then visualized using density surfaces, linear (i.e. road) features, and hotspot analysis. Preliminary results indicate that some types of calls do show an association with environmental variables, particularly with seasonality (winter vs summer months) but that issues of data quality can pose various limitations to these types of investigations.

4. The Development and Accuracy of Census Tract Maps in Postwar Canada, 1951 – 1966 **Christopher Macdonald Hewitt, University of Western Ontario**

In 1951, the Dominion Bureau of Statistics or DBS (later Statistics Canada), began mapping urban areas with a population of at least 50,000 at the neighbourhood level using census tracts. The DBS provided each tract map with several pieces of sociodemographic data including age, education, marital status and income about the population in that tract. In this study the census tract maps of several Canadian cities will be investigated including Toronto, Montreal, Vancouver and Windsor. Topics of interest focus on map development and accuracy including the key elements of a map, the location / type of the tract boundaries, distortion grids and scale variability. General statistics about the census tract maps will be presented as well. The results indicate that only maps from 1966 incorporated the basic elements of a map. Earlier maps omitted a north arrow and at times a scale bar. Additionally, a number of maps only focused on part of their study area which would force map users to consult supplementary sources to understand the complete areal extent of some tracts. Thus, the accuracy of the maps varies from urban centre to urban centre. These findings are an important consideration for any initiative to digitize these boundaries into a GIS format.

C3: Geographies of Conservation Governance (HUTT 234)

Chair: Noella Gray

1. Understanding perspectives on marine 'other effective area-based conservation measures' in Canada

Abby Sparling, University of Guelph

In 2010, Parties to the United Nations (UN) Convention on Biological Diversity (CBD) adopted the Strategic Plan for Biodiversity 2011-2020 comprised of 20 Biodiversity Targets (Aichi Targets) to be achieved within the decade. One of the few quantified targets, Target 11, aims to reduce the rate of biodiversity loss through protected areas (PAs) and a new type of designation, “other effective area-based conservation measures” (OECMs). While OECMs have since been defined, international guidance

lacked in the early stages of implementation, prompting Canada to unilaterally interpret OECMs amidst ambiguity. Through a case study approach, this research aims to explain why and how the marine OECM policy process has unfolded in Canada, identifying the opportunities and constraints for conservation in Canada's marine environment, and for its diverse conservation actors. While on the one hand, OECMs represent an opportunity to achieve ambitious biodiversity targets and recognize a diversity of conservation delivery, concerns have been raised about their ecological integrity and political vulnerability. As a maritime nation with the longest coastline in the world, it is important to pay attention to Canada's operationalization of OECMs, as it will shape marine conservation efforts in a post-2020 framework and beyond.

2. So where are the savings? Proposed changes to Conservation Authorities

Dan Shrubsole, University of Western Ontario

The Principal Government recently asked all conservative authorities to prepare plans to withdraw from non-core programs in order to reduce funding. Using the Upper Thames Conservation Authority as a case study, the presentation provides historical context for this decision and concludes the savings to the province are insignificant.

3. Trophy Hunters & Crazy Cat Ladies: Exploring Cat Conservation through Intersectionality

Sandra G. McCubbin, Lauren E. Van Patter, Queens University

What explains the silencing, dismissal, disavowal, ridicule, and stigmatizing of care for individual animals observed in conservation discourses? This paper examines this question using a comparative case study of feral cat management in North America and lion conservation in southern Africa. We apply intersectionality to illustrate the ways in which hierarchies of scale (individual/population), knowledge (emotion/reason), and gender (feminine/masculine) marginalize concern for individual animals, holding important consequences for the lives of animals and those who care for them. We explore the embodiment of these intersecting hierarchies in two contrasting, yet entangled, figures – the (othered) Crazy Cat Lady and the (privileged) Trophy Hunter – which serve to illustrate how conservation discourses position care for animals as feminine and emotional, while privileging a very different human-animal relationship based in masculine, rational concern for species and populations. We argue that these intersecting hierarchies operate to maintain a structure of human-animal relations wherein caring for individual cats makes one a misguided, emotional woman whereas killing a lion makes one a rationally acting man. We conclude by highlighting alternate ontologies which hold promise for fostering more equitable visions of multispecies flourishing.

D3: Geographies of Gender and Inclusivity (UC 430)

Chair: Roberta Hawkins

1. “They will listen to women who speak but it ends there”: Understanding the meaning and dimensions of the concept of empowerment from community stakeholders in the Asutifi North District of Ghana.

Florence Dery, Queen's University

Gender plays a vital role in shaping access to and governance of water, sanitation, and hygiene (WASH) resources. The purpose of this study is to explore the meanings of empowerment in the WASH sector from the perspective of local stakeholders in the Asutifi North District, Ghana. A qualitative approach was employed by the study, which involved fifteen (15) informant interviews with community leaders,

local government professionals, and WASH practitioners. Data were analyzed thematically. The results indicate that participants conceptualized empowerment in terms of four major themes: 1) availability of resources; 2) WASH information; 3) social and cultural factors, and 4) agency. Participants defined empowerment as a multifaceted process that is shaped by the physical, social, cultural, as well as political environments within their local communities. The findings of the study would provide researchers and practitioners with a greater understanding of the dimensions of empowerment that are relevant for strengthening WASH interventions and practices, as well as tracking progress towards gender inclusive outcomes.

2. Invisible Obstacles: Inclusion in Ontario Schools from the Perspective of Children with Invisible Disabilities

Nichol Kaiser, Queen's University

The current study examined inclusive education in Ontario public schools, as it is experienced by parents of students with invisible dis/abilities. Invisible dis/abilities are those that are not immediately visible to the naked eye, but have life altering and significant effects. Some invisible disabilities that commonly affect children include (but are not limited to) high functioning autism spectrum disorder, attention deficit disorder, externalizing behaviours, depression/anxiety, learning disabilities, and oppositional defiant disorder. Most literature to date focuses upon teacher/administrative perspectives of inclusion, while experiential data from families is absent. Parents are arguably the most qualified to opine about the success of inclusive education in their children's school, as they deal daily with their children's interactions within public school. In the present study, parents, recruited through various community organizations and Quintilian Private School, completed a survey on their families' experiences within the Ontario public school system. It was discovered that inclusive education for children with invisible disabilities is more an illusion than a reality in Ontario public schools.

3. Feelings, Femininity, & Fleshiness: Corporeal Geographies of Navigating Public Spaces with (Un)Bound Breasts

Brittany Davey, University of Western Ontario

Why is it considered 'normal' for women to wear a bra in public? Questioning normative notions of gender within the discipline of geography offers novel insights into our cultural, social, and spatial realms. However, embodied experiences related to the performative nature of dress has been under-researched: the geographies of women's bra-wearing habits have yet to be considered and the associated corporeal experiences of bound/unbound breasts are unknown. In this paper I address this gap by drawing on mobile interviews conducted with twelve self-identified women in Edmonton, Alberta. Participants were interviewed while navigating their everyday public spaces, once while wearing a bra and another time, braless. Relying upon embodied experiences as a source of knowledge production, I provide a phenomenological analysis of the spatial significance of the bra in containing the indeterminate nature of the fleshy body. Preliminary results suggest that women's breasted experiences are shaped by spatial, temporal, and social factors. For example, participants noted that unbound breasts were often gazed upon as "unprofessional", "sloppy", "slutty", and "out of control" in public. These perspectives were often embodied as feelings of discomfort by participants while braless in public; however, participants actively engaged in spatial and social mitigative techniques to negotiate feelings of discomfort that was temporally specific for negotiating the gaze on their breasts in public. Utilizing ArcGIS, I offer a visual dissemination of women's breasted experiences by spatially situating emotions in relation to (un)dress, showcasing the complex ways normative attitudes of gender, femininity, and bodies shape our embodiment and space.

4. The significance of scale in scholarship and practice

Feminist geopolitics highlights the importance of the body and the everyday as the key sites at which discursive and material relations of power are continually reproduced and defied. It unpacks geopolitical power and shows the manifestations of such power in the everyday lives of real people, those who resist, challenge and change geopolitical relations. Tracing different forms of power, oppression, and resistance across multiple scales feminist geopolitics suggests embodied, situated and politically transformative theories and methodologies for understanding various forms of oppression. By encompassing a range of subjects and scales, feminist scholars demonstrate the ways in which power relations at multiple scales (global, national, urban) are connected, and illustrate that economic, political and socio-cultural global processes are experienced in localized, every day, embodied ways. Divulging the links between the local and the global can help to understand the ways state and globalized capital relations colonize the lives and bodies and to challenge the oppressive spatial practices that sustain these geopolitical discourses. The notion of scale plays a critical role in structuring political actions that challenge the hegemonic power relations. The way we think about the concept of scale has significant implications for the ways we address the scholarships and practices. Despite the frequent reference to the concept of scale by feminist geographers, it has not been aptly articulated and the concept seems to be borrowed from various theoretical frameworks and used simply as a methodological tool. This paper examines different conceptualization of scale and explains the ways different perspectives on scale impact the research and practice.

E3: Special Session – The (R)evolution of Agri-Food in the Anthropocene II (UC441)

Chair: Abdul-Rahim Abdulai

1. Information and Communication Technology Application in Geographic Indicator Agricultural Products Management and Its Relevance with Smallholders — A case study of China

Hanfen XU, University of Waterloo

Geographic indication is necessary for value to be created around an origin-based product. In China, Information and Communication Technology gradually applied in the process of GI product management with the form like QR code, Internet of Things, traceability system etc. The research conducted field work in three provinces to see how smallholders involved in GI products management after ICT application. Through the historical analysis on the evolution of GI policy management and field research materials, ICT brings changes in the GI product governance. It strengthens the linkage between smallholders and market, the trust between producers and consumers and also brings dialogue space for different stakeholders. However, as a regional brand, during the application of ICT, digital divide is obvious through producers especially smallholders. Policies should define the scope users of GI. What's more, establishing a multiple benefit linkage mechanism between smallholders and regional brands is necessary.

2. Mapping Food Waste Reclamation to Encourage a Secure Circular Food Economy

Judith (Jude) Keefe, University of Guelph

This masters research project addresses a research gap of using maps to show information associated with food waste management statistics, using indicators associated with food insecurity will support mapping data layers for comparison. The use of GIS enables analysis of regional networks using asset points to identify areas of food insecurity, accessibility, and opportunities for waste reclamation of edible/avoidable food waste across the value-stream. Cartographic presentation and analysis of

indicators within the waste reclamation hierarchy leverage data management to be compared with other food networks in an ongoing analysis of patterns in spatially significant data. Guelph-Wellington's successful application for a circular food economy in Summer 2019 Smart Cities Challenge plans for innovative design thinking + entrepreneurship to achieve "50x50x50 by 2025", as a springboard to design an operable new way forward with a long-lasting solution for the region. One of the nine Smart Cities project foci is "mapping regional food assets and behaviours". Design of a completely circular food economy can support existing assets using GIS strategies to code categories of resources and define an actionable way forward for food surplus as a resource. By addressing spatial visualization strategies, I will discuss the process of conceptualizing distribution of food wastes in two rural/urban case studies of a networked regional partnerships: Guelph/Wellington County, Ontario and Halifax/Annapolis Valley, Nova Scotia. In these local examples, involvement with community partners showcases a strength of community-engaged scholarship by applying geographic techniques to support food security by innovative reclamation of wasted food throughout the system.

3. Dairy Farming in Western Newfoundland: Challenges and Opportunities in the Face of Climate Change

Emmanuel Tamufor, University of Guelph

Agricultural development is important in every society for providing livelihood for farmers and food security. It can be challenging in provinces like Newfoundland and Labrador which is a big island with transportation challenges within the island of Newfoundland, its mainland portion of Labrador and between the two entities of the province. Connections between the province, the other parts of Canada and the rest of the world is also challenging. The transportation issues increase local food production stress amidst the difficulties of growing crops due the rocky landscape, the short growing seasons and climate change. In the presence of these challenges, dairy farming has emerged as a thriving industry in Western Newfoundland which has been growing almost exponentially from the 1970s till today and has the potential to contribute significantly to solving the problem of food security in the region and the whole province.

F3: Urban Geographies II (UC 442)

Chair: Kate Parizeau

1. "If you don't like seagulls, don't live in Brighton": Exploring human-gull relationships in Brighton and the lively, more-than-spatial negotiations of the city/ nature divide.

Hannah Hunter, Queen's University

One of the first things you will notice on a visit to Brighton are the seagulls: swooping down to steal chips, screeching in the early morning, their image plastered on postcards and the sides of busses. As a result, Brighton residents often hold very strong views of seagulls as either a menace, an unfortunate inevitability, or a natural wonder. This paper attempts to make sense of these complex, variegated viewpoints. In contrast to much research in urban animal geography, this case study shows that there is more at play in determining the possibilities for and outcomes of human-animal relationships than just the city/ nature cultural-spatial ordering system. This paper thus asks the following questions: 1) What kind of human-gull encounters exist and what is it about urban gulls in Brighton that make these, and their outcomes, occur?, and 2) How can we make sense of these in relation to the city/ nature divide? In order to answer these, this paper utilises a multi-method approach of qualitative narrative interviews and media content analysis, as well as engages with theories of structuralism and nonhuman charisma, among others. It finds that possibilities for human-gull relationships vary significantly depending on

both intricate more-than-spatial considerations and the limitations set by cultural-spatial logics. This paper thus argues that urban human-animal relationships are ultimately haunted by powerful spatial taxonomies, but that ‘under the microscope’ the city/ nature divide is both living and lively: more-than-spatial specificities provide more room for play, friendship and trouble-making than there first appears.

2. Toronto’s Youth Violence Problem: Contrasting an emerging global city’s curated image with the reality of its growing underclass

Sarah Robertshaw, University of Toronto

Cities, like people, are defined by their unique character. As we progress into the 21st Century, globalization and urbanism have challenged how we have historically perceived what a global city is; no longer is that stage only dominated by economic western capitals like London, Paris or New York, but we now have a multitude of emerging global cities. From the megacities in the Global South to soft power players like Toronto, humanity is rapidly moving into these cities changing, densifying and diversifying the landscape. The way cities market themselves to the world has changed as well. This paper focuses on the intersection between global influences and local urban planning policies. Investigating Toronto’s quest for international attention and the direct impact those outward-focused policies have on the city’s most vulnerable citizens and neighbourhoods, specifically youth (15 to 29-year-olds) that live in areas that are experiencing urban decline, i.e. the neighbourhood of Jane and Finch. Even though Toronto is an affluent and multicultural global city- considered one of the safest and liveable places in the world- it is experiencing a disproportionate amount of youth gang violence for its population size. In this paper, I conclude that in trying to become an international leader, Toronto has engaged in policies that have pushed neighbourhoods that are the bedrock of the city into the margins, so rapid gentrification can take place, allowing for the increase of youth gang membership.

3. Social interaction and the built environment: A case study of university students in Waterloo, Ontario

Tharushe Jayaveer, University of Waterloo

There have been increasing calls for universities to develop policies supporting student well-being due to the growing concern of mental health issues on university campuses. One area of concern is the built environment: A built environment that fosters social interaction is often recognized as a vital component in supporting well-being, friendship formation, academic achievement, self-identity and even knowledge creation. This presentation will discuss a research project that surveyed students at the University of Waterloo about their perceptions of on- and off-campus housing and tested its influence on social interaction.

4. The street as a political space: Analyzing the political impact of Brazil’s 2013 protests

Sergio Borges, Federal University of Rio de Janeiro

Since 2008, the world has been shaken by a wave of political mobilizations (e.g., “Iceland’s Revolution”, 2008; Arab Spring, 2011; Los Indignados, 2012). These protests have created varying degrees of political impact. In 2013, Brazil was the site of massive political protest. During this time, the country witnessed its largest political demonstrations since the fall of the military dictatorship more than 20 years earlier. The protests were sparked by widespread discontent with: the increase in fares for public transportation; the poor quality of public services, such as health care and education; and the federal government’s spending (immense public investments on the Olympic and the FIFA World Cup). Through an in-depth analysis of draft and enacted legislation, and presidential announcements, linking them with the protesters demands and actions, I explore how citizens can influence their governments

through political action in the street, converting the street into a space of political significance. Thus, in this paper, I argue that streets of Brazil became a political space that directly influenced the decision and policy making process of local councils, state's government, the national congress, and the president. I advance the idea that the political space of street can be a power political space that shapes power, the policymaking, legislation, and government agenda.

G3: Thesis Proposals III (PCH UC0001B)

Chair: Jennifer Silver

1. Artisanal and Small-scale Mining in Ghana and Chinese Gold Rush: Determinants and Implications

Richard Kumah, Queen's University

In approximately 80 developing countries across the world, close to 100 million people derive their daily livelihoods from artisanal and small-scale mining (ASM). In Ghana, small-scale mining of gold constitutes a major source of employment for thousands of rural folks and contributes significantly to foreign exchange earnings. However, due to limited mining expertise of those engaged in ASM, empirical work generally shows that the sector accounts for widespread degradation of land, deforestation, and mercury pollution of air, land and water. Over the past recent years, an emerging trend is a growing participation of Chinese migrants through various 'partnerships' with local resident-miners; this is occurring against the backdrop that ASM license is reserved for citizens. This development has sparked controversy among industry experts and scholars. On one hand some advance a win-win argument - a spill over effect on local expertise and eventually culminating into a more sustainable ASM practice. Others argue that these Chinese prospectors are only taking advantage of a sector plagued with high level of informality to exploit natural resources by escaping state regulation. This research seeks to explore the drivers propelling such 'partnerships' and their impacts on the skill and expertise of resident-miners in relation to sustainable ASM practices.

2. Call of Duty: 416, A Survival Analysis of the Video Game Industry in Toronto

Lauren Peddle, Brock University

In Canada alone, there are 596 active video game studios which contributed an additional 3.8 billion CAD to GDP and some 21,000 jobs in 2017 (Entertainment Software Association of Canada, 2018). Despite these staggering statistics for a comparatively new industry, the video game industry is relatively under-studied. With the working title Call of Duty: 416, A Survival Analysis of the Video Game Industry in Toronto, my thesis will be centered on using Hazard models to assess the health of Toronto's video game firms. This will add to the sparse literature on the video game industry by establishing if Toronto's video game studios are positively or negatively impacted by their locational choices. I will undertake two tasks to answer this question. First, I will establish if the studios' locational pattern is spatially random using the Moran's I function in ArcGIS. While cluster theory suggests that we should see these studios co-locating, Internet and other distance-shrinking technologies may well reduce the need to co-locate. Second, I will assess the impact of agglomeration economies on local video game firms. This will build on the work undertaken by De Vaan et al. (2013) who used hazard models to establish a global baseline cluster size. The global baseline establishes at what point an agglomeration's positive externalities outweigh the negative. This work might be useful for assessing the effectiveness of industrial policy.

3. Non-commuting travel of post-secondary students in the GTA

Jordan Aharoni, University of Toronto

Travel behaviour studies have grown in number in recent years, in part due to a greater emphasis being placed on human variables for policy and planning. Despite this, students generally remain an underrepresented group among the population. This is largely due to students being a transient population, often moving frequently and living outside wide-scale survey sampling frames. Researchers have been motivated by this under-representation to conduct studies focusing on student travel in an attempt to fill in these gaps. Most studies being done in this area focus on how students travel to and from school (or work) while very few examine non-commuting trips. Post-secondary students tend to have flexible schedules and more freedom to utilize different transportation modes so there is significant benefit in studying non-commuting trips to gain a more comprehensive understanding of how and why students travel. My graduate thesis will examine these behaviours using data from four schools in the Greater Toronto Area: University of Toronto, Ryerson University, York University, and the Ontario College of Art and Design University. The campuses of these four schools can be found in different city environments ranging from downtown urban cores to a suburban setting. I will be exploring how these different environments and their transportation networks affect student travel through an in-depth descriptive analysis as well as a spatial analysis using GIS software. The findings of this thesis will inform suggestions for universities to enhance student travel experiences and encourage more sustainable travel modes.

4. Review of Heritage Conservation Districts in Stratford, ON using Public Participation Geographic Information Systems

Manpreet Singh Chahal, University of Waterloo

Heritage conservation districts (HCDs) are made of areas whose cultural heritage value contributes to a sense of place that extends beyond their individual buildings, structures and landscapes. Previous research has considered the success of HCDs as heritage planning initiatives throughout the province of Ontario. The city of Stratford is one such example, in which the downtown core is an HCD that consists of 190 commercial buildings. There has been a need for citizen consultation on local HCD composition (what is in/out), how it contributes to local sense of place, and how well it is working at conserving heritage in a socially and economically viable way. Various research approaches have been employed such as resident surveys, townscape surveys, stakeholder interviews, real estate data analyses, and requests for building alterations. One major gap in research has been the lack of citizen engagement in the Stratford Downtown Core HCD. Public meetings have been held where only few residents can attend, surveys have been conducted and mail has been sent out, but results have been limited. My thesis looks at the development of a web/mobile GIS application to allow citizens to provide feedback on heritage properties in Stratford both remote and in-situ. The goal is to see if there is a difference in types and amount of feedback when citizens enter it into the application remotely or at the specified heritage site. This will then be used to gauge citizen satisfaction levels living in the HCD and provide recommendations to Stratford.

5. Exploring the relationship between location and public feedback during infill developments in Stratford, On.

Robert Arku, University of Waterloo

Online and other web-based technological innovations allow public input to be solicited the carrying out of planning projects such as infill developments. It is unknown whether the location where public input is collected, remotely or in situ, affects the nature of information gathered. This exploratory research therefore seeks to study the nature and characteristics of public feedback on an infill development project in the City of Stratford. Public input will be collected both on site where infill is to take place

and remotely. Past literature has looked at how web-based applications are used during general planning processes such as the drawing up of Master Plans for cities. However, not much has been done in determining whether the point of collection of public feedback affects the nature of information gathered during infill developments. The study will compare input which will be gathered both remotely and on site where the infill development is to take place. A web-based application will be developed as a participatory medium to be used by various participants remotely and on site of the infill project. Infill development, which involves developing vacant or under-developed parcels of land within built areas, can be locally contentious. This may be due to the varying perceptions of the space, NIMBYism and YIMBYism. Results from the study will hopefully help ascertain and understand the relationship between location and public input to help planning bodies understand the best engagement approaches to adopt.

6. Cannabis Use Profiles and Respiratory Health Outcomes among Emerging Adults in Ontario

Susan Yousufzai and Caroline Barakat, Ontario Tech University

Background: Rates of cannabis use appear to be highest among EA (18 to 25 years of age), and evidence suggests that alternate inhalational methods of cannabis consumption (e.g. vaping) are becoming popular among this population. While research has focused on the implications of the most commonly inhaled methods (e.g. joints, pipes, bongs) of cannabis on respiratory health, sparse research has investigated the administration and effects of novel inhalational methods of cannabis use. In addition, research has primarily examined use in adolescent or adult populations prior to legalization of recreational use in Canada. Objectives: i) To determine whether there are significant gender differences in respiratory health outcomes and exposure profiles (e.g. methodology, frequency, and quantity) of cannabis consumption; and, ii) To determine if there are significant differences in respiratory health outcomes in relation to consuming cannabis through vaping or smoking. Methods: Guided by a multi-dimensional socio-ecological and policy and health framework, this cross-sectional cohort study aims to examine the health effects of different inhalational methods of cannabis consumption (such as smoking or vaping) for EA. Objective and physiological data will focus on cannabis use history (such as frequency, age of onset, and quantity), sociodemographic characteristics, and pulmonary lung function. Significance: The proposed study will develop new knowledge on acute respiratory health outcomes of different methods of cannabis consumption for EA, and provide knowledge on cannabis-related behaviors of this high consumer and customer base.

7. Hydropower development in Northern Ontario First Nations communities as a path to economic self-sufficiency and prosperity.

Charlene Monaco, Queen's University

In 1971 commercial scale nuclear power hit the grid in Pickering, Ontario as a bridging technology between fossil fuel and renewable energy. The Ontario Hydro Electric Commission had already been in operation since 1906, and had successfully operated hydroelectric and fossil fuel generating stations throughout the province for over half a century. Nuclear power was introduced as a cost competitive alternative by W.B. Lewis, Director of Atomic Energy of Canada Limited. Twenty years later, a comparison of Ontario Hydro generating costs by fuel type (1993) identified the cost of nuclear power at 5.44 cents/kWh, 5 times the cost of hydroelectric power (1.1 cents/kWh) and slightly less costly than fossil fuel (6.83 cents/kWh). As we approach the end of life for Ontario's nuclear generating stations, we enter an era of energy transition from base load nuclear power into a new geography of places, spaces, scales and patterns of energy production, distribution and consumption that has yet to be defined. This thesis research will explore the supply, demand and social constructs of run-of-the river hydropower on Northern First Nations territories as a path to economic self-sufficiency and prosperity as part of this new geography of energy in Ontario.

8. Use of artificial substrate samplers for biomonitoring of lakes in the Peace-Athabasca Delta
Cory Savage, University of Waterloo

The 6000 km² floodplain landscape of the Peace-Athabasca Delta (PAD), northern Alberta, supports diverse wildlife and holds historical and cultural significance to local residents and other Canadians alike. However, these ecosystem services are threatened by multiple stressors, including climate change, upstream river regulation, and oil sands development. Concerns over potential consequences associated with these stressors motivated the Mikisew Cree First Nation to petition in 2014 to enlist Wood Buffalo National Park, which contains ~80% of the PAD, as a UNESCO World Heritage Site in Danger. In response, the 2017 UNESCO report included a recommendation to “expand the scope of monitoring and project assessments to encompass possible individual and cumulative impacts on the Outstanding Universal Value of the property and in particular the PAD”. Here we assess the use of a biomonitoring tool by deploying artificial substrate samplers in ~60 lakes where they accrued biofilm for the duration of the ice-free seasons of 2017 and 2018. Artificial substrate samplers are advantageous because they capture a defined period of algal growth. A rare flood event of the Athabasca River in 2018 offers the opportunity to explore spatiotemporal effects of flooding on biofilm metrics, namely periphyton community composition inferred from high performance liquid chromatography and concentrations of metals of concern. Metal concentrations will be compared to pre-1920 concentrations derived from previous analyses of lake sediment cores in the PAD. Findings from this research will aid in the development of a novel protocol to contribute to a state-of-the-art monitoring framework for the PAD.

9. Experiences of female migrants in Southern Africa: A comparative study of Ghanaian and Nigerian migrants in Cape Town, South Africa
Dorcas Okyere, Queen’s University

International migration has increased in scope globally. Some reasons for migration include conflicts, economic decline, poverty and natural environment-related disasters. Perceived benefits of migrating include improvement in livelihoods, health and education of migrants and their families. Global migration has historically been male-dominated; however, there has recently been a push towards a gender balance in male and female migrants, and a consequent upsurge in female migrants who may fall victim to exploitation and trafficking. On the African continent, South to South migration is the most prevalent; similarly, half of the migrants from developing countries, the world over, are estimated to reside in other developing countries. South Africa is amongst the continent’s most popular destinations for Africa’s migrants with Ghana and Nigeria among the ten leading countries of the world offered temporary and permanent resident permits in South Africa. The traditional male-dominated pattern of migration to South Africa is changing with an increasing number of African female migrants seeking sustainable livelihoods and political stability. As studies on migration in South Africa have mainly focused on male migrants, this research seeks to explore and compare the experiences of female Ghanaian and Nigerian migrants in South Africa. Using qualitative research methods, the study will draw data from 40 Key Informant Individual Interviews to analyse the experiences of documented and undocumented Ghanaian and Nigerian female migrants in South Africa. The research will aim to identify the relevant targeted strategies that could help improve the wellbeing of these sets of migrants.

H3: Poster Session II (1st Floor HUTT)

(Posters to be displayed from 1:30PM to 5:00PM; Authors will be with their posters during this session)

1. **The Impacts of Near-Infrared reflecting Pavements on Pedestrian Thermal Exposure**
Nicole Menheere, University of Guelph
2. **Climate Change and Extreme Event Trends in Six Nations of the Grand River, Southern Ontario and Surrounding Areas from 1951 to 2098**
Tariq Deen, McMaster University
3. **Restoring the population of Giant panda in China**
Xuhau Luo, University of Waterloo
4. **Using Landsat Images to Map Spatial and Temporal Trends in Lake Bathymetry in the Credit Valley Watershed**
Zoe Bedford, Monique Dosanjh, Yuhong He, University of Toronto Mississauga
5. **Discharge and Water Quality of Groundwater Springs, Southeast Iceland: Preliminary Results**
Aiesha Aggarwal, York Univesrity
6. **Why Girls Don't "Just Do It": Piloting a Place-Specific Survey of Constraints to Sport Participation for Adolescent Females**
Irmina Klicnik, Ontario Tech University
7. **Factors Contributing to the Degradation and Successful Rehabilitation of South Korean Forests**
Bowen Roger, University of Waterloo
8. **Biomass and Soil Properties of Eastern White Cedar Forest Carbon Dynamics in the Bruce Peninsula**
Rosalyn Kish, York University
9. **The Restoration of the Endangered Hawai'ian Nene Goose**
Celina Mohni, University of Waterloo

3:00pm – 3:30pm Refreshment Break, Peter Clark Hall, University Centre

Session 4: 3:30PM – 5:00PM

A4: Geographies of Migration II (HUTT 348)

Chair: Hannah Harrison

1. **Building newcomer resilience during (re)settlement: An analysis of settlement sector discourses in Canada**
Cecilia Scoles, University of Ottawa

(Re)settling in a new country (whether voluntarily or through forced displacement) is a complex and often challenging process. In Canada, the settlement sector plays a leading role in facilitating the provision of (re)settlement services to newcomers, including orientation, access to housing, language training, employment counseling, and health care. This project examines how the Catholic Centre for Immigrants (CCI), one of Ottawa's largest Immigrant Settlement Agencies (ISAs), builds resilience among immigrants and refugees. CCI provides a vast array of services to assist newcomers as they settle and adapt to life in Canada – including the Resettlement Assistance Program for government sponsored refugees – while working to sensitize the local community to help address newcomers' needs. Through a Foucauldian approach to critical discourse analysis, I analyze the publicly available information on the CCI website (e.g., annual reports, monthly newsletters, program descriptions) and social media channels to scrutinize how the notion of resilience is used, mobilized, and framed. Looking at the types of strategies CCI has embraced over the last 5 years to accommodate political changes will inform how resilience is shaped in their service provision and reveal their institutional capacity. Since the Syrian

Refugee Resettlement Initiative, CCI has adopted a reactive form of institutional resilience that is rooted in promoting the engagement of volunteer networks and the local community.

2. Immigrants serving in local government: An overview of factors affecting their candidacy and election

Shervin Ghaem-Maghami, University of Toronto

The phenomenon of descriptive representation (i.e., the extent to which politicians reflect the descriptive characteristics of the communities they serve, such as gender or ethnicity), has been studied at various scopes and scales since it was first introduced in Hanna Pitkin's *The concept of representation* in 1967. In recent years, scholars have begun to investigate immigrant participation in politics, including their representation at various levels of government, from the local or municipal level to the national level. For immigrant communities, the election of co-ethnic politicians can hold profound significance, not only in having individuals in government who can appreciate their particular concerns because they have similar backgrounds and experiences, but because they are also a symbolic indication of a given community's prominence. The aim of this scoping review was to evaluate the current research on the factors affecting the election of immigrant candidates to local government. The paper employed a scoping review methodological framework set out by Arksey and O'Malley (2005) using a search conducted in eight databases. Forty-six relevant studies, representing a range of geographical areas and employing a wide variety of methodologies, were identified for inclusion in the review. Almost 60 distinct factors were drawn out from literature and classified under three broad areas: election dynamics, individual candidate features, and immigrant-minority group characteristics. The review elaborates on the most salient factors across the majority of the papers included in the study. We discuss policy implications for practitioners and indicate areas for inquiry for researchers.

3. "Who will take care of me"? —Care for the aged in the context of caregiver outmigration in the Upper West Region of Ghana

Joseph Asumah Braimah, Queen's University

Evidence points to a growth in the older population in sub-Saharan Africa including Ghana. At the same time, there is a rise in migration of younger adults, largely looking for better opportunities in major urban centres. In this context, our study focuses on the Upper West Region of Ghana and the lived experiences of the older population in accessing care within the context of caregiver outmigration. Using in-depth interviews (n=20) and guided by theories of modernization and aging, we interrogate how caregiver outmigration shapes the experiences of the older population. Three major themes emerged from our analysis: a) motives behind caregiver outmigration, b) lived experiences of the older population back home, and c) strategies to cope with challenges stemming from caregiver outmigration. We recommend the implementation of policies and programs to cater for the needs of the older population left behind by their caregivers in the region. There is also the need to develop strategies to reduce the inherent caregiver outmigration in the area. Further, there is the need for research to understand the experiences of migrant caregivers in providing care for the older population for relevant decision-making.

4. The connection between childhood adversities and mental health outcomes in adulthood in Africa: A scoping review

Ayah Al-Ani and Vincent Kuuire, University of Toronto Mississauga

The World Health Organisation (WHO) defines childhood adversity or maltreatment as the mistreatment of individuals under 18 years of age that leads to harm to their wellbeing. It also outlines four types of childhood maltreatment; physical, sexual, emotional, and neglect. Available evidence in developing

regions including Africa, reveal high rates of sexual and physical abuse due to several factors including, war and violence, and sociocultural practices among others. The experience of maltreatment during childhood is known to have enduring physical and mental health impacts, even into adulthood. Despite the reported high rates of childhood adversities in Africa, there is scant knowledge about the connection between childhood maltreatment and mental health in later life in the region. To address this, a scoping review was undertaken to determine the state of knowledge in the literature on the connection between childhood maltreatment and mental health in later. Using the scoping review methodology proposed by Arksey and O'Malley, the findings showed that childhood maltreatment (i.e. sexual and physical abuse) leads to five types of psychosocial outcomes in adulthood: depression/anxiety, suicidal ideation, aggression, low cognitive/educational functioning, and general mental health deterioration and other. Additionally, these outcomes often occur in conjunction with each other. All the studies included showed that abused children exhibit adverse mental health outcomes in adulthood. Based on the findings, we proposed policies targeted at improving the well-being of children as well as adults who have suffered abuse.

B4: Economic Geographies of Development and Tourism (HUTT 240B)

Chair: Noella Gray

1. Social Responsibility as Best Practice for Cannabis Tourism Providers in Southern Ontario, Canada

Susan Dupej, University of Guelph

The purpose of this presentation is to explore a newly emerging typology of cannabis tourism in Canada, and argue for a conceptual framework of social responsibility in studying the new customs and practices associated with the industry. On October 17th, 2018, Canada became the first G7 country to nationally legalize the cultivation, processing and selling of cannabis for recreational use. Cannabis tourism is a natural extension of a legal cannabis market, and although it is not new, never before have recreational products and experiences related to the purchase and consumption of cannabis been available within a federally legalized context. In this presentation, first I detail the types of cannabis tourism related businesses that have emerged in Canada in the first year of legalization. I then argue that a framework of social responsibility needs to be adopted as an approach to sustainable business management practices where profitability is balanced with consideration to public health and safety. This perspective supports the goals of reducing the potentially harmful consequences of cannabis use while, at the same time, promoting a safe way to provide cannabis enhanced recreational experiences. Significantly, this approach is an opportunity for understanding tourism's capacity for balancing morals/ethics and economic opportunity produced within spaces of cannabis legalization.

2. Bracelets for International Development: What Do Online Searches Show?

Kimberly Hill-Tout, University of Guelph

There is an increasing opportunity for consumers in the Global North to purchase products that donate towards development projects abroad, rather than governments taking on the responsibility for funding international development. This shift from the public to the private sector in funding international development projects means that these organizations are able to select the 'causes' and knowledge consumers can gain through their purchase. One common product manifestation of this pattern are fundraising bracelets. Organizations advertise that the sale of their bracelet will trigger a donation towards a development problem. And through its online interface, consumers are presented the opportunity to engage with international development problems. Therefore, an examination of the extent

and content of organizations available to consumers in the Global North is required to understand the ways that fundraising bracelets function as a mechanism of development. Using a combination of critical development studies and development geography to examine this phenomenon, this paper examines how organizations' fundraising bracelets act as a mechanism of development. This study first used a purposeful search for fundraising bracelets that can be found online in order to build a database about the scale of fundraising bracelets; then, relied on a discourse analysis of the promotional materials found on select organizations' websites including: text; images; and videos. The database points towards a grouping of causes that are financially supported by organizations through bracelets, as well as the individualization of international development. This research will ultimately address ways in which international development is framed through consumer-based goods.

3. Exploring the tourism development trajectory in the Central Region of Ghana, through the lens of Evolutionary Economic Geography

Faiza Omar, University of Waterloo

Evolutionary Economic Geography (EEG) uses path dependence theory to understand how primary resource regions use existing resources to transition along new economic paths (Brouder, Clave, Gill and Loannides, 2017). Over the past decade, geographers have been applying EEG in tourism research, in countries of North America, Europe, and Australia (e.g., Brouder, 2014; Brouder, 2013a, b; Brouder and Fullerton, 2015; Gill and Williams, 2011, 2017; Mitchell and Shannon, 2018a, b). Few studies have been conducted in the Global South. My research used EEG to understand how the Central Region of Ghana, a primary resource-based economy, is transitioning along tourism, and how the region is developing branching innovating trajectories through recombination, conversion, layering mechanisms, and if these are contributing to the region's progress towards the Sustainable Development Goals (SDGs). Using the critical realist ontology, and qualitative and quantitative research methods, I conducted key informant interviews with Ghana Tourism Ministry, and Central Region local government. Surveys were collected from 27 businesses, and semi-structured face-to-face interviews were conducted with 30 tourism entrepreneurs at three major tourism destinations in the region: Cape Coast and Elmina Castles, and Kakum National Park. I found that in-migrant proprietors bring external capital and combine with existing natural and postcolonial resources to drive the tourism industry. The study sites have experienced rapid infrastructure investment in the accommodation sector, a layering mechanism. Branching innovating trajectory based on heritage tourism is one route to reaching the SDG's and promoting economic development in the region, in addition to a comprehensive tourism development policy.

4. Plant Closures in Ontario: Local economic development practitioners' interpretation and responses

John Hutchenreuther, University of Western Ontario

Industrial plant closures have become a defining feature of the economies of Western societies over the past three decades. Closures are part of wider processes of global economic restructuring, technological change and deregulation. In small to mid-sized communities which are often inappropriately homogenized in national debates about the state of economies or labour markets—plant closures have left “deep holes” in their local economies. Since 2000, Ontario has lost over 300,000 industrial jobs and roughly 500,000 across Canada. As part of a larger plant closure research in Ontario, this presentation seeks to understand the perspectives of local economic development practitioners on key questions relating to they how interpret plant closures, the kinds of regenerating needs arising from closures, and the policies being put in place to better prepare local economies for closures? About twenty local practitioners participated in-depth interviews to share their perspectives. The findings suggest a wide

array of interpretation as to why closures are happening but a considerable similarity in local communities' responses.

C4: Special Session – New and Evolving Geographies of Energy Transitions (HUTT 234)

Chair: Abhilash Kantamneni

1. Mapping Energy Futures: A Standardized Framework for Local Renewable Energy Mapping

Philip Teri, University of Guelph

A transition to renewable energy (RE) is underway, driven by a combination of market, technology, and regulatory changes. This transition is, by nature, a shift from 'below ground energy' (fossil fuels) to 'above ground energy' and will therefore re-shape the landscapes all around us; e.g., solar panels covering agricultural fields; wind turbines dotting the countryside; and biomass grown and harvested for energy markets. As we shift toward area-intensive RE resources like the sun and wind, local planners and other stewards of local land and resources will need to think carefully about how to maximize opportunities to generate RE, while minimizing negative impacts to local ecosystems and existing land-based economies. This ongoing research is aiming to develop and implement a standardized approach to mapping RE resources at the local level, accounting for changes in technology and (land-use) policy. A detailed multi-criteria analysis in a GIS combined with policy analysis and technology modelling to identify areas that are most likely to be proposed as sites for RE development.

2. Mapping Renewable Energy Opportunities for a Small Municipality: A Case Study in Canmore, AB

Jiaao Guo & Victoria Fast, University of Calgary

Utility-scale renewable energy (RE) using wind, solar, or biomass resources to generate electricity is becoming a decisive solution for many local municipalities in Canada to meet their long-term goals of carbon emission reduction. However, studies of RE-related land suitability issues do not usually reach a conceptual consensus that can carry out a standardized framework used by different jurisdictions at a local level. Accelerating Implementation of Renewable Energy (AI-RE) initiative is a standardized RE planning framework that aims to collaborate researchers, communities, stakeholders, and decision-makers at local levels across Canada. AI-RE is currently being applied to some jurisdictions in Eastern Canada. Those jurisdictions share some common characteristics including relatively large administrative areas, flat and uniform landscapes, and nearly consistent theoretical RE potentials. In this study, however, we present Canmore, Alberta as an example of AI-RE implementation in Western Canada that has distinct characteristics: a limited municipal area surrounding by Canadian Rockies with drastic spatial variations of theoretical resources. The technical mapping results of Canmore indicates that 1) the town is rich in solar and wind resources comparing to those AI-RE partner municipalities in Eastern Canada; 2) it is also accessible to plenty of biomass residues considering a drivable service area outside Canmore; 3) much of Canmore's lands are constrained by steep slopes and north-facing aspects; 4) All of the lands in Canmore are either non-permissive or semi-permissive due to the strict land-use bylaws and overlaying of provincial park boundary; 5) Canmore still have chance to meet its Climate Change Plan by 2050 if one-fourth of its semi-permissive lands can be eventually used for RE development. The most decisive step for Canmore to take in the future is to balance the growth of energy demands, land-use change, and practicable RE development thoughtfully.

3. Barriers to Access: The Experience of Energy Poverty and Extreme Heat

Samantha Doris, Western University

Energy poverty, or not having access to sufficient energy to meet one's needs, is a serious problem in Canada and around the world. While the current literature on energy poverty largely focuses on the experiences of people utilizing energy services to stay warm during cold winter temperatures, little is known about experiences of energy poverty during summertime heat. This gap is especially urgent since current climate models suggest that cities are likely to experience extreme heat conditions more frequently in the future. This research investigates how people use energy services, such as air conditioning and fans, among other strategies to keep cool during hot summer temperatures. As seniors are considered a vulnerable population to health risks associated with extreme heat, the study focused on individuals over the age of 65. The intention of this research was to examine what constraints or enabling factors help explain variations in seniors' use of energy services to keep cool. 26 semi-structured, qualitative interviews conducted in Ottawa, Ontario, explored how seniors cope with extreme heat during the summer and their ability to access the energy services they desire. This research also investigated how seniors perceive these risks and what strategies they consider to keep themselves safe and comfortable during hot summer temperatures. Preliminary findings reveal that many seniors expressed concerns about access to energy outside their homes, and that for some, choosing to use air conditioning involves a careful balance between cost, wellness, and a desire to minimize environmental impact.

4. Innovation through disaster: reducing human exposure when monitoring contamination in the energy sector.

Chandula Fernando and Matthew Adams, University of Toronto

Producing energy in modern facilities inevitably involves the careful handling of harmful environmental pollutants affecting the air, sources of drinking water and surrounding soil. It would therefore be ideal if the science of contamination monitoring, and the policies they advise, remain current and adjust with the growing technological landscape. However, most assessment protocols remain greatly outdated with many requiring humans to make physical measurements. Further, most advancement in unmanned monitoring techniques occur in response to major disasters and incidents of accidental release. This study proposes a pipeline through which innovation during disasters can convert to routine environmental assessment protocols. The key difference between disaster and routine situations is the availability of contaminant. In disaster conditions, levels of pollutants can be high and easily detected. In comparison, routine situations require vastly different search strategies, flight patterns, build designs and algorithms. Through case studies in monitoring ambient radiation, air pollution, water pollution and soil contamination, this study compares and identifies facets in disaster technology to improve routine assessment in the energy sector. In addition to quantifying the ability to identify contaminants through limits of detection and resolution, comparison focuses on exposure metrics such as "user-time per area covered". Besides improving safety and quality assurance, it is hoped that a consolidated platform of impact assessment across different facilities in the region allows for a more enriched discussion when comparing energy solutions, in planning to meet future climate and energy targets.

D4: Climate Change: Resilience and Adaptations (UC 430)

Chair: Ben Bradshaw

1. Desperate Times, Desperate Measures: Resilience against Climate Change among Business Operators in Coastal Jamaica Shenika McFarlane-Morris, Church Teachers' College

There is no doubt that climate change and its associated effects, have had some of the most devastating impacts on geographical areas such as small islands, which have made the least contribution to this global crisis. Many suggestions have been made and critiqued as to what the best response to it should be, ranging from migrating affected populations to safer locations to physically engineering islands. For the residents and business operators of the fishing villages of Alligator Pond and Treasure Beach, however, migration is not on their list of response options. Rather, and especially in the case of Alligator Pond, they are largely averse to such an idea, claiming that the sea is their main source of economic survival. With the acceleration of coastal erosion, more intense storms and hurricanes as well as sea level rise, the residents and business operators have been making notable efforts to preserve what remains of their businesses. The ongoing, qualitative study shows that the sustainability of the economic activities in these areas will largely depend on the financial and social capacities of the people and how well they are utilized in resilience efforts. There is a desperate call from particularly the seafood restaurant operators of Alligator Pond for urgent intervention from governmental entities. If these calls go unheeded for much longer, the ripple effects of the erosion of the local economies of these communities by climate change could possibly include the exacerbation of social issues with which the Jamaican society is already grappling.

2. Climatic Changes in the Mesoscale Wind Regimes in the Hudson Bay Lowlands and the Impact on the Surface Energy Balance

Olalekan Balogun, York University

We present a comprehensive and long-term regional study on the changes in the advective role of the Hudson Bay and the impact on the surface energy balance of the Hudson Bay Lowlands (HBL). Climatological variables and energy balance fluxes for ~200 grid locations over the HBL were obtained from the North American Regional Reanalysis (NARR) over a 40-year period (1979-2018). Changes in the mesoscale wind regimes were assessed by segregating the temperature and energy fluxes into onshore and offshore winds. Over the study period, the generally warm and dry offshore winds were more dominant (63% frequency) than the cold and moist onshore winds (37% frequency). Wind frequency analyses reveal a shift from positive to negative anomalies in offshore winds, demonstrating an overall increase in the frequency of onshore winds. The temperature graphs show significant warming trends over the HBL, with the offshore wind temperatures rising (0.06 °C per year) faster than the onshore winds (0.04 °C per year). The sensible heat flux (QH) was significantly greater during onshore winds than during offshore winds, while both the latent heat (QE) and ground heat fluxes (QG) were significantly higher during offshore winds. QH anomalies show positive trends of about 0.29 Wm⁻² and 0.13 Wm⁻² per year for onshore and offshore winds, respectively. On average, QE and QG increased about 0.17 Wm⁻² and 0.05 Wm⁻² per year, respectively. Given the changes in the wind regimes and their associated energy fluxes, we estimate their climatic impact on present and future warming in the HBL.

3. Agroforestry, adaptation, and the Intergovernmental Panel on Climate Change

Adam R. Martin, University of Toronto

The biophysical and social sciences strongly point to agroforestry management as a key pillar in agricultural adaptation to climate change, with decades of research indicating agroforestry management promotes food security and crop yield stability under shifting climatic conditions. However, it remains unclear if agroforestry has been integrated into global assessments of agricultural adaptation to climate change. Here, I critically evaluate how agroforestry science has been integrated into analyses and adaptation strategies published by the Intergovernmental Panel on Climate Change (IPCC). While climate change impacts on agriculture factor prominently into all IPCC reports published since 1990, agroforestry science per se remains weakly integrated in these reports and associated communications.

For example, “agroforestry” and related terms are nearly-completely absent from any of the ~20 policy summaries published by the IPCC since 1990. There is also little evidence that agroforestry has been integrated into quantitative analyses of food security under climate change within more recent IPCC reports. My analysis supports hypotheses on why the integration of agroforestry (or agroecology more broadly such as intercropping) into IPCC analyses and policy summaries remains limited. It also indicates that stronger integration of agroforestry into global climate change assessments represents a potential avenue for elevating agroforestry and other sustainable agricultural systems onto agricultural policy agendas.

4. Enhancing Ontario’s Rural Infrastructure Preparedness: Inter-Community Service Cooperation in a Changing Climate

Bryce Gunson, Brenda Murphy, Wilfred Laurier University

Rural communities experience challenges preparing for the impacts of climate change (CC) which are exacerbated by aging infrastructure built by now out-of-date assumptions, leading to increased vulnerability and difficulty handling future climate extremes. The goals of this 3-year project were to 1) assess the potential of inter-community service cooperation (ICSC) as a possible tool to address the impacts of CC in rural Ontario communities and 2) understand the extent to which such cooperation and the impacts of CC are, or could be, embedded within the community’s infrastructure (asset) management processes (AMP). Methods employed were key informant interviews with experts drawn from Canadian universities, industry, government and local communities, a provincial survey directed to Ontario public works and community emergency management coordinator staff in 163 rural communities with a population of 500-7500 south of the Sudbury region, and the completion of 10 case studies that outlined best practices and highlighted examples of ICSC for CC in rural Ontario communities. This presentation will outline some of the key results and insights from the study as well as practitioner best practices.

E4: Special Session – Extractive Geographies (UC 441)

Chair: Chloe Alexander & Jessica Lukawiecki

1. Mala Prohibita vs Mala in Se: Understanding Settler Colonialism via the Deregulation of Alberta Oil Sands and Criminalization of Indigenous Land Defenders

Chloe Alexander, University of Guelph

We problematize the differential legal treatment of corporations who cause environmental harm in the Alberta oil sands and Indigenous land defenders who protest this harm. We do this by exploring two contemporary trends in Canadian climate and Oil Sands governance. The first is the decreasing power of regulatory bodies to govern environmentally harmful activities of oil corporations. We trace the rise of carbon capture and storage as the main method for addressing greenhouse gas emissions to demonstrate how this regulatory regime narrowly defines environmental harm and has opened the door for rapid deregulation. The second trend is the increasing power of police organizations to monitor and criminalize Indigenous opposition to oil sands activity. We analyze reports from several government agencies (e.g. RCMP, CSIS, INAC) and draw on the works of other academics to reveal the ever-expanding network of surveillance aimed at Indigenous land defenders. Juxtaposing these trends, we argue, exposes the deeply colonial character of climate and oil sands governance.

2. Monitoring oil palm and land use change in Guatemala: implications for development and environmental policy

Anastasia Hervas, University of Toronto

In recent decades, oil palm has been one of the fastest expanding flex crops in Guatemala. Although it has been widely associated with deforestation, water pollution, and other environmental problems, cultivation of the crop continues to spread with minimal regulatory oversight. The absence of consistent and up-to-date land use statistics is a confounding issue that adds difficulty to oil palm research, monitoring, and impact assessment. Using the latest high-resolution imagery from Landsat 8, this project works to track oil palm cultivation in Guatemala and the historical changes in land use associated with the crop. Preliminary results illustrate divergent patterns in four parts of the country, with differing socio-economic and environmental implications.

3. How tourism as a panacea for declining access to natural resources is changing coastal livelihoods within the Marine Protected Area of Cu Lao Cham, Vietnam

Alisa Greenwood-Nguyen, University of Guelph

In many marine protected areas in Vietnam, tourism is promoted as an alternative where natural resource access is declining or restricted in conservation areas. No-take zones alter traditional access to fish stocks and makes artisanal small scale fishing more challenging. The promotion of tourism necessitates livelihood change and sometimes declining environmental conditions, and, despite the potential benefits of tourism, these benefits are not always evenly distributed and even can lead to specialization among fishers. Tourists are known to avoid overly polluted beaches and with increasing plastic pollution on the coasts of Southeast Asia, I looked at what impact plastic waste policies in marine protected areas are having on coastal livelihoods that are already being restricted. For this presentation, I will discuss a case study conducted in Bai Huong, Cu Lao Cham, Vietnam; the site of a 10 year plastic bag ban enacted specifically to promote tourism. This study included participant observation and key informant interviews with fishermen, tourists and park staff (N=45) between May and August 2019. Interviews were conducted primarily in Vietnamese, recorded, and transcribed to be coded in NVivo for analytical and descriptive codes. During this presentation, I will discuss how coastal livelihoods are mapped with the SLA framework, paying specific attention to how plastic policies effect well-being, and discuss future research possibilities.

F4: Special Session – Perception vs. Reality: Exploring Case Studies of Rural and Northern Ontario (UC 442)

Chair: Sarah Epp

1. Demystifying the Economic, Social and Environmental Barriers to Livestock Production in Northern Ontario

Sara Epp, University of Guelph

When compared to southern Ontario, northern Ontario is rarely considered an ideal location for agricultural endeavours, given the limitations of both soil quality and climate. Perceptions of the north often include an inhospitable climate, rocky landscapes and a dispersed population throughout isolated communities. These extreme perceptions generalize northern Ontario, ignoring the diversity of landscapes, communities and people. Perhaps surprising to some, there is a history of agriculture in the north, with livestock, market gardening and cash crop production making significant contributions to local economies. While opportunities within the agricultural sector are abundant, attracting new farmers is complicated by a variety of economic, social and environmental barriers. This presentation will explore the reality of these barriers, focusing on the Clay Belt region in northern Ontario, along the

Highway 11 corridor between Cochrane and Hearst. The Clay Belt region has highly productive soil and a suitable climate for agriculture; however, this study has found that the perpetuation of myths has impacted the expansion of agriculture, attraction of new farmers and retention of local youth. Distinguishing the myths from reality is a significant barrier impacting the expansion of agriculture within the Clay Belt region but is necessary for this sector to grow.

2. Power in Policy: Measuring Farmland Loss in Ontario and Testing the Strength of the Greenbelt Act

Wayne Caldwell, Rachel Singer, University of Guelph

Farmland in Ontario continues to be under immense pressure from development associated with population growth and urbanization, such as residential subdivisions, commercial developments and aggregate operations. These developments often consume large tracts of our most productive prime agricultural soils and impact the public's perception of planning tools' efficacy. This research investigates the strength of existing policy, primarily the 2005 Greenbelt Act, in preserving Southern Ontario's agriculture by measuring the rate of farmland lost to non-farm land uses from 2000–2017 using official plan amendments. This methodology has been applied across southern Ontario and the results provide an assessment on the effectiveness of existing policy in comparison with other measurement tools. This presentation will also report on associated trends within the data and present policy recommendations.

3. Aggregates and Agriculture: Understanding the Impacts of Aggregate Production on Agriculture and Identifying Mitigating Strategies

Emily Hehl, Jeff Reichheld, University of Guelph

Aggregate extraction in Ontario is an important economic stimulus for many rural communities. However, these operations can significantly alter the landscapes upon which they occur and are often considered a nuisance to adjacent land owners. Aggregate resources must be extracted from where they occur in nature, and thus frequently overlap with agricultural land or exist in close proximity to productive farmland across Southern Ontario. Given the disruptive nature of aggregate extraction, it is important to understand potential impacts on nearby farms. This research provides an understanding of the social, environmental, and economic impacts of aggregate extraction on agricultural activity. This project seeks to understand the reality of the relationship between the two industries that appear, or are perceived, to exist in conflict. Further, the land use implications and policies regulating aggregate extraction activity are explored. From this assessment, mitigative measures and promising land use planning practices are identified. This presentation will cover an informative background on the topic and provide an overview of the methodology employed to analyze the relationship between aggregate extraction and agricultural activity in Southern Ontario, as well as identify case studies. The research provides a framework to assist municipal governments in land use planning and policy application relating to the management of aggregate extraction and perceived impacts on agricultural activity.

4. Exploring children's perceptions of determinants to physical activity in a rural Northern community

Brenton Button, University of Guelph

Introduction: Children living in rural areas are not active enough. The rural research body has failed to adequately capture the contextual nuances imperative for creating successful interventions. The purpose of this study was to explore rural children's perspectives on physical activity (PA) and discuss any barriers or facilitators to participating in PA. Methods: Children (n=84) in grades 4-8, in rural Northwestern Ontario agreed to participate in focus groups. Twenty focus groups were held over three

months and analyzed using thematic analysis. These methods allowed researchers to stay close to the data by creating sub-themes based on the explicit content of the data and subsequently grouping these to form broader themes. Results: Three themes were identified: environment, social environment, and perceptions of fear. Environmental features that were discussed includes weather and the built environment (e.g., splash pads and indoor facilities). Social environment includes the role of friends and adults to either facilitate or restrain children's play. Finally, the fear of wildlife was pervasive across the focus groups and resulted in restricted independent mobility. Conclusion: PA levels of Canadian children are consistently low and continue to be a significant health concern. Rural children are continually under-researched, and in this study, rural children had similar and distinct concerns when compared to the research body. These findings suggest that researchers can potentially use results from the literature as a starting point but need to understand contextual nuances on the rural environment.

G4: Special Session – Digital Geographies (PCH UC001B)

Chair: Eric Nost

1. Intersectional Feminist Geographies of Instagram: Visuality, Viscerality, Digitality

Alex Perna, Brock University

The discipline of feminist geographies is in the midst of a 'digital turn' (Ash, Kitchin & Leszczynski 2018). Social media sites are rich, complex sites for geographic exploration of the body (Del Casino Jr. & Brooks 2015), though not all have occupied equal 'weight' in the discussion. Instagram has yet to be studied as an emergent digital geographic space, orienting a shift in representations and discourses of fatness. The special sessions paper will discuss my exploratory thesis work to consider the ways that Instagram is facilitating intersectional representations of fatness, influencing counter-discourses of beauty, health, desirability, and worth. By providing examples from fat activist Instagram accounts, shifting visual ontologies of fat subjects can be documented and conceptualized. While fatness has been initially explored (Colls & Evans 2009; Longhurst 2005, 2012), feminist digital geographers have yet to contribute unique insight to consider the socio-spatial complexity of virtual representations of fat bodies. Incorporating the voices, bodies and stories of fat people into feminist digital geographies will help to contest practices of pathologization and dehumanization, both online and offline.

2. Place and city: finding the bridge between individuals' perceptions and spatial features in the notion of place

Albert Acedo, University of Waterloo

The relationship between an individual, space, and place has been studied intensely over the last forty years. Fortunately, the surge of Information and Communication Technology (ICT) research and tools, allows new ways to study this triple connection. This paper is an exploratory study that attempts on the comparison of the human attitude towards places (i.e., sense of place) and the spatial characteristics of the targeted geographical area to understand their spatial relationship towards the notion of place. Using spatial data collected through a WebGIS survey, we performed an exhaustive examination and comparison between humans' attachment towards places and the relevant spatial features within those places. We found that the characteristics of the human-place connection are related to the nature and character of the geographical area that embraces the relationship. This research offers a new approach for place studies, comparing two different characteristics of a given place (1) individuals' perceptions and identities, and (2) the material shape of spaces and objects location.

3. Worth the wait and hype? Gentrification, anxiety, and the hipster geographies of boutique ice cream

Bryan Mark, York University

Tracing urban cultural change within the Lower Ossington neighbourhood located in downtown Toronto, this thesis examines the micro-level spatial practices of ice cream retail and its relationship to the urban geographies of gentrification. Interrogating the subjectivities and experiences of an independent merchant, its customers, and workers, this case study unravels the entanglements between processes of foodie gentrification, anxieties of cultural consumption, and consumptive landscapes of social media shaping socio-spatial dimensions of hipster culture. In addition to retail-based ethnography and semi-structured interviewing, I methodologically deploy a netnography of 100 Instagram images to scrutinize the cultural role of social media users acting as ‘visual investors’ in both the private and public image of retail gentrification. The social pervasiveness and visual persuasiveness of Instagram food images stoke aesthetic tastes, advocate the conspicuous cultural consumption of gentrification, and help drive the production of retail lineups. The persistence of the externalized consumer lineup spilling out onto the public space of Ossington Avenue normalizes middle-class entitlement over urban neighbourhoods, civilizes the behaviour of the street with a moral geography of politeness, and antagonizes the social relations between independent merchants of retail gentrification. Reflecting the hype and worthiness of ice cream commerce, the enigmatic rise of urban lineup culture is a spatial articulation of hipster capitalism, shaping ideals of the urban good life around exclusive middle class taste-driven processes of retail gentrification.

4. Sharks on Twitter: The entanglement of ocean conservation, animal tracking and social media

Roberta Hawkins, Jennifer Silver, University of Guelph

Miss Costa is a female white shark with thousands of fans. In 2016, she was captured, tagged and released off of Nantucket, Massachusetts by a non-profit organization called OCEARCH. She was named after Costa sunglasses, one of OCEARCH’s corporate sponsors, and given a Twitter account. The account, @MissCostaShark, now has over 20,000 followers and tweets regularly. Tweets often show Miss Costa’s recent location(s) on screenshot maps, information that is available because OCEARCH fitted her with acoustic, accelerometer, and ‘smart position and temperature’ (SPOT) tags that constantly gather and report data about her. In this presentation we ‘follow’ Miss Costa to outline the complicated entanglements of nature, technology, business and science in which she is situated. We examine three controversial moments in Miss Costa’s material and virtual existence that are illustrative of the digital natures that are constructed by ‘disruptors’ like OCEARCH. We conclude that geographers can learn an awful lot from a tweeting shark!